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Development Instrument Test Basketball Chest Pass Skills for 11-13 Year Olds

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Abstract
Study this aims to create a test prototype of skills technique basic passing in basketball chest pass movements for elementary school students aged 11-13 years which is valid and accurate based on indicator skills technique basic basketball chest pass movement. Method used development qualitative, and quantitative with the Brog and Gall development model with ten stages. Subject in study this is SDN 3 Lemba Regency Soppeng in research here, students class on aged 11-13 years. Chosen with use technique cluster. With the SPSS Version 29 program, the data was analyzed using the normality test and homogeneity test. Research results obtained in the scale test big expert material is lecturer test measurement sport by 80%, media experts tested by experts computer by 84%, and practitioner test coach licensed with 90% yield. With results more of than 80% in three initial test stages, test scale small and arrived scale test stage big so can conclude study development is a product new in test measurement sports basketball in the particular technique of basic passing in the chest pass movement for children aged 11-13 years, based on results the state that proto type test development this can be used and developed with good effectiveness and efficiency.

Keywords: Basketball Chest Pass, Instrument Test, Skills, Aged 11-13 Years

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1. Introduction

Development knowledge and technology in basketball games already experience very rapid progress, good in education likewise with knowledge coaching price sports. So development and preparation test basketball also continue to continuously develop with covers level ability increasing the number of basketball players well, evolving regulations, as well knowledge knowledge, and technology that accompanies it (Ani & Aryanto, n.d.). The Skills technique in basketball games must trained and evaluated so that trainers or teachers can know where shortcomings and weaknesses technique. The Basketball is one of the game one of the big ball sports and mandatory material is given at the level of unit education because sports this not only sports performance but also Sports Education (Sabransyah, 2020). A number of Skills and technique basics on the game of basketball that must be mastered by students are among them like technique passing, dribbling, shooting, and pivoting (Muharam et al., 2021). In line with (Rahmadani et al., 2021) there are 3 techniques mandatory basis mastered including passing (throwing and catching the ball), dribbling (rebounding), and shooting (shooting). During the game taking place third technique base this is very necessary in the printing process a number or points. For a master, technique base it's not something easily done, but Regular exercise is required to increase ability Skills. Technique-based basketball games on passing consist of 3 forms Chest Pass (chest pass), Bounce Pass (bottom pass), and Over Head (top pass). Chest pass more known in other words chest surgery is a frequent pass used in basketball games being played for move the ball from a player to player other. In other words chest pass is one of method fastest and most effective for attacking the next team determining the opportunity tobacco for scoring points (numbers). Besides that players can control the ball from trying to opponent seize (Ahmad & Prasetyo, 2013). In line with (Agung Nugroho & Fajar Mugo Raharjo, 2020) the chest pass is one of the basic techniques in a very important basketball game because with a good chest pass, then we can control the way game. However, often in the field moment match player, no do chest pass with Good so that can harm the team alone. (Darmawan et al., 2016). On learning basketball passing at school, no a little student do movement not enough perfect, scared of injury if do movement throwing and receiving the ball when making a basketball pass (Yosi et al., n.d.). Lots of mistakes are carried out during implementation Chest pass is the ball that is passed missed so that no appropriate target because no leads chest recipient, due to the ball being passed height or understated and sometimes too far left and right so that the ball is not accepted either by the recipient. As for the method do a chest pass, namely (1) position the legs parallel with your shoulders, (2) place the ball in front of your chest with your elbows open, (3) release the ball straight forward, (4) When the ball is released from hand followed by forward leg movements forward. One of the lack of tests and measurements in the game of basketball, namely the tools used is still manual so use time takes a long time and is less flexible and the data produced can say no objective. Circumstances can happen because the data obtained can manipulated. The chest pass test will be developed researcher seen drawn so that need exists innovation with the development of a chest pass test instrument in basketball games. Study this aim is to float the chest pass instrument in a basketball game with the hope will give an alternative to doing chest pass test in basketball games with the resulting data being more objective and valid.

2. Methods

The Borg and Gall model is the model used for research and development in context education. This model was developed by Meredith D. Gall and Walter R. Borg in 1983.

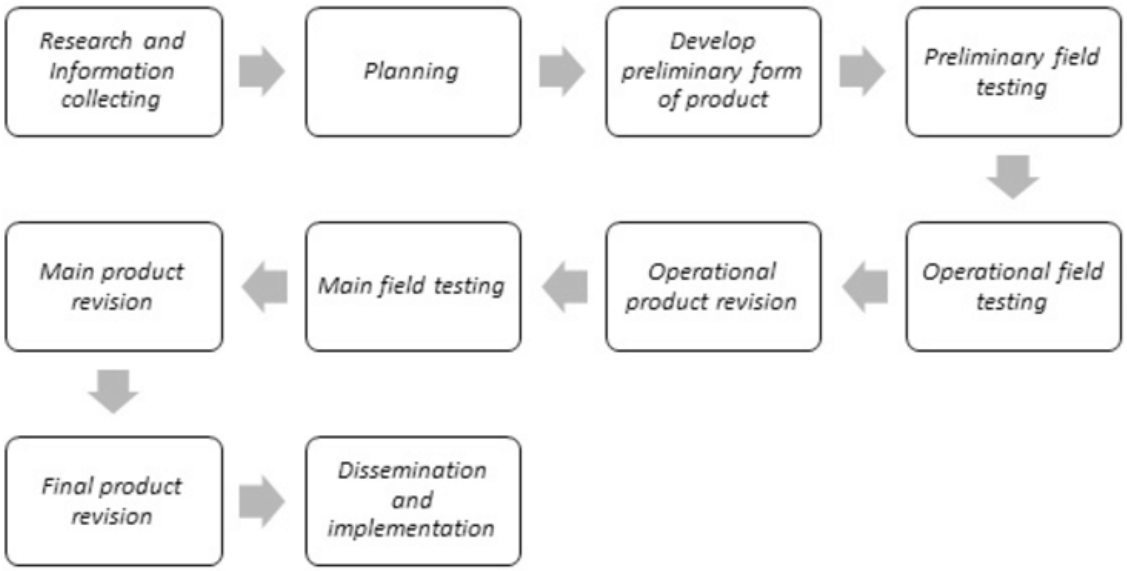


Figure 1: Borg & Gall Development Model

The Borg and Gall model consists of 10 interconnected stages linked and integrated in the process of developing learning programs. Following is explanation about 10 stages in the Borg and Gall Model:

1. Analysis need: Stage this aim for identify necessary needs and problems overcome in development of learning programs.
2. Goals and objectives learning: Stage this focuses on determination specific, measurable, and related goals and objectives with need learning.
3. Study introduction: Stage this covers collection information about context learning, participants education, and materials relevant learning for support development of learning programs.
4. Planning Instructional: Stage this focusing on design proper instruction for reach goals and objectives learning that has been done set.
5. Development and validation material learning: Stage this covers development, testing, and validation material learning for ensure that material the in accordance with goals and objectives learning.
6. Development and validation assessment: Stage this covers development and validation of assessment instruments for measure achievement goals and objectives learning.
7. Development and validation of learning media: Stage this covers development and validation of appropriate learning media with goals and objectives learning.
8. Implementation: Stage this covers implementation of existing learning programs developed with notice context and characteristics participant educate.
9. Evaluation formative: Stage this covers evaluation carried out in a way periodically during implementation of learning programs for ensure that program - walk with good and accomplished goals and objectives learning.

10. Evaluation summative: Stage this covers evaluation carried out after implementation of learning programs for evaluate effectiveness of learning programs and identify strengths and weaknesses of the program.

3. Subject Study

Subject study this classified in two parts that is first, Material Expert, Media Experts, and Practitioners. The second group that is test subjects on which trials are carried out on scale small and trial scale big.

Data Collection Technique

3.1 Data Type

Techniques in research this uses qualitative data analysis narrative/sentence, while quantitative data form numbers. Data was obtained from the results of interviews with physical education teachers, and quantitative data was obtained from evaluation experts.

3.2 Instrument Data Collection

a. Questionnaire validation expert material the questionnaire here uses a theory scale Likert together with five choices, including the First: Very Good (SB), Good (B), Fairly Good (CB), Poor (K), and Very Poor (SK).
b. Questionnaire Media Expert Validation together with validation before, in evaluation, this uses the scale Likert with five choices including the First: Very Good (SB), Good (B), Fairly Good (CB), Poor (K), and Very Poor (SK).
c. Questionnaire Small Scale Trial Assessment as evaluation appropriateness from the researched product. Questionnaire this uses a scale Likert with five alternative options, namely Very Good (SB), Good (B), Fairly Good (CB), Poor (K), and Very Poor (SK).
d. Questionnaire Large-Scale Trial Assessment for the questionnaire trial assessment scale is big his assessment is the same as the trial questionnaire -the scale is small.
e. In research this is the technique used in data collection by giving a questionnaire to Material Expert. Media Expert and Practitioner then the product was tested try it on a group small and a group big.

3.3 Data Analysis

Data analysis in research this uses analytical techniques quantitative and qualitative (Sugiyono, 2010) in nature evaluation uses numbers with formula calculation appropriateness as follows. Analysis Appropriateness Product Product results development can be considered worthy if already passed a small and large test process and then calculated with achievements score standard minimum eligibility. Score results changed with mark percentage use the formula: $Penilaian = Skor\ yang\ diperole\ h / Skor\ maksimal\ x\ 100$. After the changed become mark percentage, p next is converted with using assessment norms that refer to assessment reference benchmark (PAP) with form range score as follows:

Table 1: PAP Score Range

No	Value Score Range	information
1	80% - 100%	Very good
2	70% - 79%	Good
3	60% - 69%	Enough Good
4	50% - 59%	Not good
5	40 – 49%	Very less Good

Whereas to test effectiveness using the t-test using SPSS. Data results from SPSS are then explained in the form of qualitative data that shows the appropriateness product.

4. Results

Research Result

Study this was held with the objective of giving a solution in the implementation test, Chest pass skills in basketball. Stages First tools developed given the name “Basketball Test Chest Pass”. Validation chest pass expert in basketball Validation results in expert material as follows.

Percentage = amount / value maximum
=40/50X100%
=80%

According to the results calculation validation, the percentage obtained was 80% with thereby can stated that according to expert material enters in “worthy” category.

Validation Media Expert
Results of media validation at stage First is as following.

Percentage = amount / value maximum
=42/50X100 %
=84 %

According to results calculation validation media experts, the percentage obtained was 84%. Thereby can stated that according to expert lecturer tests and measurements, in the “worthy” category.

Validation Practitioner
Validation results Practitioner at stage First as following.

Percentage = amount / value maximum
=45/50X100 %
=90 %

According to the results calculation validation practitioners, the percentage obtained is 90%. Thereby can stated that according to expert lecturer tests and measurements, in the “very good “category.

Product Trial

Small Scale Trials

Based on the trials scale small student grades 4. 5 and 6 of SD Negeri 3 Lemba. I got its test results scale small by 80%. Based on the results, the development tool tests and measurements of chest passes in basketball games category “Very Good”. Large Scale Trials Large-scale trials were done to class A and B students in Classes 4, 5 and totaling 60 students at SD Negeri 3 Lemba. Based on test results the obtained results by 90%. Thus the prototype of the tool developed is very good and worth used as a test instrument for chest pass measurement in basketball.

5. Conclusions

Study development is done through stages that begin with seeing the problem, collecting information, designing a product, do validation. Do revision products, conduct trials, and create product end. Stages validation expert done with two stages. Stages First made basis by researchers for revising lack shortcomings that exist in the tools developed.

In stages validation, Chest pass expert in volleyball suggested that a tool be developed customized with conditions in the field. Validation the made as base for the perfect medium tool developed.

Research results were obtained from expert material which is lecturer test measurement sport by 80%, media experts tested by experts computer by 84%, and practitioner test coach licensed with 90% yield. With results more of than 80% in the three initial test stages, scale test small and scale test stage big so can conclude study development is a product new in test measurement sports basketball in the particular technique of basic passing in the chest pass movement for children aged 11-13 years.

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Examining Student-Perceived Attributes in Rating Professors: A Course Evaluation Approach

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Abstract
All higher institutions are concerned about delivering quality education for all students. Every university must develop an evaluation system to improve teacher effectiveness in building successful educational learning. One of the most influential teachers' teaching effectiveness criteria is student evaluation, which has been applied in most schools. Several studies have been found on the factors affecting teachers' effectiveness that correlate to personality, experience, and digital skills. This research examines the validity of teacher effectiveness using the evaluation results data of college students in a Sino-American joint University and explore some relevant factors affecting teacher rating. Furthermore, this paper specifically looked into the criteria for how students rated their professors. The study utilized random sampling with at least 300 students of Wenzhou-Kean University were selected as the participants in this research and supplemented with an interview schedule for both students and professors from different departments. Theoretically, a Triangulation method was also applied to understand the phenomena better. This research mainly used a mixed approach and correlational research design using survey questionnaires regarding teachers' personalities, grade distribution, and factors affecting teacher ratings. The researchers analyzed the collected data qualitatively and quantitatively using descriptive and inferential statistics. Specifically, a thematic approach applied to qualitative data due to its flexibility. The results proved that the grade is the most closely correlated with course clarity, interest, practicability and personality. A considerable gap exists between male and female students in course clarity. Teachers with intuitive personalities enjoy the most incredible popularity among the students, followed by teachers with thinking personality. The study is significant to educators, students, and university administrators as a basis for reevaluating the tools for gauging teachers' effectiveness.

Keywords: Course Evaluation. Teaching, Student’s Perspectives

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Introduction

All higher institutions are concerned about delivering quality education for all students.This concern underscores the imperative for universities to devise robust mechanisms that not only gauge the quality of education imparted by their faculty but also ensure its continual enhancement. As Ellis et al. (2021) state, assessing the quality and efficacy of course delivery constitutes a fundamental undertaking within the purview of all educational entities.[1] Such evaluations are pivotal in fostering the enhancement of pedagogical practices and the refinement of curricular material. Amidst a plethora of criteria for evaluating teaching effectiveness, student evaluations have gained considerable traction for their direct reflection of the educational experience. Such evaluations are instrumental in offering insights into the multifaceted dimensions of teaching that contribute to effective learning outcomes. Numerous investigations have elucidated the variables influencing educators' efficacy, establishing correlations with characteristics such as personality, experience, and proficiency in digital skills across a variety of academic disciplines (Centoni & Maruotti, 2021; Constantinou & Wijnen-Meijer, 2022; Reverter et al., 2020).[2]

Recognizing the complex interplay of factors influencing teacher effectiveness, this research extends beyond the conventional paradigms to explore the underlying elements that shape student perceptions and, consequently, evaluations of teaching performance. So much so that this research examines the validity of teacher effectiveness using the evaluation results data of college students in a joint Sino-American university, Wenzhou-Kean University (WKU), and explores some relevant factors affecting teacher rating. This inquiry leverages a mixed-methods approach, employing both quantitative and qualitative analyses to scrutinize the validity of using student evaluations as a barometer for teaching effectiveness. Through a methodical examination involving random sampling of 110 students in WKU complemented by interviews with faculty and students across various departments, the study seeks to unearth the criteria influencing student ratings of their professors. Furthermore, this study employs the triangulation method to enhance the understanding of the phenomena under investigation, thereby contributing to a more nuanced comprehension of how personality traits, experience, digital proficiency, and pedagogical strategies impact teacher evaluations.

Through the elucidation of the intricate relationships among course clarity, engagement, practical applicability, instructor personality traits, and student academic performance, this investigation seeks to furnish critical perspectives for educators, administrative leaders, and policy formulators. The objective is to enhance the mechanisms utilized for appraising pedagogical efficacy in the higher education sector. By dissecting these correlations, this research aims to contribute substantively to the ongoing discourse on pedagogical assessment, offering evidence-based recommendations that could inform the development of more nuanced and effective evaluation frameworks. This endeavor not only underscores the multifaceted nature of teaching effectiveness but also highlights the potential for such evaluative insights to drive educational innovation, improve instructional quality, and, ultimately, optimize student learning outcomes. This study is guided by the following questions:

[1] Heidi J. Ellis et al., *SIGITE '21: Proceedings of the 22nd Annual Conference on Information Technology Education.*

[2] Centoni Marco and Maruotti Antonello; Constantinou Constantina and Wijnen-Meijer Marjo; Reverter and Antonio et al., *Unravelling student evaluations of courses and teachers.*

Research Questions

1. What are student evaluation on teacher effectiveness regarding course clarity, interest, and practicability?
2. Do the following factors influence the student's evaluation of the teacher effectiveness?
    a. effectiveness
    b. expected grade
    c. gender
    d. nationality
    e. personality
    f. relationship
    g. accent
    h. cumbersome assignment
3. What's the rank of the popularity of teachers' personality in students' perspectives?
4. Is there any correlation between course clarity and gender?
5. Is there any relationship between teacher's personality, student's interest in teacher's content and grade respectively?

Methodology

Research Design

This study addresses students' evaluation of teacher effectiveness. The study adopts a mixed-method approach to answer the research problem. A mixed-method questionnaire has been utilized; qualitative and quantitative questions were investigated as forms of inquiry (Creswell & Plano Clark, 2011).[3] This approach aims to understand the data at a more detailed level by using qualitative follow-up data to help explain a quantitative database. We designed the present study to explore students' responses regarding different attributes they use to evaluate their professors. The aim of this mixed-method study was to investigate students' perspectives on professor evaluations, with the goal of enhancing teaching effectiveness.

Research Instrument

The study adopts two validated survey questionnaires taken from the studies of Mark Shevlin, Philip Banyard, Mark Davies, and Mark Griffiths (2010),[4] and Al-Issa, A., & Sulieman, H. (2007).[5] The survey questionnaires were tied to the research questions being addressed in the study. This study collects data through an online survey questionnaire among 200 respondents from Wenzhou Kean University using convenience sampling. Data were collected by means of a questionnaire containing closed-ended questions presented in Likert-scaled items and multiple-choice formats. All information used in this analysis was derived from questionnaire data.

Data Analysis

Statistics play an important role in answering the research questions to measure the association of variables (Kumar, 2019).[6] The study specifically utilized a Convergent Mixed-Method Approach; two databases were merged using a side-by-side approach for data analysis. The

[3] John W Creswell and Vicki L Plano Clark, *Designing and Conducting Mixed Methods Research* (Thousand Oaks Sage Publications, 2011)
[4] Mark Shevlin et al., *The Validity of Student Evaluation of Teaching in Higher Education: Love me, love my lectures?*
[5] Ahmad Al-Issa and Hana Sulieman, *Student evaluations of teaching: perceptions and biasing factors.*
[6] Ranjit Kumar, *Research Methodology A Step-by-Step Guide for Beginners*

quantitative data were presented in table form, followed by qualitative findings using thematic analysis and narrative analysis. Interpretations of the results were included in the discussion section. SPSS software has been used for quantitative data analysis using Pearson-r correlation. This approach allows researchers to derive accurate results for better interpretation.

Problems and Limitations of the Study

The study's limited sample size of 200 respondents from the total population may limit its representativeness. This small sample size can also impact the correlational interpretations of the study. Convenience sampling was employed for respondent selection, which is not ideal as it may introduce bias; however, due to constraints in time and resources, random sampling was not feasible. Additionally, certain questions in the survey raised concerns regarding validity and reliability.

Ethical Considerations

The researchers strictly followed ethical procedures in this research activity. Respondents of the study were informed of the purpose of the study and sought voluntary participation. They were also informed that the data they shared were private and confidential, protecting individual confidentiality and the anonymity of the information. The researchers strictly followed ethical procedures in this research activity. Prior to participating in the study, respondents were provided with detailed information about the purpose, objectives, and procedures of the research. This included a clear explanation of how their data would be collected, stored, and used. Respondents were assured that their participation was voluntary, and they had the right to withdraw from the study at any time without consequences.

Furthermore, participants were informed about the confidentiality measures in place to protect their data.

Results and Discussions

Participants

A total of 110 Chinese undergraduate students at Wenzhou-Kean University, thirty males (27.27%) and eighty females (72.73%) were recruited into this study. Among these participants, there were 20 freshmen (18.18%), 34 sophomores (30.91%), 31 juniors (28.18%), and 25 seniors (22.73%). They stemmed from different colleges, forty-three (39.09%) participants came from the College of Business & Public Management (CBPM), forty-six (41.82%) samples studied in the College of Liberal Arts (CLA), six (5.45%) students were from the College of Architecture & Design (CAD), and fifteen (13.64%) students came from the College of Science and Technology (CST). They studied differentiated majors in Accounting (19, 17.27%), Finance (16, 14.55%), Economics (3, 2.73%), Management (2, 1.82%), Global Business (2, 1.82%), Marketing (1, 0.91%), English (23, 20.91%), Psychology (13, 11.82%), Communication (10, 9.09%), Design (4, 3.64%), Architecture (2, 1.82%), Computer Science (9, 8.18%), Mathematical Science (2, 1.82%), Biology (2, 1.82%), Environmental Science (1, 0.91%) and Chemistry (1, 0.91%). Table 1 shows the demographic information.

Table 1. Socio-demographic characteristics of the respondents

Measures	Sub-group	Frequency	Percentage (%)
Gender	Male	30	27.27
	Female	80	72.73
Grade	Freshman	20	18.18
	Sophomore	34	30.91
	Junior	31	28.18
	Senior	25	22.73
College	College of Business & Public Management	43	39.09
	College of Liberal Arts	46	41.82
	College of Architecture & Design	6	5.45
	College of Science and Technology	15	13.64
Major	Accounting	19	17.27
	Finance	16	14.55
	Economics	3	2.73
	Management	2	1.82
	Global Business	2	1.82
	Marketing	1	0.91
	English	23	20.91
	Psychology	13	11.82
	Communication	10	9.09
	Design	4	3.64
	Architecture	2	1.82
	Computer Science	9	8.18
	Mathematical Science	2	1.82
	Biology	2	1.82
	Environmental Science	1	0.91
	Chemistry	1	0.91

Data Analysis and Result

To assure the reliability of measures, a reliability test is conducted for each dimension of the questionnaire about the teacher's effectiveness evaluation, including course clarity, students' interest in the teacher's content, course practicability, teacher's personality, and students' attitudes toward student evaluation. The results of the reliability test are listed in Table 2.

All of the five main measures in the questionnaire exhibit strong reliability, as shown in Table 2, with Cronbach's Alpha values ranging from .85 to .87, which provide a basis for further data analysis.

Table 2. Descriptive and Reliability Statistics

Scales	Cronbach's Alpha	N of Items	Mean	SD
Course Clarity	0.87	3	3.93	0.77
Interest	0.87	4	3.99	0.67
Practicability	0.85	3	3.95	0.71
Personality	0.87	3	4.04	0.82
Attitude	0.86	8	3.86	0.66

Interest = Students' interest in the teacher's content; Practicability = Course practicability; Personality = Teacher's personality; Attitude = Students' attitude towards student evaluation.

In the beginning, Bivariate Pearson's correlations are conducted to examine the relationship between all variables in this study, including course clarity, students' interest in the teacher's content, course practicability, teacher's personality, and students' attitude towards student evaluation.

Results in Table 3 show that all main variables are significantly positively correlated with each other. Specifically, course clarity is positively correlated with students' interest in the teacher's content, $r(108) = .69$, $p < .001$, course practicability, $r(108) = .67$, $p < .001$, teacher's personality, $r(108) = .61$, $p < .001$, and students' attitude towards student evaluation, $r(108) = 50$, $p < .001$. Furthermore, students' interest in the teacher's content is favorably associated with course practicability, $r(108) = .76$, $p < .001$, teacher's personality, $r(108) = .71$, $p < .001$, and students' attitude towards student evaluation, $r(108) = 61$, $p < .001$. Moreover, course practicability is positively related to teacher's personality, $r(108) = .74$, $p < .001$, and students' attitude towards student evaluation, $r(108) = .62$, $p < .001$. Lastly, teacher's personality is found to be positively related to students' attitude towards student evaluation, $r(108) = .56$, $p < .001$.

Table 3. Pearson's Correlations Among the Study Variables

N=110	Course Clarity	Interest	Practicability	Personality	Attitude
Course Clarity	-				
Interest	.69***	-			
Practicability	.67***	.76***	-		
Personality	.61***	.71***	.74***	-	
Attitude	.50***	.61***	.62***	.56***	-

Note. *p < .05; ** p < .01; *** p < .001

Interest = Students' interest in the teacher's content; Practicability = Course practicability; Personality = Teacher's personality; Attitude = Students' attitude towards student evaluation.

In the second part, the results of Spearman's correlations between ordinal demographic variables and study variables are demonstrated in Table 4. All demographic variables did not have significant correlations with the main study variables ($p > .05$) except grade. Table 4 exhibits grade is positively correlated to course clarity, $r(108) = .21$, $p < .05$, students' interest in the teacher's content, $r(108) = .37$, $p < .001$, course practicability, $r(108) = .27$, $p < .001$, teacher's personality, $r(108) = .33$, $p < .001$, and students' attitudes towards student evaluation, $r(108) = .19$ $p < .05$. These results indicate that participants from higher grade are more likely to evaluate higher scores on teacher's effectiveness. This finding contradicts to Lawson's finding that there was no correlation between class grade and teacher grade (Lawson, 2005). [7]

[7] Luther D. Lawson, *The Correlation between Teaching Attributes and the Instructor's Rating.*

Table 4. Spearman's Correlation between All Categorical Demographic Variables and Study Variables

N=110	Course Clarity	Interest	Practicability	Personality	Attitude
Gender	.16	.03	.09	.01	.07
Grade	.21*	.37***	.27***	.33***	.19*
College	-.12	-.13	-.19	-.04	.06
Major	-.08	-.08	-.13	-.01	.05

Note. *p < .05; ** p < .01; *** p < .001
Interest = Students' interest in the teacher's content; Practicability = Course practicability; Personality = Teacher's personality; Attitude = Students' attitude towards student evaluation.

Table 5. Independent T-test (Gender)

	Group	Mean	SD	t	p
Course Clarity	Male	3.60	1.01	-2.85**	.005
	Female	4.05	0.61		
Interest	Male	3.88	0.80	-1.12	.266
	Female	4.03	0.61		
Practicability	Male	3.78	0.83	-1.62	.108
	Female	4.02	0.65		
Personality	Male	3.90	1.05	-1.07	.288
	Female	4.09	0.72		
Attitude	Male	3.68	0.87	-1.72	.087
	Female	3.92	0.56		
Factor	Male	2.09	1.11	-0.64	.524
	Female	2.23	1.02		

Independent T-tests are conducted to compare binary sociocultural groups including male and female. The T-tests will test the influence of gender on students' evaluation of teachers' effectiveness. Table 5 shows females (M = 4.05, SD = 0.61) have a significantly higher appraisal of teachers' course clarity compared to males (M = 3.60, SD = 1.01), $t(108) = -2.85$, $p = .005$, while others have no difference between males and females ($p > .05$). Figure 1 shows the description of males and females on course clarity. According to the research (Csank & Conway, 2004), women tend to have higher standards of clarity in terms of evaluation, which corresponded to the current result.[8]

Note. Male (N=30); Female (N=80); *p < .05; ** p < .01; *** p < .001
Interest = Students' interest in the teacher's content; Practicability = Course practicability; Personality = Teacher's personality; Attitude = Students' attitude towards student evaluation.

[8] Csank Patricia A. R.and Conway Michael, *Engaging in self-reflection changes self-concept clarity: On differences between women and men, and low- and high-clarity individuals*.



Figure 1. Course Clarity Comparison between Male and Female

To further investigate differences in key variables across different grades and colleges, ANOVA analysis has been conducted and the detailed results are shown in Table 6 and Table 7.

Table 6 shows that there is no significant difference in students' attitudes towards student evaluation across different grades ($p > .05$). However, a one-way ANOVA revealed there is a significant difference in course clarity across different grades, $F(3, 106) = 2.79$, $p < .05$. The effect size eta squared (η^2), was 0.07, indicating a medium effect. Tukey's HSD post hoc test showed juniors ($M = 4.06$, $SD = 0.61$) scored significantly higher than freshmen ($M = 3.50$, $SD = 1.00$) ($p < 0.05$).

A one-way ANOVA also reported the effect of grade on students' interest in the teacher's content, $F(3, 106) = 5.00$, $p < 0.01$. The effect size, eta squared (η^2), was 0.12, indicating a medium effect. Tukey's HSD post hoc test showed seniors ($M = 4.34$, $SD = 0.43$) scored significantly higher than both freshmen ($M = 3.64$, $SD = 0.78$) ($p < 0.01$) and sophomores ($M = 3.89$, $SD = 0.63$) ($p < 0.05$).

A one-way ANOVA also reported the effect of grades on students' interest in the teacher's content, $F(3, 106) = 5.00$, $p < 0.01$. The effect size, eta squared (η^2), was 0.12, indicating a medium effect. Tukey's HSD post hoc test showed seniors ($M = 4.34$, $SD = 0.43$) scored significantly higher than both freshmen ($M = 3.64$, $SD = 0.78$) and sophomores ($M = 3.89$, $SD = 0.63$) ($p < 0.001$).

Furthermore, a one-way ANOVA also reported the effect of grades on course practicality, $F(3, 106) = 4.21$, $p < 0.01$. The effect size, eta squared (η^2), was 0.11, indicating a medium effect. Tukey's HSD post hoc test showed seniors ($M = 4.25$, $SD = 0.43$) scored significantly higher than freshmen ($M = 3.55$, $SD = 0.95$) ($p < 0.01$).

In addition, a one-way ANOVA also reported the effect of grades on teacher's personality, $F(3, 106) = 6.89$, $p < 0.001$. The effect size, eta squared (η^2), was 0.16, indicating a large effect. Tukey's HSD post hoc test showed freshmen ($M = 3.40$, $SD = 1.15$) scored significantly lower

than sophomores (M = 4.00, SD = 0.63) ($p < 0.05$), juniors (M = 4.22, SD = 0.75) ($p < 0.01$) and seniors (M = 4.37, SD = 0.53) ($p < 0.001$). Figure 2, 3, 4 and 5 described the significant difference in variables across difference grades. The highlighted bars show the significant comparisons. For Chinese students, professors with intuitive traits tend to enjoy greater popularity among students.

Table 6. One-Way ANOVA Analysis of Multiple Dimensions across Different Grades

	Group	Mean	SD	Mean Differences (I-J)		*F*	*p*
Course Clarity	Freshman	3.50	1.00	Sophomore	-.47	2.79*	.044
				Junior	-.56*		
				Senior	-.55		
	Sophomore	3.97	0.61	Freshman	.47		
				Junior	-.09		
				Senior	-.08		
	Junior	4.06	0.61	Freshman	.56*		
				Sophomore	.09		
				Senior	.01		
	Senior	4.05	0.85	Freshman	.55		
				Sophomore	.08		
				Junior	-.01		
Interest	Freshman	3.64	0.78	Sophomore	-.25	5.00**	.003
				Junior	-.41		
				Senior	-.70**		
	Sophomore	3.89	0.63	Freshman	.25		
				Junior	-.16		
				Senior	-.45*		
	Junior	4.05	0.67	Freshman	.41		
				Sophomore	.16		
				Senior	-.29		
	Senior	4.34	0.43	Freshman	.70**		
				Sophomore	.45*		
				Junior	.29		
Practicability	Freshman	3.55	0.95	Sophomore	-.35	4.21**	.007
				Junior	-.48		
				Senior	-.70**		
	Sophomore	3.90	0.60	Freshman	.35		
				Junior	-.13		
				Senior	-.35		
	Junior	4.03	0.71	Freshman	.48		
				Sophomore	.13		
				Senior	-.22		
	Senior	4.25	0.43	Freshman	.70**		
				Sophomore	.35		
				Junior	.22		
				Sophomore	-.60*		

Personality	Freshman	3.40	1.15	Junior	-.82**		
				Senior	-.97***		
	Sophomore	4.00	0.63	Freshman	.60*		
				Junior	-.22		
				Senior	-.37	6.89***	<.001
	Junior	4.22	0.75	Freshman	.82**		
				Sophomore	.22		
				Senior	-.16		
	Senior	4.37	0.53	Freshman	.97**		
				Sophomore	.37		
				Junior	.16		
Attitude	Freshman	3.54	0.85	Sophomore	-.33		
				Junior	-.35		
				Senior	-.49		
	Sophomore	3.88	0.49	Freshman	.33		
				Junior	-.01		
				Senior	-.15		
	Junior	3.89	0.65	Freshman	.35	2.16	.097
				Sophomore	.01		
				Senior	-.14		
	Senior	4.03	0.67	Freshman	.49		
				Sophomore	.15		
				Junior	.14		

Note. *p < .05; ** p < .01; *** p < .001
Interest = Students' interest in the teacher's content; Practicability = Course practicability; Personality = Teacher's personality; Attitude = Students' attitude towards student evaluation.

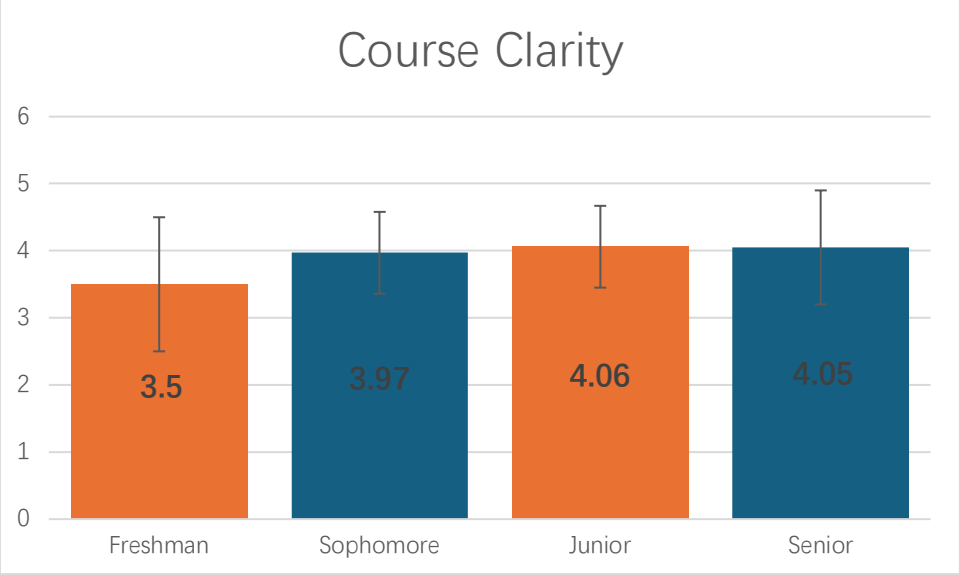


Figure 2. Course Clarity Comparison among Different Grades

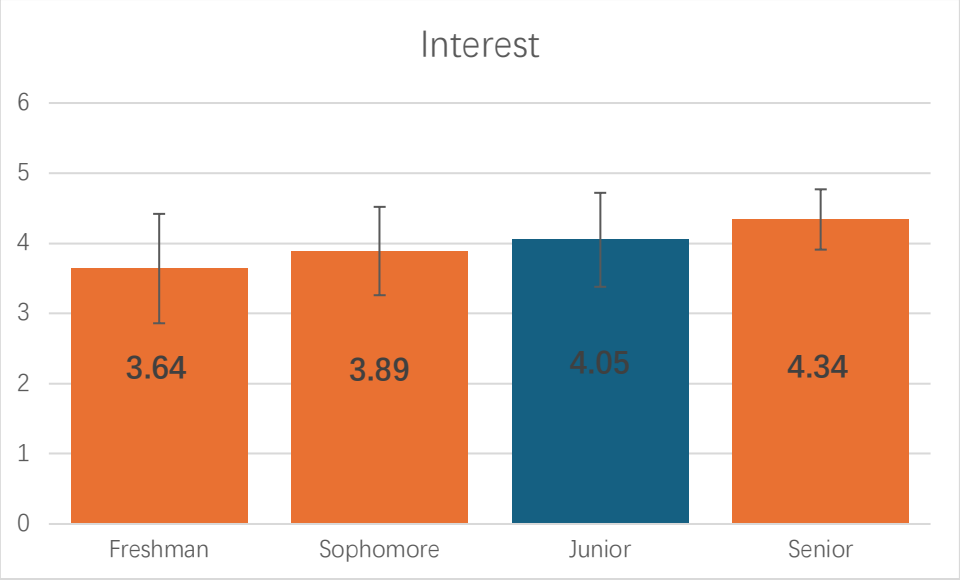


Figure 3. Student's Interest to Teacher's Content Comparison among Different Grades

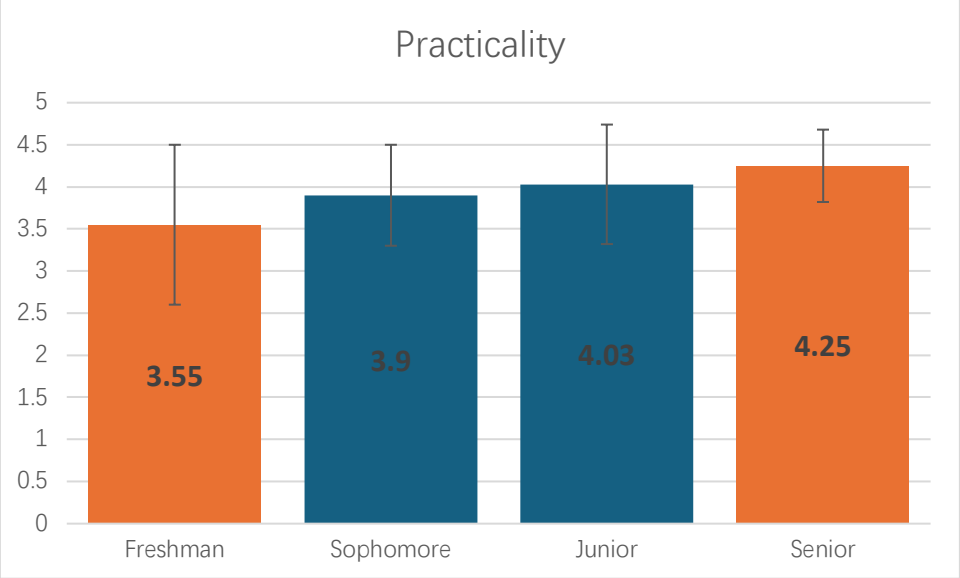


Figure 4. Students' Evaluation on Course Practicality Comparison among Different Grades

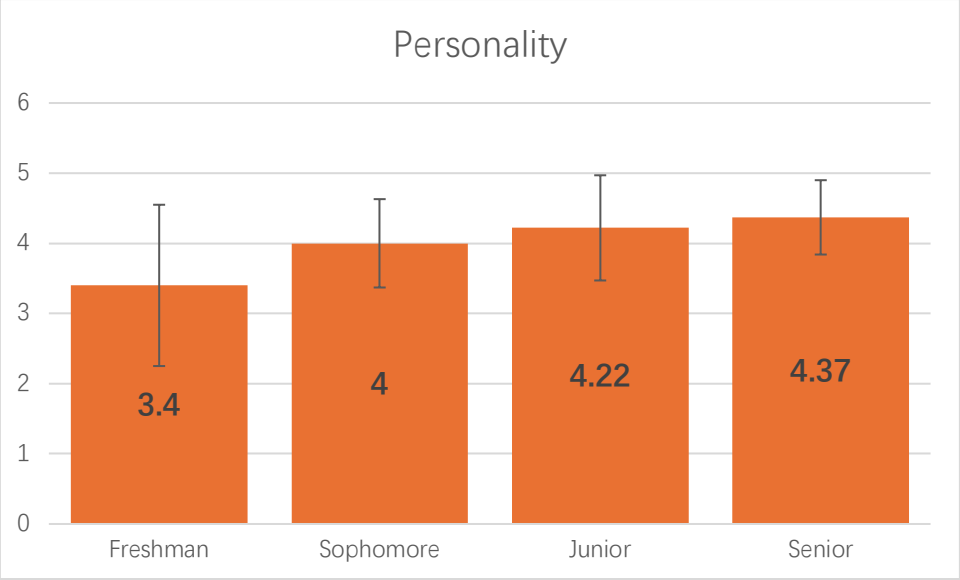


Figure 5. Students Conception on Teacher's Personality Comparison among different Grades

Table 7 shows one-way ANOVA analysis of study variables across different colleges. No significant difference was found in teacher's personality and students' attitudes towards student evaluation across different colleges ($p > .05$). However, in terms of course clarity, its p-value is close to 0.05, thus the author reserves this for further discussion. Tukey's HSD post hoc test showed CLA ($M = 4.06$, $SD = 0.75$) scored significantly higher than CST ($M = 4.00$, $SD = 0.63$) ($p < 0.05$), juniors ($M = 3.47$, $SD = 0.88$) ($p < 0.05$).

Additionally, a one-way ANOVA revealed there is a significant difference in students' interest in the teacher's content across different colleges, $F(3, 106) = 2.92$, $p < .05$. The effect size eta squared (η^2), was 0.08, indicating a medium effect. Tukey's HSD post hoc test showed CLA ($M = 4.17$, $SD = 0.61$) scored significantly higher than CST ($M = 3.62$, $SD = 0.51$) ($p < 0.05$).

Moreover, a one-way ANOVA also reported the effect of colleges on course practicality, $F(3, 106) = 3.51$, $p < 0.5$. The effect size, eta squared (η^2), was 0.09, indicating a medium effect. Tukey's HSD post hoc test showed CLA ($M = 4.11$, $SD = 0.64$) scored significantly higher than CST ($M = 3.49$, $SD = 0.65$) ($p < 0.05$). Figures 6, 7, and 8 describe the significant difference in variables across different colleges. Significant comparisons were exhibited by the highlighted bars show the significant comparisons.

Table 7. One-Way ANOVA Analysis of Multiple Dimensions across Different Colleges

	Group	Mean	SD	Mean Differences (I-J)		*F*	*p*
Course Clarity	CBPM	3.95	0.73	CLA	-.10	2.35	.077
				CAD	.01		
				CST	.49		
	CLA	4.06	0.75	CBPM	.10		
				CAD	.11		
				CST	.59*		
	CAD	3.94	0.65	CBPM	-.01		
				CLA	-.11		
				CST	.48		
	CST	3.47	0.88	CBPM	-.49		
				CLA	-.59*		
				CAD	-.48		
Interest	CBPM	3.94	0.73	CLA	-.23	2.92*	.038
				CAD	.03		
				CST	.33		
	CLA	4.17	0.61	CBPM	.23		
				CAD	.25		
				CST	.55*		
	CAD	3.92	0.61	CBPM	-.03		
				CLA	-.25		
				CST	.30		
	CST	3.62	0.51	CBPM	-.33		
				CLA	-.55*		
				CAD	-.30		
Practicability	CBPM	3.99	0.73	CLA	-.12	3.51*	.018
				CAD	.33		
				CST	.50		
	CLA	4.11	0.64	CBPM	.12		
				CAD	.44		
				CST	.62*		
	CAD	3.89	1.07	CBPM	-.33		
				CLA	-.44		
				CST	.18		
	CST	3.49	0.65	CBPM	-.50		
				CLA	-.62*		
				CAD	-.18		
Personality	CBPM	4.01	0.87	CLA	-.20	1.764	.158
				CAD	.12		
				CST	.34		
				CBPM	.20		

	CLA	4.20	0.60	CAD	.31			
				CST	.54			
				CBPM	-.12			
	CAD	3.89	1.07	CLA	-.31			
				CST	.22			
				CBPM	-.34			
	CST	3.67	1.07	CLA	-.54			
				CAD	-.22			
				CLA	-.28	1.64	.185	
	CBPM	3.72	0.74	CAD	-.28	0		
				CST	-.01			
				CBPM	.28			
Attitude	CLA	4.00	0.59	CAD	.00			
				CST	.27			
				CBPM	.28			
	CAD	4.00	0.82	CLA	.00			
				CST	.27			
				CBPM	.01			
	CST	3.73	0.51	CLA	-.27			
				CAD	-.27			

Note. *p < .05; ** p < .01; *** p < .001
Interest = Students' interest in the teacher's content; Practicability = Course practicability; Personality = Teacher's personality; Attitude = Students' attitude towards student evaluation.

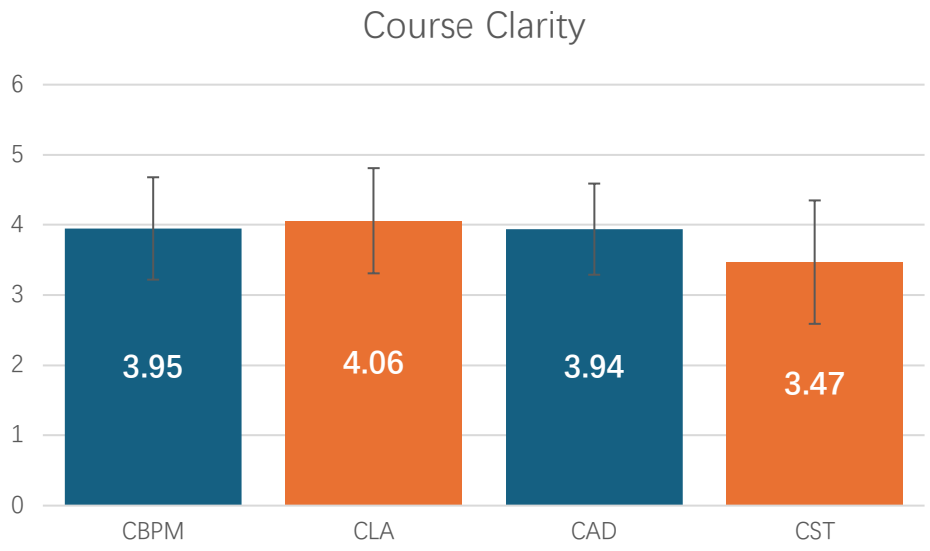


Figure 6. Course Clarity Comparison among Different Colleges



Figure 7. Student's Interest to Teacher's Content Comparison among Different Colleges

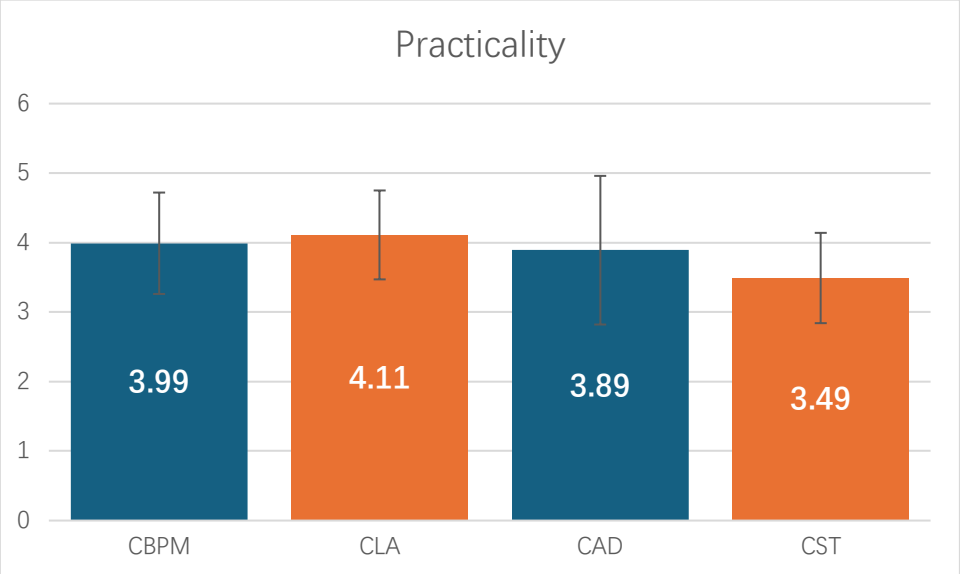


Figure 8. Students' Evaluation on Course Practicality Comparison among Different Colleges

Table 8 shows the statements of factors that affect student evaluation of teacher effectiveness for respondents by choosing the numbers 1-5, 1 is "strongly disagree", and 5 is "strongly agree". From the statements, nine factors influence student appraisal. The mean of factors that impact students' evaluation was listed in the following orders in students' perspectives: 1) the cumbersome of the teacher's homework/class requirements 2) the teacher's accent 3) expected grade 4) the relationship with teachers 5) teacher's knowledge 6) personality 7) gender 8) age 9) nationality. Students agreed that the top three factors, the cumbersome of the teacher's homework/class requirements, the teacher's accent and expected grade, influence their evaluation on teacher's effectiveness. Apart from the top three factors and nationality, the rest of factors were not sure to effect teachers' effectiveness in students' minds. Students disapproved that nationality have an influence on their evaluation on teachers' effectiveness.

The result is corresponding to Pacek (2005), students have no preference about teachers nationalities. [9]

Table 8. Factors Effect Student Evaluation

Descriptive statements	Mean	SD	Interpretation
1. My rating of my professors is affected by my expected grade in the course.	3.74	1.03	Agree
2. The gender of my professor (male-female) affects my evaluation.	2.67	1.37	Not Sure
3. The age of my professor (old-young) affects my evaluation.	2.65	1.36	Not Sure
4. The nationality of my professor affects my evaluation.	2.58	1.36	Disagree
5. When evaluating my professors, I usually pay more attention to their personality (friendsless, looks, dress, etc,) than their teaching methods or course content.	2.72	1.33	Not Sure
6. If I have a good friendship with my professor, I will rank him/her high on teaching effectiveness even if he/her is not an effective teacher.	3.26	1.14	Not Sure
7. If I ask my professor a question that is related to the subject being taught and my professor responds by saying, “I am not really sure, but I will check on that and get back to you,” I will still not consider him/ her knowledge.	3.15	1.20	Not Sure
8. I think a teacher's accent will affect my evaluation of the teacher/class.	4.11	.95	Agree
9. I think how cumbersome the teacher's homework/class requirements are will affect my evaluation of the teacher.	4.16	.89	Agree
Average	3.07	0.51	Not Sure

Table 9 shows students’ notions on personalities of a good teacher. Chinese college students’ opinions on personalities to be a supportive teacher: Intuitive (imaginative, enthusiastic) (ranked 1); Thinking (critical logical objective) (ranked 2); Extraverted (outgoing) (ranked 3); Sensing (realistic, practical) (ranked 4); Introverted (reserved) (ranked 5). This result is similar to a finding that the four strongest personalities most expected of students were caring, humble, responsible and patience (Hidayah at el., 2023). [10]

[9] Dorota Pacek, *Personality not nationality’: Foreign students’ perceptions of a Non-native speaker lecturer of English at a British university.*

[10] Nur Hidayah Md Noh et al., *Assessing ideal teacher’s personality: Students’ perspective and expectations.*

Table 9. Students' Conception on traits of a good teacher

	Numbers*	Percent	Rank
Extraverted (outgoing)	75	68.18%	3
Intuitive (imaginative, enthusiastic)	97	88.18%	1
Introverted (reserved)	17	15.45%	5
Sensing (realistic, practical)	73	66.36%	4
Thinking (critical logical objective)	77	70.00%	2

* Multiple responses

Conclusion

Student evaluation is highly associated with teaching effectiveness, as it encompasses various factors that influence ratings. The majority of students express that they evaluate teachers based on course clarity, level of engagement, and practicality. Additionally, professors who demonstrate intuition tend to be more popular among students, followed by those who possess critical thinking and logical objectivity.

Moreover, there is a correlation between course clarity and gender. Female students tend to have higher expectations regarding course clarity compared to their male counterparts. Additionally, there exists a relationship between a teacher's personality, student interest in the content being taught, and grades. Among these factors, grades exhibit the closest correlation with the study variables.

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Students' Use of Social Networking Sites for Educational Purposes

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Abstract
This study responds to the modern global concerns in the field of media, and it seeks benefiting from social media in teaching subjects of media as being considered as media and communicational methods in the first place, and as being considered as an educational method in which the main elements and constituents of modern educational approaches are available. This study seeks getting acquainted with media students' opinions on the social media as an educational method, its merits and demerits as well as the most apparent elements, which can be used within an educational curriculum on social media. Moreover, results of the study clarified that the most students' attitudes towards social medias an educational method were negative; especially in terms of saying that teaching curricula on social media needs capabilities, which are unavailable in our universities, and there insufficient qualified professors in our universities to teach curricula on social media. Results of the study indicated that there is no statistically significant relation in terms of students' opinions towards the merits of social media as an educational method and there is no statistically significant relation between male and female students in terms of their opinions towards the demerits of social media as an educational method.

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Introduction

This study responds to the modern global concerns in the field of media, which seeks to benefit from the social media in teaching the subjects of media as being considered a media and communicational method in the first place as well as being an educational method in which the main constituents and elements of the modern educational methods are available.

Despite of the attention given to those studies, there are no any Arabic studies that deal with this topic on the one hand, and there are no any opinions expressed about employing the social media in the field of media studies and the media academic education on the other hand. Moreover, the perspectives of the concerned people and the users of social media towards their advantages, disadvantages and constituents as an educational method are not observed.

This study seeks to know the media students' perspectives towards the social media as an educational method; their advantages, disadvantages and the most significant elements that can be employed within a curriculum on the social media.

Importance of Study

1. Considered from the first Arabic studies, which attempt to know the possibility of employing the social media as an educational method.
2. Considered from the first Arabic studies, which attempt to deal with the social media as an educational and media method at the same time.
3. Seeking to clarify the educational and media constituents of the social media.
4. Seeking to know the perspectives of one of the important parties relevant to the employment of social media, which are the young people and the university students on the one hand and the media learners on the other hand.
5. Attempting to employ some new educational approaches in studying the social media as a media and educational method.
6. Attempting to make the curricula flexible to understand the modern teaching methods; especially the interactive ones.
7. Attracting the attention of the educational institution including the students and academic people, as well as the significant role played by the social networking sites in education.

Previous Studies

Essam Obeid's study entitled "The role of social networks in supporting university courses from the perspective of male and female students" on a research sample of (100) male and female students in the Faculty of Computer and Information Sciences at Imam Muhammad bin Saud Islamic University. The students' lack of confidence in the importance of social networks in supporting university courses, and their lack of acceptance of the actual participation in social networks in support of university courses, as well as the lack of access to the teachers to link their personal sites or sites on the web Social data.

A study by the British Council on the impact of the Web in the patterns of young learners who want to learn English as a second language showed a great effectiveness and interaction of teachers in the use of technology in education and they were able to integrate their students with a larger world outside the class. These students were able to get more marks and acquired skills Faster and more, and the most important results of this research also is that about 69% of learners around the world learned more effectively when they used interactive social sites.

Studies have also revealed the educational role of social networking sites as in the study of Calpido, Costin & Morris (2011), which showed the positive and important role of social media and showing that Facebook is a social network that strengthens the social relations and helps students to be socially and psychologically compatible. (Lee, Lee & Jang, 2011) study revealed using social media has predictive signs of psychological and social compatibility for students.

One of the studies revealed the negative role of social networking sites such as Sangari, Limayem and Rouis (2011). The results indicated that Facebook has no important role to play in academic performance, Lei & Wu, 2007), which revealed the positive correlation between psychological isolation and the high number of internet usage hours, and the results of the 2008 study that showed some of the negative effects of Internet addiction. Topmost of which are: The tendency to isolation, distance from communicating with others, and lying in conversations and chats.

The study of Cristina Maria. Balteretu, 2010, which sought to identify the motives of the use of university students in Romania for social networking sites. The researcher relied on the tool of concentrated groups as a tool for data collection, and the study reached many results, the most important: The most popular social networking sites among young people is Hi5. Facebook, Netlog. Tagged, Myspace, and motivated to use these networks are concentrated in: Easily connect with my friends, discover a lot of information about others, stay in touch with my friends who keep away from me, chat with others and share photos and video clips.

Comments on Previous Studies

1. The lack of studies that linked the means of social media and how to benefit from them in the educational process.
2. The lack of studies that tried to explore the possibilities of social media as a media medium and a course that can be taught to students of media, as a distinct media.
3. Contradiction of the results of the studies on the perceptions of users about social networks and the positive and negative aspects of these methods.

Theoretical Framework of Study

Several researchers attempted to develop the theories used in studying the phenomena of social media and employing them in studying the social media, including:

Public Domain Theory, which is one of the theories that tried to study the behavior of the individual recipient and its relationship with society, especially after the relationship between civil society and public life, has become a main topic of discussion in many disciplines.

Media Dependency is one of the approaches that make up public relations with the media. The degree to which individuals rely on media information is the basis for understanding the impact of media messages on beliefs, feelings and behavior.

It is assumed that the input of the uses and saturation of the audience is motivated by psychological and social effects of the use of the media in order to obtain special results called "saturation". Such as creating a profile on social networking sites, reducing stress, rest and relaxation, getting rid of boredom and isolation, content surmises such as getting information, discovering reality, and linking the information a person gets from its Social relations network, such as the ability to talk to others.

Adapting the model of dissemination of ideas developed in the study of the uses of media for social media, by knowing the prevalence of the use of these means in the media institutions, and study at two levels: the level of adoption across institutions, and then the level of individual adoption, with a focus on study the impact of complexity of the use of these means And their relevance to the possibility of adoption, taking into account the factors that affect the adoption of these new institutions.

The study seeks to benefit from all the previous models and theories in reading the phenomenon of using the social media as an educational medium in the field of studying media and the users' perspectives about this method.

Problem of Study

The problem of the study is determined by answering the following question: Media students or social networks as an educational tool, and what are their attitudes about the benefits and disadvantages as an educational tool?

Questions of Study

1. To what extent are media students exposed to social media in exchange for exposure to traditional media?
2. What are the most social media outlets used by media students in Arab universities?
3. What are the students' perceptions of the most important features of social media as an educational medium?
4. What are the main advantages and disadvantages of social media as educational tools from the point of view of media students in Arab universities?
5. What are the general attitudes of media students in Arab universities regarding the use of social media as an educational tool?

Sample of Study

In this study, the researcher uses the purposive sample. The researcher chose in this type of study cases that are thought to represent the society in the aspect dealt with in the research. Thus, the study was applied to a sample of 148 students from media students at different Arab universities as the number of participants from Arab universities reached 60 male and female students at a rate of (40.5%) and from UAE universities 78 at a rate of (59.5%). The following table shows the characteristics of the sample of study.

Results of Field Studies

The researcher reviews in this part the results of the field study Relevant to the Media Students' Exposure to the Social Media as follows:

Media Students' Exposure to the Social Media

Methods	Rarely		Sometimes		Always	
	Q	%	Q	%	Q	%
Newspapers	65	44.5%	65	44.5%	16	11.0%
Television	16	11.0%	75	51.7%	54	37.2%
Computer in general	14	9.6%	38	26.0%	94	64.4%
Internet in general	1	.7%	10	6.8%	136	92.5%
Social Media	1	.7%	14	9.5%	133	89.9%
Mobile Devices	3	2.0%	8	5.4%	136	92.5%

Table 1: Media Students' Exposure to the Social Media

The above table shows the rise of students' exposure to social media and the Internet compared to the traditional media. 92.5% of the respondents said that they are exposed to the Internet permanently, 92.5% to mobile phones, 89.9% are exposed to social media and 64.4% are computer users, 37.2% are exposed to television 11% of the newspapers permanently, which reveals the increasing exposure to social media and the Internet by media students in return for the decline of exposure to the traditional media.

Rate of Exposure to Social Media Compared to Other Media Methods

Rate of Exposure	Mobil Devices		Social Media		Internet		Computer		Television		Newspapers	
	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%
Less than an hour.	10	7.1%	10	7.0%	4	2.8%	26	18.6%	35	24.6%	123	89.1%
From one to less then two hours.	12	8.6%	21	14.8%	15	10.4%	37	26.4%	57	40.1%	11	8.0%
From two to less than three hours.	21	15.0%	33	23.3%	45	31.3%	35	25.0%	30	21.1%	2	1.4%
More than three hours.	97	69.3%	78	54.9%	80	55.6%	42	30.0%	20	14.1%	2	1.4%

Table 2: Rate of Exposure to Social Media Compared to Other Media Methods

The above table shows that students use mobile devices to a great extent. The percentage of respondents who use it for more than three hours per day is 69.3%, followed by using the Internet at a rate of 55.6% and social media 54.9%. 30% said that they use computers for more than three hours a day while 14.1% said they watch TV for more than three hours a day and only 1.4% read newspapers for more than three hours a day. The above reveals the diversity of ways in which students are exposed to and are increasingly interested in social media.

The Most Commonly Used Social Media

Social Media	Q	%
Facebook	51	34.9%
Twitter	82	56.2%
My Space	1	.7%
YouTube	114	78.1%
Hi5	2	1.4%
Linked In	5	3.4%
WhatsApp	128	87.7%
Flickr	3	2.1%
Blogs	10	6.8%
Live Journal	3	2.1%
Wikis	5	3.4%
Google Plus	30	20.5%

Table 3: The Most Commonly Used Social Media by the Students

The above table shows that the most commonly used means of social communication by media students are: WhatsApp at a rate of 87.7%, followed by YouTube at a rate of 78.1%, Twitter at a rate of 56.2%, followed by Facebook at a rate of 34.9%, Google Plus at a rate of 20.5%, blogs at a rate of 6.8%, Wiki at a rate of (3.4%), LiveJournal and Flickr (2.1%) for both, Hi5 at a rate of (1.4%) and Myspace (7.%). The above reveals the diversity of social media used by students, which calls for using more than one means in the teaching of media materials and exploring ways to use them in educational courses.

Students' Perspectives Towards the Advantages of Social Media

The Most Prominent Advantages of Social Media	Order	Mathematical Average	Standard Deviation
They outperform traditional means of communication in the field of creating social ties and relationships.	2	3.41	2.311
The closest means of interaction, discussion and dialogue among users.	3	3.35	2.158
Updating news, information and opinions promptly.	1	2.97	2.370
Creating homogeneous communities of users with common interests.	7	4.27	2.144
Employing them for tools such as text, images, videos, graphics, etc.	6	4.18	2.203
Monitoring and following the interests of others.	4	4.88	2.350
Representing a platform for those, who cannot find a place to express themselves in traditional media.	5	4.53	2.437

Table 4: The Students' Perspectives Towards the Advantages of Social Media

The above table shows the students' attitudes towards the most prominent advantages of the social media. The first place was the renewal of news, information and opinions with a mathematical average of 2.97, followed by the traditional means of communication in the field of creating social relations and relationships with an average of 3.41, followed by the closest means of interaction, discussion and dialogue between users and a mathematical average of 3.35, and in fourth place it helps to monitor and follow the interests of others with a mathematical average of 4.88, and in fifth place they represent a platform for those who cannot find a place to express in the traditional media and a mathematical average of 4.53 , and in sixth place they are used for several tools of texts, pictures, videos, drawings, etc. with a mathematical average of 4.18, and in seventh rank they help to create homogeneous groups of users with common interests and a mathematical average of 4.27. In general, positive attitudes were found among students about the advantages of using social media.

The Social Media Preferred to Be Used Within the Educational Curricula

In case of using social media within any educational curriculum, what are the most used methods?						
	Highly Used		Moderately Used		Not Used	
The most commonly used forms within the classroom.	Q	%	Q	%	Q	%
Web sites such as Facebook, Twitter and YouTube.	60	42.9%	49	35.0%	31	22.1%
Sending and reading emails.	85	61.2%	40	28.8%	14	10.1%
Using mobile phones to send and read instant messages for educational purposes; such as student groups on the WhatsApp.	78	56.5%	38	27.5%	22	15.9%
Using the search engines like Google within the classroom.	81	58.3%	38	27.3%	20	14.4%
Using computers in their different forms within the classroom.	74	53.2%	45	32.4%	20	14.4%
Using collaborative websites and networks such as blogs, Wikipedia, Google documents, etc. within the classroom.	68	48.6%	51	36.4%	21	15.0%

Table 5: The Preferred Social Networking Sites that are Used Within the Educational Curricula

The following table shows students' perceptions on the best electronic communication methods that can be used in educational courses. They found that the most widely used forms are sending and reading emails at a rate of 61.2%, followed by the use of in-class search engines; such as Google at a rate of 58.3%, followed by using mobile phones to send and read instant messages for educational purposes; such as students' groups on the WhatsApp at a rate of 56.5%, followed by the use of computers in various forms in the classroom at a rate of 53.2%, followed by the use of collaborative web sites and networks; such as blogs, Wikipedia and Google documents within the classroom at a rate of 48.6%, followed by the use of the electronic networking sites, such as Facebook and Twitter and YouTube at a rate of 42.9%.

The Most Suitable Forms That Can Be Used Within a Curriculum on Social Media

The Most Forms that can be used (within a curriculum on social media)						
	At a High Degree		Moderately		At a Low Degree	
The Most Forms that can be used	Q	%	Q	%	Q	%
Facebook Groups	44	31.7%	29	20.9%	66	47.5%
Google Plus Groups	35	25.9%	49	36.3%	51	37.8%
Group work tools, such as Wikis and Google Doc	37	27.6%	41	30.6%	56	41.8%
Audio share, such as Podcast	41	31.8%	43	33.3%	45	34.9%
Microblogging, such as Twitter	53	39.3%	39	28.9%	43	31.9%
Photo Sharing, such as Flickr	28	21.2%	47	35.6%	57	43.2%
Video Shares (YouTube for instance).	79	58.5%	35	25.9%	21	15.6%
Blogs	37	29.8%	51	41.1%	36	29.0%
Other Media Tools	35	38.5%	32	35.2%	24	26.4%

Table 6: The Forms that can be used within a Curriculum on Social Media

The above table reveals that media students believe that the most prominent forms that can be used in a course on social media are video shares via YouTube at a rate of 58.5%, followed by microblogging; such as Twitter at a rate of 39.3%, followed by other media tools at a rate of 38.5%, followed by audio posts (31.8%), followed by Facebook groups (31.7%), blogs (29.8%), group work tools (27.6%), Google Plus (25.9%) and Flickr (21.2%). The above refers to the variety of social media that can be used in educational courses, as well as the preference of students to use video and Twitter.

The Most Apparent Disadvantages of Social Media as an Educational Method

The most Apparent Disadvantages of Social Media as an Educational Method									
	Agree		Neutral		Disagree		Average		
Disadvantages	Q	%	Q	%	Q	%		Chi Square	Significant Value
Waste of Time	48	35.6%	62	45.9%	25	18.5%	2.17	0.430	0.806
They help in spreading rumors and circulating them rapidly.	103	76.3%	27	20.0%	5	3.7%	2.73	9.950	0.007
Considering them an entertaining method rather than an educational one.	80	59.7%	48	35.8%	6	4.5%	2.55	3.971	0.137
Lack of privacy.	74	54.8%	46	34.1%	15	11.1%	2.44	10.769	0.005
Lack of confidence in the information shared via those methods.	79	58.5%	46	34.1%	10	7.4%	2.51	1.707	0.426
Difficulty of documenting the shared information.	75	55.6%	48	35.6%	12	8.9%	2.47	6.063	0.048
Losing information easily among the huge number of messages and posts.	72	53.3%	44	32.6%	19	14.1%	2.39	4.052	0.132
Distracting the student's attention in case of using them within the classroom.	88	66.2%	33	24.8%	12	9.0%	2.57	4.417	0.110
They can be used in disseminating negative behaviors; such as harassment, bullying and insulting others.	78	59.1%	40	30.3%	14	10.6%	2.48	0.831	0.660
Can be used outside the classroom and not inside it or vice versa.	69	53.9%	42	32.8%	17	13.3%	2.41	6.201	0.045
There are no integrated programs or courses so far on social media and their relation to media.	33	47.1%	25	35.7%	12	17.1%	2.30	2.071	0.355
Lack of textbooks relevant to the application of social media.	37	54.4%	23	33.8%	8	11.8%	2.43	3.696	0.158

Table 7: The Most Prominent Disadvantages of Social Media as an Educational Method

It is clear from the above table that media students found that among the most prominent disadvantages of using social media are:

- They help to spread the rumors and circulating them rapidly at a rate of 76.3%, and distracting students if used in the classroom at a rate of 66.2%, and can be used to disseminate negative behaviors such as harassment and bullying and insulting others by 59.1%, and considered as 59.7%, and the lack of confidence in the information that is traded through these means by 58.5%, and the difficulty of documenting the information that is traded by 55.6%, lack of privacy at a rate of 54.8%, and Lack of textbooks related to social media applications 54.4%, and losing information easily within the large number of messages and posters at a rate of 53.3%, and can be used outside the classroom and not in the classroom or vice versa by 53.9%, and there are no programs or integrated courses so far on social media and its relationship to the media at a rate of 47.1%, and the transfer of social media for courses will eliminate students from performing their original lessons by 44.9%, and unsafe use in terms of Internet access at any time and quickly at a rate of 43.5%.

Media Students' Attitudes towards the Social Media as an Educational Method

Phrases	Agree		Neutral		Disagree		Average			
	Q	%	Q	%	Q	%		T Test	Degree of Freedom	Significance
The curricula of the media colleges in the Arab World lack courses on social media.	83	62.4%	37	27.8%	13	9.8%	2.53	.449	131	.654
Teaching courses on social media need capabilities that are not available at our university.	49	36.8%	56	42.1%	28	21.1%	2.16	.097	131	.923
There are not enough qualified professors in our university to teach courses on social media.	50	37.9%	43	32.6%	39	29.5%	2.08	-.547	130	.585
Media students consider courses on social media to be less useful and closer to entertainment than to education.	33	25.0%	54	40.9%	45	34.1%	1.91	-1.116	130	.266
Social media do not need their own courses to be taught.	49	37.4%	59	45.0%	23	17.6%	2.20	-1.996	129	.048
Teaching most media courses should be done through social media	76	58.0%	46	35.1%	9	6.9%	2.51	-3.742	129	.000

Table 8: The Media Students' Attitudes Towards the Social Media as an Educational Method

It is evident through the previous table relevant to the students' attitudes toward social media as an educational tool that while 62.4% agree that the curricula of Arab media colleges lack courses on social media, 9.8% disagree, while 27.9% Neutral. While 36.8% said that they agree to teach courses on social media that need the possibilities that are not available in our university, 21.1% said they do not agree, while 42.1% took a neutral position. While 37.9% agree that there are not enough qualified professors in our university to teach courses on social communication, 29.5% said they do not agree, while 32.6% have a neutral attitude. While 25% said they agree with media students that they consider courses on social communication to be less useful and closer to entertainment, 34.1% said they do not agree, while 40.9% have a neutral attitude.

While 37.4% agreed that social media did not need their own courses to teach, 17.6% said they did not agree, while 45% took a neutral stance. While 58% agreed that most media courses should be taught through social media, 6.9% said they did not agree, while 35.1% took a neutral stance. While 51.4% said they agree that media colleges in the Arab world should change their curricula and incorporate social media, 11.4% said they do not agree, while 37.1% have a neutral attitude. While 62.4% agreed that media colleges in the Arab world should encourage more use of technology within the classroom, 4.3% said they did not agree, while 32.9% had a neutral attitude.

1.91, and that do not need the means of social communication of special decisions for the purpose of teaching, where the average of those who say that 2.20, and that the colleges of information in the Arab world should change their curricula and include the means of social communication, with an average of 2.40, and that the predominance of traditional teaching in most of the media professors at our university.

Only positive attitudes were expressed in terms of the fact that Arab media organizations were in dire need of students who were aware of how to use the means of communication. The average number of respondents was 2.57, and the media colleges in the Arab world should encourage the use of technology more in classrooms. The average number of respondents was 2.59, and most of the information courses should be taught through social media. The average number of respondents was 2.51. The educational curricula of the Arab media colleges lack courses on social media, with an average of 2.53.

On the other hand, there is no statistically significant difference between male and female students' attitudes towards social media as educational means, except that they do not need the means of social communication for their own courses in order to be taught. T-1.996, reached a degree of freedom of 129 and a significant value of 0.48, as well as the phrase that teaching most of the media courses should be through social media, where the value of T-3.742, at a degree of freedom.

Conclusion and Discussing Questions and Results

Results of the study revealed the following:

- Increasing exposure to the social media and the Internet by media students in return for the decline of exposure to traditional media.
- There are various ways in which students are exposed to the social media, and their increasing interest.
- The use of WhatsApp, YouTube, Twitter and Facebook came on top of the social media by the media students, which means the diversity of social media used by students,

which calls for the use of more than one means in the teaching of media materials and exploring ways to use them within the curricula.

- The number of students, who benefit from the use of social media. The first place was occupied by the renewal of news, information and opinions promptly, followed by the fact that it surpasses the traditional means of communication in the field of creating social ties and relationships, followed by the closest means of interaction, discussion and dialogue among users.
- The results of the study showed that media students see that among the most prominent advantages of social media as an educational tool are: The means of social communication can be employed in many media campaigns. In the same percentage, it is said to suit the interests of media students, followed by immediate and simultaneous communication between students and teachers, (pictures, video, etc.).
- The results of the study showed that media students see that among the most prominent disadvantages of social communication means as an educational tool are: They help spread rumors and their circulation speed, and focus the student if used in the classroom, and can be used in the dissemination of negative behaviors such as harassment and bullying And the insult to others and consider it as a recreational and entertainment rather than educational and lack of confidence in the information that is traded through these means and the difficulty of documentation of shared information.
- The results of the study showed that there are no statistically significant differences between the attitudes of media students (males and females) about the means of social communication as educational means except in terms of saying that they do not need the means of social communication for their courses in order to teach them. It must be done through it.

The study recommends the importance of employing social media in the teaching of media courses, working on the formulation of special courses to study the means of social communication, providing the possibilities that will help to employ them in Arab universities, and the rehabilitation of students and media professors to deal with these new means. And to avoid the negative effects, not only to use a certain means, but also to employ the interactive possibilities provided by these means in order to create a distinct learning environment in the teaching of media courses and others.

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Enhancing Early-Stage Adult Maltese Language Learning: Unleashing the Potential of Visual Culture

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Abstract
Language learning, especially in its early stages, has been associated with right-brain practices. However, the utilization of visual culture to enhance these practices and promote language knowledge retention remains underexplored. This study investigates the role of right-brain processes through visual culture in early-phase language learning, with a specific focus on teaching Maltese as a second language (ML2) to adult learners. Employing a qualitative research methodology, a focus group of twenty-seven teachers was engaged to explore diverse visual culture practices applied in language classes. Thematic analysis in NVivo was employed to analyze the data collection. The study reveals a range of visual culture practices, such as drawing, sketching, matching games, orthographic mapping, the memory palace approach, wordless picture books, picture-based learning methods, infographics, the Face Memory Game, Spot the Difference, Word Search Puzzles, the Hidden Object Game, videos, the Shadow Matching, Find the Differences, and colour-coding methods, which are used with Primary, Middle, and Secondary school students. These practices offer promising opportunities for ML2 classes that could be used with adult learners, presenting valuable recommendations for incorporating specific visual culture techniques to facilitate language learning and elevate essential language skills and competencies. By unlocking the potential of visual culture, educators can enrich the early-stage ML2 learning experience and empower adult learners to achieve greater proficiency in the Maltese language.

Keywords: Visual Culture, Second Language Acquisition, Maltese Language, Orthographic Mapping, Memory Palace Approach, Picture-Based Learning Methods

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Introduction

Language acquisition is a multifaceted process involving the enhancement of various skills such as reading, speaking, writing, listening, and comprehension (Ampera et al., 2021). The contemporary educational system offers a plethora of teaching techniques for second language (L2) learning, tailored to different types of learners. Among these techniques, visual learning methods have gained popularity (Lenkaitis and Hilliker, 2019). These methods encompass activities like drawing, learning through pictures, using graphics and animated flashcards, card memory games, video watching, virtual reality, and wordless picture books (Kalaja and Pitkanen-Huhta, 2018). Such methods are effective in capturing and sustaining students' attention and fostering motivation.

The research in question seeks to explore the impact of right-brain activities via visual culture in the initial stages of learning Maltese as a second language (ML2). The role of visual culture in facilitating L2 learning from the perspective of the right brain hemisphere's functionality is not well understood. ML2 is a relatively new field in Malta and many teachers who began their careers before 2014 lack training in teaching ML2 (Żammit, 2021). The research problem stems from adult ML2 learners' feedback that incorporating visual culture and music, especially in the early stages of second language acquisition (SLA), would enhance their vocabulary retention and overall ML2 learning experience.

The primary objective of the study was to critically examine the significance of right-brain activities via visual culture in the early stages of adults learning ML2. The research outcomes could potentially inform instructional methods that enhance students' success in learning any L2. These methods could specifically improve adult learners' pronunciation skills, augment the retention of new vocabulary and grammar concepts, and offer valuable guidelines for teachers untrained in L2 teaching. The study addresses a clear research gap, as no previous research has explored the importance of right-brain activities via visual culture in the early stages of learning ML2, a finding that could be generalized to other L2 learning contexts. The research questions were as follows:

1. How can an educator enhance right-brain activities in the language classroom?
2. What are the ways to introduce visual culture in the Maltese language classroom?
3. What language skills or competences could be improved through visual activities?

Literature Review

This study focuses on the role of right-brain processes in language learning, with a theoretical framework grounded in theories that posit the involvement of the brain's right hemisphere in processing visual and spatial information, thereby enhancing language learning (Qi et al., 2019; Yang, 2023; Bak, et al., 2016; Nilsson, et al., 2021).

The theoretical framework of right-brain processes in language learning is predicated on the understanding that the brain's two hemispheres (left and right) perform distinct functions, with language processing involving both hemispheres. The left hemisphere is generally linked with language processing, encompassing grammar, syntax, and vocabulary, while the right hemisphere is engaged in processing visual and spatial information, such as images, patterns, and shapes (Nilsson, et al., 2021). Bialystok's work on the impact of bilingualism on the brain has revealed that bilingual individuals exhibit enhanced cognitive control, potentially related to the right hemisphere's involvement in language processing (Yang, 2023).

Roehr-Brackin (2018) has conducted research on the use of visual input in language learning and has discovered that visual input can aid learners in better comprehending the structure and meaning of new words and phrases, which is crucial in the early stages of language acquisition. Bak's research on the effects of age on language learning has indicated that older learners may benefit from visual input and other techniques that engage the right hemisphere of the brain (Bak, et al., 2016).

Research in neuroscience and psychology suggests that visual and spatial information can enhance language processing by stimulating the right hemisphere of the brain (Nilsson, et al., 2021). For instance, studies have demonstrated that when language learners are exposed to visual stimuli, such as pictures, videos, or diagrams, they are better equipped to remember and utilize new vocabulary and grammar rules (Roehr-Brackin, 2018). Visual stimuli can also assist learners in forming mental connections between words and concepts, thereby enhancing their overall language proficiency.

One theory proposed to explain the role of right-brain processes in language learning is the "Dual Coding Theory". According to this theory, information is processed in two separate but interconnected systems: a verbal system that processes language-based information and a nonverbal system that processes visual and spatial information (Luo, 2022). When information is presented in both verbal and nonverbal formats, learners are more likely to retain and retrieve that information (Luo, 2022).

Another theory used to explain the role of right-brain processes in language learning is the "Memory Palace" or "Method of Loci" technique. This technique involves creating a mental image of a physical space (such as a room or a street), and then associating each item or concept to be learned with a specific location within that space (Ralby, Mentzelopoulos and Cook, 2017). This technique is particularly effective for language learners because it engages the right hemisphere of the brain, which is involved in processing spatial information (Ralby et al., 2017).

Consequently, the theoretical framework of right-brain processes in language learning suggests that visual and spatial information can play a significant role in language processing and retention and that language teachers can employ visual stimuli and techniques to enhance language learning for their students. The use of right-brain practices through visual culture in the early stages of learning an L2 has garnered attention from scholars (Xing et al., 2015; Bidelman and Howell, 2016; and Qi et al., 2019).

Methodology

The research methodology for this study is rooted in the interpretivism research philosophy, which relies on understanding the inner perceptions of the research participants. This approach aids in comprehending the psychology of participants and their attitudes towards a research problem (Saunders, Lewis and Thornhill, 2020). The study employed a qualitative research methodology, as the issue of right-brain practices through visual culture in the early stages of learning ML2 is yet to be explored. Interpretivism could offer a chance to delve into teachers' viewpoints on visual culture in the ML2 class, as qualitative research methods facilitate the analysis of participants' experiences, concepts, and opinions (Creswell and Creswell, 2018).

The primary data collection method for this study was the focus group. Unlike interviews, focus groups enable participants to express a variety of thoughts and interact with others, providing deeper insights into the problem under investigation (Breakwell, Wright, and Barnett, 2020). The focus group session, which lasted three hours, was conducted online via Zoom for the convenience of the participants. The session was structured around a set of predetermined open-ended questions aimed at eliciting detailed responses about the use of visual culture in early-stage adult Maltese language learning. These questions were formulated based on the research objectives and the existing literature on visual culture and language learning.

The data analysis process comprised several steps. Initially, the focus group discussion was transcribed verbatim. The transcript was then read multiple times to gain a comprehensive understanding of the data. The data was subsequently coded using NVivo, a qualitative data analysis software. The coding process involved identifying significant phrases or sentences related to the research objectives and labelling them with appropriate codes. These codes were grouped into potential themes and sub-themes, which were reviewed and refined to ensure they accurately represented the data. The themes were then used to interpret the data and answer the research questions. This thematic analysis process facilitated the identification of specific themes and sub-themes related to the use of visual culture in early-stage adult Maltese language learning.

The qualitative validity of the results was ensured through member-checking. The participants were recruited using a snowball sampling technique, and all ethical considerations were observed during the focus group. Participants signed informed consent forms, and their anonymity was preserved. These methods align with the recommendations of scholars such as Saunders et al. (2020), Breakwell et al. (2020), and Braun and Clarke (2021).

Participants

The study incorporated 27 participants who were part-time instructors of Maltese as a second language (ML2) for adults. These educators offered private ML2 lessons to adults in various settings, including home, online, or evening classes. The participant pool consisted of 10 full-time primary school teachers, five middle school teachers, and four secondary school teachers. Additionally, eight participants were independent teachers specializing in business English, medical English, and English as a second language for adults.

The researcher employed purposive sampling, selecting participants who taught ML2 to adults part-time and possessed a TEFL Certificate. The TEFL certificate was a crucial requirement as visual culture is not typically utilized in adult ML2 lessons, given that most ML2 educators were only trained to teach Maltese as a first language. The training for teachers to instruct ML2 commenced in 2018. Therefore, the researcher targeted educators with a TEFL certificate, indicating their training in teaching a foreign language, albeit not specifically Maltese as a foreign language.

Results

Thematic analysis revealed several key themes and subthemes regarding the integration of right brain practices through visual culture in early L2 teaching. The majority of participants, including Teachers 2, 3, 24, and 27, emphasized the effectiveness of incorporating art and play in language learning. Techniques such as drawing without looking, collaborative sketching

games, and using real-life objects were discussed to engage students and enhance vocabulary memorization, especially among younger learners.

Matching Games

Teacher 10 described the use of matching games as a visual tool to stimulate the right hemisphere of the brain, improving attention and visual memory. This interactive approach not only aids in vocabulary retention but also fosters a sense of competition and engagement among students.

Orthographic Mapping

Participants discussed the orthographic mapping method as a powerful technique to facilitate instant word recognition and effortless recall of unknown words, particularly beneficial for young learners grappling with complex phonemes. The method's simplicity in breaking down lengthy words into manageable parts resonated with the teachers, who found it instrumental in enhancing students' pronunciation and spelling skills.

Memory Palace Approach

The memory palace technique emerged as a valuable strategy for improving information recall, particularly among ML2 adult learners facing memory challenges. Teacher 26's example of using a memory palace to memorize the days of the week in Maltese showcased the method's adaptability and effectiveness in real-world language learning contexts.

Wordless Picture Books

The use of wordless picture books was lauded for its ability to foster critical analysis and storytelling skills irrespective of students' reading abilities. Teachers like Teacher 22 emphasized the importance of such books in laying the foundation for language learning by encouraging students to construct narratives based solely on visual cues.

Picture-Based Learning

Various visual methods, including PowerPoint presentations and movies, were explored to enhance language learning and critical thinking. Teachers leveraged visuals to elucidate complex concepts, stimulate discussion, and deepen students' understanding of linguistic and cultural nuances.

Infographics

Teachers utilized infographics as a dynamic tool to improve vocabulary retention, emphasizing their capacity to distill complex information into visually appealing representations. The accessibility and versatility of infographics were particularly advantageous for engaging students and facilitating quick comprehension of language concepts.

Using Videos

Videos emerged as a versatile resource for enhancing language learning, with teachers employing diverse approaches such as kinetic typography and augmented reality to create immersive learning experiences. The integration of videos not only catered to different learning styles but also fostered a sense of excitement and curiosity among students, making language learning more interactive and enjoyable.

Language Skills and Critical Thinking
Teachers creatively employed visual culture to enhance language skills and critical thinking through various activities such as storytelling and imaginative reading. By immersing students in visual narratives and thought-provoking discussions, teachers cultivated a dynamic learning environment conducive to holistic language development.

Working Memory
Visuals and gestures were harnessed to enhance students' working memory and facilitate the retention of new language concepts. Teachers recognized the importance of multisensory approaches in reinforcing language learning and empowering students to make meaningful connections between visual stimuli and linguistic concepts.

Creativity
Visual tools were championed as catalysts for fostering creativity among students, with projects like posters and sculptures serving as outlets for self-expression and exploration. By encouraging students to engage with visual media in imaginative ways, teachers nurtured a culture of creativity and innovation in the language classroom.

Recognition
Recognition processes were underscored as foundational to language learning, with games like word search puzzles and Spot the Difference serving as fun and interactive means of honing visual recognition skills. Through engaging activities that challenge students to identify patterns and make connections, teachers facilitated the development of cognitive skills essential for language acquisition.

Learning to Read
Strategies to simplify reading through right-brain activities were discussed in depth, with teachers employing visual aids and multisensory techniques to support students' literacy development. By capitalizing on visual stimuli and kinesthetic learning experiences, teachers empowered students to navigate the complexities of written language with confidence and fluency.

Storytelling
Speaking activities like storytelling emerged as powerful tools for enhancing fluency and comprehension in language learners. Teachers embraced visual aids such as story maps and graphics cards to scaffold students' storytelling abilities, encouraging them to weave narratives rich in detail and imagination.

Activity-Based Learning
Participants advocated for activity-based learning as an effective approach for engaging students and promoting language acquisition. Through hands-on activities like creating models and enacting stories, teachers fostered a dynamic learning environment where students could actively participate and collaborate in their language learning journey.

In general, the integration of right-brain practices through visual culture emerged as a multifaceted and transformative approach to L2 teaching, empowering educators to nurture creativity, critical thinking, and language proficiency in their students.

Discussion

The current study further elucidates the integration of right-brain practices in language learning, with a specific focus on teaching Maltese to international adult learners. By engaging a focus group of twenty-seven teachers, the study thoroughly examines the utilization of various visual culture practices within language classrooms. While highlighting the efficacy of practices like drawing, sketching, orthographic mapping, and games in facilitating language acquisition and promoting collaboration among students, it also acknowledges a notable gap in strategies tailored to diverse learning styles or learners with specific needs.

The study underscores the use of the matching game and orthographic mapping techniques, though it notes a lack of empirical evidence supporting their cognitive benefits. Furthermore, the incorporation of infographics and videos in language learning showcases the potential of visual culture practices to enhance comprehension and retention. Infographics, with their visually appealing representations, aid in vocabulary acquisition, while videos, including kinetic typography and augmented reality, offer immersive learning experiences, albeit dependent on individual learning preferences.

Various methods employed by teachers to enhance language skills and critical thinking through visual culture are discussed. These methods, such as using pictures for writing tasks, employing flashcards in games, and posing open-ended questions about visual stimuli, provide interactive and engaging learning opportunities, fostering both linguistic proficiency and critical thinking abilities.

The prevalence of interactive methods like playing, drawing, and sketching in language learning underscores their importance, not only in aiding vocabulary retention but also in promoting collaboration and communication. However, their limited application with adult learners suggests an area requiring further research and development.

Orthographic mapping emerges as a promising method, particularly with detailed descriptions provided by teachers. The use of colour coding simplifies the learning process and facilitates word recognition and recall. Yet, further discussion on adapting this method for diverse learner profiles could enhance its applicability.

The Memory Palace Approach, embraced by some participants, leverages spatial visualization to improve information recall, potentially benefiting ML2 adult learners with memory challenges. Similarly, Wordless Picture Books foster critical analysis and storytelling skills, engaging the right brain hemisphere crucial for processing visual information.

Picture-based learning methods, extensively discussed by participants, offer diverse approaches to second language acquisition, promoting collaboration and communication while facilitating comprehension. These practices underscore the potential of visual culture in language learning but may require adaptation to individual learning styles.

Teachers demonstrated a creative use of visual culture to enhance language skills and critical thinking through activities such as storytelling and imaginative reading. By immersing students in visual narratives and engaging them in thought-provoking discussions, teachers created a dynamic learning environment conducive to holistic language development. These activities not only fostered language acquisition but also encouraged students to think critically, analyze information, and express themselves effectively.

Visuals and gestures were effectively utilized to enhance students' working memory and aid in the retention of new language concepts. Teachers recognized the importance of multisensory approaches in reinforcing language learning, understanding that by incorporating visual stimuli and gestures, students could make meaningful connections between what they see and hear, thus deepening their understanding and retention of language concepts.

Visual tools were celebrated as catalysts for fostering creativity among students. Projects like posters and sculptures provided outlets for self-expression and exploration within the language classroom. By encouraging students to engage with visual media in imaginative ways, teachers nurtured a culture of creativity and innovation, empowering students to express themselves confidently and develop their linguistic skills in novel and exciting ways.

The importance of recognition processes in language learning was emphasized, with interactive games like word search puzzles and Spot the Difference serving as engaging means of honing visual recognition skills. Through these activities, teachers facilitated the development of cognitive skills essential for language acquisition, such as pattern recognition and making connections between visual stimuli and linguistic concepts.

Strategies to simplify reading through right-brain activities were explored in-depth, with teachers employing visual aids and multisensory techniques to support students' literacy development. By capitalizing on visual stimuli and kinesthetic learning experiences, teachers empowered students to navigate the complexities of written language with confidence and fluency, enhancing both their reading comprehension and overall language proficiency.

Speaking activities like storytelling emerged as powerful tools for enhancing fluency and comprehension in language learners. Teachers utilized visual aids such as story maps and graphics cards to scaffold students' storytelling abilities, encouraging them to weave narratives rich in detail and imagination. Through these activities, students not only improved their language skills but also developed their storytelling prowess and creative expression.

Participants advocated for activity-based learning as an effective approach for engaging students and promoting language acquisition. Through hands-on activities like creating models and enacting stories, teachers fostered a dynamic learning environment where students could actively participate and collaborate in their language learning journey. These activities not only enhanced language skills but also encouraged teamwork, problem-solving, and communication skills development.

While the study provides a comprehensive examination of visual culture practices in language learning, it also identifies areas for further research, particularly concerning their adaptation for adult learners and diverse learner needs. Despite limitations, the study contributes valuable insights to language studies, offering practical recommendations and shaping future research and teaching practices. By focusing on right-brain practices and visual culture, this study pioneers a novel approach that could revolutionize traditional teaching methods and optimize Maltese language learning outcomes.

Limitations of the Study

Several limitations are evident in this study regarding the use of right-brain practices through visual culture in language learning. Firstly, ongoing debates about the functions of the right and left-brain hemispheres in language acquisition create contradictory opinions among

researchers (Qi et al., 2019), which may affect the interpretation of the study's findings. Secondly, the small number of participants in the focus group results from the limited availability of ML2 teachers in Malta, potentially impacting the representativeness of the sample. Thirdly, the reliance on teachers' experiences introduces biases, and the findings may lack generalizability due to the small sample size. Lastly, the study overlooks the perspective of adult students, focusing solely on the viewpoint of teachers.

Recommendations

The study proposes incorporating right-brain activities and visual culture methods, including drawing tools, matching games, orthographic mapping, wordless picture books, and videos, in ML2 classrooms for adult learners to enhance language skills and learning outcomes. However, further research is needed to understand the impact of these practices on the right hemisphere and their effectiveness for adult learners in the early stages of learning Maltese. Conducting follow-up studies focusing on adult learner perspectives through individual interviews or additional focus groups can provide valuable insights into their experiences with visual practices in language learning.

Exploring adult learners' viewpoints on the impact of visual practices, comparing them to traditional methods, and suggesting improvements based on personal experiences can offer a comprehensive understanding of the effectiveness of visual practices in language acquisition. Additionally, investigating the influence of visual methods on the left hemisphere and conducting longitudinal studies to assess the long-term effects on ML2 proficiency and retention are recommended. Such studies can track learners' progress over time and evaluate the sustainability of learning outcomes achieved through visual culture practices.

Implications of the Study Findings for Language Researchers and Teachers

The study underscores the importance of integrating visual culture practices into language teaching methods for adult learners, emphasizing the need to move beyond traditional approaches focused solely on linguistic processes. By incorporating visual elements such as drawing, wordless picture books, and videos, teachers can create engaging learning environments that increase learner motivation and immersion.

The study also highlights the benefits of visual culture practices in the early stages of language acquisition, suggesting techniques like picture-based learning methods and memory palace approaches to help learners establish a strong foundation in the target language. Additionally, memory-enhancing aspects of visual culture practices such as infographics and memory games can aid vocabulary acquisition and improve memory retention.

Moreover, incorporating visual materials showcasing the target culture can promote cultural understanding and intercultural competence among language learners. Overall, the study provides valuable recommendations for language researchers and teachers to enhance language learning outcomes by integrating visual culture practices into instruction.

Conclusion

The study delved into the significance of integrating visual culture and right-brain practices in instructing ML2 to adult learners. Gathering qualitative insights from 27 part-time ML2 teachers, the research revealed that while these educators employed visual methods to enhance speaking and writing skills and fostered right-brain development through visual activities for

various student groups (e.g., Primary, Middle, and Secondary students, and adult English learners), they did not utilize them in teaching ML2 to adult students. Consequently, the study suggests that incorporating visual culture practices could effectively cultivate the right hemisphere's capabilities, particularly during the initial phases of language acquisition. This finding presents an encouraging avenue for further investigation into ML2 instruction for international adults.

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Mechanisms of Driving Science-Based and Technology Demonstration Classrooms Under the Supervision of Rajamangala University of Technology Lanna, Chiang Rai, Thailand

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Abstract
This qualitative research aimed to analyze the mechanisms of driving the science-based technology demonstration classrooms under the supervision of Rajamangala University of Technology Lanna, Chiang Rai. The research sample consisted of 30 individuals, including university administrators, curriculum administrators, instructors, teaching assistants, and support staff. Interviews and focus group discussions were utilized as research tools, and descriptive statistics were employed for data analysis. The findings revealed that the mechanisms of driving science-based technology demonstration classrooms under the university's supervision have a significant impact on creating educational opportunities and enhancing competitiveness. Moreover, these mechanisms also contribute to producing skilled workers who can contribute to both government and industrial sectors. The collaborative efforts and participation of stakeholders in identifying and solving organizational issues have led to the development of education strategies that align with the requirements of both public and private sectors. For elevating the university to higher standards, it is vital for every staff member to take responsibility for producing competent graduates who can actively contribute to society. For this, leaders must be dares to innovate and take action is imperative, while faculty members must embody the spirit of professional educators, going beyond their roles as mere instructors. Additionally, the community's support, modern and comprehensive curriculum standards, and students' practical knowledge and skills transfer are also essential. Furthermore, the active involvement of enterprises in curriculum development and supporting the industrial labor market is vital for fostering a well-rounded educational environment.

Keywords: Driving Mechanisms, Science-Based Technology Demonstration Classrooms

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Introduction

This research project of science-based technology demonstration classrooms is a joint initiative between Rajamangala University of Technology Lanna - RMUTL and San Kamphaeng Technical College and the Prototype Development Project is jointly conducted by Rajamangala University of Technology Lanna (RMUTL) and the National Science, Technology, and Innovation Policy Office (STI). These initiatives have been implemented between the academic years 2018 to 2020 with Diploma level in Mechatronics, and they aim to integrate seamless educational management processes. These processes encompass Vocational Certificate (Voc.) three-year program and Higher Vocational Certificate (Higher Voc.) two-year programs, followed by the Bachelor's degree program, with a focus on the core vocational curriculum aligned with the Vocational Education Commission (VEC) guidelines.

In the context of this study, science-based technology demonstration classrooms within the Pre-Engineering program were examined. These classes involve a unique arrangement where graduate students serve as mentors, taking on roles that encompass life care, academic support, and project consultation for Vocational Certificate (Voc.) students. Moreover, these graduate mentors actively contribute to the transfer of industrial knowledge by conducting instruction and collaborating on industry-related research.

Furthermore, the university and college faculty members participate in teaching and knowledge sharing, ensuring that students acquire fundamental skills that align with industry standards. The curriculum emphasizes a fusion of academic and vocational learning, incorporating lessons derived from industrial practices to prepare students for further studies in technology-related professional programs.

Upon successful completion of the Vocational Certificate (Voc.) level, students have two career development pathways: 1) Those demonstrating expertise in practical work are further developed as productive professionals and may pursue the Higher Vocational Certificate (Higher Voc.) program, and 2) Those displaying innovation, creativity, and product development capabilities are nurtured as innovative personnel, fostering a continuous of exploration and progress.

The development of a country's capacity for global competition necessitates the cultivation of skilled individuals who can effectively drive various mechanisms towards predetermined objectives. University-level education plays a pivotal role in knowledge advancement, facilitating the integration of cutting-edge technologies into academic content, and producing specialized professionals who possess the ability to align their skills with theoretical knowledge, thereby meeting the demands of the labor market. This synchronization of education with the economic and social landscape, both at local and national levels, enables seamless expansion of businesses, communities, and industries.

Although, the educational institutions had not been fully aligned their outputs with the societal and industrial needs, resulting in an insufficient supply of personnel tailored to meet the demands of communities and industries. For the expansion of technical, technological, and innovative competencies, teaching and learning practices must integrate working skills with contemporary science and technology. However, the developing instructors, curricula, and teaching methodologies to meet requirements of industries and communities have been limited. As part of Thailand's strategy for economic advancement and to prevent from being a middle-income country, the nation has undertaken efforts to restructure its economy, emphasizing the

fields of science and technology. This approach aims to drive economic growth and develop skilled labor to propel the country towards becoming a center for human resource development and scientific and technological progress. These endeavors are crucial for supporting the expanding labor market and driving development across all sectors in Chiang Rai Province, as well as in the Upper Northern Region, including the Mekong sub-region and the five traditional industries and five new industries (5 S-curves and 5 new S-curves).

In this context, planning and developing human resources and skilled labor are of utmost importance and necessity. This involves equipping individuals with relevant knowledge and specialized expertise, aligning with the demands of both the industrial sector and the labor market of the country. A well-designed development plan is vital to efficiently and effectively drive economic growth, create jobs, generate income, and foster transformative societal changes in all dimensions of the nation with the government's policies. This requires collaboration between relevant state agencies involved in educational management, as well as cooperation from all sectors, including the public, private, tertiary, vocational, and secondary education sectors.

Adopting an integrated education model that encompasses both theoretical learning and practical work within business entities is essential. In this regard, Rajamangala University of Technology Lanna, Chiang Rai, under the guidance and supervision of the College of Technology and Interdisciplinary, Rajamangala University of Technology Lanna, Doi Saket has actively been involved in such efforts since 2007 to the present.

The development of skilled technical and vocational education graduates to meet the demands of the industrial sector has been a paramount objective in driving Thailand's economic progress and elevating its global competitiveness. To achieve this goal, educational institutions have emphasized the integration of theoretical knowledge and practical skills relevant to the contemporary workplace, fostering graduates who possess the necessary expertise to contribute effectively to the industrial and vocational sectors. Furthermore, the aim has been to produce graduates equipped to meet the needs of both vocational and higher education institutions with the principles of the "Cooperative Education 4.0" concept proposed by Wijit Srisa-an (2017). In recognition of this initiative, Wichit Srisa-an was honored as a visionary and pioneer of Cooperative Education in Thailand, leading towards Cooperative Education 4.0 in the 21st century, an integral part of Education 4.0 that seeks to enhance the quality of human resource development, knowledge creation, and innovation with the standards set by the Office of the Higher Education Commission (OHEC).

This paper focuses on the significance of planning and developing human resources and skilled labor, designed to equip graduates to enter the labor market. The study reveals three crucial key attributes by employers: (1) the promptly ability to apply knowledge and skills in the workplace, (2) tolerant, and (3) advanced English proficiency. From these findings, the concept of Cooperative Education has evolved into a "University-Workplace Engagement," where Cooperative Education is now integrated into specialized and vocational undergraduate curricula, for four-year study, with full-time, four-month work placements at partnering enterprises. This approach creates a unique Teaching Engagement model that bridges the gap between university and workplace, promoting collaborative thinking and mutual benefits. As a result, this innovative University-Workplace Engagement has become a catalyst for positive social impact.

Moreover, RMUTL remains committed to meeting the labor market demands and industrial sectors by adhering to the government's policies on human resource development for national progress. The institution focuses on developing self-skills and knowledge for a successful career, creating "Hands-On Professionals." These professionals are well-prepared to meet the requirements of the labor market and industrial enterprises. This proactive approach is aligned with the country's vision to foster human capital, leading to national development. (RMUTL, 2022).

In 2019, Rajamangala University of Technology Lanna, Chiang Rai, was granted an educational equity fund to administer educational management, providing educational opportunities and equal access for students who are disadvantaged in their educational pursuits. The university organized educational programs for both vocational certificate and higher vocational certificate levels. It was found that students and their parents became aware of education, the opportunities that offered, and the future progress of their children. Consequently, a substantial number of students were enrolled in this institution, surpassing the university's admission plan.

The university perceived this as an opportunity to educate this group of students who could study in higher-level educational programs at Rajamangala University of Technology Lanna, Chiang Rai. However, it was recognized that some students did not fully meet the required qualifications and criteria set by the industries.

From the reasons mentioned above, Rajamangala University of Technology Lanna, Chiang Rai, realizes the significance and opportunities in education, as well as the importance of building collaborative networks with all stakeholders, including the government, private sector, and educational institutions at all levels: tertiary, vocational, and secondary. Embracing the concept of experiential learning in real workplace settings, the university aims to develop students' fundamental vocational skills through "Gifted Hands-on" learning approaches. This initiative aims to foster teaching methodologies and essential skills necessary for the 21st century and encourages students to learn effectively.

To achieve this, teachers must act as facilitators, coaches, and mentors, moving away from their comfort zones and embracing a learning-oriented environment. This necessitates continuous teacher development and a shift towards a learner-centered approach via educational research which promote self-development and continuous upskilling and reskilling of the teaching staff (graduate or postgraduate students). The goal is to equip them with up-to-date technological knowledge and adapt to the changing trends, thereby creating a conducive learning environment that prepares students for the demands of the industry.

Research Objectives

To investigate the mechanisms of driving technology demonstration classrooms under the supervision of Rajamangala University of Technology Lanna, Chiang Rai.

Research Benefits

1. The study's findings will provide insights for curriculum development to produce graduates aligned with the requirements of both the public and private sectors.
2. The study's outcomes will guide strategies to increase the number of students pursuing higher education levels at the university.

3. The study's results will enable the university to compete in the educational landscape and formulate future strategies encompassing proactive, preventive, corrective, and adaptive approaches.
4. The study's findings will provide directions for curriculum enhancement to meet the needs of students, parents, and collaborating organizations, including industrial partners.
5. The study's outcomes will facilitate planning communication strategies to enhance the accessibility of university information, thus creating opportunities for engagement with the university's data.

Research Methodology

This research employs a qualitative research design to investigate the educational management situation at the undergraduate level of Rajamangala University of Technology Lanna, Chiang Rai, and the mechanisms driving the implementation of science-based technology demonstration classrooms under the university's supervision.

***Population**:*
The research involves a sample of 30 individuals, including university administrators, program administrators, instructors, teaching assistants, and support staff.

***Data Collection Instruments**:*
The study adopts a qualitative research approach with the following data collection instruments:

1. Semi-structured interviews: Interviews will be conducted with groups of university administrators, program administrators, and instructors. The interview questions will focus on the educational management situation at the undergraduate level of the university and the mechanisms driving the implementation of science-based technology demonstration classrooms under the university's supervision.
2. Focus group discussions: Focus group discussions will be held with university administrators, program administrators, instructors, teaching assistants, and support staff to explore the educational management situation at the undergraduate level of the university and the mechanisms driving the implementation of science-based technology demonstration classrooms under the university's supervision.

Data Analysis:
The data in this research was analyzed using a interpretative approach, and conclusions were drawn deductively as a result of the research. After conducting interviews and focus group discussions, the findings were subjected to a SWOT analysis to identify strategic directions for curriculum development that align with the needs of students and the labor market. The TOWS Matrix was employed to further analyze the current university environment and situation identified from the SWOT analysis, enabling the generation of new strategies. This process involved matching internal and external factors of Rajamangala University of Technology Lanna, Chiang Rai, which have been developed based on the results of the SWOT analysis.

Research Results

Educational Management Issues at the Undergraduate Level of Rajamangala University of Technology Lanna, Chiang Rai, and Mechanisms Driving the Project of Science and Technology-Based Practice Rooms under the University's Supervision.

Based on the results from interviews and focus group discussions, the SWOT analysis yielded the following findings:

(1) Internal Factors Within the Organization

Strengths:

1. The university has a unique identity and a management that emphasizes driving the project of science-based technology demonstration classrooms.
2. There is a diverse range of specialized professional courses suitable for students.
3. The faculty staff possesses knowledge, skills, and expertise in their respective fields and has a service-oriented mindset.
4. The university is an adaptable organization in terms of management and administration.
5. There is a quality-oriented teaching and learning system that aims to produce graduates who are skilled practitioners, emphasizing experiential training and professional skills.
6. The university offers language programs for students' learning.
7. A customer-oriented approach is adopted within the organization.
8. The university has strong collaborations with various networks, both from the public and industrial sectors.
9. Academic mentors provide guidance and support for students' academic and life skills development.
10. The university is equipped with comprehensive and up-to-date professional laboratories.

Weaknesses:

1. The university is located in a remote area.
2. Limited resources, such as budget and information systems.
3. The place on managing specialized professional learning facilities is relatively limited.
4. There is limited research and international networking at the university.
5. Some staff members lack a shared sense of responsibility and efficiency in their work.

(2) External Factors Outside the Organization

Opportunities:

1. The global wave of digital transformation has created a demand for graduates who possess relevant skills and professional readiness for the workforce.
2. The university's location within an economic special zone and the Greater Mekong Sub-region offers collaborations opportunities to provide specialized vocational training.
3. The growing industrial network within Chiang Rai's economic special zone presents the university opportunities for recognition and enhance cooperation.
4. Chiang Rai's infrastructure development is ready to support the city's growth, including road, water, and air transportation.

Threats:

1. The declining school-age population reduces the pool of qualified applicants.
2. Increased competition in student admissions.
3. The availability of online education diminishes the necessity for university-based learning.
4. Economic crises and pandemics impact the decision-making process for students and parents.

5. The labor market demands more knowledgeable and specialized graduates, such as those with professional skills and language proficiency.

The SWOT analysis is a valuable tool used by organizations to assess their current position by analyzing internal factors (Strengths and Weaknesses) as well as external factors (Opportunities and Threats). Once the SWOT analysis is complete, the TOWS Matrix (also known as the SWOT Matrix) can be employed to develop new strategies that align with the organization's situation. The TOWS Matrix combines the elements from the SWOT analysis to formulate appropriate strategies.

Aggressive Strategies:

1. Develop specialized professional programs to produce skilled labor force and workforce for both public and industrial sectors.
2. Establish collaborations with industrial establishments in Chiang Rai's economic special zone to provide specialized vocational workforce for the labor market.

Corrective Strategies:

Enhance the standards of specialized laboratories to conduct tests and train labor skills, supporting the growth of industrial networks in Chiang Rai's economic special zone.

Preventive Strategies:

Develop online distance learning courses to reduce learning time, enhance knowledge through online media, and provide practical experience through hands-on training.

Responsive Strategies:

Implement a rebranding of the organization to create a memorable identity, aligning it with the modernization and improvement of courses to meet the workforce demands for both short-term and long-term vocational programs.

Research Conclusion

1. The research findings from interviews and group discussions, coupled with the SWOT analysis and subsequent analysis using the TOWS Matrix, have led to the development of new strategies and data for decision-making regarding the establishment of a technology-based science demonstration classroom under the supervision of Rajamangala University of Technology Lanna, Chiang Rai.
2. Project Mechanism of Driving Science-based Technology Demonstration Classrooms under the Supervision of Rajamangala University of Technology Lanna, Chiang Rai, for the Pre-Engineering Vocational Certificate Program.

Findings Summary:

2.1. The research team conducted meetings to plan the analysis results from the SWOT analysis process and developed new strategies using the TOWS Matrix. The project to establish the mechanism of driving science-based technology demonstration classrooms under the supervision of Rajamangala University of Technology Lanna, Chiang Rai, was approved. The research project was initiated to create mechanisms for the establishment of the Science-based and Technology in 2022. Research funding in the amount of 371,800 Baht was requested and supported by the Fundamental Fund (FF) for the fiscal year 2023.

2.2. Preparations were made to request permission for the implementation of the Pre-Engineering Vocational Certificate Program from the Institute of Technology and Innovation, Rajamangala University of Technology Lanna. This information was used in the management of education and the teaching process in 2023, with the curriculum administrators, faculty members, and instructors. Additionally, a plan for student enrollment in 2023 was prepared, targeting 20 new students.
2.3. After the data and resource preparations were completed, the research project proposal was presented at the meeting of Rajamangala University of Technology Lanna's management committee, with a presentation to the research committee for funding from the Fundamental Fund (FF) for the fiscal year 2023. The proposal was approved, and funding sources for driving the establishment of the Science and Technology Vocational School's Training Laboratory were secured.
2.4. The research team, curriculum administrators, academic affairs department, and public relations department held a meeting to plan the promotion of student enrollment. The enrollment period was set from December 2022 to April 2023, with information disseminated through various channels, both traditional and online media. The four rounds of enrollment attracted significant interest of students and parents, with a confirmation rate of 75% for online media channels, such as Facebook, Line, Videos, Websites, and Webpages, which served as the most effective means for prospective students to access information.

The student admission plan for the academic year 2023 comprises two main stages: student recruitment and preparatory activities before enrollment. The responsibility for overseeing all activities lies with the Student Affairs Office, with collaboration from the research team. The entire process, from planning to execution, evaluation, and summarization of the activities, will take place from June 17th to June 25th, 2023.

In terms of the teaching and learning process, the research team, with all faculty members, will participate in curriculum planning with course coordinators. Each faculty member will be responsible for teaching courses during both the first and second semesters of the academic year 2023.

Lastly, in order to enhance the curriculum and life skills, the research team and all faculty members, including course coordinators, will emphasize an integrated approach to teaching and learning that actively involves students. This approach is designed to meet the requirements and students' aptitudes.

Research Discussion

The driving mechanisms for the science-based technology demonstration classrooms, under the supervision of Rajamangala University of Technology Lanna, have proven to create educational opportunities and enhance competitiveness in the realm of education. Moreover, the program effectively produces skilled labor, thereby meeting the demands of both the public and private sectors. The collective awareness and recognition of organizational challenges have active participation from all stakeholders. Consequently, the program has developed education strategies that align with the needs of both the public and private sectors. This endeavor serves as a critical focal point for all personnel in elevating the university's standards, fostering acceptance, and nurturing its distinct identity. The core mission centers around the production of well-prepared graduates.

To achieve success, resolute and innovative leadership is essential. Faculty members must possess a professional teaching spirit, moving beyond mere duty to become devoted educators. Community support is indispensable, and curricula and instructional processes must be modern, comprehensive, and up-to-date. Students must truly comprehend, apply, and disseminate knowledge, while employers must actively participate in curriculum development and adapt their workforce to support the industrial market, aligning with the findings of the research conducted by Watcharin Siripanich, Director of EEC TOP (2018). The study outlines the "EEC Model," which serves to build a supplementary workforce capable of accommodating investments in the development of targeted 20 industrial clusters, comprising both existing and new S-Curve groups.

The two educational approach comprises vocational and university levels. The former involves the Statchic Certificate Level (Vocational Certificate; Voc.Cert.), followed by the Advanced Vocational Certificate Level (Advanced Vocational Certificate; Adv.Voc.Cert.), while the latter involves the 2+2 formula. In this context, "2" refers to the transition from Voc.Cert. to Adv.Voc.Cert., and the second "2" denotes the progression from Adv.Voc.Cert. to a Bachelor's degree. Additionally, for the university sector, short-term technological courses in collaboration with vocational education have been offered to approximately 400,000 unemployed graduates to facilitate their entry into the industrial sector within the EEC area. These short-term modules, which require three to six months of study, serve as a supplement to regular studies and short-term training. The aim is to augment technical expertise among the workforce within the industrial setting, as the industry approaches the era of Industry 4.0. Consequently, it is essential to prepare a workforce well-equipped to embrace the Industry 4.0 system, emphasizing automation knowledge.

The development of workforce preparation in support of the Eastern Economic Corridor (EEC) adheres to the Work-integrated Learning (WiL) model, initially pioneered and implemented years ago at the Sattahip Technical College to address the incongruity between industrial demands for technologically competent labor and educational outputs that emphasize general knowledge and common skills. This model will be further extended to other educational institutions nationwide next year. Aligning with the findings of Nuttinan Lalorkaew (2018) who proposed the implementation of the School in the Workplace (STI-WiL) project aimed to address this incongruity. It was designed to bridge the gap between the "industrial sector," which requires workforce expertise in technology, manufacturing, and production processes, and the "educational sector," which produces a workforce emphasizing general knowledge and skills. This was achieved through the development of an educational management approach that connects industry with effective educational institutions using a "School in the Workplace" or "Work-integrated Learning" format, spanning the two-year duration of the curriculum. The motto of the STI-WiL project emphasizes "Learn what you Work & Work what you Learn," exemplifying a two-way learning process which was relevant to Niwat Moonpa (2020), Former Director of College of Technology and Interdisciplinary who presented fours projects: 1. Educational management to produce technicians in the form of a school in Michelin Siam factory. 2. The development of teachers for the school system in the factory. 3. The model of professional education and technology collaboration with industrial sector. 4. WIL feeder. All of the projects will operate by demand driven with public, industries, and academic cooperation.

Additionally, the successful implementation of the STI-WiL project has prompted Rajamangala University of Technology Lanna to assume the role of an agency that coordinates and manages education in conjunction with industry and comprehensive vocational and high school

institutions in the STEM for TVET format through the establishment of the first TVET HUB LANNA in the country. This collaboration includes the National Science, Technology, and Innovation Policy Office (STIPO), Chevron Thailand Exploration and Production Limited, and the Asian Institute of Technology since December 2015. All the courses are integrated from lower educational levels to the tertiary level.

Furthermore, personnel development has been enhanced to foster innovative learning in various forms, such as Constructionism, CDIO (Conceive, Design, Implement, Operate), and STEM for TVET teacher professional development for college instructors and educators from vocational and networked high schools. Additionally, educators have been empowered with research and integration capabilities in teaching, research, and administration, thus transforming the university into an innovative vocational education organization for the benefit of Thailand's future.

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Productive Failure Application in Adult Learning: Benefits and Challenges

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Abstract
This paper draws on both Adult Educators' (AE) observations of and learners' experiences with the Productive Failure (PF)-infused lessons. In applying the PF Design principles (DPs) to lessons for learners from various sectors, this paper elaborates on the benefits and challenges faced by both AEs and their learners. Seven AEs from different sectors, e.g., healthcare, early childhood, security, professional development, participated in this project with about 150 learners involved in two pilot lessons. With the advice and support of the inventor of PF, Prof Manu, the AEs went through two iterations of designing PF lesson for two different batches of learners. Both surveys and semi-structured interviews were employed after each pilot lesson to understand the experience of PF by AEs and their learners. The project can be considered a success where The benefits and challenges as identified by both AEs and learners provide us some recommendations on how we can better support the Training and Adult Education (TAE) sector when they are incorporating PF DPs in their own teaching contexts.

Keywords: Productive Failure, Adult Learning, Professional Development

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Introduction

What is Productive Failure?

Productive Failure[1] embodies constructivist principles, where failure is deliberately designed into the learning, to facilitate deep learning and imbue learners with resiliency and learning agility. These are much needed skills as jobs are transformed by new technologies of the Fourth Industrial Revolution (World Economic Forum[2], 2020). The PF learning environment is designed deliberately to provide learners with the safe space and opportunity to innovate solutions while exploring complex and novel problems. This guided exploration also allows learners to activate and differentiate relevant prior knowledge, generate multiple representations of problems, and consolidate the knowledge and skills needed to solve "wicked" real-world problems.

PF can be considered a subset of PS-I (Problem solving followed by Instruction) that fall under the broader design paradigm of Preparation for Future Learning (PFL) (Sinha & Kapur, 2021). The central tenet of PF is that failure, when well designed, may be beneficial for learning, especially in developing conceptual understanding and transfer (Kapur, 2015; Sinha & Kapur, 2021). According to Kapur, (2015), PF is a learning design that encourages learners to generate solutions to a novel problem that involves a concept they have not learned yet, followed by consolidation and knowledge assembly where they learn the targeted concept. Because learners have not learned the concept, and further, are asked to generate solutions without any cognitive support or scaffolds, they can be expected to use their prior knowledge to generate sub-optimal or even incorrect solutions to the problem. However, the process can be productive in preparing them to learn better from the subsequent instruction that follows. A critical feature of PF is therefore not to provide cognitive guidance or support during the generation and exploration phase. The design of the tasks, activities and social surround is developmentally calibrated with each group of learners, through multiple iterations of pilot-testing, refinement, and implementation.

As such, the desired outcomes from the use of the design principles (DPs) in the Productive Failure approach are to:

- strengthen conceptual connections within the content areas,
- deepen learning (e.g., application and transfer of learning to diverse and different contexts),
- develop learner adaptive capacity through generative and exploratory learning.

Literature Review

In linking "transfer" in learning to "preparation for future learning" (PFL), Schwartz, Bransford and Sears (2005), argued for an expansion of the definition of transfer to include "preparation for future learning" (PFL). In the PFL paradigm, transfer is defined as the use of prior

[1] As detailed by Kapur & Bielaczyc (2012), PF has a two-phase design: a generation and exploration phase (Phase 1) followed by a consolidation phase (Phase 2). Phase 1 provides opportunities for learners to generate and explore the affordances and constraints of multiple representations and solution methods. Phase 2 provides opportunities for organizing and assembling relevant learner-generated solutions into canonical solutions. [Kapur, M., & Bielaczyc, K. (2012). Designing for Productive Failure. Journal of the Learning Sciences, 21(1), 45–83. https://doi.org/10.1080/10508406.2011.591717]

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experiences to inform and improve later formal learning, as opposed to a simplistic one-to-one mapping of prior content to a new context. The idea is that we use prior knowledge to identify and frame new information, and that these "knowings" can greatly shape and improve our understanding of the new context. Transfer in PFL is therefore treated both as an experience that can foster deeper learning (that is transferring out), and as a measure of learning (that is transferring in). Transfer as a process, where accessing prior experiences and information is a practice, and thus, can and should be cultivated for more effective learning (Schwartz & Bransford, 2005).

In exploring how PFL can be incorporated into learning design Loibl et al. (2016) noted the growing interest in learning approaches that combine two phases: an initial problem-solving phase followed by an instruction phase (PS-I). This was evidenced in several recent research publications (Loibl et al. found that PsychINFO lists 11 journal papers that include Productive Failure in the title published in 2010–2014) as well as articles in mainstream publications (e.g., article in the Time Magazine: Paul, (2012). Loibl et al. (2016) further distinguished PS-I from inquiry or guided discovery learning, noting that the latter's goal is to give learners various forms of support to discover the underlying model or concept on their own. In contrast, the problem-solving phase in PS-I is not designed to facilitate the acquisition of the target concept (Kalyuga and Singh, 2015) as the concept is taught during the subsequent explicit instruction phase. By asking learners to engage in problem solving prior to being taught the target knowledge, PS-I differs from other instructional methods that offer upfront instruction followed by problem-solving (I-PS).

Kapur & Bielaczyc (2012) highlighted that there is an "incommensurability between learning and performance; that is, conditions that maximize performance in the shorter term may not necessarily be the ones that maximize learning in the longer term". Kapur (2015) highlighted findings which suggested that learners from the PF condition outperformed those from the Direct Instruction approach (DI) and guided-generation conditions on procedural fluency, conceptual understanding and transfer, that is, in spite of guidance helping learners generate better quality solutions, there was no significant difference between guided and unguided problem-solving, that is, cognitive guidance during the generation phase did not result in better learning on the post test. He suggested that a plausible reason, which is consistent with the design theory of PF, could be that both low- and high-quality solutions present opportunities to learn during subsequent instruction, especially through a comparison and contrast between learner generated solutions and the canonical solution. Another finding suggests that when learning a new concept, learners seem to learn better from their own failed solutions than those of others' although, learners are still better off trying to learn from others' failed solutions than from direct instruction absent if there is no opportunity to learn from their own failures. What learners seemed to be learning from PF is an understanding of the critical features of the concept, and why it is formulated the way it is. Simply telling and explaining these features does not seem to be effective if learners have not had the opportunity to activate and differentiate their prior knowledge and engage in the comparison and contrasting of the solutions to attend to the critical features of the concept (Kapur, 2015).

The preliminary literature review conducted to date revealed that PF in K-20 settings, is well established and grounded. This raises the question whether and how PF can be applied in the adult learning field. We believe that the lack of PF experimentation in adult learning is not due to the different ways children and adult learn. Learning is no longer just about "transfer" of knowledge and skills for direct application(s) but should include adapting knowledge and skills

to new contexts effectively and meaningfully. Adult learning therefore needs to meet this challenge to remain relevant and useful; and be a valued part of lifelong learning.

This paper will be focusing on the data collected from both AEs and learners in terms of their design and experience of PF in their respective settings,

1. What are the benefits and challenges of PF application from both adult educators' and adult learners' perspectives through the comparison of Phase 1 and Phase 2 of the application?
2. What recommendations can be provided to TAE communities on the adoption of PF in terms of its application process?

PF Design Principles

When designing PF-infused lessons, there are 2 broad phases: phase 1, generate and explore followed by phase 2, consolidate and knowledge assembly. Learners undertake different activities in both phases. In phase 1, learners leverage their prior experience with peer inputs to propose new solutions to challenging problems. Subsequently, in phase 2, learners make sense of their earlier endeavour by linking their learning with the theoretical concepts presented to consolidate their learning.

During the lesson design and implementation process, the three design principles (Activity, Participation Structure and Social Surround) guide how the AEs applied the PF approach, based on the respective phases:

- Phase 1: the learners engage in creative solutioning to generate outcomes based on their own experiences, prior to any theory-building and without intervention from the AE;
- Phase 2: the learners construct their understanding through consolidating efforts together with their peers and AE to draw together key learnings based on the outputs from phase 1.

For AEs intending to apply PF to their instruction and learning design, they may have to bear in mind that the outputs from the problem-solving activities in phase 1 should drive the consolidation process in phase 2. To put it simply, the quality of the learning in phase 2 depends on how immersed the learners are in reflecting and generating their own solutions in phase 1.

Ensuring a psychologically safe environment at the start of the lesson is key to the solution generation so that learners open up to share their thoughts and ideas. Peer learning processes empower learners to play an active role in developing new understanding, positions, and solutions to problems, facilitated by occasional interjections from the adult educator. The learners can move from an initial exchange of accumulating information to a state of knowledge co-construction. Being responsible for the outcomes from joint activities builds trust and ownership of the learning space when learners own the right to express their ideas. Sharing this responsibility promotes dialogic exchanges which can be useful to prepare learners for future work.

Likewise, learners need to be receptive to assimilate the theoretical constructs put forth in the second phase of the lesson and feeling psychologically safe is important for opinions to be voiced and accepted.

Phase 1: Generation and Exploration With Unpacked PF DPs

Activity (Complex problem)	Participation Structure (Collaboration)	Social Surround (Affective support for persistence)
• Create intuitive hooks with an affective draw • Engage students in design • Admit multiple representations and solutions • Use variant-invariant features to bring about failure in problem-solving • Use contrasting cases • Keep computational load as low as possible	• Enable collaboration in mixed ability groups • Support learners to collaborate through an appropriate macro script • Push learner thinking through the disciplinary facilitation	• Create a safe space to generate and explore ideas • Set and constantly emphasize appropriate socio norms and values <specific to your own subject/ topic> • Provide affective support for persistence

With the outputs from phase one, the AEs proceeded to consolidate their learnings for phase two. Seemingly foundational, the challenge is the variance in the learner outputs generated from phase one which required AEs to be agile in assembling these diverse points/solutions to consolidate the learning effectively and efficiently, which also implies that AEs need to possess a deep level of subject matter and pedagogical expertise especially when constrained by the lack of time at the end of the lesson.

Phase Two: Consolidation and Knowledge Assembly

In the second phase, learners in the pilot classes are given the opportunity to extract the critical features or first principles from the earlier activities, that is, learners undertake the knowledge assembly process themselves, guided by feedback from their peers. The contrast in the learner outputs within and among the groups in phase 1 facilitates the theory building in phase two.

The facilitation by the AE at critical junctures of the consolidation process is also important to clarify doubts concerning the content. Hence, one AE competency is identifying the evolving learner needs and the point of interjection by the AE to effect the greatest learning impact.

Design of the Study

Figure 1. PF application Process

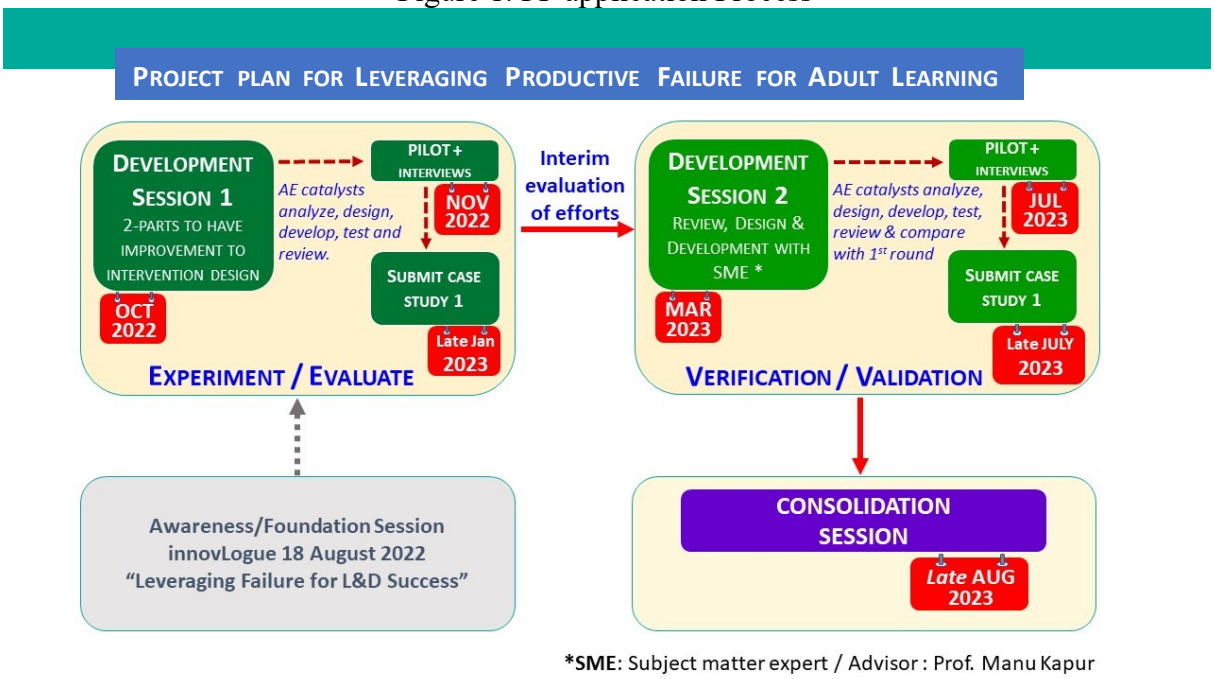


Table 1. Evaluation process for PF application

Phases on the experimentation	**Evaluation Instrument and process**
After Pilot Case 1	• Post lesson, interviews of AEs on their use of PF (input and process) • Post lesson, interview with two selected learners on their learning experiences on the use of PF in their respective classes • Post lesson, survey for learners on their learning experiences on the use of PF in their respective classes • Observation of AEs and learners in their own classes
After Pilot case 2	• Post survey on AEs' understanding and challenges of using PF in their contexts own teaching context (Input and process) • Post interviews of AEs on their use of PF (process and product) • Post interview with two selected learners on their learning experiences on the use of PF in their respective classes • Post survey for learners on their learning experiences on the use of PF in their respective classes • Observation of AEs and learners in their own classes

Using the instrument developed for the entire evaluation process, the findings are presented in the following two sections from both AEs and learners' perspectives for the benefits and challenges in applying PF in CET contexts.

Table 2. Data collected for evaluation

Industry Sectors of AEs	Pilot Case 1	Pilot Case 2
AE from Early Childhood	Learner Interview and Survey, AE interview, and class observation	Learner Interview and survey, AE interview and Survey, and class observation
AE from Teacher Training		
AE from Security		
AE from Healthcare 1		
AE from healthcare 2		
AE from TAE sector		
AE from Building and Environment		

The analysis of the data collected is to describe and make comparison between Phase 1 and Phase 2 in order to understand the challenges and benefits of PF application in different adult learning contexts. Drawing on these challenges and benefits, the team would be able to make a more objective evaluation of the PF application in adult learning.

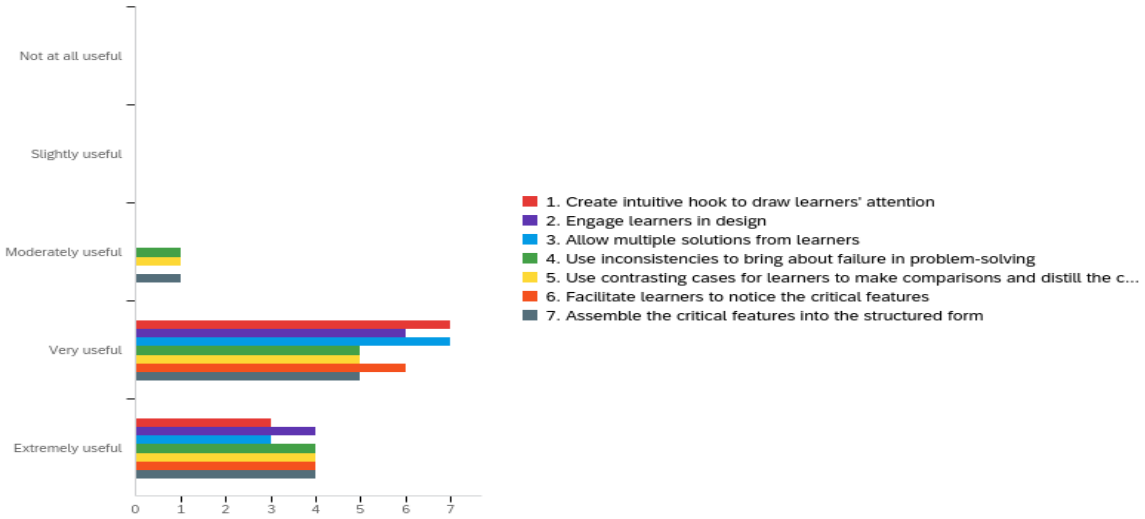
AE Survey and Learner Surveys Results for Pilot 1 and Pilot 2

AE's Profile

Most of the AEs (6 out of 10) participating in this study are falling in the age range between 41 to 50 years old, and all of them have minimum bachelor's degree or above. In addition, most of them (6 out of 10) have more than 20 years of industry experience with the course they are teaching.

AE's and Learners' Self-Perception of PF DP During Their Teaching and Learning Process

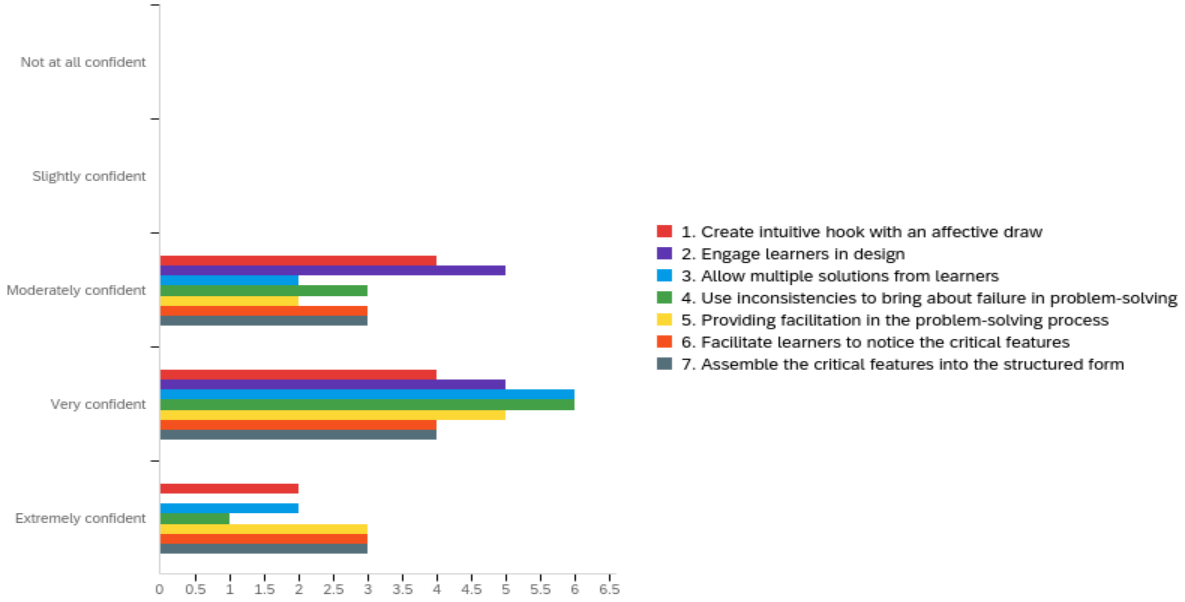
Figure 2. How useful the participating AEs were using different PF DPs for ACTIVITY?



Majority (over 5) of the AEs rated all of the seven DPs for activity as very useful. The top two very useful DPs for activity rated by most of the AEs (7 of them) are,

1. Creating intuitive hook.
2. Allow multiple solutions.

Figure 3. How confident the participating AEs were using different PF DPs for ACTIVITY?



However, when coming to the confidence level of using these different DPs for activity, most of the AEs rated the following to DPs with moderate confidence,

1. Engage learners in design.
2. Creating intuitive hook.

This finding may imply that AEs may need more training and assistance in creating the intuitive hood for learners during their own lessons as they rate it as a very useful DP for activity but they are only moderately confident in how they use it.

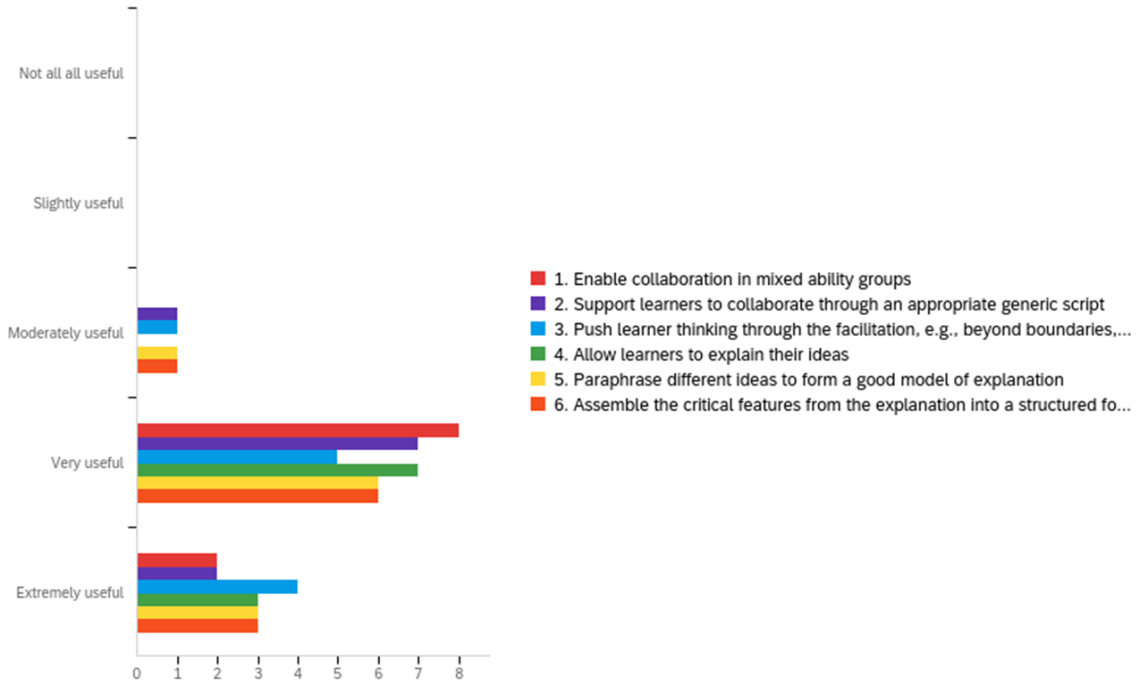
Table 3. Learner Experience of PF DPs for Activity for Pilot 1 and Pilot 2

Question	Never	Sometimes	About half the time	Most of the time	Always	Mean	SD
1. I was encouraged to challenge myself to solve the problem	0.00%	8.86%	13.92%	51.90%	25.32%	3.94	0.87
	1.35%	10.81%	12.16%	51.35%	24.32%	3.86	0.95
2. I was involved in the design of the solution to a problem	1.27%	13.92%	17.72%	40.51%	26.58%	3.77	1.04
	6.76%	22.97%	12.16%	33.7%	24.32%	3.44	1.28
3. I was encouraged to explore different solutions	2.53%	13.92%	15.19%	39.24%	29.11%	3.78	1.09
	2.7%	14.86%	20.27%	37.84%	24.32%	3.67	1.08

4. I learned from my mistakes in developing different solutions	0.00%	7.59%	17.72%	51.90%	22.78%	3.90	0.84
	2.7%	8.11%	17.57%	47.3%	24.32%	3.84	0.99
5. I was encouraged to compare different solutions to develop a better understanding	1.27%	8.86%	16.46%	43.04%	30.38%	3.92	0.97
	1.35%	13.51%	12.16%	45.95%	27.03%	3.85	1.02
6. I find it challenging to solve the problem given but feel supported to continue to do so	1.27%	13.92%	17.72%	40.51%	26.58%	3.77	1.04
	0.00%	10.81%	10.81%	51.35%	27.03%	3.92	0.92
7. I was encouraged to identify the important features of the learning content	2.53%	10.13%	11.39%	48.10%	27.85%	3.89	1.01
	1.35%	8.11%	10.81%	44.59%	35.14%	4.05	0.95
8. I was encouraged to put the important features together into a structure to form the basis of my solution	2.53%	8.86%	13.92%	45.57%	29.11%	3.90	1.01
	0.00%	12.16%	13.51%	44.59%	29.73%	3.93	0.96

Correspondingly, the AE's moderate confidence in engaging learners in design are also reflected in learners' experience in these PF-infused lessons. For learner survey item 2, pilot one and pilot two showed the lowest mean value from learners as compared with other items. Therefore, AE's moderate confidence in engaging learners in design does affect learners' experience in this DP as shown above.

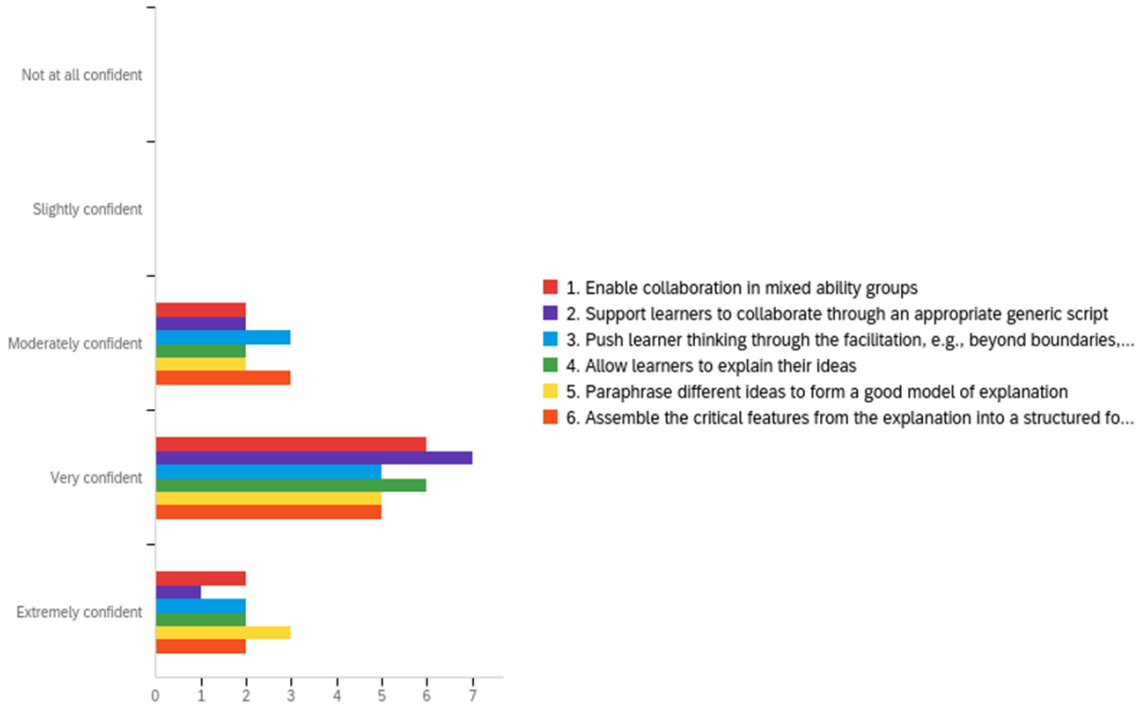
Figure 4. How useful the participating AEs were using different PF DPs for PARTICIPANT STRUCTURE?



Most of the AEs (7 to 8 of them) rated the following three DPs for participant structure as the most useful one in their PF application, Enable collaboration in mixed ability group;

1. Support learners to collaborate through generic script;
2. Allow learners to explain their ideas.

Figure 5. How confident the participating AEs were using different PF DPs for PARTICIPANT STRUCTURE?



In using these DPs for participant structure, most of the AEs (6 to 7 of them) felt they were very confident in using the three DPs that they found very useful,

1. Enable collaboration in mixed ability group;
2. Support learners to collaborate through generic script;
3. Allow learners to explain their ideas.

This finding implies that in using the DPs for participant structure, the AEs tend to be consistent in terms of their rating for the usefulness and confidence of these DPs. That is, they showed strong confidence in using the DPs they rated as very useful.

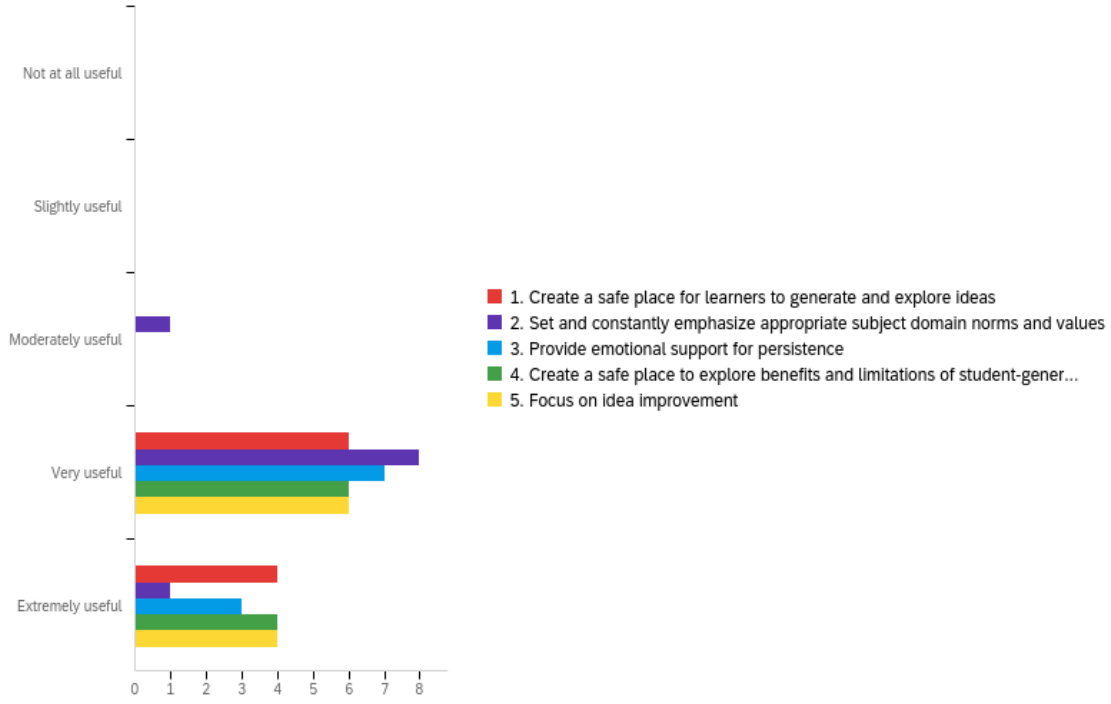
Table 4. Learner Experience of PF DPs for Participant Structure for Pilot 1 and Pilot 2

Questions	Never	Sometimes	About half the time	Most of the time	Always	Mean	SD
1. I was encouraged to challenge my fellow learners' solutions/ideas	3.85%	17.95%	20.51%	35.90%	21.79%	3.54	1.14
	4.05%	22.97%	24.32%	31.08%	17.57%	3.33	1.14
2. I was encouraged to work with other learners to find solutions/ideas	2.56%	10.26%	10.26%	46.15%	30.77%	3.92	1.03
	1.35%	12.16%	10.81%	44.59%	31.08%	3.93	1.02
3. I find it difficult to work with my fellow learners as we have very different abilities (reverse coding)	38.46%	29.49%	11.54%	14.10%	6.41%	3.81	1.03
	45.95%	32.43%	13.51%	2.70%	5.41%	4.13	1.06
4. I was encouraged to think out of the box	2.56%	14.10%	10.26%	50.00%	23.08%	3.77	1.04
	1.35%	17.57%	16.22%	39.19%	25.68%	3.72	1.09
5. I was encouraged to explain my ideas	1.28%	17.95%	7.69%	50.00%	23.08%	3.76	1.05
	2.70%	14.86%	10.81%	43.24%	28.38%	3.81	1.10

6. The trainer used and worked on our explanations to form a model answer	1.28%	11.54%	12.82%	50.00%	24.36%	3.85	0.97
	2.70%	4.05%	12.16%	45.95%	35.14%	4.07	0.93

Again, strong confidence shown by AEs are also reflected in learners' experience. For example, learners are encouraged to work with other learners quite often to find out solutions with high mean values (Pilot 1: 3.92; Pilot 2: 3.93). In addition, the trainer used and worked on learners' explanations to form a model answer very often too (Pilot 1: 3.85; Pilot 2: 4.07).

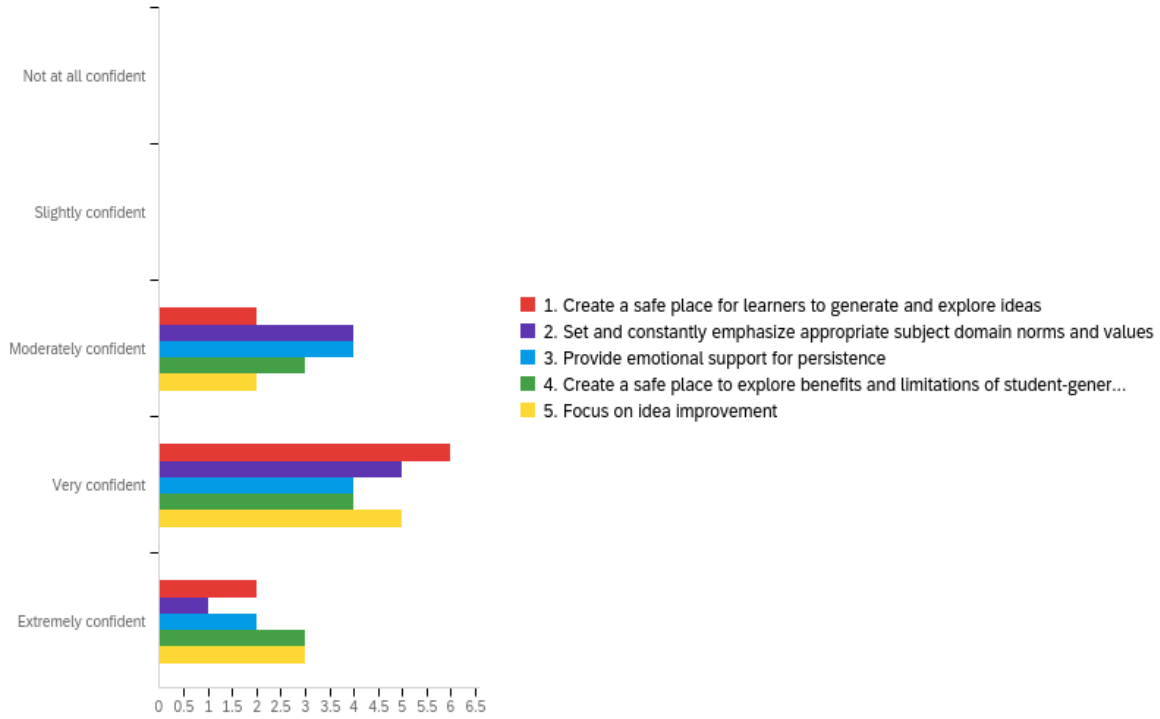
Figure 6. How useful the participating AEs were using different PF DPs for SOCIAL SURROUND?



Most of the AEs (7 or 8 of them) rated the following two DPs for social surround as the most useful DPs,

1. Set and constantly emphasize subject domain and values;
2. Provide emotional support for persistence.

Figure 7. How confident the participating AEs were using different PF DPs for SOCIAL SURROUND?



While in using these DPs for social surround, the top two DPs they felt moderately confident are,

1. Set and constantly emphasize subject domain and values;
2. Provide emotional support for persistence.

This finding implies that these AEs may need some more support in using these DPs more confidently as they rated as very useful from their application.

Table 5. Learner Experience of PF DPs for Social Surround for Pilot 1 and Pilot 2

Questions	Never	Sometimes	About half the time	Most of the time	Always	Mean	SD
1. I feel encouraged to generate and explore ideas	0.00%	7.69%	11.54%	53.85%	26.92%	4	0.84
	0.00%	9.46%	13.51%	52.70%	28.38%	3.96	0.89
2. I feel I am supported for my ongoing efforts to find the solutions	0.00%	7.69%	19.23%	47.44%	25.64%	3.91	0.87
	2.70%	5.41%	13.51%	52.70%	25.68%	3.95	0.93

3. I feel motivated to try again when my earlier solution did not work out	0.00%	8.97%	17.95%	48.72%	24.36%	3.88	0.88
	2.70%	9.46%	18.92%	43.24%	25.68%	3.8	1.01
4. I was encouraged to share my views on different ideas presented by other learners	0.00%	10.26%	12.82%	44.87%	32.05%	3.99	0.93
	1.35%	9.46%	14.96%	43.24%	31.08%	3.95	0.98
5. I was encouraged to improve my ideas	0.00%	11.54%	17.95%	38.46%	32.05%	3.91	0.98
	1.35%	9.46%	14.86%	47.30%	27.03%	3.91	0.96
6. I have the know-how to improve my ideas	1.28%	15.38%	19.23%	43.59%	20.51%	3.67	1.02
	0.00%	20.27%	24.32%	43.24%	12.16%	3.45	0.96

Again, from learners' experience, they did not feel very motivated to try again when their earlier solution did not work out (Pilot 1: 3.88; Pilot 2: 3.8), and they did not always have the know-how to improve their ideas (Pilot 1: 3.67; Pilot 2: 3.45) as compared with other DPs.

Benefits of using PF From AE's Observation

Ownership of Learning and Strong Engagement of Learners

I think one of the key things about PF is the onus of engagement. So in this case, where the participants are free to explore the sense of ownership over the gap or challenge that they uncovered, even though we identified the challenge for them, but having them being able to freely explore, to kind of identify the challenge on their own or identify gaps on their own, and to reaffirm actually pushes or places much of the ownership on their shoulders. And that way, when the discussion started, it's a lot richer, because the sense of ownership, responsibility is a lot greater (From English teacher PD session_phase 1).

Strong Engagement of Learners

I think they were very engaged. Maybe the topic was well chosen. And I think that was a key. They saw the benefits of doing those activities. *And because they clarified, so the engagement was there* (From English teacher PD session_phase 1).

So in terms of engagement, I would say that it will be similar or better than the last one. Yeah. Because I think that time the PF thing sort of like also they thought is PF workshop. So they were little confused maybe the first time we had the phase one. So that's why we had to clarify you know, it's really spiral progression that we are looking at in curriculum. So this round I would think like in terms of engagement, I would say that none of them were like a playing with your phone or, you know, like trying to or just sitting back, you know, not so involved. I think all of them were really, really trying their best to solve whatever activity that was given to them. *So the engagement was extremely high* (AE from English teacher PD session_phase 2).

Challenges Faced by AE in Applying PF DPs From Surveys

More practices may be helpful in PF application.	As this is a newly learnt model, practice will make it easier and better in any learning process. All areas are useful and will need to be mindful to look and build the components in.
To differentiate the challenging levels of DPs may be more helpful in PF application.	To clearly state which DP is more effective or challenging. I would think the DPs work together as a whole.
Creating contrasting cases is one of the DPs reported being challenging.	Compare and contrast learner ideas to distill critical features: This can be challenging, especially when our participants have a great deal of commonality in terms of professional competency, meaning it can be tough to collate different ideas required for contrast and comparison.
Time constraints, familiarity of topics chosen may create challenges for allowing multiple solutions from learners and using variant-invariant DP.	Admitting multiple representations & solutions and using variant- invariant features. Bringing about enough representations & variations within a given time constraint is a challenge that we faced.
	Multiple representations. The time for these sessions may be limited. Wondering as well, how principles of andragogy and learner motivations sit will PF. I see the benefits but the trainers must be willing to put themselves out there to address uncertainty.
Creating failure in a safe and encouraging space could be challenging.	Phase 1 Generation. This is the starting point of the PF activity and a lot of emphasis is required to create the safe space and encourage the learners to try the activity despite them being 'loss' or 'afraid' to make mistake as they are unsure on the required answer.

Learners' Reflection on Their Experience of Taking PF Lessons

Deep Understanding by Learners

> "But now, because we have to do it, I think we see more meaning in it. Yeah. We understand in a sense why we need to do it, the process and all. So I guess that experience, *we understand better as well the mechanism behind it at the same time why we do it.*" (Adult learner from English PD session_Phase 2)

> "Memorable like… because we tried it out on our own and then like… there's the… a bit of vulnerability or embarrassment when we fail and picking up ourselves from that is a very interesting process also. *So, I think that was something that was quite memorable for me.*" (Adult learner from Healthcare_Phase 2)

Learner-Led Session

> "Yes. It's like a student led session or rather student discovery session. Yes. Because for AE, what she did was to you know, like give us a task and then as we discuss about it, as we discover it and then after that, we went around to talk about other groups and then after that, we could defend our own thoughts and all and say that hey this is what we think and stuff like that. *So, with that kind of discussion that's… that kind of bouncing off ideas, then it created a richer discussion because of that.*"

> "Yes. So, the… so we had group… first, we had group discussion where you talk about your own things and then discuss. After you discuss, then there was intermingle of groups where you talk about different perspectives from other groups. Then you're like, "huh? What? I don't agree with what they say" or "I agree" or whatever. Then, you are able to defend yourself. So, there was many*... there were many points where we could think about our own responses.* So, it's not just I give you a question, you answer, I give you feedback. That's it. You know? Because a lot times, especially when we mark assignments right? I feel that I give all the comments right, at the end of the day, do the students actually read it? Does it actually matter?" (Adult learner from early childhood _phase 1)

More Peer Learning Generated

> "That's why just now when I shared about the affirmation, *I learn so much from others. The ideas is much better than just from my own because they have so much richness in their experience, so I learn a lot from everyone today.*" (Adult learner from early childhood_phase 1)

> "*Not just to express one way, but there were different points when you could have different feedback.* So, there was feedback from your own… let's say I have my idea, then I feedback from my own group, right? Then, after we put it up, then another group comes and look at your thing. Then, they have feedback for you. And then after that at the end, you have your own feedback as well. You know, after seeing what other people written. So, there are…" (Adult learner from early childhood_phase 1)

Summary and Implications of the Findings

These benefits proves that the overall design of the project was successful which brings about above benefits for the learning process. The project started from the webinar by Prof Manu in Aug 2022 to gather the interested AEs on using PF in their own classes. After the webinar, the selected AEs attended first round of development session with Prof Manu to design their lesson plan using PF for their pilot 1 lesson. After pilot one lesson ended around Nov 2022, these AEs attended second round of developmental session with Prof Manu to develop their lesson plan with a new topic using PF DP, followed by their pilot 2 lesson with different batch of leaners for most of the AEs. Such an iteration design of the project helps AEs improve their lesson design with more intentional changes between the two pilot lessons. As shared by the AEs during their interviews and case report, they tend to be more conscious in designing PF DPs in their lessons and think ahead of the possible engagement and challenges faced by their own learners to better prepare themselves for these different spontaneous scenarios. More importantly, for those AEs who were teaching same group of learners in the two pilot rounds, the learners could benefit most from the improvement of PF DPs used by their AEs. As shared by the learners undergoing both rounds of pilot lessons, they strongly felt the smoother flow of the lesson and became more engaged and used to the challenges posed by AEs in pilot 2 lesson. However, not all of the AEs taught the same group of learners in the two pilot lessons, it would be more revealing on improvements of AE's application of PF DPs in their own contexts if the same group of learners were engaged in both pilot lessons.

Recommendations for PF Application in CET Community

The findings presented above, e.g., self-reported usefulness and confidence is using PF DPs and also the reflections from both AEs and learners regarding their experiences of PF lessons showed that PF DPs are applicable in CET contexts. Particularly, in terms of motiving self-directed learning, peer learning and higher learner engagement, PF DPs proves highly useful in the teaching contexts of various courses in CET sector. Therefore, drawing on these findings, the present evaluation study could, to some extent, facilitate the decision-making of stakeholders on proliferation and application of PF DPs in adult learning. However, in promoting the use of PF DPs in adult learning, some recommendations drawing on the challenges faced by these participating AEs may need to be taken into consideration,

1. Course content to be covered using PF DPs needs to be carefully selected to ensure the intuitive hook could be built up easily and equally with all the learners. If some learners have already been familiar with the content, if may be unlikely to be successful to apply PF DPs.

2. PF DPs themselves cannot generate the benefits as identified in this evaluation study. AEs' rich experience of facilitation skills plays an important role to enable the power of PF DPs. The evaluation study reveals that AEs with higher facilitation skills tend to apply the PF DPs more proficiently. For those novice AEs, some guidance from experienced AE maybe more helpful in applying PF DPs.

3. A prior understanding of adult learners' mindset toward learning may also need to be taken into consideration when apply PF DPs. The present evaluation study found out that if adult learners hold strong belief in passive learning, meaning downloading from AEs, it is hard to engage them in PF activities. Therefore, the open mind of adult learners to embrace

different types of learnings could be another factor to be considered before applying PF DPs.

4. Last but not the least, the duration of the courses and the frequency of the practices are important considerations for AEs to apply PF DPs. As revealed by most of the AEs from pilot one to pilot two case, longer duration of the course gave them more chances and time to practice and refine the PF DPs at the different stages of the lesson. In addition, most of them reported that they were more proficient in applying PF DPs in pilot two case.

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The Urgency of Formal Education for Women From the Perspective of Society of Ellak Daya Village, Lenteng, Sumenep

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Abstract
The problem statement of this research is to know the perspective of the educational environment, namely society and the family, on the importance of formal education for women and also to find out the factors of gender inequality that affect society's perspective on the importance of women's education. The research method used in this research is a descriptive quantitative approach with survey instruments. The total population in this research was 3306 with a sample of 349. The instrument validation used Exploratory Factor Analysis (EFA) with good and feasible results. The results of this research provide an explanation that from 4 aspects of gender inequality that are used as benchmarks, there are 3 aspects that indicate a change in thinking about women. The aspect of Merginalization gets 37.5% of strong disagreement and 55.75% of disagreement. The stereotypes that have existed in society for a long time are strongly disagreed for 47% and disagreed for 34%. The double burden, which is still being discussed today is strongly disagreed for 47% and disagreed for 36.8%. One form of gender inequality which based on the results of this research has not gotten a shift in thinking, namely subordination is still agreed for 47%, while the educational environment, means people who approve of educated women 49.8% and 43.6% strongly agree. The family environment also supports women to continue their education 43.6% strongly agree and 47.7% agree.

Keywords: Education, Women, Gender Inequality, Educational Environment

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Introduction

One of the factors that influence the progress of a country is education. Education can open the doors of the world and give a better effect on other fields such as economy, health, national defense, and etc. Education is also a shared responsibility of three educational environments that give influence, such as family, government, and society, to open the darkness to be bright (Saptandari, 2005:4). According to RI Law no. 20 of 2000 chapter II article 3 concerning the National Education System states that national education functions to develop capabilities and form dignified national character and civilization in the framework of educating the nation's life. In this law, it is stated clearly that development education in Indonesia will increase more quickly.

National Education based on Pancasila and the 1945 Constitution of the Republic of Indonesia which functions to develop the ability to shape dignified national character and civilization in order to educate the nation's life, aims to develop the potential of students to become human who believe and fear God Almighty, having noble character, being healthy, knowledgeable, capable, creative, independent, and being a democratic and responsible citizen. To carry out this function, the government organizes a national education system as stated in the Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System that is abbreviated as the National Education System Law 20/2003.

According to the 2003 National Education System Law, education is carried out through 3 (three) channels, namely formal, non-formal, and informal education. The formal education consists of kindergarten (TK/RA), elementary school (SD/MI), junior high schoo (SMP/MTs), and senior high school (SMA/MA). Then the non-formal education (PNF) consists of life skills education, kindergarten, youth education, women's empowerment education, literacy education, family education, skills education, and job training/courses, equality education, and other educations that aimed at developing students' abilities. Informal education means all education held in the family and environment.

It is clear that in various sources and also in public policies related to education, there is no a discussion that discusses the obligation of education is only for men, but women also have the same rights, but it cannot be avoided in the social construction of society. Gender difference always becomes the first variable whether someone has the right to take an action or not. The differences that have been determined from birth are biological differences between women and men, while those that determine differences in roles and other variables that can be carried out by both parties but are socially shaped and influenced are called gender. Gender is the difference in roles, functions, status, and responsibilities for men and women as a result of socio-cultural constructions (constructions) embedded through socialization processes from one generation to the next (Puspitawati, 2012). As explained above, gender is not synonymous with biological sexual differences, but rather symbolic and social differences that are rooted in gender differences. Gender is a social construction with meaning through social awareness that gender is formed through a long historical and cultural process determined by socio-culture (Bhasin, 1996). Boserup states that education is able to solve the problem of women's contribution to the development. Women are one of the sources of production, so women's education should also be considered important, so the development becomes more effective and developed. Women are included in the development process, but in reality their autonomy towards themselves is ignored (Azkiyah, 2002. Murniati, 2004). Women should be one of the sources of development, but until now it cannot be fully achieved. There are still not a few who argue that women can be educated if the men in their family are educated. Another problem is

that women are only a complement to development, not one of the sources, as we often meet the policy of 30% of women must exist in the political sphere, where this policy, in some cases, is only responsible for completing it, regardless of the quality and ability of these women.

A discrimination against women in education occurs for various reasons. Women are considered irrational and will cause trouble. In work, women often experience discrimination, for example, it is difficult for women to get promoted because their education is relatively low compared to men (Gornick, 1988: 73). This discrimination is also caused by the concept of gender which is misinterpreted by society.

Errors in interpreting the concept of gender cause injustice to women in various forms, namely: a) marginalization of women. It means placing or shifting women to the margins which results a poverty (Murniati, 2004). b) Society's stereotypes towards women labeling or marking a group. This stereotype creates injustice, for example the community has the notion that women's main task is to serve their husbands (Murniati, 2004, Fakih, 2012). c) A subordination to women. A subordination means an attitude or am action in society that places women in a lower position than men, such as women being beaten by men in education by their families, women are considered unsuitable for various jobs, taking care of the household is considered as a woman's nature, and a double burden on women. d) The double burden on women is happened because they are considered as the person most responsible for domestic tasks, so if a woman works outside the home, she must still take care of the household, for example taking care of the children, cleaning the house, cooking and serving her husband. Women's tasks become piled up and very much. e) Violence against women is any form of violence that causes physical, sexual, or psychological harm or suffering to women including threats of such acts, such as coercion or arbitrary deprivation of liberty, whether occurring in a public place or in one's personal life (Murniati, 2004, Fakih, 2012).

In addition to gender inequality, the factors that influence women's rights and desires to pursue education are also influenced by the educational environment or commonly referred to as the Tricenter of Education. The tricenter of education is a concept of thought by Ki Hajar Dewantara which states that education has three environmental focuses, namely the family environment, school environment, and society environment. Where these three environments synergistically have roles and responsibilities in developing education for the nation's generation.

The tricenter of education is important because in learning activities, it is not enough just to use the efforts of the school mechanism, but the surrounding environment as well as the family are important factors to support the success in learning activities. There needs to be cooperation between the three environments, so everyone can achieve educational goals (Ahmadi, 2014).

Educational goals cannot be achieved with just one environment, but all educational environments must work together in building education. The following are the roles of each environment: 1) The family environment remains the most important and first educational environment in building ethical, religious, and social behavior education. 2) The school environment becomes an institution that has an obligation to impart knowledge and expertise education. 3). The society environment is a place where children learn to build their character and personality (Ahmadi, 2014). Because the family has a great responsibility for meeting the educational needs of children, so of course they have to provide the best, but not all families can easily meet the educational needs of their children even though they already have the will to provide the best education. This is also influenced by socio-economic status consisting of

three main things that are interrelated with one another, namely parents' educational level, parents' employment status, and family income. The majority of families who are unable to provide their families with basic needs are families that often experience difficulties in the material field (Afiyanti, 2020), so the economic influence on women's education must also be studied because from various studies, the low level of women's education is also due to economic factors, even just the paradigm that is already built.

Nowadays, the progress of women in various sectors has been very good, but the existence of gender inequality that has been lasting in society is a question for now, whether women are still the second subject in obtaining education is important to be researched and known. The growth and development of women have not had an effect on the perspective of today's society. This research was conducted in Ellak Daya Village, Lenteng District, Sumenep Regency, East Java. According to DKB village data for semester II of 2021, the population of Ellak Daya village is 4080 residents from 0-75 years old. This research focuses on the societies or residents that are above 15 years old. The details of this discussion are written below.

Table 1: The total of population of Ellak Daya village, Lenteng, Sumenep

Age	**Total**
15-24	565
23-39	829
>40	1912
Total	3306

Based on the data obtained from village data, the education level of the society of Ellak Daya as measured by graduation from formal education according to DBS Semester 1 of 2022 is still very low:

Table 2: The final education of the society of Ellak Daya village, Lenteng, Sumenep

Final Education	**Men**	**Women**	**Total**
Not going into school	35.68%	39.97%	37.90%
Do not graduate from elementary school/ the same level	19.69%	20.91%	20.32%
Graduate from elementary school/the same level	19.60%	20.09%	19.85%
Junior High School/the same level	9.29%	8.31%	8.78%
Senior High School/the same level	11.57%	7.74%	9.59%
DIPL I/II	0.39%	0.26%	0.32%
Academy/DIPL III/S	0.37%	0.49%	0.43%
DIPP IV / LEVEL I	3.16%	2.16%	2.64%
LEVEL II	0.23%	0.07%	0.15%
LEVEL III	0.01%	0.01%	0.01%

As a support for this research, there are several references from previous research that has been carried out by different researchers with discussion themes that are relevant to this research. One of the relevant research is Community Perceptions of the Importance of Higher Education for Women. This case research in Curahdringu Village, Tongas District, Probolinggo Regency was researched by Faiqotus Silvia Nabila and Jakaria Umro. Their research used a qualitative approach method, while this research used a quantitative method. Another fundamental difference is this research also emphasizes different variables, namely how the influence of gender inequality that has been ingrained in the perspective of society today, and also how the educational environment influences the importance of education for women. This research has a problem statement to find out the factors of gender inequality that affect the society's perspective on the importance of women's education. It also aims to know how is the perspective of the educational environment namely the society and family on the importance of formal education for women as well as whether for now the family's economic situation affects women's education or not.

A. Research Method

This research uses descriptive quantitative method. A quantitative data is a research method that is based on positivistic (concrete data). The research data is in the form of numbers that will be measured using statistics as a counting test tool, related to the problem that is researched to get a conclusion (Sugiyono 2018). While descriptive is a collection of sentences that express problems or circumstances or events as they are, so they are simply expressing facts (Moleong, 2000). Another reason for using descriptive methods in this research is reinforced by the opinion of Arikunto (2010) that "...descriptive research is a research that is intended to investigate circumstances, conditions, or other matters that have been mentioned where the results are presented in the form of a research report".

Variables in this research besides the perception of the educational environment, namely the society and family on the importance of formal education for women, are also the factor of gender inequality in influencing people's perceptions. Theoritically, a variable is every form that is determined by the researcher to be researched, so it can get an information about it, and the conclusion can be drawn (Sugiyono 2012). The design in this research uses descriptive statistics. The population in this research are residents of Ellak Daya village who are over 15 years old. This is motivated by the fact that the questionnaire used to find out community opinion requires respondents who understand and know the conditions in their environment and are also able to analyze. According to the Isaac and Michael formula, this research had a population of 3306, and it could be determined that there were no less than 348 respondents, so the sample of this research was 349 respondents using random sampling method. In addition to the instrument, in order to ensure that the instrument is good, it needs to be measured according to the dimensions used. The implementation that needs to be remembered is the principle of instrument construction, namely instrument validity. The instrument in this research uses the validity of the Exploratory Factor Analysis (EFA) analysis where the validity value is used to simplify and to explain the relationship between components in the form of factors (Firdaos, 2016). An analysis is required to determine the number of factors or dimensions that is measured which are obtained through Exploratory Factor Analysis (EFA) (Mardapi, 2008).

B. Discussion

In this research, to find out the importance of education for women can be seen from the various forms of gender inequality itself, but from 5 forms of gender inequality, it can be seen only from 4 factors because in the last factor, violence against women has now become a common enemy. On the other hand, there is truth of any kind in violence against women. In addition, other variables that influence are 3 educational environments, such as society, school, and family, but because this research is to find out the importance formal education (school) for women, so the variables that affect only two environments, those are society and family.

First, we will discuss how society's perspective regarding forms of women's injustice has taken root from the past. women experience marginalization in terms of education rights. The stereotypes regarded that women are only enough to be housewives without having to go to high school, and women also experience subordination because society thinks men are more important than women for schooling, and the society regarded related to the double burden that is already attached to women thus giving the impact of women to prioritize family more than their own family. However, the results of this research show:

Table 3: The society's response to the injustice for women

Response/Gender Inequality	**Marginalization**	**Stereotype**	**Subordination**	**Double Borden**
Very disagree	37.5%	47.1%	15.8%	47.7%
Disagree	55.75%	34%	35%	36.8%
Agree	6%	11.8%	47%	11.8%
Very agree	0.75	7.1%	2.2%	3.7%

From the percentage above, it can be understood that there are 37.5% who disagree with the marginalization of women's right to education, 55.75% do not agree, which means that society has started to provide equal opportunities for women without marginalizing women's rights to learn and continue to develop. However, even though nowadays women have received a lot of education, there are still 6% who agree that women's rights and education in education are neglected. In fact, there are 0.75% who strongly agree to continue positioning women as marginalized part. The results show that the labeling of women not to continue education has greatly decreased, and the results of the research are only 7.1% of people who still think education for women is not important and 11.8% agree with it. Meanwhile, there were 47.1% who strongly disagreed and 34% disagreed with the existing dynamics for labeling women not requiring higher education. Although the injustice towards women in terms of marginalization and stereotypes has begun to fade in society, subordination where women are the second subject who will get the right to education still persists. The results of the research show that there are still 47% of respondents who agree that educated men are far more important than educated women, supported by 2.2% of respondents who strongly agree with this. There are 15.8% strongly disagree and 35% disagree with making women as the second class who have the right to grow up in education. The double burden that women get will continue to occur although the position of women is not to be a housewife but to be a career woman who works in an office and so on because even if women choose to have a caree, they still have the obligation to take care of the household. This is what is called a double burden on women.

There were 47.7% of respondents who stated that women should also have the right to continue their education although they still have double burden. There are 11.8% who still think that women do not need to be highly educated because in the end they will only be housewives.

Table 4: The society and family's perspectives on women's education right

Response/Educational Perspective	**Society**	**Family**
Very disagree	1.1%	1.7%
Disagree	3.9%	7%
Agree	49.8%	47.7%
Very agree	45.2%	43.6%

The results above explain that most of society supports women to obtain and to function the right of education. There are 45.2% of respondents who strongly agree that women attach importance to education because education is one of the factors that influence the progress of state civilization. The community also realizes that education is important for all Indonesian citizens without exception. Th changes in the paradigm of society are also influenced by the level of education of its citizens. Not everyone thinks the same thought. The results of the research explained that there were 3.9% who disagreed and 1.1% who strongly disagreed with this. This is influenced by the condition of society which also makes economic factors as one of the reasons for women not prioritized in getting an education. This research obtained data that 32.3% of respondents stated that economy was the reason why women dropped out of school, and 32.3% also agreed. There were 24.8% who strongly disagreed and 10.7% validated it. According to the respondents who did not agree with this, there are currently many ways to get an education, not with personal money if you can't afford it because the state also has various programs to improve an education.

In addition to the social perspective that influences one's thinking about women's education, the family environment is also very important. According to the results of this research, the family is very supportive of women's education. There were 43.6% of respondents who gave the opinion that if they had families who wanted to continue their education, they would support it. This statement was also agreed by 47.7% of respondents. There were only 7% of respondents who disagreed and 1.7% strongly disagreed with this statement.

Table 5: The society's perspective on the condition of economy that affect the right of education for women

Response/Factor	**Economy**
Very disagree	24.8%
Disagree	10.7%
Agree	32.3%
Very agree	32.3%

The results of this research are related to whether economic factors play a role in the family perspective that women also have the same rights in education because not only does the perspective support women to be educated but also how the economic situation of the family is. According to the survey, it was explained that the community strongly disagreed by 24.8%, 10.7% of respondents disagreed, agreed 32.3%, strongly agreed. This means that there are still many families who are constrained by economic factors to be able to support women who can also have higher education.

The results of this research show that the KMO value and the Bartlett test reach 0.745. It is greater than 0.50 and Bartlett's Test of Sphericity (sig) score is 0.000. This value is less than 0.05, which means that this value indicates effectiveness in use and can be continued for factor analysis (Hernikawati and Sensuse 2016). The results of the Exploratory Factor Analysis (EFA) in this research contained 3 factors which could represent a number of indicators. The number of factors formed must first consider the eigen values. A factor is formed if the eigenvalue > 1. The eigenvalues are always sorted from the largest to the smallest (Sitinjak et al., 2017). Component factor 1 was able to explain 27.634% of the variance, and reduced to factor 2 which was able to explain 42.570%, and reduced to factor 3 which was able to explain 52.307%. Overall, Total Variance Explained can be described in Figure 1.

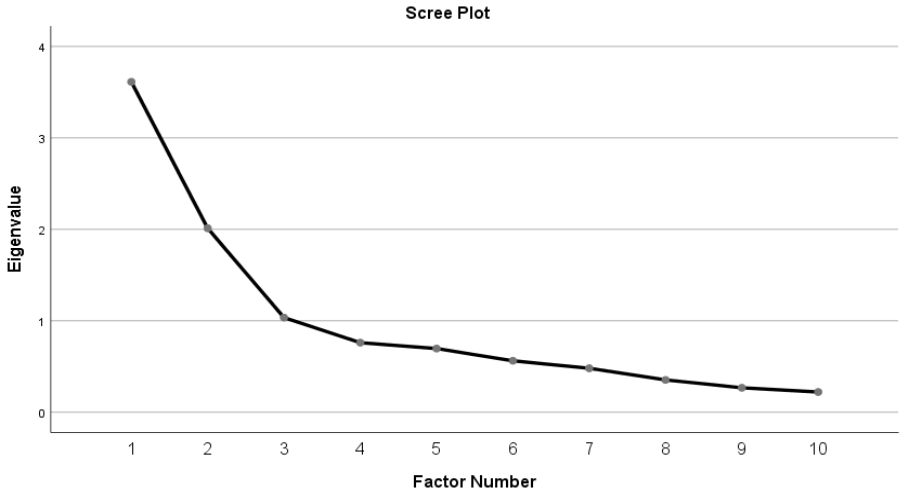


Figure 1: Scree Plot Exploratory Factor Analysis (EFA)

Scree Plot displays the values in graphical form. The scree plot output results in Figure 1 show the data points above the break (inflection point) which changes the value of the X-axis component from 1 to 3 with a sharply decreasing line direction. Then, starting from the value 4, 5, 6, and so on, it can be seen that the line starts to slope and all the analysis factors after point 4 are below the number one on the Y eigenvalue axis. This shows that there are 3 factors that are well formed and have good validation values.

Conclusion

This research has the conclusion that in the perspective of society, forms of gender injustice to women in terms of education are getting smaller. With the development of the times, women have grown and processed a lot, so it will certainly have an effect on the paradigm built by society. Even though we all know that our society has been very patriarchal from the past. Women's struggles can actually change people's views little by little. The results of this research provide an explanation that from 4 aspects of gender inequality that are used as

benchmarks, there are 3 aspects that indicate a shift in thinking towards women, namely aspects of marginalization, stereotypes, and double burdens. One aspect of subordination that has not experienced a shift in thinking, where women are still the second subject in education. However, in terms of the educational environment, there is a society environment and family environment that has experienced a change in perspective, namely by supporting women to continue their education. Although the family environment has shown a positive response in supporting education, economic factors will affect the decline in women's right to education.

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Enhancing Chinese Speaking Proficiency Through Leveraging Higher Order Thinking Skills in ACTFL OPI-Aligned Activities

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Abstract
The ACTFL Oral Proficiency Interview (OPI) assessment serves as a widely acknowledged and reliable measure of an individual's linguistic speaking aptitude. Prioritizing Higher Order Thinking (HOT) skills in the creation and execution of ACTFL OPI-aligned speaking activities offers a profoundly effective strategy for cultivating students' oral proficiency at a higher level in the target language, both within and beyond the classroom confines. Speaking activities that are ACTFL OPI-focused enhance students' exposure to a wide array of subjects, fostering their communicative competence to encompass practical daily conversations as well as articulate argumentative discourse across familiar and unfamiliar topics. The present study delves into the strategic integration of HOT skills: analyzing, evaluating, and creating. For instance, within our weekly speaking club, students actively engage in discussions on contemporary hot topics. Each session, students assume different roles, such as the impromptu topic host (creating), evaluators (evaluating), master of ceremonies (creating), and speakers (analyzing). This multifaceted approach allows students to exercise their HOT skills and fosters a well-rounded language proficiency. This endeavor not only aims to enhance students' interpersonal and presentational communication competencies but also to cultivate their critical thinking abilities. Through drawing upon the experiences of a prominent California-based language institution, the present study will shed light on how these integration of HOT skills into OPI-aligned speaking activities and pinpoint on fostering peer learning and autonomous learning paradigms through these discussions.

Keywords: ACTFL OPI, Higher Order Thinking (HOT) Skills, Speaking Activities

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Introduction

Mastering a language, particularly for foreign language learners, presents significant challenges, particularly in oral communication, which demands not just vocabulary and grammar knowledge but also social interaction fluency. Achieving proficiency in speaking a foreign language is widely acknowledged as formidable. Therefore, this presentation aims to illustrate how Chinese speaking proficiency can be enhanced through the strategic application of higher-order thinking skills (HOTS) within ACTFL OPI-aligned activities.

Before delving into practical examples, it is crucial to understand why fostering HOTS is essential and how they can elevate language proficiency. Moon (2008) emphasizes that the development of thinking skills in education epitomizes its fundamental objectives. Similarly, Ku (2009) suggests that teaching for HOTS is pivotal in preparing students to critically engage with social issues in our rapidly evolving world. To attain advanced language proficiency levels, students must not only grasp language mechanics but also excel in inference-making, argument evaluation, and logical deduction. These HOTS must be cultivated through meticulously crafted activities and tasks. As Hashemi and Ghanizadeh (2012) assert, the cultivation of HOTS not only enhances learning skills but also significantly boosts language proficiency levels.

In summary, by integrating higher-order thinking skills into language instruction, we can empower students to excel in both critical thinking and language proficiency, equipping them for success in an increasingly interconnected global landscape.

Background Survey

Bloom's Revised Taxonomy

Thinking skills are commonly classified based on the level of cognitive processing involved, with certain types necessitating deeper engagement such as critical thinking, analysis, and synthesis. One of the most renowned taxonomies in this domain was introduced by Bloom in 1986. However, Anderson and Krathwohl subsequently revised Bloom's taxonomy in 2001. In the revised taxonomy, 'remembering' entails recalling or retrieving previously learned information, while 'understanding' involves grasping the meaning, translation, and interpretation of instructions and problems. 'Applying' refers to the ability to employ a concept in a new context or spontaneously apply an abstraction. 'Analyzing' involves breaking down an idea into its constituent parts to enhance comprehension and differentiate facts from inferences. 'Evaluating' encompasses making judgments about the value of ideas, whereas 'creating' focuses on constructing a new structure or pattern from various elements, emphasizing the generation of novel meaning or structure. Thus, the revised Bloom's taxonomy serves as a valuable tool for curriculum design and assessing learning outcomes. Moreover, it facilitates the conceptualization and promotion of higher-order thinking skills in teaching practices.

Why ACTFL OPI-Aligned Activities?

We have designed speaking activities or tasks that are aligned with the American Council on the Teaching of Foreign Languages (ACTFL) Oral Proficiency Interview (OPI). This choice stems from several key reasons. Firstly, OPI tasks underscore functional ability in spoken language, emphasizing practical communication skills essential for real-world interactions. Moreover, these tasks are proficiency-based, meaning they are designed to assess learners'

overall language proficiency rather than just their knowledge of vocabulary and grammar. By aligning our speaking activities with OPI tasks, we aim to cultivate students' intercultural competence, preparing them for diverse linguistic and cultural encounters.

Furthermore, designing activities in compliance with OPI tasks provides students with opportunities to engage with language in a low-stakes environment, thereby reducing anxiety and facilitating learning. This approach fosters an environment conducive to experimentation and exploration, encouraging students to take risks and learn from their mistakes. As a result, learners can gradually build confidence in their speaking abilities, paving the way for more successful interactions in real-life settings.

Additionally, by incorporating ACTFL OPI-oriented speaking activities into our curriculum, we aim to enhance learners' social interaction skills. These activities are designed to simulate authentic communication scenarios, enabling students to practice navigating various social and professional contexts. Through meaningful interactions with peers and instructors, students can refine their conversational strategies and develop a deeper understanding of cultural norms and etiquette.

In designing ACTFL OPI-oriented speaking activities, we employ a systematic approach that prioritizes proficiency goals and intended learning outcomes. Utilizing backward design principles, we first identify the desired proficiency level that students should achieve. Subsequently, we select language functions that correspond to the communicative goals of the activity, such as giving instructions, introducing oneself, or making requests. During the execution of these activities, we emphasize meaning-making over grammatical accuracy, encouraging students to focus on conveying their intended message effectively.

Furthermore, we tailor our activities to align with learners' interests and aspirations, ensuring that the content is relevant and engaging. Additionally, we address nonverbal aspects of communication, such as gestures and body language, recognizing their importance in conveying meaning and enhancing overall communicative competence. Through these strategic design considerations, we aim to create rigorous, authentic, and meaningful speaking activities that effectively promote language learning and proficiency development.

Practical Ideas for ACTFL-Aligned Activities and Tasks

There are 7 tasks that form the backbone of our class activities: introduction (covering family, occupation, hobbies, travel experience, and education), past/present/future narrations, instruction/direction, description (a person or place), role play, news and probes. These tasks encompass daily life transactions, social interactions, and professional scenarios, making them essential for developing students' speaking proficiency and fostering peer learning.

For instance, at the beginning level, we utilize self-introduction activities as warm-ups. Here, students simply discuss topics related to their personal experiences, helping them get comfortable with speaking in Chinese. In the second semester, students are given opportunities to elaborate on giving instructions related to their hobbies or providing directions to go to their favorite restaurant or public park. This challenges them to use more complex language structures and vocabulary while engaging in practical, real-life scenarios.

During the third semester, we introduce news and probes as a means to spark discussions, debates, and forums. This encourages students to express their opinions, share information, and

engage in meaningful exchanges with their peers. These activities not only enhance their speaking skills but also deepen their understanding of Chinese culture and society. For example, , students read a news article discussing how AI is expected to continue replacing some jobs. After reporting on the news, they are divided into two teams: one agreeing with the idea and the other disagreeing. Students then use evidence to support their respective positions. This activity not only stimulates critical thinking but also enhances higher-order thinking skills as students express their points of view.

Engaging in debates like this provides students with a valuable platform to practice and improve their Chinese language skills. Through structured arguments and counterarguments, students learn to articulate their thoughts effectively, bolstered by evidence and logical reasoning. This not only strengthens their language proficiency but also cultivates their ability to think critically and analytically.

Furthermore, such activities promote active participation and collaboration among students, fostering a dynamic learning environment where ideas are exchanged and challenged. By expressing themselves in Chinese, students gain confidence in their language abilities and become more proficient communicators.

Activities like these not only provide opportunities for language practice but also encourage the development of essential skills for academic and real-world success. Overall, incorporating these tasks into our class activities not only strengthens students' speaking proficiency but also fosters engagement in peer learning. As students' progress through different levels, they are continuously challenged to apply their language skills in increasingly complex and diverse contexts, preparing them for real-world communication in Chinese.

Sample Lesson Designed With HOT Skills

In the endeavor to cultivate higher-order thinking skills (HOTS) among students, a speaking activity implemented is the round table discussion. This pedagogical approach assigns students various roles aimed at stimulating their cognitive engagement. Following advanced reading sessions, round table discussions are frequently organized, centered around the day's reading material.

During these discussions, students are tasked with assuming different roles, including the impromptu topic host, master of ceremonies, speakers, evaluators, or impromptu topic participants. Each role carries unique responsibilities, allowing students to exercise their higher-order thinking skills effectively. An accompanying image illustrates the diversity of roles and functions within this activity.

A specific instance demonstrating the application of this methodology is the organization of a round table discussion following a reading class focused on the topic of "China's real estate as the government's monetary reservoir," featuring a level 3 commentary article. This discussion, titled "Future Trends and Strategies for the Chinese Real Estate Market," was conducted via Microsoft Teams' Class Notebook, with the objective of delving deeper into the subject matter and fostering critical analysis among students.

The agenda for the discussion, structured within the Class Notebook, encompassed the following components:

1. Opening Remarks

2. Introduction of Experts and Exchange of Views
3. Main Discussion: Analysis of the Current Status and Problems of the Chinese Real Estate Market

To ensure the smooth progression of the discussion, various roles were assigned to participants:

- Moderator: Responsible for guiding the discussion, facilitating communication, and ensuring the event's smooth flow.
- Experts and Scholars: Comprising economists, financial experts, policy analysts, among others, to provide diverse perspectives and insights.
- Industry Professionals: Including real estate developers, investors, brokers, among others, to offer practical expertise and experiences.
- Government Representatives: Officials from relevant government departments and regulatory agencies, contributing insights into policy implications and interventions.

Additionally, students were provided with key issues to address during the discussion, including the current status and characteristics of the Chinese real estate market, causes of real estate bubbles, risk assessment, and the intricate relationship between government intervention and market mechanisms.

This structured approach aimed to stimulate thoughtful discourse and empower students to critically analyze complex issues within the real estate sector, thereby fostering the development of higher-order thinking skills.

Interactive Peer Feedback

From the surveys, students provided valuable feedback:

The teacher moderated in a minimal capacity, enabling students to assist one another, and I feel more confident in my speaking ability as a result.

I particularly liked that the teachers let the students lead entirely on their own, which was great. However, when students got stuck or didn't have enough content to share with the class, our teacher filled in the gaps. I feel like that struck a healthy balance. The teacher didn't micromanage us, but she didn't leave us floundering either. This approach empowered us to take ownership of our learning while ensuring we had the support we needed to succeed.

Having to prepare for the speaking club, especially on the days when I was the presenter, put a healthy pressure on me to thoroughly understand whatever topic we were discussing that day. Instead of just skirting by and halfheartedly answering homework questions, I found myself delving deeper into the material. This not only improved my understanding but also increased my confidence in speaking about the topic. The responsibility of presenting in front of my peers pushed me to strive for a deeper level of comprehension, which ultimately enhanced my overall learning experience.

By assigning roles, providing guidance, answering difficult questions, and offering a unique perspective on many issues related to Chinese culture and history, the teachers played a crucial role in our learning experience. Their guidance helped us understand complex topics more deeply and navigate challenging concepts with confidence. Additionally, their insights into Chinese culture and history enriched our understanding and appreciation of the language. Their

support was invaluable in our language journey, and we are grateful for their dedication and expertise.

The opportunity to ask questions and discuss issues with the teacher and classmates while practicing speaking and listening to Chinese has been immensely valuable. This interactive environment not only allows us to clarify doubts and deepen our understanding but also enhances our language skills through practical application. Engaging in discussions provides opportunities to practice speaking fluently, while actively listening to others helps improve comprehension. Overall, this dynamic exchange fosters a more immersive and effective learning experience.

Allowing all students to share opinions on a topic helps create a dialogue that enables students to expand their thinking toward a certain idea or cultural topic. When every student has the opportunity to express their views, it encourages a diverse range of perspectives and fosters a deeper understanding of the subject matter. Through this open exchange of ideas, students not only learn from each other but also develop critical thinking skills as they consider different viewpoints. This collaborative approach to learning promotes a more inclusive and enriching educational experience.

She provided spot corrections and background information in the running chat for the classroom, which I found very helpful. I really appreciated when she would occasionally interject with information or her opinion on the topic. These additional insights added depth to our discussions and helped clarify any misunderstandings. It also showed that she was actively engaged and invested in our learning process, which was encouraging and motivating. Overall, her contributions to the conversation were valuable and greatly appreciated.

Conclusion

In conclusion, our study first addressed the importance of speaking skills among all four language skills, as it plays a crucial role in our daily conversations and forms the impression we make on others. Therefore, teaching this skill effectively is paramount. We proposed implementing effective technology and designing ACTFL OPI-aligned activities/tasks to achieve this goal.

With this approach, we have successfully enhanced our students' Chinese speaking abilities. Moreover, this approach has received positive feedback from our students. We believe a well-designed speaking club can be a powerful tool for language learning and peer collaboration.

Additionally, our study has provided valuable insights and practical ideas on how to integrate these tools into your speaking classes.

By incorporating an effective and well-designed speaking club as well as designing activities aligned with ACTFL OPI standards, educators can create engaging and effective learning experiences that foster improved speaking proficiency.

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Action Research in an Educational Research Methods Course to Implement Alternative Teaching Approaches

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Abstract
Teacher education programs put emphasis on the inclusion of educational research methods courses in the curriculum for the successful completion of teacher training. There are problems in engaging pre-service teachers in the research process to explore educational issues. To overcome these challenges, the author aimed to conduct an action research study to integrate inquiry-based teaching and learning experiences into an educational research course to assist students in designing applicable research proposals. The instructor prepared different instructional materials for each week to guide students understand the theoretical perspectives in an active process. The design of the course materials followed the backwards design to emphasize the learning outcomes of each week and supported students to prepare a research proposal. Through the qualitative design of the study, instructor journals, student reflections, and samples of students' written work or assessment artifacts were collected as the data sources and analyzed through inductive analysis to understand the challenges and successes of the instructor and students' attitudes and experiences: The instructor focused on the preparation of formative and summative assessments in an iterative process by listening to the learners' perspectives. Evaluation of student achievement was based on completion of weekly materials and final proposal; students' active involvement in weekly activities contributed to their final grades to develop satisfactory research proposals. Integrating alternative approaches to teacher training is necessary to guide pre-service teachers' learning in an active process with diverse formative assessment materials. Inquiry-oriented instruction can help pre-service teachers gain competency to deal with problems in practice.

Keywords: Action Research, Educational Research, Alternative Teaching Methods

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Introduction

Teacher education aims to focus on pedagogical knowledge as well as basic subject knowledge training (Berry et al., 2015). Pedagogical knowledge is not just about transferring the knowledge; it aims to enhance teachers' inquiry-oriented practices and raise the teacher as a good researcher. Therefore, it is of great importance to include educational research methods courses in the curriculum of teacher education programs for the successful completion of training. Teachers need to understand scientific research methods and apply them in practice to investigate problems in the teaching and learning process. It is necessary to involve teachers in solving the problems to make them aware of and investigate problems in teaching and learning. For this reason, it is important to take educational research courses and pass them successfully for teachers. This study aimed to improve the teaching of educational research methods to enable teacher candidates to design applicable research proposals. The instructor acted as a researcher and aimed to conduct an action research study to integrate inquiry-based teaching methods into the educational research course. During the action research process, the instructor designed the teaching materials in accordance with the backward design to emphasize the learning outcomes to ensure active participation of the students. The purpose of this study was to investigate and understand an instructor's teaching of an educational research methods course as an action researcher through inquiry strategies. The research questions guiding this study are: 1. How does the design of the course change across different cycles? 2. What experience does the instructor have when integrating the questioning method?

Methods

Action research can be defined as a practitioner-oriented inquiry to actively think, practice specific situations while doing research (Putman & Rock, 2016). Action research focuses on implementation to understand the problems and take actions for change and improvement and treatment of problematic situations. This process requires practitioners to diagnose the problems, make evaluations and monitor the process of change as an action for future development.

Action research aims to link theoretical perspectives into research and practice. It is a process of linking action, theory, and research to improve teaching and learning practices as well as knowledge about a problem or specific situation. According to Altrichter et al. (2013), action research continues in different cycles to modify the instructional practices through planning the lesson, acting on or teaching the lesson plan, observing the implementation, and reflecting to make changes for future practices. In this process, teachers as researchers plan, teach, observe and reflect in different cycles to better understand how they teach and how effectively their teaching methods help their students learn. They ask questions, collect data, reflect on it, and evaluate it in ongoing cycles. The data and assessments collected provide an understanding of how the instructor teaches and how effectively his teaching methods help his students learn.

The action research study was conducted in an "Educational Research Methods in Mathematics and Science Education" course. The course aimed to teach the basics of educational research, understand how to conduct your own research and how to evaluate and use the findings of research conducted by others. Students in the course were guided to develop basic knowledge about research methods utilized in education. The course also

aimed to help learners engage in discussions on processes involved in research to understand how to use specific methods and findings or previous research to address the problems.

The research was conducted across three semesters with different pre-service mathematics and science teachers. Each semester, the course included 20-30 pre-service mathematics and science teachers. The education language of the course was in English. Instructor as action researcher and the main participant of the study was a science educator in a research university in Turkey, who had qualifications in qualitative and quantitative research methods.

The study aimed to understand the challenges and successes of the instructor and students' attitudes and experiences. The study included a qualitative design with variety of data sources: instructor pre- and post- lesson journals, student reflections, and samples of students' written work or assessment artifacts. The data were analyzed through inductive analysis to construct themes of the instructor's experiences.

Results

The instructor-as-researcher collected data in three semesters as cycles of the study. In the first cycle, the instructor planned the lesson, taught the lesson, observed what happened, and reflected on what to do for next cycle. In the second cycle, the instructor's lesson planning changed based on reflections in the first cycle, taught the new planning, observed what happened and reflected on what to do for the third cycle. During the third cycle, the instructor combined the reflections and prepared a new teaching plan for the following semesters.

In the first semester, the instructor started asking questions about how to teach the course. The course content was prepared to focus on what research is, what research is not, research problem, question, and purpose, review of literature, validity and reliability in research, and qualitative and quantitative data collection and analysis. The instructor gave homework on exploring a research topic, conducting review of literature, writing research proposal, determining data collection and analysis methods, and writing the results and discussion sections. At the end of the semester, the instructor's reflections showed that the instructor had difficulties in explaining sampling and instrumentation, in focusing on quantitative methods, and managing the time and grading across the given assignments.

The instructor's experiences in the first semester led her to prepare more organized lesson plans. Students were given five assignments at the beginning of the semester with appropriate timing and grading. The assignments focused on identification of research problem, methodology, data collection and analysis, review of literature, and results and discussion sections. Then, the instructor prepared the learning objectives and essential questions for each week. For example, the first week's content addressed the following essential questions: What is the nature of research in academic settings? What research paradigms can guide research process? What kind of of research tools can we utilize during the research process? As to learning objectives, the following one was prepared to plan the instruction: students will be able to explain the nature of research in academic settings, compare the research paradigms, and identify research tools. Additionally, the course emphasized the ethical standards in research through addressing confidentiality and informed consent. Then, the instructor explained the types of sampling and instrumentation strategies. To emphasize statistics, the instructor integrated a discussion on variables under investigation including dependent, independent, mediating, moderating, and confounding variables along with descriptive and inferential statistics. With this plan and organization, the instructor's

reflections showed that she was satisfied with more organized teaching and learning process, students' use of quantitative data collection and analysis methods and diversity in students' research topics.

The third semester was used to reorganize the instructor's planning, assessment, and reflections. The instructor redesigned the learning objectives in a comprehensive way as follows:

By the end of the semester, students will be able to:

- design, conduct, and interpret educational research to
  - understand research terminology, concepts, and practices
  - generate research questions in the selected educational issue of interest
  - review the related literature
  - develop basic skills for statistical and qualitative analysis
  - design an appropriate research study to collect and analyze data
  - understand how educational research can inform teaching
- express findings clearly in oral and written form based on disciplinary standards
- apply ethical standards when evaluating and conducting educational research
- enhance collaborative work to design and conduct educational research

The instructor also rearranged the class topics and activities for 12-week course period as follows:

Week-1: Introduction to Educational Research
Week-2: Research Paradigms in Education
Week-3: Research Problem, Hypothesis, and Assumptions
Week-4: Review of Literature
Week-5: Quantitative Research Design
Week-6: Qualitative Research Design
Week-7: Sampling Strategies
Week-8: Variables and Instrumentation
Week-9: Data Collection
Week-10: Data Analysis
Week-11: Ethical Standards and Outline of Research Proposal
Week-12: Conclusions

Moreover, the instructor prepared the lesson activities and learning tasks based on a three-level teaching cycle. The cycle included engagement phase to read the content of the lesson, exploration phase to work on the activities and formative assessment to provide feedback on students' learning, and evaluation phase to work on multiple-choice questions as summative assessment. Figure-1 presents the teaching cycle.

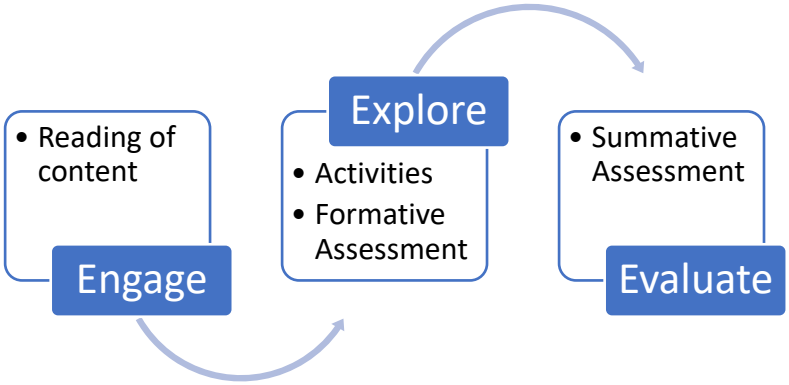


Figure 1. Teaching cycle

Conclusion

This study showed that students' active involvement in weekly activities contributed to develop satisfactory research proposals. Integrating alternative approaches to teacher training is necessary to guide pre-service teachers' learning in an active process with diverse assessment materials. Inquiry-oriented instruction can help teacher candidates gain competency to deal with problems in practice (Sengul & Schwartz, 2020). The instructor could experience consistent rehearsal across semester, refine delivery style and prepare useful resources. In this process, it was easy to arrange timing and transitions across the assessments. Action research is useful methodology to seek feedback, reflect on performance, explore new techniques through setting goals in an iterative process.

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Which Background of University Students Have Higher Entrepreneurial Intentions After Receiving an Entrepreneurship Education?

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Abstract
Many studies in the past have shown that students in higher education who receive entrepreneurship education will increase their entrepreneurial intentions. Some studies even suggest that students in business schools are more likely to start a business after receiving entrepreneurship education than students in other schools. However, which students from which backgrounds have higher entrepreneurial intentions after receiving entrepreneurial education? Based on the above, the purpose of this study was to examine the key backgrounds that influence university students' entrepreneurial intentions. In this study, 702 university students were randomly selected from the 60 technology and science universities in Taiwan, and using regression analysis, the research found that: 1. The most important factors affecting students' entrepreneurial intentions are entrepreneurial attitudes and innovative behaviors; 2. Undergraduates who participated in off-campus internships had a positive impact on their entrepreneurial intentions; 3. Entrepreneurship education does not have a significant impact on entrepreneurial intentions, only freshmen and sophomore students received entrepreneurial education more effectively than junior and senior year students.

Keywords: Entrepreneurial Intention, Entrepreneurial Attitude, Entrepreneurial Education, Innovative Behavior

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Introduction

Entrepreneurship education is an educational model that integrates various educational concepts such as innovation, entrepreneurship, and literacy in higher education. Its main content is to enhance the awareness of innovation and entrepreneurship, shape the spirit of innovation and entrepreneurship among university students, improve the ability of innovation and entrepreneurship, and cultivate the entrepreneurial spirit. In 2006, UNESCO defined entrepreneurship education as a formalized approach to educating and training anyone interested in participating in and contributing to the economic development of society through a series of entrepreneurship awareness programs (Office & Unesco, 2006). Entrepreneurial education is an educational activity that aims to develop individuals with the potential to innovate socially, culturally, socioeconomically, and politically, to create new spaces for development, and to provide opportunities for others and society (Zou, 2022).

Entrepreneurship Education (EE) refers to the combination of various forms of knowledge transfer (Bird, 1988). Anjum et al. (2018) mentioned that entrepreneurship education can improve students' entrepreneurial intentions by increasing their knowledge to improve their perceived feasibility (Anjum et al., 2018). In addition, entrepreneurship education not only improves students' entrepreneurial knowledge and skills, but also significantly increases students' entrepreneurial intentions (Martin et al., 2013), and two scholars, Rideout and Gray, commented that there is a significant relationship between entrepreneurship education and entrepreneurial intentions (Rideout and Gray, 2013).

Based on the above, there were many studies in the past have shown that students in higher education who receive entrepreneurship education will increase their entrepreneurial intentions. Some studies even suggest that students in business schools are more likely to start a business after receiving entrepreneurship education than students in other schools. However, which students from which backgrounds have higher entrepreneurial intentions after receiving entrepreneurial education? Do students from different backgrounds who receive entrepreneurship education at the same university really have the same educational outcomes? Even if they are in the same college, will their entrepreneurial intentions be the same when they receive entrepreneurial education? Based on the above, the purpose of this study wants to examine the key backgrounds that influence university students' entrepreneurial intentions.

Literature Review

Entrepreneurial Intention

Entrepreneurial intention could be referred as a belief that an individual can prepare for entrepreneurial action and then implement it (Krueger et al., 2000). Entrepreneurial intention begins with the ideas and motivations that emerge in the mind of an entrepreneur before he or she is ready to start a new business or is in the process of starting one. After the intention is formed, the entrepreneur will pay attention to and discover entrepreneurial opportunities (Krueger et al., 2000). In other words, intention refers to the amount of effort an individual is willing to put into performing a behavior (Matthews, Eilert, Carlson, & Gentry, 2020). Therefore, entrepreneurial intention can guide critical strategic thinking and decision making, as well as the future outcomes they expect from entrepreneurial behavior (Bird, 1992). Entrepreneurial intention is subject to change due to many factors and is subject to change due to many factors also, such as personal, psychological, environmental, cognitive, etc. Therefore, this study examines the key backgrounds that influence university students' entrepreneurial

intentions, including gender, grade, family's business experience, study in business college, select entrepreneurial education et al.

Entrepreneurship Education and Entrepreneurial Intention

There have been many previous studies on the topic of entrepreneurship, but many of them have failed to clarify the contradictions regarding whether individuals can learn entrepreneurship or whether entrepreneurship is a natural skill (Henry, Hill, & Leitch, 2005). Some studies have confirmed that some aspects of entrepreneurship can be appropriately provided to students to equip them with the necessary competencies and qualities (Chang, & Shih, 2021; Jones, & English, 2004; Matlay, 2005; Riani, 2014). Therefore, educators in higher education believe that entrepreneurship education (EE) develops entrepreneurial literacy and knowledge in a self-employment model. In Jones & English's (2004) said EE is a process to aid individuals with the skills and aptitude to spot economically obtainable chances and the expertise, perceptiveness, and self-efficacy to act on them (Jones & English, 2004).

Bakar et al. (2015), also agree that EE fosters the individual's entrepreneurial level by enhancing their decision-making and entrepreneurial abilities. A variety of research evidence from various resources seems to advise that those individuals who enroll in any kind of entrepreneurship educational program in comparison to those who are not enrolled show a high tendency to start new business ventures (Galloway, & Brown, 2002; Klofsten, 2000; Wang, 2020).

Global Entrepreneurship Monitor's (GEM) recent study discovered that in cheering productive youth entrepreneurship, EE in the academic curriculum is an important factor. The report suggests that a perception of experimental learning gives students favorable environments to study from the skillful world that aids them in their entrepreneurial expedition (Todd, & Javalgi, 2007). Since the year 2011 in Taiwan, a large number of students from higher education showing more willingness to study innovative & entrepreneurship courses, to promote entrepreneurship culture in Taiwan, the Ministry of Education (MOE) of Taiwan also fostered EC-SOS in 2020, in addition, by 2020 MOE set up Taiwan's major start-up platform Startup Terrace to provide students with practical entrepreneurial experience, giving them chance to experience a real startup creation process (Ministry of Education, 2023).

According to the above discussion, the students become more optimistic and confident in adopting entrepreneurship in their future careers by getting the essential education, knowledge, and skills through a good entrepreneurship course and training (Thompson, 2009). However, entrepreneurial education could enhance the student's entrepreneurial intention, whether the factors also affect their intention or not, such as personal, psychological, environmental, cognitive, etc. (Matthews, et al., 2020). Therefore, this study examines the key backgrounds that influence university students' entrepreneurial intentions, including gender, grade, family's business experience, study in business college, select entrepreneurial education et al.

Methodology

Research Framework

The purpose of this study is to examine besides entrepreneurial education, the key backgrounds that influence university students' entrepreneurial intentions, including gender, grade, family's business experience, study in business college, select entrepreneurial education et al. The research framework was as proposed in Figure 1. The regression analysis was used to analyze the prediction of the above variables on entrepreneurial intention.

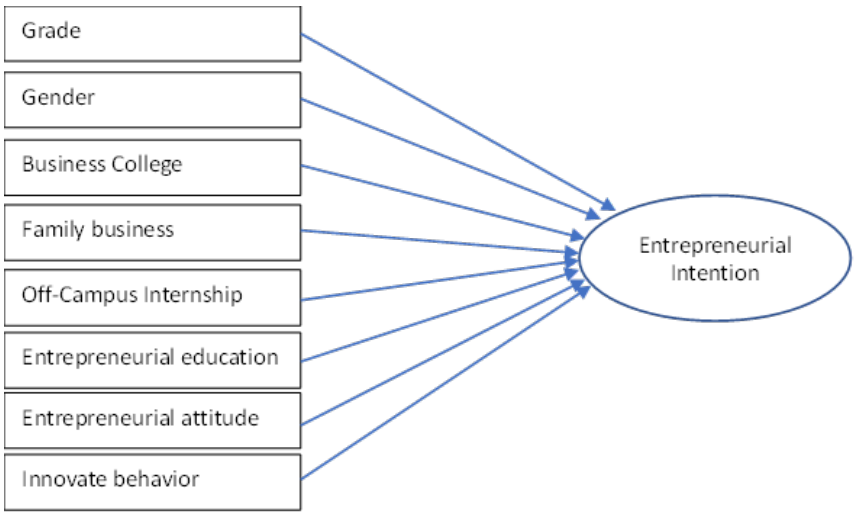


Figure 1: The research framework

Samples Participate

This study examines the key factors that influence university students' entrepreneurial intentions. According to the calculations of Creative Research Systems, a total of 272,256 students from 60 universities of science and technology across Taiwan for the questionnaire survey at a 95% confidence level with a 4% margin of error. Therefore, 880 students from 60 universities of science and technology were randomly selected. After excluding invalid questionnaires, a total of 702 valid questionnaires were collected in this study, with a valid recovery rate of 79.77%.

Table 1: The different area sampling of distribution in Taiwan

Area	Parameter	Percentage	Survey samples	Valid samples	Valid recovery rate
Northern	104,022	38.21%	398	389	98%
Central	67,868	24.93%	195	122	63%
Southern	96,735	35.53%	277	182	66%
Eastern	3631	1.33%	10	9	90%
Total	272,256	100%	880	702	79.77%

Instruments

A. Entrepreneurship Education Effectiveness Scale

The scale was designed by Mwiay (2014) in a survey for 452 university graduates in the United Kingdom, with five questions and a raw reliability coefficient of Cronbach's α of .87 (Mwiya, 2014). This scale covers whether the entrepreneurship curriculum improves students' entrepreneurial attitudes, motivation, skills, entrepreneurial knowledge, and the ability to identify opportunities, and enables students to understand the preparation for entrepreneurship. The Likert-type seven-point scale is used. The higher the score, the better the learning outcome of the student after taking entrepreneurship education (EE); conversely, the lower the score, the less effective the learning outcome.

B. Entrepreneurial Attitude Scale

Liñán & Chen (2009) used the Entrepreneurial Attitude Scale (EAS) proposed by Liñán & Chen (2009) to survey 511 Taiwanese and Spanish students on their attitudes toward entrepreneurship across countries based on the theory of planning behavior. The Likert-type seven-point scale was used to measure the entrepreneurial attitudes of the study participants, with higher scores indicating a more positive entrepreneurial attitude and lower scores indicating a lower entrepreneurial attitude.

C. Innovative Behavior Scale

The original reliability coefficient of Cronbach's α was .95-.96. The Likert-type seven-point scale was used to measure the innovative behaviors of the participants. The higher the score, the more innovative the participant is.

D. Entrepreneurial Intention Scale

This study used the Entrepreneurial Intention Scale proposed by Liñán and Chen (2009), which is based on the Theory of Planning Behavior (TPB). The Likert-type seven-point scale was used to measure the entrepreneurial intentions of the study participants, the higher the score, the stronger the entrepreneurial intention, and the opposite, the lower the entrepreneurial intention.

Results

The Relationship Between Entrepreneurial Intention and the Other Factors

Pearson’s product-moment correlation was used in this study to explore the relationship between different variables. From Table 2, the correlation between senior students and entrepreneurial intention is a negative relationship, nevertheless, entrepreneurial intention is a positive correlation with freshman students, sophomore students, male students, business college students, students with family business, internship, entrepreneurial attitude, and entrepreneurial behavior. Furthermore, there is the highest correlation among entrepreneurial intention (EI), entrepreneurial attitude (EA), and entrepreneurial behavior (EB).

Table 2: The variables correlation matrix in this research

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. EI	1.000											
2. freshmen	.066*	1.000										
3. sophomore	.085**	-.137***	1.000									
4. junior	.010	-.180***	-.328***	1.000								
5. senior	-.112***	-.237***	-.432***	-.570***	1.000							
6. gender	.063*	-.002	-.032	.031	-.002	1.000						
7. business college	.079**	-.032	.138***	-.012	-.083	-.161***	1.000					
8.family_business	.251***	.027	.072	.028	-.097	.032	.065*	1.000				
9. internship	.200***	-.169***	.084*	.025	-.003	-.004	.046	.184***	1.000			
10. EE	.240***	-.075*	.058	.110**	-.111	.053	.105***	.245***	.315***	1.000		
11. EA	.811***	.070*	.045	-.010	-.064	.027	.098***	.253***	.174***	.245***	1.000	
12. IB	.739***	.019	.028	.001	-.033	.025	.079***	.218***	.168***	.169***	.748*	1.000

*Note: *p<.05, ** p<.01, ***p<.001*

The Regression Analysis of Entrepreneurial Intention as a Validated Variable

In this study, regression analysis was used to explore the predictive variables affecting entrepreneurial intention. This study considers entrepreneurial intention as the dependent variable. The background variables of the study sample were considered predictor variables, including grade level, gender, business school, entrepreneurial experience of family members, and whether they participated in an externship. After regression analysis, as shown in Table 3, all key backgrounds explained 70.3% of the variance and the regression effect reached a significant level ($F=166.805$, $p<.05$). Freshman year ($\beta=.045$), sophomore year ($\beta=.066$), internship ($\beta=0.41$), entrepreneurial attitudes ($\beta=0.561$), and innovative behaviors ($\beta=0.300$) all had a significant and positive effect on entrepreneurial intentions.

The results after regression analysis, we can find:

1. Freshmen and Sophomore students have a positive effect on entrepreneurial intentions.
2. Students who have participated in off-campus internships are more likely to have higher entrepreneurial intentions.
3. Students with higher entrepreneurial attitudes and innovative behaviors also have higher entrepreneurial intentions.
4. Entrepreneurial attitude is the most important factor affecting entrepreneurial intention.
5. Students' entrepreneurial intentions are not affected by their gender, their family's experience in entrepreneurship, or whether they are in business school.

Table 3: An analysis of regression of the entrepreneurial intention as the dependent variable

DV=EI	Unstandardized coefficients		*Beta*	*t*	*p*	Collinearity	
	B	*Se*				tolerance	*VIF*
(constant)	-4.282	.714		-5.994	.000		
Freshman	1.098	.529	.045	2.077*	.038	.887	1.127
Sophomore	1.012	.349	.066	2.897**	.004	.826	1.210
Junior	.526	.304	.039	1.731	.084	.825	1.212
Gender	.471	.259	.038	1.817	.070	.967	1.034
Business college	-.086	.268	-.007	-.322	.747	.939	1.065
Family business	.264	.272	.021	.968	.333	.883	1.132
Internship	.558	.303	.041	1.845*	.056	.852	1.173
EE	.373	.305	.028	1.223	.222	.819	1.221
EA	.665	.038	.561	17.546***	.000	.415	2.408
IB	.311	.032	.300	9.617***	.000	.436	2.295
Whole Model	R^2= .707, adj R^2= .703 F (10, 691) =166.805, (p=.000)						

*Note: *p<.05, ** p<.01, ***p<.001*

Conclusions

The most important factors affecting students' entrepreneurial intentions are entrepreneurial attitudes and innovative behaviors. In this study, five background variables (including grade, gender, whether they were enrolled in business school, whether their family members had entrepreneurial experience, and whether they participated in off-campus internship), and entrepreneurial attitude and innovative behavior were considered as predictor variables in the regression analysis with entrepreneurial intention as a valid variable. It was found that the factors affecting students' entrepreneurial intentions were freshmen, sophomore, and off-campus internship students had a positive influence on entrepreneurial intentions, and entrepreneurial attitude and innovative behavior were the most important factors affecting entrepreneurial intentions.

Undergraduates who participated in off-campus internships had a positive impact on their entrepreneurial intentions. Many previous studies indicate that receiving an entrepreneurship education program will help increase entrepreneurial intentions. However, this study found that student's participation in off-campus internships had a much greater effect on entrepreneurial intentions than receiving entrepreneurship education. In other words, allowing students to participate in off-campus internships to gain practical experience and to learn how the industry makes money through services, processes or products has a high positive impact on their entrepreneurial intentions.

Entrepreneurship education does not have a significant impact on entrepreneurial intentions, only freshmen and sophomore students received entrepreneurial education more effectively than junior and senior year students. Overall, entrepreneurship education does not affect a student's intention to start a business, but only freshmen and sophomores who receive entrepreneurship education have a significant impact on entrepreneurial intention, while juniors and seniors have no impact. This study found that freshman and sophomore students positively influence entrepreneurial intentions. The study further analyzed that freshmen and sophomores

also have a significant impact on entrepreneurial intentions after receiving entrepreneurship education, with sophomores having a slightly higher impact than freshmen. In other words, we should not only encourage students to take entrepreneurship education in higher education but also explicitly encourage sophomore students to take it.

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An Analysis of Competency's Connotations and Training Needs Assessment for Travel Agent Managers in Taiwan

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Abstract
This study is based on Chang & Chen's (2023) study of 7 job duties, 46 knowledge (K), 46 skills (S), and 11 attitudes (A) that a travel manager should have. To further explore the sequence of training needs of travel managers, this study used a questionnaire survey to investigate the training needs of 27 supervisors who have been working in the travel industry for more than 20 years and analyzed the results using the IPA method. The study results showed that travel managers' most important job responsibility was risk management, the most frequently used competency was business management, and their priority training need was "quality customer service enhancement". Among them, the most important knowledge Competency and the highest frequency of use are "being able to develop tourism product features"; the most important skills competency is "being able to discuss with colleagues about the key needs of traveler services", and the highest frequency of use is "exploring common traveler service problem"; the most important attitude competency and the highest frequency of use are "being active and positive", and the highest training demand is "improving customer service quality". The most important and frequently used competency is the "proactive approach". Prioritize training needs skills such as "commission and markup structure skills". It is expected to provide a reference for the design of professional training courses for travel agency managers to enhance their professionalism.

Keywords: Competency's Connotations, Competency Analysis, Travel Agent Manager, IPA, Training Needs Assessment

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Introduction

The travel industry plays an important role in the development of tourism. As of December 2023, there were 4,038 travel agencies in Taiwan (Tourism Administration, MOTC, 2023), and competition was fierce. Regardless of the type of travel agency, whether it is consolidated, Class-A, or Class-B, at least one travel agent manager is required to apply for the establishment of a travel agency.

In the travel industry, whether it is a large operator with a large establishment or a small operator with a lean staff, to be innovative in terms of business management (Verreynnea, Williamsb, Ritchiea, Gronuma, & Bettsc, 2019). According to Chang (2013), the establishment of competency standards can serve as standards for education and training to follow and can help companies become learning organizations to enhance organizational competitiveness and individual professional knowledge. Since talents play an important role in the process of industrial development, central industry competent authority must set the competency benchmarks for industrial talents, issue certificates of competency identification, and promote international mutual recognition based on the needs of industrial development following the Industry Innovation Act (IIA).

To understand the analysis of the connotation of professional competency and the demand for education and training of travel managers, the purpose of this study is as follows.

1. To explore the importance of knowledge(K), skills(S) and attitudes(A) in the connotation of professional competencies of travel managers.
2. To investigate the frequency of using knowledge(K), skills(S) and attitudes(A) within the professional Competencies of travel managers.
3. To evaluate the training needs of travel managers in terms of knowledge(K), skills(S) and attitudes(A) within their professional competencies.

Literature Review

To examine two parts, this study compiles pertinent literature and analyzes it. First, the qualifications of travel agent managers and related regulations. Second, the job duties and tasks of past travel agent managers. Third, the analysis of the professional competency of past travel agent managers. The following is a brief description of the above.

Qualifications and Related Regulations of Travel Agent Manager in Taiwan

According to Article 15 of the Travel Industry Regulations stipulated in Article 66(3) of the Taiwan Development and Tourism Regulations, travel industry professionals must fulfill one of the following qualifications, and complete a certification process to be certified by the Tourism Administration, MOTC. According to the tourism industry management rules, a photocopy of the manager's roster and the manager's certificate of completion must be presented to the Tourism Administration, MOTC. According to Article 7 of the Travel Industry Management Rules, for a travel manager to establish a branch office, the branch manager roster and the manager's certificate of completion must be presented to the Tourism Administration, MOTC.

Professional Competencies of Travel Managers

This study covers six competencies required of travel industry managers, including market operation analysis, business development, product development, conflict and risk management, marketing strategy execution, and customer relationship management, based on the competency benchmarks for "Tourism Operations Supervisor" and "Tourism Business Development Manager" announced by the Taiwan Labor Force Development Administration on the Integrated Competency and Application Platform (iCAP). The benchmark covers six competencies required of travel industry managers, including market operation analysis, business development, product development, conflict and risk management, marketing strategy execution, and customer relationship management (Chang & Chen, 2018).This study was further based on the focus group interviews conducted by six academics and experts, and regarding the interview outline and iCAP functional benchmarks, it was found that based on the seven job duties of travel managers, 26 job tasks, 46 knowledge (K), 46 skills (S), and 11 attitudes (A) were developed respectively.

Methodology

This study is based on the expert's perception, in-person interview or online video explanation, and through a questionnaire survey, the target respondents are the senior executives or persons in charge of travel agencies that have been awarded the Golden Quality Award of Tourism or listed on the stock market or have served as the education and training committee of the Travel Industry Council for more than 20 years. The total number of questionnaires distributed was 27, and 27 questionnaires were returned. Through the professional quality and practical experience of experts, the knowledge, skills, and attitudes of travel managers are explored in terms of their practical application of the knowledge, skills, and attitudes. To analyze the average of the importance and frequency of use of the connotations of the professional competencies of travel managers, the Importance-performance analysis (IPA) was applied to illustrate the distribution of the importance and frequency of use of the connotations of the professional competencies of travel managers by the experts.

Results and Discussion

In this study, the questionnaire survey was used to analyze the importance and frequency of the competencies of travel managers, and the Importance-Performance Analysis (IPA) was used to analyze the distribution of the professional competencies of travel managers. The results were analyzed using the Importance-Performance Analysis (IPA) to analyze the distribution of the connotations of professional competencies of travel managers. The statistical analysis and frequency of use of the 46 knowledge, 46 skills, and 11 skills that a travel manager should possess were analyzed by 27 experts. In the consistency test, the Kolmogorov-Smirnov One-Sample Test was used to determine the suitability of the items, and all items reached the consensus of the experts.

Analysis of Experts' Perceived Importance and Frequency of Use of Travel Managers' Job Responsibilities

The results show that the average number of experts' perceptions of travel industry managers' job responsibilities in terms of importance is 4.74 (inclusive) or more, with the top 2 being T7, Risk Control and Crisis Management, T1, Travel industry operation coordination and business development; the mean number of frequencies of use was 4.39 (inclusive) or above, and the

top 2 were T2. business creation and management and T6 tourism product development, as shown in Table 1.

Table 1: Importance and Frequency of Job Responsibilities of Travel Managers as Perceived by Experts

Job Responsibilities	Importance (N=27)			Frequency of use (N=27)		
	Average	SD	Ranking	Average	SD	Ranking
T1. Travel industry operation coordination and business development	4.81	.396	2	4.32	.954	4
T2. Business Creation and Management	4.74	.594	3	4.88	.445	1
T3. Recruitment, selection, and training	4.67	.620	6	4.20	1.071	6
T4. Marketing campaign coordination	4.74	.447	3	4.26	.962	5
T5. Quality customer service enhancement	4.63	.565	7	4.51	.903	3
T6. Tourism product development	4.74	.526	3	4.57	.876	2
T7. Risk Control and Crisis Management	4.85	.362	1	4.01	1.328	7

Analysis of Experts' Perception of the Importance and Frequency of Knowledge Competency of Travel Managers

The results show that the top 2 items in the total ranking of experts' perception of the importance of knowledge competency of travel managers are as follows: K40 Tourism product planning and design developing features and content; K38 In order to determine the appropriate selling price. It is necessary to consider the financial operating costs, the profitability rate and achieving a high yield for the tourism industry, and K39 Procedures and appropriate rates for industry commissions and markup in the tourism industry. The top 3 items in terms of frequency of use are: K40 Tourism product planning and design developing features and content; K08 Sources of the suppliers of business context in related industries; K38 In order to determine the appropriate selling price. It is necessary to consider the financial operating costs, the profitability rate and achieving a high yield for the tourism industry, and K39 Procedures and appropriate rates for industry commissions and markup in the tourism industry. (K08, K38, and K39 are in the same row as No. 2.) Details are shown in Table 2.

Table 2: Experts' perception of the importance and frequency of the knowledge competency of the travel managers

Knowledge (K)	Importance (N=27)			Total Ranking	Frequency of use (N=27)			Total Ranking
	Average	SD	Ranking		Average	SD	Ranking	
T1	4.23	.387			3.40	.711		
K01	3.85	.770	5	47	2.53	.963	6	47
K02	4.70	.465	1	9	4.57	.746	5	5
K03	4.26	.526	4	43	3.64	1.13	1	35
K04	4.30	.609	3	41	3.46	1.12	1	41
K05	4.52	.580	2	26	3.46	1.12	1	41
K06	3.78	.577	6	48	2.78	1.22	4	46
T2	4.58	.283			4.15	.592		
K07	4.52	.580	6	26	4.01	.956	5	22
K08	4.59	.501	3	18	4.63	.844	1	2
K09	4.74	.526	1	5	4.44	.802	2	9
K10	4.56	.577	4	21	4.07	1.16	4	19
K11	4.48	.643	8	34	4.01	.955	5	22
K12	4.52	.509	6	26	4.01	1.06	5	22
K13	4.56	.641	4	21	3.83	1.21	8	48
K14	4.74	.447	1	6	4.20	1.17	3	17
T3	4.31	.454			3.55	.703		
K15	4.52	.580	1	26	4.07	1.07	1	19
K16	4.04	.706	6	46	3.15	1.16	6	45
K17	4.37	.565	3	39	3.70	.963	2	33
K18	4.30	.542	4	41	3.58	.761	3	37
K19	4.48	.509	2	34	3.58	1.00	3	37
K20	4.19	.557	5	45	3.21	.914	5	44
T4	4.50	.391			4.03	.662		
K21	4.70	.465	1	9	4.32	.836	1	12
K22	4.70	.465	1	9	4.26	.846	2	14
K23	4.52	.643	3	26	3.89	1.03	6	28
K24	4.37	.565	7	39	3.83	1.01	8	29
K25	4.44	.577	6	38	4.13	.967	3	18
K26	4.48	.700	5	34	3.89	1.13	6	27
K27	4.52	.643	3	26	3.95	1.15	4	25
K28	4.26	.656	8	43	3.95	1.05	4	25
T5	4.64	.390			4.27	.563		
K29	4.70	.465	1	9	4.51	.777	1	7
K30	4.67	.620	2	14	4.38	.942	2	10
K31	4.67	.480	2	14	4.38	.822	2	10
K32	4.67	.555	2	14	4.32	.955	4	12
K33	4.52	.509	5	26	3.76	.877	5	32
T6	4.73	.248			4.44	.455		
K34	4.70	.542	6	9	4.26	1.16	6	14
K35	4.74	.447	4	6	4.51	.778	5	7
K36	4.56	.577	7	26	4.26	1.067	6	14
K37	4.74	.447	4	21	4.57	.877	4	6
K14	4.52	.643	8	6	3.83	1.11	8	29
K38	4.85	.362	2	2	4.63	.708	2	2
K39	4.81	.396	3	3	4.63	.708	2	2

Knowledge (K)	Importance (N=27)			Total Ranking	Frequency of use (N=27)			Total Ranking
	Average	SD	Ranking		Average	SD	Ranking	
K40	4.89	.320	1	1	4.81	.535	1	1
T7	4.60	.399			3.68	.823		
K41	4.59	.572	3	18	3.58	1.20	5	37
K14	4.56	.506	5	21	3.52	1.07	6	40
K42	4.59	.572	4	18	3.64	1.04	4	35
K43	4.48	.643	7	34	3.39	1.08	7	43
K44	4.56	.577	5	21	3.70	1.07	3	33
K45	4.81	.396	1	3	4.07	1.16	1	19
K46	4.63	.688	2	17	3.83	1.21	2	29

Analysis of Experts' Perceptions of the Importance and Frequency of the Skills Competency of Travel Managers

Based on the IPA analysis of experts' perception of the importance and frequency of use of travel managers' skills and their importance and frequency of use, the corresponding skills of their task structure are shown in Table 3. The results show that experts' perception of the importance of travel managers' skills in the competency's connotation of "skills" in the top two items in the total ranking are S26 Able to communicate with colleagues to discuss the key needs of traveler services, S07 Proactively seek to build innovative development skills for business opportunities, S27 Be able to explain the company's key policies and procedures for providing quality service, S36 Proactivity in identifying or actively seeking opportunities for innovative products (S07, S27 and S36 are ranked together in 2nd). The top 2 items in terms of frequency of use were S33 Make self-criticism about frequently asked traveler service questions, S34 Teamwork skills to engage employees in practical traveler service practices and proactively solicit their feedback and opinions, as shown in Table 3.

Table 3: Experts' perception of the importance and frequency of the skills competency of the travel managers

Skills(S)	Importance (N=27)			Total Ranking	Frequency of use (N=27)			Total Ranking
	Average	SD	Ranking		Average	SD	Ranking	
T1	4.31	.405			3.53	.892		
S01	4.41	.636	3	31	3.70	1.41	3	31
S02	4.52	.509	1	19	4.01	1.16	1	20
S03	4.19	.681	4	41	3.09	1.28	4	43
S04	4.00	.734	5	45	3.02	1.13	5	44
S05	4.44	.577	2	29	3.83	1.11	2	26
T2	4.55	.345			4.03	.683		
S06	4.52	.580	3	19	4.13	.967	2	16
S07	4.78	.424	1	2	4.63	.708	1	3
S08	4.52	.580	3	19	4.13	1.07	2	16
S09	4.52	.700	3	19	3.83	1.01	6	46
S10	4.52	.580	3	19	3.89	1.13	4	22
S11	4.41	.501	7	31	3.70	1.07	7	31
S12	4.59	.572	2	16	3.89	1.22	4	22
T3	4.36	.423						
S13	4.52	.580	4	19	4.13	.850	4	16
S14	4.59	.501	2	16	4.20	.967	3	14
S15	3.93	.781	7	46	3.27	1.08	5	40
S16	4.04	.759	6	44	3.21	1.02	7	42
S17	4.59	.501	2	16	4.26	.963	2	13
S18	4.70	.465	1	8	4.32	.836	1	10

Skills(S)	Importance (N=27)			Total Ranking	Frequency of use (N=27)			Total Ranking
	Average	SD	Ranking		Average	SD	Ranking	
S19	4.19	.622	5	41	3.27	1.08	5	40
T4	4.38	.418						
S20	4.63	.492	1	15	4.20	.850	1	14
S21	4.33	.620	4	35	3.76	1.09	4	29
S22	4.33	.555	4	35	3.46	1.02	4	35
S23	4.37	.565	3	34	3.46	1.12	4	35
S24	4.41	.636	2	31	3.83	1.01	3	31
S25	4.19	.622	6	41	4.13	.967	2	44
T5	4.60	.353						
S26	4.85	.362	1	1	4.57	.746	3	4
S27	4.78	.424	2	2	4.57	.746	3	4
S28	4.33	.620	8	35	3.83	.903	8	26
S29	4.67	.480	5	14	4.01	1.06	6	20
S30	4.48	.643	6	27	4.13	.967	5	16
S31	4.33	.620	8	35	3.76	1.09	9	29
S32	4.44	.577	7	29	3.89	.802	7	22
S33	4.78	.424	2	2	4.81	.535	1	1
S34	4.78	.424	2	2	4.69	.661	2	2
T6	4.64	.318						
S35	4.70	.465	3	8	4.44	.802	3	9
S36	4.78	.506	1	2	4.44	1.03	3	8
S37	4.33	.679	7	35	3.83	1.11	7	26
S38	4.70	.465	3	8	4.32	.836	4	10
S39	4.52	.580	6	19	4.32	.955	4	10
S40	4.70	.465	3	8	4.57	.746	1	4
S41	4.74	.447	2	7	4.57	.746	1	4
T7	4.54	.359						
S42	4.30	.669	5	40	3.33	1.13	5	39
S43	4.48	.700	4	27	3.52	1.25	3	34
S44	4.52	.580	3	19	3.46	1.12	4	35
S45	4.70	.542	1	8	3.89	1.31	1	22
S46	4.70	.609	1	8	3.39	1.34	1	38

Analysis of Experts' Perceptions of the Importance and Frequency of the Attitudes' Competency of Travel Managers

The results showed that the top 2 rankings in terms of the importance of "attitudes" in the competency of travel managers were "A02 Proactive approach" and "A06 Team awareness". The top 2 in terms of frequency of use were "A02 Proactive approach", "A01 Agreeable relationship", "A03 Integrity and honesty" and "A04 Self-management" (A01, A03 and A04 are ranked the same as No. 2), as shown in Table 4.

Table 4: Experts' perception of the importance and frequency of the attitudes' competency of travel managers

attitudes(A)	Importance (N=27)			Frequency of use (N=27)		
	Average	SD	Ranking	Average	SD	Ranking
Total	4.79	.224		4.57	.369	
A01 Agreeable relationship	4.74	.526	7	4.81	0.535	2
A02 Proactive approach	4.96	.192	1	4.88	0.446	1
A03 Integrity and honesty	4.93	.267	3	4.81	0.535	2
A04Self-management	4.81	.396	6	4.81	0.535	2
A05 Stress tolerance	4.89	.320	4	4.69	0.661	6
A06 Team awareness	4.96	.192	1	4.75	0.605	5
A07 Responding to unknown conditions	4.67	.480	9	4.07	0.963	10
A08 Self-confidence	4.70	.465	8	4.38	0.822	8
A09 Discrete and attentive	4.85	.362	5	4.69	0.661	6
A10 Flexibility	4.67	.480	9	4.38	0.822	8
A11 Curious and open	4.52	.580	11	3.95	1.049	11

Expert's Analysis of the Importance and Frequency of Use of Travel Managers in Competency's Connotations by IPA

Regarding the evaluation of the connotation of the professional competency of travel managers, the mean value of the importance of 27 experts was 4.54 (X-axis), and the mean value of the frequency of use was 3.97 (Y-axis), and these two points were used as the midpoint to cross the X-axis and Y-axis, and then the mean value was calculated and cut into four regions as shown in Fig. 1.

Based on the results of IPA, experts perceived that knowledge (K), skills (S), and attitudes (A) are important and frequently used in the training needs of travel managers.

1. Area A-Continuous training, totaling 44 items.
2. Area B - Priority training, totaling 11 items.
3. Area C - Delayed training, totaling 41 items.
4. Area D - Secondary training, total 9 items.

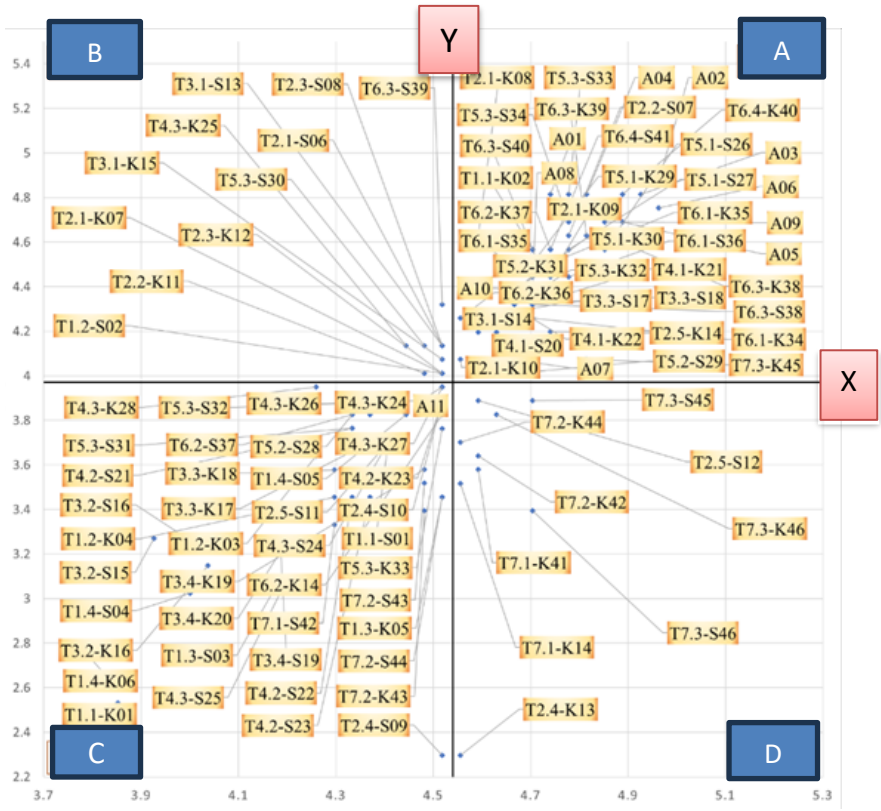


Figure 1: Experts' perceived importance and frequency of use of travel managers in competency's connotations

The top 11 training priorities are, in order, as follows: S39 The calculation skills for different commissions and markup structures; S08 Calculation skills to evaluate business data and cost structures; S06 Evaluate critical thinking skills that affect professional relationships and business negotiation; S13 Communication skills for conducting interviews; S30 Survey and statistical skills to assess traveler satisfaction; K25 Features, advantages, and practical applications of commonly used marketing campaigns, including advertising, experiences, and social network media; K15 Recruitment and selection criteria; K12 The nature of agreements and contracts for travel-related industries and the key elements of cooperation; K07 The relationship of the industry structure of the business context in related industries with each other; K11 Negotiation principles, stages of the negotiation process, various techniques that can be applied; S02 Communicate with colleagues and stakeholders to consult on environmental and social responsibility issues, and to make visitors be responsible for environmental protection.

Conclusion

The top three knowledge competencies in terms of importance are 1. tourism product planning and design development features and content. 2. To determine the appropriate selling price, it is necessary to consider the financial operating costs, the profitability rate, and achieving a high yield for the tourism industry. 3. Procedures and appropriate rates for industry commissions and markup in the tourism industry. The top three skills competency in terms of importance are: 1. Be able to communicate with colleagues to discuss the key needs of traveler services; 2. Proactively seek to build innovative development skills for business opportunities; 3. Be able to explain the company's key policies and procedures for providing quality service and

proactivity in identifying or actively seeking opportunities for innovative products. The most important attitudinal competency is to be a proactive approach.

The top three knowledge competencies in terms of the frequency of use are 1. Tourism product planning and design developing features and content; 2. Sources of the suppliers of the business context in related industries; 3. To determine the appropriate selling price, it is necessary to consider the financial operating costs, the profitability rate, and achieving a high yield for the tourism industry. The top three skills competency in terms of the frequency of use are: 1. Make self-criticism about frequently asked traveler service questions; 2. Teamwork skills to engage employees in practical traveler service practices and proactively solicit their feedback and opinions; 3. Proactively seek to build innovative development skills for business opportunities. The most frequently used attitudinal competency is to be a proactive approach.

The top three training priorities competency's connotation is: 1. The calculation skills for different commissions and markup structures; 2. Calculation skills to evaluate business data and cost structures evaluation of business data and cost structure calculation skills; 3. Evaluate critical thinking skills that affect professional relationships and business negotiation.

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Translanguaging in Multilingual Context: Graduate Students' Voices From Yogyakarta, Indonesia

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Abstract
Translanguaging is crucial for fostering student learning in the twenty-first century because it takes a holistic view of language, multilingualism, and bilingual education. Learning what college students think about language use is important, yet previous studies have mostly focused on college students in other countries. The objective of this study is to investigate the perspectives on translanguaging held by graduate students who are bilingual or multilingual and attend a large university in Indonesia that is home to a wide variety of languages. This research was conducted at Yogyakarta State University. The design of this study was the qualitative approach. To be more specific, we used survey data to establish how participants view the overall practice of translanguaging, specifically for the goals of learning a foreign language for social purposes, and inside a higher education classroom setting. In this study, the perspectives of graduate students on translanguaging were analyzed. Descriptive statistics were used to examine the information gathered from a survey. The findings indicate that graduate students had positive perspectives on translanguaging, especially in classroom settings and when learning a foreign language. Moreover, this study yielded various implications for practice, policy, and research. The majority of respondents expressed that the utilization of translanguaging was advantageous and fundamental in the process of acquiring a second language.

Keywords: Translanguaging, Multilingual, Graduate Students

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Introduction

Traditional multilingual education practices in Indonesia during the twentieth century served to separate the country's many languages. As a result, bilingual people often feel torn between two separate worlds, a phenomenon that Cummins labels "the two solitudes" (Eslami et al, 2016). According to García (2009), there has been a need for teachers in elementary, secondary, and tertiary institutions to acknowledge and make use of the first language (L1) in order to facilitate another language (L2) learning and idea achievement. Recent studies have shown that using a variety of languages in the classroom, including the strategic use of students' original languages, has no negative effect on language acquisition (Garcia et al, 2017). 'Translanguaging' is one way that a student's L1 can be integrated into the classroom.

The term "translanguaging," which is synonymous with the term "translingualism," refers to the adaptable use of several languages as a resource that goes beyond the conventional understandings of each individual language (Anderson, 2018). Both of these phrases place an emphasis on the blurring of boundaries between named languages and are predicated on the notion that emergent bilinguals routinely draw from the entirety of their linguistic repertoires in order to make sense (Pacheco and Miller, 2016). The theory that underpins these approaches in education is that teachers can better help students comprehend new ideas and topics by employing the L1 as a scaffold to activate students' prior knowledge, which in turn reduces the amount of mental effort that is required of the students to learn. Researchers have hypothesized that teachers who engage in translanguaging understand, interpret, scaffold, and challenge their students' choice of linguistic resources effectively (Anderson, 2018), which improves students' ability to comprehend and remember newly acquired information. Additionally, translanguaging assists individuals who are bilingual or multilingual in accessing various language characteristics and realizing their full communicative potential.

The utilization of one's mother tongue during the acquisition of a foreign language is not a recent notion. In the pedagogical approach of Content Language and Integrated Learning (CLIL), learners are prompted to employ their primary language during the initial phases of acquiring a secondary language (Navés, 2009). To promote the transfer of literacy skills across languages, it is common practice to instruct reading and writing in the primary language (L1) (Cummins, 2000). Translanguaging has the potential to create a more equitable learning environment for both monolingual and bilingual individuals, setting it apart from other language learning approaches (Otheguy, 2015). In terms of showcasing their proficiency, individuals who speak only one language possess the capacity to employ all of their linguistic abilities. However, those who are bilingual are obligated to suppress half of their linguistic abilities, placing them at an inherent disadvantage (Otheguy, 2015). The utilization of translanguaging has the capacity to address this concern as it enables bilingual individuals to utilize all the linguistic resources available to them. This, in turn, enhances their ability to articulate intricate ideas, offer comprehensive justifications, persuade, debate, and exhibit their complete potential (García and Lin, 2017). The utilization of translanguaging has the potential to address this concern as bilingual individuals are able to exhibit their complete abilities more readily when they are permitted to utilize all of the features in their linguistic repertoire.

Despite the obvious advantages of translanguaging, many schools and universities still adhere to monolingual philosophies, which encourage a reductionist approach to the local language (Doiz and Lasagabaster, 2016; Garcia et al, 2011). Numerous educators remain reluctant to use translanguaging due to their perception that it implies a deficiency in their professionalism. In addition, certain instructors assert that they do not engage in translanguaging, hence creating

challenges for students in comprehending their courses. Although participants acknowledge the value of translanguaging as a skill, past research have shown that they are hesitant to actively integrate it into their professional activities or openly teach it in the classroom. Although there have been several studies conducted on the perception of translanguaging among students at international universities, none have explicitly focused on graduate students from Indonesia and their experiences with several languages.

The objective of this study is to investigate the perspectives on translanguaging held by graduate students who are bilingual or multilingual and attend a large university in Indonesia that is home to a wide variety of languages. To be more specific, we used survey data to establish how participants view the overall practice of translanguaging, specifically for the goals of learning a foreign language for social purposes, and inside higher education. In the following parts, we will first conduct a literature study on translanguaging, followed by the presentation of our findings and a subsequent discussion of those findings.

Translanguaging in University Classrooms: Perceptions

A limited number of academic inquiries (Adamson and Coulson, 2015; Rivera and Mazak, 2017) have explored the attitudes of tertiary-level students towards the practice of translanguaging. A survey and year-end reflection were conducted by Adamson and Coulson (2015) among university students in Japan to assess their perspectives on translanguaging within an English language preparation course. According to the findings of a survey, a significant proportion of students concurred that the practice of translanguaging was beneficial in terms of enhancing classroom management and promoting clarity in assignments. According to research, the utilization of translingual writing has proven to be beneficial for students with limited proficiency in English, as it has enabled them to effectively complete writing tasks. Additionally, students with advanced English proficiency have employed this technique to conduct comparative analyses of resources published in both Japanese and English languages (Adamson and Coulson, 2015). The study's participants generally expressed a consensus regarding the usefulness of translanguaging in their preparatory course. However, the authors omitted any details regarding the language study backgrounds of the participants, which could have potentially impacted their perspectives.

Carstens (2016) utilized a comparable methodology, utilizing a semi-structured questionnaire, to examine the responses of South African undergraduate students who were pursuing a degree in construction engineering to the implementation of translanguaging pedagogy. Based on the gathered data, a significant majority of participants reported that the practice of translanguaging facilitated their understanding of overarching concepts, as well as aided in the comprehension of intricate topics and the acquisition of the English language (Carstens, 2016). Conversely, a small group of students held the view that the utilization of translanguaging resulted in an increased level of complexity when dealing with unfamiliar topics. According to the students, the various dialects of Afrikaans were identified as a contributing factor to the lack of success in translanguaging. According to some individuals, the utilization of English ought to be limited to the field of engineering, while the employment of Afrikaans should be disapproved. (Carstens, 2016). The discoveries prompt a series of compelling inquiries, notably including how the effective integration of translanguaging can be achieved in classrooms with a diverse range of linguistic backgrounds, and to what extent deeply entrenched beliefs regarding the dominance of the English language can be contested within STEM fields.

A study was conducted by Rivera and Mazak (2017) to investigate the impact of students' pre-existing attitudes towards language on their perceptions of translanguaging in an advanced psychology course. According to the survey results, a significant proportion of the respondents believed that translanguaging was a suitable mechanism for promoting classroom discourse and perceived it as a conventional and socially acceptable practice among individuals who are proficient in more than one language (Rivera and Mazak, 2017). In response to inquiries regarding the level of professionalism associated with translanguaging, roughly 50% of the respondents indicated that it was a somewhat or entirely unprofessional approach. This was documented in a previous study (Rivera and Mazak, 2017). A significant proportion of the participants held the view that translanguaging was either somewhat disrespectful or disrespectful. Additionally, more than 50% of the respondents expressed the opinion that translanguaging did not aid in the clarification of the course content. These findings were reported in a previous study. The results of this study indicate that although the respondents express a belief in the inherent usefulness of translanguaging, they exhibit reluctance to fully embrace it in a professional context. Analogous to the research conducted by Adamson and Coulson, an analysis of the antecedent language acquisition encounters of the subjects would have been advantageous in comprehending the genesis of these ideologies. Further inquiry is warranted regarding the observation that translanguaging did not appear to be efficacious in promoting comprehension of academic subject matter.

To the best of our knowledge, a singular study has been conducted regarding the attitudes of professors towards translanguaging. In their study, Mazak and Herbas- Donoso discovered that science professors at a Puerto Rican university perceived translanguaging in instruction as having three primary objectives: (1) rendering essential scientific terminology from Spanish to English to acquaint students with English, which is considered the "language of science." Two strategies for bilingual instruction include integrating English textbook information with Spanish instructor explanations and facilitating class discussions that build upon information presented in both languages. In general, akin to the research conducted by Carstens, the educators in this study acknowledged being influenced by the ideology of English-only. Consequently, it can be posited that the utilization of translanguaging is subject to contextual factors that exert a noteworthy influence on its reception among academic audiences, particularly those within the STEM disciplines.

The Rationale of the Present Study

Based on the reviewed literature, it can be inferred that there is a general consensus among university students and educators regarding the utility of translanguaging. However, there appears to be some reluctance to fully embrace this approach as a universally valid pedagogical method. The efficacy of translanguaging in enhancing students' learning outcomes is contingent upon the specific languages that are being employed. The utilization of translanguaging may pose a greater challenge than benefit for students who speak languages with a multitude of dialects. Empirical research on the perceptions of translanguaging among students from diverse ethnic and linguistic backgrounds in Indonesian colleges is scarce. Except for Mazak and Herbas-Donoso, the studies examined in our analysis were primarily concerned with the perspectives of students within the same field of study, neglecting to consider the viewpoints of students from diverse fields regarding translanguaging.

The current investigation utilizes a survey tool to investigate the perspectives on translanguaging among postgraduate students at a significant, publicly funded university located in Yogyakarta, Indonesia. The researchers chose to employ a quantitative approach for various reasons. Due to

the limited number of empirical studies conducted on translanguaging (Adamson and Coulson, 2015; Rivera and Mazak, 2017), the researchers aimed to gain insight into the prevailing perceptions of individuals from diverse ethnic and linguistic backgrounds, while also avoiding any potential influence on the graduate students' responses. Therefore, a quantitative methodology was employed. Scholars acknowledge the restricted capacity of quantitative data to impact perceptions yet aspire to employ it as a basis for forthcoming qualitative investigations on translanguaging within the context of post-secondary education.

The present study employed a diverse sample of graduate students from various fields of study, thereby ensuring that the language and ethnic diversity of the graduate student population at institutions was accurately represented. The recruitment process did not target a specific field of study or class. Through this approach, it will be possible to collect data regarding the perceptions of translanguaging among individuals with diverse age groups, native language backgrounds, and varying levels of prior language learning experience.

Theoretical Framework

The present investigation is underpinned by Garcia's translanguaging theory as its theoretical framework. According to this theoretical perspective, individuals do not possess multiple linguistic systems; rather, distinct languages are formed because of societal regulations and constraints (Garcia, 2017). The state of being bilingual is a dynamic procedure that prioritizes the utilization of language in the establishment and comprehension of social circumstances (Garcia, 2017). According to Garcia (2017), there is a limitless potential for the generation of knowledge. Pedagogical employment of translanguaging and encouragement of creative utilization of linguistic repertoires among students can facilitate the development of critical thinking through collaborative efforts between teachers and students. The present study draws upon translanguaging theory to inform our examination of graduate students' viewpoints regarding language and its utilization within the academic setting.

Method

The present study utilizes a qualitative methodology. The present study seeks to investigate the viewpoints of graduate students who are proficient in two or more languages regarding their educational practices, language learning, and higher education. The researchers employed a self-designed survey to gather information, which was subsequently subjected to descriptive statistical analysis to obtain responses to the posed inquiries.

1. How do graduate students who are bilingual and multilingual perceive the practice of translanguaging?
2. How do bilingual and multilingual graduate students view translanguaging for L2 learning?
3. How do bilingual and multilingual graduate students view the implementation of translanguaging in higher education?

Procedures and Instruments

The methodology employed for data collection involved the utilization of a survey that is conducted through an online platform. The employed method for selecting participants in this study is purposive sampling. The act of participating in the questionnaire is completely voluntary, and there is no provision for the remuneration of students. The collection of personally

identifiable information is contingent upon the participants' voluntary completion of a brief interview, during which they furnish their names and email addresses.

The present study employed a survey instrument that was designed by Rivera and Mazak (2017) to investigate individuals' dispositions toward the practice of translanguaging among university educators. The current study required the participants to respond to a total of 25 questions. The initial set of five comprises demographic information, encompassing the profiles of students, their ethnic backgrounds, and linguistic data. The respondents are requested to evaluate the statements using a Likert scale that ranges from one to five, where one denotes "strongly disagree" and five denotes "strongly agree" for the remaining 20 inquiries.

Setting and Participants

The research is conducted at an academic institution located in Yogyakarta, Indonesia. The present investigation seeks to enlist the involvement of postgraduate (both master's and doctoral) and professional students, with a particular emphasis on those enrolled in the English Department. Our guiding principle is that the amalgamation of graduate students' professional experiences and their undergraduate coursework completion will offer a more comprehensive outlook on the perceptions of translanguaging in higher education compared to that of undergraduate students.

Data Analysis

The researchers performed a descriptive analysis on the survey data that has been collected. The statistical measures of mean, standard deviation, and variance have been reported for each element of the research queries. The arithmetic mean is determined by dividing the sum of all responses by the total count of responses. The variance is computed as four times the squared deviation of the mean from the mean, while the standard deviation is obtained by taking the square root of the variance. The survey topics have been categorized into three distinct groups to facilitate the reporting of students' perceptions and to gain a better understanding of their perspectives. Scores falling within one standard deviation from the mean are regarded as neutral. Perceptions are deemed neutral when falling within the range of 2.5 to 3.5. Scores below 2.5 are indicative of negative perceptions, while scores exceeding 3.5 suggest positive perceptions.

Results

The subsequent section presents the outcomes of the survey to ascertain the perspectives of students regarding translanguaging in diverse contexts and for various objectives. The findings have been systematically arranged based on our research inquiries and furnish insights into the attitudes of students towards translanguaging as a means of communication, specifically for second language acquisition, in communal contexts, and in tertiary education.

The study presents mean scores of various survey items to address four research questions. These scores depict (1) the general perception of translanguaging as a practice, (2) its perceived effectiveness as a language learning tool, and (3) the acceptability of its use in higher education. Overall, the statement indicating that translanguaging is a natural practice for bilingual individuals yielded the highest mean score (M=4.10, SD=0.77), while the statement suggesting that translanguaging is a disrespectful practice resulted in the lowest mean score (M=1.99, SD=0.88). The data exhibits a satisfactory degree of variability, as evidenced by the range of

variance falling between 0.70 and 1.35. In general, the standard deviations seem to be distributed within a range of three standard deviations from the mean.

Perceptions of Translanguaging as a Practice

Regarding the initial inquiry, which pertains to the perception of translanguaging practice among graduate students who are bilingual or multilingual, our findings indicate that most responses were either neutral or positive, with a mean score of 3.54. The study's findings indicate that the respondents held favorable attitudes towards translanguaging, considering it a common phenomenon among individuals who are proficient in two or more languages (mean score=4.87). The study's findings indicate that the participants maintained a neutral stance regarding the avoidance of translanguaging (M=2.95), its potential to cause confusion (M=3.28), and its perceived level of disrespectfulness (M=2.87). Collectively, these results suggest that students perceive translanguaging as a typical language tool that does not impede effective communication. Notwithstanding the predominantly affirmative and impartial reactions, the pupils maintained favorable attitudes towards the notion that translanguaging implies an insufficiency in L2 linguistic competence (mean score=3.68).

Perceptions of Translanguaging for L2 Learning

The results pertaining to our second research inquiry, which examines the perspectives of bilingual and multilingual postgraduate students on the application of translanguaging in L2 acquisition, were predominantly affirmative, particularly with respect to the effectiveness of translanguaging in facilitating the acquisition of a supplementary language (mean score= 4.13). The study's participants expressed a high level of agreement regarding the importance of translanguaging in L2 learning, with a mean score of 4.62. However, they held a neutral stance towards the notion that translanguaging by a language instructor would hinder the acquisition of an L2, as indicated by a mean score of 3.33. The study's participants maintained a neutral stance towards the assertion that "translanguaging is solely permissible during the process of acquiring a new language," with an average score of 3.31. The study findings indicate that the participants held favorable attitudes toward translanguaging as a means to facilitate second language acquisition and to facilitate communication beyond the confines of the language learning environment.

Perceptions of Translanguaging in Higher Education

The ultimate inquiry for this investigation pertained to the perceptions of translanguaging utilization in higher education among graduate students who are bilingual or multilingual. The survey items that were exclusively focused on translanguaging by university instructors were received favorably by students, with an overall mean score of 4.09, except for a single item. The utilization of translanguaging was found to be positively perceived by participants who spoke two or more languages (mean=4.53) and were situated in higher education contexts (mean=4.55). Specifically, participants reported favorable perceptions of translanguaging during conversational exchanges with colleagues (mean=4.40) and as a means of promoting mutual comprehension (mean=4.53). The graduate students exhibited favorable attitudes towards the implementation of translanguaging in academic tasks at the university level, as evidenced by their mean scores of 3.99 and 4.02 for assignments and assessments, respectively. Notwithstanding, the participants' responses indicated a tendency to perceive the use of translanguaging by an instructor as unprofessional (M=3.67) when asked about its appropriateness.

Discussion

In summary, the results of our study indicate that graduate students hold a strong belief that translanguaging is a natural practice for bilingual individuals, with an average score of 4.87. Additionally, bi- and multilingual individuals perceive translanguaging as a useful tool in acquiring a second language and advocate for its implementation in language learning classrooms, with an average score of 4.53. Lastly, the use of translanguaging in higher education was positively perceived, with an average score of 4.55. According to Carroll and Mazak (2017), there is a growing trend among individuals who are proficient in two or more languages to reject the notion of using only one language, and this has led to universities worldwide adopting a more receptive approach towards translanguaging pedagogy. Although some scholars may view the notion of "translanguaging" as a passing trend or a new phenomenon, the findings of this study suggest that individuals who are bilingual or multilingual reject the structuralist perspectives of language and are receptive to engaging in translanguaging activities (Canagarajah, 2018). In the following section, a detailed analysis of our findings will be presented in relation to the research questions.

Perceptions of Translanguaging as a Practice

The majority of the participants regarded translanguaging as an inherent phenomenon and did not consider it to be perplexing. The present study's results are in opposition to Carstens' research, wherein individuals who spoke different Afrikaans dialects expressed their belief that the use of translanguaging in the classroom was perplexing and unproductive for educational purposes (Carstens, 2016). It is possible that the individuals involved in Carstens' research adhered to a structuralist perspective on language. Nonetheless, this discrepancy warrants additional examination.

The study's participants did not express any perception of translanguaging as a disrespectful practice, which is in contrast to the results reported by Rivera and Mazak (2017). Approximately 50% of the student participants at a university in Puerto Rico expressed negative attitudes towards translanguaging, per the findings of the research. In contrast, less than 7% of the participants in our study reported similar sentiments. The study conducted by Rivera and Mazak suggests that the utilization of translanguaging may be more widely accepted in diverse linguistic contexts, such as Indonesian universities.

According to the findings of the current research, the respondents expressed a favorable perception that the practice of translanguaging is indicative of inadequate mastery of the second language, with a mean score of 3.68. This finding is significant when compared to the predominantly favorable responses to translanguaging in other contexts. It can be postulated that certain graduate students who are proficient in two or more languages may inadvertently adhere to notions of linguistic supremacy, whereby the primary language is regarded as a hindrance that should be abandoned upon achieving complete fluency in the secondary language (Canagarajah, 2018). Although it may seem unexpected in light of the survey results, this perspective is not rare among other individuals who are bilingual or multilingual, particularly those who work in the field of education (Martinez et al, 2015). It is common for universities to implement rigorous language separation protocols that significantly impact the perspectives of both educators and learners, even if such policies are not overtly articulated in written form (Carroll and Mazak, 2017).

Perceptions of Translanguaging for L2 Learning

The collective average for the items that pertained to translanguaging in the context of second language acquisition was 4.13, indicating a predominantly favorable inclination towards utilizing linguistic tools to facilitate the acquisition of language and subject matter. The study's participants expressed a belief in the efficacy of translanguaging as a tool for acquiring a new language and recommended that educators incorporate translanguaging practices into their instruction (M=3.63). It is plausible to hypothesize that translanguaging pedagogies may already be present in universities of other nations (Doiz and Lasagabaster, 2016; Makalela, 2016), thereby potentially impacting the perspectives of the participants in our research, who predominantly hail from international contexts. The discovery has significant ramifications for language policies in higher education. Translanguaging can be viewed as a mechanism to optimize instructional efficacy and enhance students' comprehension of advanced concepts (Carroll and van den Hoven, 2016; Groff, 2016).

Perceptions of Translanguaging in Higher Education

The results of the survey indicate that most respondents (M = 4.09) perceived positively seven out of the eight questions pertaining to the utilization of translanguaging in the context of higher education. The aforementioned convictions could have arisen from previous encounters with translanguaging pedagogy, which has been posited by scholars to foster a secure environment for students with limited second language proficiency (Carroll and Sambolín Morales, 2016), alleviate the apprehension linked to communicating in a non-native tongue in an unfamiliar milieu (Makalela, 2016; Mbirimi-Hungwe, 2016); Pujol-Ferran, 2016; Motlhaka and Makalela, 2016), and provide support for novel concepts (Carroll and van den Hoven, 2016; He et al, 2016). The results of our study align with the research conducted by Adamson and Coulson, indicating that Japanese university students consider translanguaging as a valuable tool for managing classroom activities and enhancing task comprehension. Carstens (2019) found that South African university students perceived that the use of translanguaging by instructors aided in comprehending the broader context (Carstens, 2019, p. 11).

Our research outcomes regarding the professionalism of translanguaging in the context of higher education exhibit a degree of similarity in comparison to the findings of Rivera and Mazak (2017). According to the findings of our study, the general perception of Puerto Rican university students towards translanguaging was that it is an unprofessional practice for instructors. This aligns with a previous study which reported similar views among the students. The mean score for the unprofessional nature of translanguaging was 3.67, indicating a generally positive response toward this perception.

Conclusion, Limitations, and Implications

This research contributes to the extant body of literature by investigating the perspectives of graduate students in Indonesia who are proficient in two or more languages, regarding the practice of translanguaging in diverse settings. The findings of our study indicate that graduate student participants exhibit a predominantly favorable attitude towards the utilization of translanguaging as a means of facilitating second language acquisition, perceiving it as an inherent and organic bi- and multilingual phenomenon. Furthermore, a majority of the respondents expressed their willingness to embrace the concept of translanguaging in the context of tertiary education. However, they demonstrated a proclivity towards the perception that translanguaging was suggestive of inadequate second language proficiency. The

aforementioned discovery is somewhat disconcerting, given that scholarly investigations indicate that individuals who use language have a tendency to utilize their linguistic resources and repertoires in a strategic manner to achieve various objectives and results. Additional investigation is required to ascertain the underlying reasons for students' unfavorable attitudes toward the correlation between translanguaging and second language proficiency.

Similar to any research, this study is subject to various limitations. The present study is limited to quantitative data analysis, thereby precluding an in-depth investigation into the underlying rationales for the participants' translanguaging perceptions. The present study could have potentially gained advantages from a comprehensive qualitative comprehension of perceptions. Further investigation by future researchers may be necessary to ascertain the effects of being raised in an environment predominantly composed of monolingual individuals on educational policies.

This study yielded various implications for practice, policy, and research. The majority of respondents expressed that the utilization of translanguaging was advantageous and fundamental in the process of acquiring a second language. Therefore, it may be advisable for L2 educators to permit and promote the practice of translanguaging in their instructional settings. In addition, it is recommended that policymakers, administrators, and curriculum designers in both K-12 and higher education abandon the notion of linguistic segregation and instead explore effective methods for integrating translanguaging into instructional practices. The present study can serve as a valuable reference for future researchers who aim to design a translanguaging intervention study with the purpose of delving deeper into the perceptions of university students.

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Altruism as a Manifestation of Global Citizenship: Global Citizenship Education in the Age of COVID-19

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Abstract
This institutional case study delves into global citizenship education (GCE) and its impact on fostering altruistic values and behaviors among college students within Soka University of America (SUA), a private liberal arts college in Southern California. This all-residential institution, serving a diverse student body with 50% international representation, is dedicated to cultivating global citizens committed to living a contributive life. Notably, SUA's distinctive curriculum includes a mandatory study abroad component. Employing a quantitative approach, the study comprehensively explored students' global citizenship qualities and altruistic tendencies. The survey, designed to gauge the influence of curricular and co-curricular programs on altruism development, involved students' self-assessment. Correlational analysis established a significant link between global citizenship qualities and altruistic behavior. However, intriguingly, the duration of students' collegiate tenure did not emerge as a predictor of altruistic behavior—a phenomenon likely attributed partly to the disruptive impact of the COVID-19 pandemic. Intriguing insights surfaced from a multiple regression analysis, underscoring the pivotal role of human interaction on campus in shaping altruistic values and behaviors. Particularly noteworthy is the positive association between altruism development and interactions with students of diverse backgrounds. This implies that, despite the challenges introduced by the pandemic, meaningful social exchanges with peers from varied cultural backgrounds contribute significantly to the cultivation of altruistic attitudes among college students.

Keywords: Global Citizenship Education (GCE), Altruism, Study Abroad, Soka University of America (SUA), COVID-19 Pandemic

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Introduction

In the ever-globalizing landscape of the twentieth and twenty-first centuries, the spotlight on global citizenship education (GCE) has intensified within higher education (Schattle, 2008). While scholars extensively discuss the conceptual facets of global citizenship (GC), there remains a relative dearth of exploration into its practical application and tangible actions (Karlberg, 2008; Oxley & Morris, 2013; Schattle, 2008). Daisaku Ikeda, a distinguished Japanese Buddhist philosopher and educator, contributes to this discourse by articulating the fundamental qualities of global citizenship as wisdom, courage, and compassion (Ikeda, 1996). His philosophy emphasizes the embodiment of these traits through the practice of living a contributive life, a concept aligned with the ideals of Tsunesaburo Makiguchi, another influential Japanese philosopher and educator. Makiguchi's educational philosophy revolves around nurturing students' capacity to generate happiness within themselves and for others, with a central tenet being the commitment to "contribute to the lives of others and the realization of their happiness" (Ikeda, 1994, n.p.).

In contrast to the discourse that predominantly centers on GC qualities and identities, Ikeda emphasizes the tangible expression of global citizenship through altruistic behaviors—a paradigm shift that distinguishes his approach from the mainstream discourse (Karlberg, 2008; Oxley & Morris, 2013; Schattle, 2008). This study, therefore, sets out to investigate how college students cultivate their inclination to assist and support others through the prism of GCE and, subsequently, manifest these values in altruistic behavior. The literature review navigates the conceptual development of GC, aiming to contextualize Ikeda's GC philosophy within the broader academic dialogue. Subsequently, the study delves into the practical application of Ikeda's approach by scrutinizing Soka University of America (SUA) and how its students develop a contributive mindset.

Literature Review

Conceptualizing Global Citizenship

The historical roots of global citizenship discourse trace back to ancient Greece, where civic duties formed the cornerstone of community engagement. Philosophers like Plato and Socrates emphasized state politics, whereas Roman thinkers such as Cicero and Seneca focused on broader world concerns (Schattle, 2009). Citizenship, understood as the possession of certain rights by inhabitants of a community, highlighted participation and responsibility (Karberg, 2008).

Contemporary GC emerged from cosmopolitanism, an ideology asserting equal rights for every human globally (Schattle, 2009). The aftermath of World War II witnessed the founding of the United Nations, accelerating the dissemination of GC to address global challenges (Schattle, 2009). The intensification of globalization drew scholarly attention to GC, encompassing various tenets of politics, economics, cultures, and environmental studies (Oxley & Morris, 2013). This indicates the necessity for global citizens to possess interdisciplinary knowledge and competency to address the multifaceted challenges of our interconnected world effectively.

Diverse GC concepts have evolved from ideologies in different disciplines. Political scientists and philosophers aim to cultivate democratic citizens who are actively involved in societal decision-making (Oxley & Morris, 2013). In alignment with ancient Greek and Roman philosophers, moral cosmopolitanism takes an ethical approach to GC, emphasizing the shared

responsibility of human beings coexisting in an interdependent world (Schattle, 2008). Moral cosmopolitanism, as an ethical concept, places value on the undeniable human rights of citizens.

Economists, confronted with a growing global market, adopt a neoliberal approach to GC, emphasizing the preparation of graduates for the global labor market, where academic achievement and tangible skills are highly valued (Schattle, 2008). The neoliberal notion of GC, influenced by international migration and trade, emphasizes participation in the global economy as a prerequisite for global citizenship. However, it is crucial to recognize that neoliberal capitalism has exacerbated economic disparities. Therefore, competent global citizens are called upon to address inequality and alleviate poverty (Shultz, 2007). The power structures perpetuated by neoliberal capitalism have given rise to radical and transformational GC ideologies. Activists and reformers advocate for the deconstruction of existing social structures, urging global citizens to challenge injustice and contribute to building an inclusive society that resists systemic oppression and eradicates poverty in a radical manner (Shultz, 2007).

Moving towards a more liberal perspective, multiculturalism has become a prominent foundation of GC. The liberal multicultural approach perceives cultural interaction, including immigration and student exchange, as an opportunity to expand the capacity to coexist and understand individuals from different cultural backgrounds (Schattle, 2008). This multicultural notion of GC, evident in contemporary society, can be seen as an extension of cosmopolitanism. Both cosmopolitanism and multiculturalism value the concept of the globe and emphasize the coexistence of humans from diverse cultural backgrounds.

Amid various GC ideologies, scholars often discuss it as an identity grounded in common humanity. This shared identity fosters a sense of belonging to global society, encouraging individuals to transcend differences in nationality, language, culture, and religion (Schattle, 2009). This concept aims to bring humans together as citizens of a global society, collectively addressing intricate global predicaments.

Delving into the conceptual qualities of global citizens, Schattle (2009) identifies awareness, responsibility, and participation as primary attributes. Awareness, as a broad quality, extends from individual self-awareness to recognizing others beyond national, cultural, or religious boundaries. It involves self-reflection and identification with the community or society one belongs to. Noddings (2005) uses the term “concern” instead of “global awareness,” introducing the concept of “global citizen-carer,” emphasizing the importance of caring for others. “Concern” is defined as responding to the expressed or unexpressed needs of others. Consciousness and awareness towards people beyond one’s immediate environment are critical qualities of global citizens.

Responsibility and participation, closely tied to political and civic engagement, are vital attributes of global citizenship. Schattle (2009) underscores the significance of political participation in the decision-making process as a global citizen, emphasizing the alignment of responsibility with political engagement. While community or state membership naturally invokes a sense of responsibility, the global perspective diminishes physical boundaries. Global citizenship is thus a flexible notion dependent on individual identification, extending beyond physical space.

While these attributes relate primarily to political domains, the qualities of global citizenship extend across various disciplines, including economics, environment, language, and culture. Schattle (2009) expands on GC qualities, introducing secondary components such as personal achievement, international mobility, and cross-cultural empathy. Personal achievement and international mobility are associated with the expanding global job market and opportunities abroad. Personal achievement implies an expectation for global citizens to compete effectively in the job market, while international mobility signifies the impact of globalization on transnational movements and immigration.

As transportation and communication technology advance, societies become more interconnected, fostering diversity and multiculturalism. In this cross-cultural setting, interactions occur among individuals with diverse cultural backgrounds. Schattle (2009) emphasizes the importance of the ability to empathize with those holding different cultural backgrounds or positionalities. Many scholars argue that it is an educational task to foster globally concerned citizens engaged in their communities and societies (Karberg, 2008; Noddings, 2005).

Ikeda's Thoughts on Education for Global Citizenship

Daisaku Ikeda (1928–2023), the founder of Soka University of America, offers a profound moral and philosophical approach to GC grounded in Buddhist philosophy. Ikeda's ideas are derived from Tsunesaburo Makiguchi (1871–1944) and Josei Toda (1900–1958), a Japanese educator and Buddhist activist, inheriting and expanding upon their ideologies. Makiguchi, a school principal, advocated for value-creating pedagogy, cultivating the capacity to contribute to the well-being of others (Ikeda, 1996). Toda furthered Makiguchi's ideology by promoting "world citizenship," an identity based on shared humanity, transcending narrow nationalism focused on the prosperity of a nation-state (Soka Gakkai, 2020).

Ikeda's approach emphasizes the action of global citizens concerned about the world beyond their immediate environment, contributing to the happiness of others and societal prosperity (Ikeda, 1996). In his lecture at Columbia University Teachers College in 1996, Ikeda outlined essential attributes for global citizenship:

- The wisdom to perceive the interconnectedness of all life and living.
- The courage not to fear or deny difference but to respect and strive to understand people of different cultures and to grow from encounters with them.
- The compassion to maintain an imaginative empathy that reaches beyond one's immediate surroundings and extends to those suffering in distant places. (Ikeda, 1996, n.p.)

Ikeda places a strong emphasis on altruistic acts as constituting global citizenship, introducing a Buddhist canon in support of this perspective (Ikeda, 1996). This emphasis on a contributive life is encapsulated in Soka University of America's mission statement: "to foster a steady stream of global citizens committed to living a contributive life" (Soka University of America, n.d.). In alignment with this philosophy, Ikeda founded Soka schools worldwide, promoting the same values in Japan, the U.S., Brazil, Malaysia, Hong Kong, South Korea, and Singapore.

Altruistic Behavior: Development and Manifestation

Altruism has been the subject of extensive study across psychology, sociology, and biology. Evolutionary psychologists contend that altruism is inherently predisposed in humans, serving as a mechanism for survival. Kin selection theory posits that protecting relatives enhances the survival probability of the kin group, manifesting in behaviors like parental care, cooperative hunting, rescuing, and resource sharing (Penner et al., 2005).

The nature versus nurture debate has given rise to the socio-psychological argument regarding the development of altruism. Psychologists and sociologists, adopting a multi-level analysis, provide an overview of the development of altruism. For the purposes of this study, Bar-Tal's (1982) definition is employed, defining altruism as a voluntary and intentional behavior conducted for its own end to benefit another person without expectations for external rewards (Bar-Tal, 1982, p. 102). This definition underscores the importance of motivation, intention, and consequence in altruistic behavior.

Altruistic behavior, as per Bar-Tal's definition, is voluntarily initiated with the intent to benefit recipients, not the benefactor themselves, and without expectations of returns (Bar-Tal, 1982; Dovidio, 1984). True altruism involves individuals taking personal costs to help others, differentiating it from egoistic motivations driven by self-interest. Individuals often engage in cost-reward calculations, either unconsciously or intentionally, and genuine altruism involves taking personal costs to help others (Dovidio, 1984).

Another dimension of the behavioral analysis of altruism is examining the characteristics of benefactors and recipients. While studies often analyze recipients' characteristics and relationships to examine the consequences of altruistic behavior (Krebs, 1970), this research focuses on global citizens, assuming recipients are likely from diverse backgrounds in terms of nationality, ethnicity, gender, language, culture, and religion. Therefore, the characteristics of recipients are less likely to predict benefactors' altruistic behavior, justifying the examination of benefactors' qualities as antecedents of altruistic behavior.

Learning theory suggests that altruistic behavior can be learned through classical conditioning, which pairs a target behavior with a particular stimulus, and operant learning, which employs reinforcement to increase a specific behavior and punishment to reduce a target behavior (Dovidio, 1984). In prosocial behavior, physical and psychological rewards can serve as reinforcement, while sanctions or guilt can function as punishment. Beyond classical learning, social learning is the most prominent theory elucidating the mechanism of altruistic development. Individuals learn appropriate and desirable acts through stages of development and socialization in a community and society, emphasizing the influence of the environment on behavior and decision-making (Dovidio, 1984). This emphasizes the role of models, such as faculty members or fellow students, in demonstrating altruism in an educational setting. Reciprocity is another mechanism rooted in social exchange theory that encourages altruistic behavior. Reciprocal altruism is based on balancing the inequity of support; an individual feels obligated to help after receiving help, leading to generalized reciprocity or "paying it forward," where an original donor is compensated by the original recipient offering help to another person (Dovidio, 1984).

Considering the socio-psychological developments of altruism, these mechanisms can frequently be observed in an educational setting. School education provides students with models of altruistic acts and offers a space for socializing and learning ethical behaviors and

morals. Experiences of receiving support and care from others increase the likelihood of reciprocating altruistic behavior. Hence, one's educational experience and social interaction at school play a significant role in developing and manifesting an altruistic mind. This underscores the importance of formal and informal school curriculums, shaping individuals willing to help (Dovidio, 1984).

Present Study

This institutional case study delves into GCE and its impact on fostering altruistic values and behaviors among college students within Soka University of America (SUA), a private liberal arts college in Southern California.

GCE at Soka University of America

The Aliso Viejo campus of SUA, founded by Daisaku Ikeda in 2001, operates as a private liberal arts college in Southern California. Enrolling 454 undergraduate students as of January 2023, the university boasts a diverse student body with 50% international from all over the world and 50% domestic students from all over the U.S. The institution's unique focus lies in developing global citizenship and altruism, as outlined in its mission statement (Soka University of America, 2022a).

The Bachelor of Arts program at SUA, offering concentrations in Humanities, Social Behavioral Sciences, International Studies, Environmental Studies, and Life Sciences, equips students with interdisciplinary knowledge and integrative skills to address global complications (Soka University of America, 2022b). In addition to concentration-specific courses, students engage in general education, fostering interdisciplinary thinking. SUA's distinctive feature lies in its mandatory study abroad program, providing students with opportunities for language acquisition and cultural immersion. Learning Clusters, intensive three-week seminars, offer students a platform to explore real-life problems, conducting fieldwork domestically or internationally. Additionally, students can create Learning Clusters aligned with their interests, demonstrating academic leadership. Student organizations and clubs provide avenues for self-expression, connection, and appreciation of differences, crucial for global citizenship (Soka University of America, 2022c).

Research Questions and Hypotheses

The literature review above suggests that social environment and psychological reaction mechanisms influence one's development of altruism. During socialization, an individual learns from others when and how to conduct a helping behavior and internalizes prosocial values or norms (Dovidio, 1984; Schwartz, 1977). However, how education fosters individuals acting upon altruistic values and committing to others' welfare has not been thoroughly studied. More so, what aspects of college life account for a student's development process of altruism have not been comprehensively explored. This study thus examines the case of SUA regarding its GCE curricular and co-curricular programs and the development of students' willingness to help others. The research questions specifically investigated were:

1. To what extent does SUA students' GC score correlate with their altruistic behavior?
2. To what extent does the time spent at SUA predict students' degree of altruistic behavior?
3. To what extent do SUA's programs and campus life facilitate students' development of an altruistic mindset?

Based on the literature review and reviews of similar studies such as Kishino and Takahashi (2019), it was hypothesized:

1. SUA students' GC scores and altruistic behaviors tend to correlate positively.
2. The time spent at SUA correlates positively with the degrees of students' altruistic behavior.

3a. Curricular and co-curricular programs that facilitate social learning predict SUA students' development of the altruistic mind and its manifestation.

3b. Curricular and co-curricular programs that facilitate reciprocity predict SUA students' development of the altruistic mind and its manifestation.

Methodology

Participants

An invitation to participate in this study was sent to 454 undergraduate students enrolled at SUA as of January 2023, and 135 students participated. A summary table of their demographic data is presented in Table 1. All participants were aged 18 years or above.

Table 1: Participant demographics (N=135)

Demographic	*n*	%
Gender		
Female	77	57
Male	50	37
Non-binary	6	4.4
Prefer not to answer	2	1.5
Expected graduation year		
2026	45	31.1
2025	35	25.9
2024	26	19.3
2023	30	22.2
Prefer not to answer	2	1.5
Student status		
Domestic	58	43
International	76	56.3
Prefer not to answer	0	0
Concentration*		
Humanities	25	18.5
International Studies	19	14.1
Social Behavioral Sciences	65	48.1
Environmental Studies	19	14.1
Life Sciences	28	20.1
I don't know yet	7	5.2

*The total percentage of concentration distribution is not 100 due to the presence of double concentrations.

Instrument

The questionnaire consisted of questions regarding demographics, GC, altruism, and curricular and co-curricular programs.

Demographic Information: The participants were asked about their gender, concentration, class, status (domestic [US citizens and residents] or international [F-1 visa students]), ethnicity, and religion.

Global Citizenship (GC) Assessment: The questionnaire comprised 16 items evaluating participants' GC qualities. Eleven items, adapted from the Global Citizenship Scale by Reysen and Katzarska-Miller (2013) with modifications, gauged aspects like empathy and global citizen identity. Another five items, selected from Ikeda (1996), explored wisdom and interconnectedness perceptions. Participants responded on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree).

Altruism Measurement: Seventeen items assessed participants' altruistic behaviors, reflecting GC in action. Adopting a Simplified 9-item Version of the Self-Reported Altruism Scale (Manzur & Olavarrieta, 2021) with adjustments, the questionnaire included volunteer work, helping others, and addressing kindness. Participants indicated their agreement on a 5-point scale from 1 (Never) to 5 (Always). Additional items explored reciprocity's role in altruism, adopted from past research (Dohmen et al., 2008; Maximiano, 2017).

Curricular and Co-curricular Programs Assessment: Participants rated SUA's curricular programs and co-curricular activities related to altruism development. Fifteen items, adapted from Kishino and Takahashi (2019), measured the impact of general education courses and club activities. Three items focused on social learning, assessing the influence of SUA's community as a model. Participants used a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). The questionnaire also gathered data on participants' participation in Learning Clusters and completion of the Study Abroad program. Participants had the option to share relevant experiences and provide additional comments.

Data Collection Procedures

The questionnaire for this study was created by the survey software Qualtrics and was distributed to 454 students enrolled at SUA in January 2023 after IRB approval. The link to the online survey was sent through email, and participants were redirected to the survey by clicking the link and agreeing to the consent. The respondents who were underage or did not agree to the consent were excluded from the study.

Data Analyses

To test Hypothesis 1, Spearman's rank order correlation analyzed participants' GC scores, encompassing self-identification and altruism. Hypothesis 2 employed a one-way analysis of variance (ANOVA) to gauge the statistical significance of mean differences across expected graduation years (2023, 2024, 2025, and 2026) concerning GC and altruism scores. For Hypotheses 3a and 3b, a multivariate test examined the significance of participants' ratings on curricular and co-curricular activities, followed by multiple regression on psycho-social mechanisms (reciprocity and social learning) against altruism scores to identify the stronger

predictor. T-tests and F-tests were conducted for all hypotheses, with a significance level set at .05 for hypothesis rejection.

Results

Hypothesis 1: GC and Altruism

The Spearman's rank order correlation revealed a moderate positive correlation between students' GC score and altruism score ($r_s = .569$, $p < .000$). The finding confirmed the hypothesis that the students' qualities and understanding of GC are somewhat manifested in their altruistic behavior.

Hypothesis 2: Altruism and Duration in College

One of the 14 items measured the participants' altruism score, and first-, second-, third-, and fourth-year students—the classes of 2026, 2025, 2024, and 2023, respectively—scored somewhat similarly ($M = 50.67$, $SD = 7.40$: $M = 49.06$, $SD = 6.89$: $M = 50.54$, $SD = 5.73$: $M = 48.82$, $SD = 7.82$). The results of a one-way ANOVA show that the altruism scores did not significantly differ from each class, $F(4, 128) = 0.49$, $p = 0.742 > 0.5$, which does not support the hypothesis (see Figure 1).

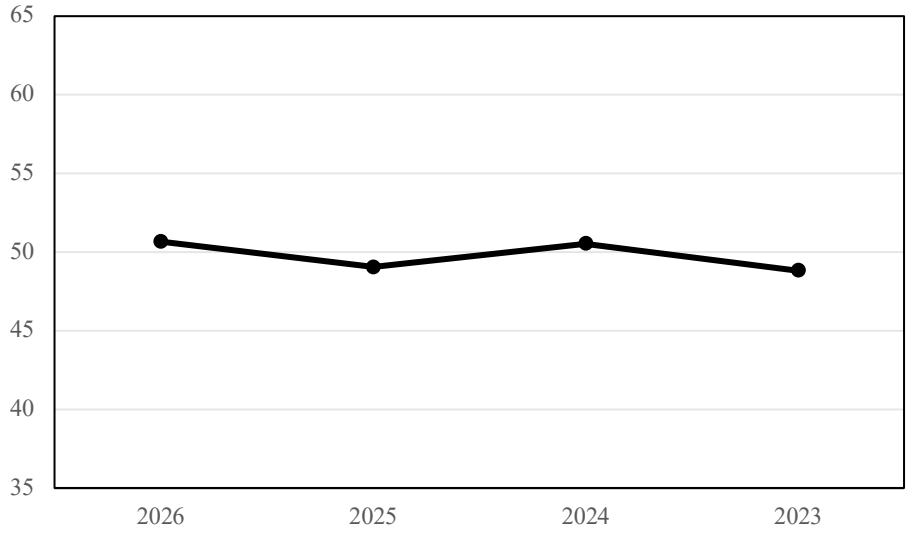


Figure 1: Altruism scores by expected graduation year

Hypothesis 3a: Social Learning and Altruism

The participants scored highest on items related to social learning. Students reported that fellow students and faculty on campus, as a model, helped them become more willing to help and support others ($M = 4.13$, $SD = 0.836$; $M = 4.09$, $SD = 0.848$). The highest score was found in the statement, "*Students having different backgrounds have helped me become more willing to help and support others"* ($M = 4.27$, $SD = 0.859$). The multivariate test of means revealed the statistical significance between the mean differences, where $F(13, 96) = 28.28$, $p = 0.00 < .05$. The detail of the mean score is found in Table 2. The results support Hypothesis 3a.

Table 2: Mean scores of curricular and co-curricular programs

University Offerings	*M*	*SD*	*n*
Students having different backgrounds	4.27	0.86	135
SUA students in general	4.13	0.84	135
Faculty members	4.09	0.85	111
Campus staff	3.87	0.96	134
Concentration courses	3.87	0.89	135
Residential life	3.83	1.08	135
Regular courses	3.76	0.89	134
Club activity	3.76	1.44	105*
General Education courses	3.5	1.02	134
Student organization activity	3.29	1.74	113*
Learning cluster	3.23	2.07	43*
Affinity group activity	2.82	1.70	124*
Leadership	2.61	1.82	102*
Study abroad	2.57	2.17	33*

**Responses indicated as "N/A" were excluded from the calculations.*

Hypothesis 3b. Reciprocity Learning and Altruism

A multiple regression specified psychological mechanisms responsible for students' altruism development. Among the university offerings related to social learning and reciprocity, the item "students having different backgrounds" was not found to be a significant predictor of higher altruism ($t = 1.61$, $p = 0.11 > .05$). In contrast, the statement measured reciprocity "*I have been encouraged or supported by the people on campus*" was found to be the best predictor of higher altruism ($t = 3.02$, $p = 0.003 < .05$), which supports Hypothesis 3b.

Discussion

The study supported Hypothesis 1—i.e., one's extent of GC qualities somewhat predicts altruistic behavior and vice versa. This finding indicates that students' qualities and understanding of GC manifest in their altruistic behavior. This augments Ikeda's focus on living a contributive life as an act of global citizens while supporting the rationale for GC action to be explored as much as its qualities in the scholarship of global citizenship.

The study failed to validate Hypothesis 2, indicating that the time spent at SUA did not predict the level of altruism among students, with no statistically significant differences observed (see Figure 1 above). A study by Kishino and Takahashi (2019) revealed a general tendency for upperclassmen to score higher on the Global Citizenship Scale than underclassmen (see Figure 2). Given the positive correlation between altruism and GC, the non-support for this hypothesis requires scrutiny.

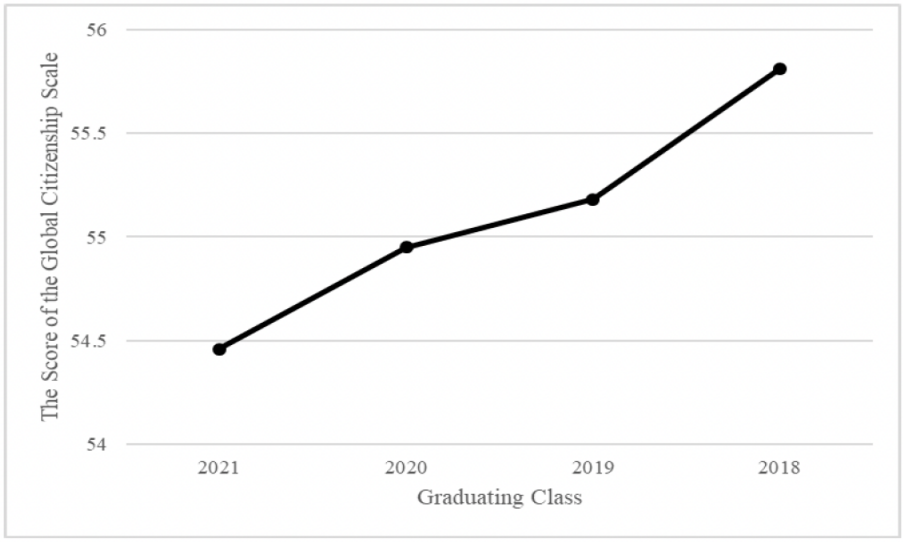


Figure 2: Global citizenship scale mean scores by expected graduation year, (p >.05) (Kishino & Takahashi, 2019, p. 1561)

A plausible explanation for the lack of improvement in students' altruism scores found in the present study can be attributed to the onset of the COVID-19 pandemic in March 2020, which led to the evacuation of all SUA students from the residential campus. The class of 2023, particularly, experienced significant disruption, spending their second year at home engaged in online learning. The subsequent class of 2024 commenced their first year online from home. Consequently, those fourth- and third-year students spent markedly less time on campus during the formative years of their college life. In January 2023, at the time of the survey, these upperclassmen had only lived on campus for two to four semesters, while first- and second-year students had spent one to three semesters. Had it not been for the pandemic, fourth-year students would have accumulated six to seven semesters on campus by January 2023. This disrupted timeline suggests that upperclassmen may have yet to have the expected duration at SUA to witness the anticipated improvement in GC and altruistic scores.

Beyond the reduced time on campus, the pandemic thwarted on-campus interactions for the classes of 2023 and 2024, limiting their in-person educational experiences. This restriction may have diminished opportunities for altruistic behavior, contributing to lower altruism scores. Additionally, the pandemic imposed unprecedented stress on students globally, impacting mental health and exacerbating feelings of isolation. Lockdowns, prevalent economic recession, and financial struggles further strained students' psychological well-being and motivation to learn.

Higher education institutions, including SUA, adapted online teaching modalities in response to the pandemic but often fell short in meeting social and psychological needs. Challenges such as attending online classes predicted negative school ratings among students. International students also faced difficulties attending online courses from different time zones, further impacting their learning and interactions.

Similarly, the global notion of GC faced challenges due to the pandemic's impact on international travel restrictions. COVID-19 underscored national citizenship, with border control becoming a discriminatory factor. This emphasis on national identity contradicted the inclusive nature of global citizenship. The pandemic's disruptions, including declining

international student populations, further impeded the development of cultural competency—an essential GC quality.

In the case of SUA, mandatory study abroad, a significant predictor of improved global citizenship (Kishino & Takahashi, 2019), was disrupted by the pandemic. The option to opt out or delay study abroad significantly limited opportunities for students to immerse themselves in different cultural environments, hindering the development of cultural competency and potentially stunting the growth of GC qualities, including altruism. Consequently, the limited opportunities for social interaction during the pandemic likely contributed to reduced engagement in altruistic behavior among third- and fourth-year students.

The outcomes substantiated Hypotheses 3a and 3b, indicating that curricular and co-curricular programs facilitating social learning and reciprocity predict the development of an altruistic mindset and its manifestation among SUA students. This underscores the significance of human interaction in fostering altruism. Notably, the impact of COVID-19 appears to have heightened the perceived importance of human connection. In normal circumstances, students rated interaction with fellow students at 3.9 (Kishino & Takahashi, 2019). However, participants in the present study rated general student interaction at 4.13 and interaction with students from diverse backgrounds at 4.27. Similarly, "residential life" received a higher rating ($M = 3.83$, $SD = 1.08$) compared to the previous study conducted under normal circumstances (Kishino & Takahashi, 2019). These findings suggest that students who navigated the challenges of the pandemic value human interaction and communal living more, considering them essential factors in the development of altruism.

Moreover, participants' elevated ratings of social-learning-related activities imply the potential of college socialization in nurturing an altruistic mindset. Although prosocial development through higher education has received limited attention, the well-established social learning theory of altruistic attitudes and behaviors provides a strong foundation. According to Rushton, (1982), observing adults engaging in desired and socially expected behaviors influences children or students to mimic those behaviors, aligning with the norms and values associated with the actions. In an educational context, teachers or peers can serve as models for students to identify and adopt prosocial behaviors. This socialization process, inherent in formal education, contributes to the development of a prosocial orientation, as evidenced in higher education institutions (Brandenberger & Bowman, 2015).

With the increasing emphasis on cultural diversity in higher education spurred by globalization (Schattle, 2008), the development of GCE has gained momentum. Research demonstrates that incorporating cultural diversity into students' college experiences yields academic and social benefits. Students engaging with peers of different ethnicities or races exhibit higher levels of critical thinking, openness to diverse cultures, increased political participation, and heightened civic engagement compared to their counterparts (Hu & Kuh, 2003). Such intercultural learning and interaction align with the objectives of GCE.

SUA, characterized by its ethnic, cultural, linguistic, and religious diversity, actively implements GCE, offering students a culturally rich experience that includes study abroad and cross-cultural interactions with peers. This study supports the notion that GCE contributes to the cultivation of altruism, with students indicating that interaction with peers from diverse backgrounds most significantly influences their altruistic behavior. This aligns with existing literature demonstrating that exposure to diverse cultures during college, whether through

cultural interactions or co-curricular activities, predicts students' altruistic tendencies (Brandenberger & Bowman, 2015).

Furthermore, the study reveals that experiences of encouragement or support from individuals on campus serve as predictors of reciprocal altruism. This finding aligns with generalized or upstream reciprocity, wherein one receiving help pays it to a third party. Gratitude or a sense of indebtedness mediates this process, motivating benefactors to engage in altruistic behavior (Beeler-Duden & Vaish, 2020). In essence, experiences of support may inspire students to cultivate altruism and actively participate in such behavior. This perspective is congruent with the evolutionary standpoint on reciprocal helping, where promoting prosocial behavior within a species is seen as advantageous for species survival (Trivers, 1971). In the context of inter-group assistance and reciprocity effects, the present study underscores the importance of receiving support from peers, faculty, or administrative staff at school to develop an altruistic orientation.

Conclusion

This study confirmed the link between global citizenship qualities and altruistic behavior, supporting Ikeda's emphasis on tangible global citizen actions. At the same time, GCE is shown to be vulnerable to disruptions like pandemics, with online learning falling short of replicating the complete campus experience. The study also found that modeling and reciprocity play a crucial role in fostering altruistic values, and having diverse fellow students is the most influential predictor of global citizenship development. Among social learning and reciprocity factors, being cared for on campus is the strongest predictor of heightened altruistic behavior, suggesting a culture of care. In summary, this study indicates that the challenges of COVID-19 underscore the importance of human interaction in developing altruism. Fostering a culture of care within educational institutions is key to cultivating contributive global citizens.

Limitations of this research include a self-reported scale and correlational analysis. The participants rated their altruistic level, which diminished objectivity in measurement. Given the nature of the cross-sectional correlational study, it does not testify to the causality of students' altruism and curricula at SUA. The small sample size may also limit the generalization of the study findings.

For the future direction, it will be valuable to compare the results under the pandemic with those free from such interruptions. A longitudinal study tracking students' GC development and altruistic engagement across campus years can reveal potential improvements. Comparative studies with different schools will assess GCE efficacy. Exploring care and support psycho-social mechanisms, especially in other Soka schools, would provide deeper insights.

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Learning Food Safety and Other STEM Topics: A Review

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Abstract
Scholars have long used problem-based learning along with other pedagogical approaches that immerse learners in the content to foster an understanding of Science, Technology, Engineering, and, Mathematics (STEM) subjects. However, little has been written about learning food safety as a food science topic. This paper uses a narrative review to understand the ways in which food safety has been taught and how effective these methods have been. The main questions that this review sought to answer are (a) What pedagogical approaches have been used in teaching food safety in college and professional settings, and (b) How effective have these methods been in increasing knowledge retention? Special attention was paid to journals of food science education and more specifically food safety education worldwide, along with searches in institutional databases and other authoritative texts. The focus of the search was on article titles and abstracts with teaching methodology, learning, and effectiveness of these practices. Food safety as a STEM subject is very relevant to the agricultural sector and society at large. Learning food safety is important as it maintains a sustainable food system that provides safe and nutritious food to consumers, whilst ensuring that students and professionals are literate in STEM. Most of the literature on learning food safety suggests that immersing students in experiential, active learning, and problem-based learning significantly increases their knowledge retention.

Keywords: Food Safety, STEM, Learning Food Safety, STEM Education

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Introduction

Science has always been seen as dealing with abstractions (McCormick, 2004). With initiatives like Project 2061, there has been a need to improve the pedagogical approaches to scientific conceptual understanding through the integration of science, technology, and mathematics to produce scientifically literate citizens in the United States. Project 2061 was introduced by the American Association for the Advancement of Science (AAAS) to aid in the scientific literacy of the American public. Project 2061 specifically sought to bring about literacy in Science, Engineering, and Mathematics by reforming curricula (Campbell-Phillips, 2020). Following the introduction of Project 2061, some scholars have made suggestions on how to best produce scientifically literate citizens.

In order to address learning approaches, it is imperative to discuss pedagogical approaches and how they can aid in producing STEM-literate citizens. Technology or Engineering Design (T/E design) and other forms of experiential learning can act as facilitators of understanding the abstraction of science. McCormick (2004), for example, states that "science concepts deal with generalities (abstractions), whereas technology with how these concepts are manifest in particular contexts" (McCormick, 2004, p. 24). McCormick's view of science education and knowledge has major implications for the role of pedagogical approaches such as T/E design in science. He shows that design plays a fundamental role in contextualizing the otherwise abstract concepts of science. If science deals in abstractions, then T/E design is an important facilitator in making sense of these abstractions.

Cajas (2001) in discussing what it means to be science literate points out how the American Association for the Advancement of Science (AAAS) outlines how mathematics, technology, and science (STEM) depend on each other and how design is at the core of science literacy (Cajas, 2001). This shows how associations like the AAAS have seen the need to emphasize the role that T/E design plays in science education, namely making it more understandable to learners. Cajas (2001) also points out how T/E design goes beyond the application of science and is concerned about literacy. T/E design is not merely about what people are doing but the ideas and skills that are relevant to literacy. Becoming literate in STEM is important as science helps in naming the world.

Significance of Learning Food Safety as a STEM Topic

Food safety is a public health issue that is relevant to every human being. The United States Department of Agriculture (USDA) defines food safety as "the conditions and practices that preserve the quality of food to prevent contamination and food-borne illnesses" (USDA, n.d.). Safe food benefits a host of infrastructural issues in that it "improves economic growth of the region where food safety is practiced and enhanced. Safe food supply depends on both sound science and equitable law enforcement. With technological advances, new regulations must be enacted to protect a continuing supply of food products that are safe and wholesome for the health and wellness of people" (Fung et al, 2018, p. 89). Scholars like Fung et al. (2018) emphasize how important STEM literacy is when it comes to improving any nation's food safety system. Topics like food safety are learned within professional and academic environments, therefore prompting a need to look into how to best improve these learning approaches.

This paper takes a deliberate aim to understand the ways in which food science or more specifically, food safety has been learned and taught. It also briefly covers how other STEM

topics have been addressed in the literature. The paper covers food safety in professional and academic spaces. This paper answers the following questions: (a) What pedagogical approaches have been used in teaching food safety in college and professional settings, and (b) How effective have these methods been in increasing knowledge retention?

Methods

The main questions that this review sought to answer are (a) What pedagogical approaches have been used in teaching food safety in college and professional settings, and (b) How effective have these methods been in increasing knowledge retention? Special attention was paid to journals of food science education and more specifically food safety education worldwide, along with searches in institutional databases and other authoritative texts. The focus of the search was on article titles and abstracts with teaching methodology, learning, and effectiveness of these practices. Studies that discuss learners in K-12 settings were not included.

Literature Review

Problem-Based Learning

Problem-based learning is one of the most popular means of learning and teaching STEM subjects. The literature shows the benefits of using problem-based learning to teach STEM courses. Duffrin (2003) explored how using problem-based learning aided in teaching an introductory food science course. The study showed that Integrating problem-based learning aids in students' communication, problem-solving, and self-directed learning along with other desirable skills. Developing these and other skills is necessary for improving the literacy of STEM and other related disciplines knowledge.

Problem-based learning itself is about learning through problem-solving. “In PBL [Problem-Based Learning], student learning centers on a complex problem that does not have a single correct answer. Students work in collaborative groups to identify what they need to learn to solve a problem. They engage in self-directed learning (SDL) and then apply their new knowledge to the problem and reflect on what they learned, and the effectiveness of the strategies employed” (Hmelo-Silver, 2004, p. 235). Having a complex problem to solve engages students' self-learning by encouraging them to investigate various inquiry forms to understand the problem and its solution better. Since the problem does not have a single correct answer, students can find multiple solutions.

Problem-based learning dates to John Dewey (1938) who advocated for learning that is experiential. Dewey reasoned that experience and education go hand in hand even though not every experience is educational. Experiences or experiential learning are beneficial for knowledge retention. This becomes an even greater necessity for complex studies such as food science and other STEM courses. Food science makes a unique course in which problem-based learning can occur as the subject matter is very practical. For example, when it comes to topics such as food safety, instructors can immerse learners in solving problems that are likely to occur during food preparation. It is this kind of learning that Duffrin (2003) probed by presenting an ill-structured problem for first-year food science students.

Ill-structured problems provide students with limited explanations of the problem they have to solve to stimulate interest and learning. One area that made Duffrin’s (2003) study unique was

that students had to consult the literature on how to best go about solving the problems presented. In this way, students provided a variety of solutions and focused on studies that were of interest to them. This kind of learning engages students as they can probe issues that are specific to their interests. Duffrin (2003) also cautioned on how to properly use problem-based learning, explaining how good problems motivate students to begin working on solutions and engage in critical thinking.

Project-Based Learning

Scholars have also looked into project-based learning as a pedagogical approach. In project-based learning, students are assigned a project, much like problem-based learning, and are engaged in inquiry. Students can dialogue not only with new knowledge but also with their past experiences.

Oliveira and Cardoso (2021) combined project and problem-based learning to promote innovation and entrepreneurship among master's students in Food engineering. "The PBL strategy allowed students to mobilize knowledge from several curricular units of food studies for the development of different deliverables to participate in the innovation program and contest. This participation allowed students, supported by business mentors, to demonstrate their products to stakeholders" (Oliveira & Cardoso, 2021, p. 120). By allowing students to have deliverables at the end of the study, students demonstrated mastery of the desired learning outcomes and most importantly, the acquisition skills necessary for their profession.

Design-Based Learning and Other Pedagogical Approaches.

Design-based learning or "Design-Based Science (DBS) is a pedagogy in which the goal of designing an artifact contextualizes all curricular activities. Design is viewed as a vehicle through which scientific knowledge and real-world problem-solving skills can be constructed" (Fortus et al., 2004, p. 1081). Much like the other modes of learning, DBS helps students contextualize scientific material by making connections with real-world examples whilst engaging students in design projects.

By utilizing the analyze-design-develop-implement-evaluate (ADDIE) model, Alberts and Stevenson (2017) redesigned an undergraduate food safety management systems course. The premise of using the ADDIE model was to engage students in learning that was student-centered, engaging, authentic, and inspiring. Following the intervention, there were significant gains in knowledge, which prepared the learners for the workforce.

Discussion

John Dewey (1899) decades ago proposed that the work students do in the classroom should not merely be mindless or utilitarian but should be instrumental in connecting learners to society and social processes. To do this, learners must be shown the connections between what is taught in the science classroom to the world outside the classroom using T/E design as a facilitator. This helps learners develop critical thinking skills and habits of the mind.

Helping students make connections between what is learned, and the real world is essential for topics like food safety as it is a public health issue that affects everyone. For STEM topics to be learned properly, students must be engaged in hands-on projects, as prescribed by the literature to aid in a literate citizenry.

While the literature does not have numerous examples of learning food safety specifically, much can be drawn from how other STEM courses are learned. Similarly, learning STEM topics cannot be discussed without probing pedagogical approaches.

Conclusion

Learning about food safety is important as food safety is a public health issue that affects everyone. This paper sought to ascertain from the literature how to best learn food safety and other STEM topics. The literature prescribed involves learners in hands-on projects and other experiential learning opportunities to achieve scientifically literate citizens. The literature also showed how science is best learned when students can make connections between what is learned in the classroom and what is happening in the real world. It would be beneficial for the literature to use food safety as a model of how to incorporate the various sciences (STEM) to achieve scientifically literate citizens.

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Analyzing the Implementation of Anti-corruption Education Curriculum Guidelines in Basic Education Institutions in Thailand

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Abstract
The article aims to 1. Analyzing the anti-corruption education curriculum in line with the National Strategy for Corruption Prevention and Eradication, Phase 3 (2017-2021). 2. Synthesizing the implementation of anti-corruption education curriculum in basic education institutions. The research methodology involves a combination of document analysis and in-depth interviews. Research has found that there are six approaches for implementing the curriculum in educational institutions: 1. Adding supplementary courses. 2. Integrating with the curriculum of social studies, religion, and culture. 3. Integrating with other subject areas. 4. Incorporating it into student development activities. 5. Organizing extracurricular activities. 6. Incorporating it into the school's lifestyle. The monitoring results from The National Anti-Corruption Commission (NACC) show that out of the 56,283 basic-level educational institutions, 54,529 (96.88%) have adopted the curriculum. Despite achieving significant quantitative outcomes in the effectiveness of the anti-corruption curriculum's implementation, qualitative dimensions remain inadequately addressed in the quest to construct a society resilient to corruption. Consequently, this article proffers a set of recommendations. It urges educational administrators to heighten awareness of the critical role played by anti-corruption education and advocates for mutual understanding among educators to minimize subject overlap. Schools are encouraged to provide resources, including media, equipment, budgets, and support for extracurricular learning. Educational administrators, teachers, and staff are called upon to set exemplary standards and foster a positive atmosphere, while schools are urged to establish collaborative networks with pertinent organizations, fostering both academic and managerial exchange.

Keywords: Sustainable Development Goals, Anti-corruption Education, Leadership, Educational Administrators, Basic Educational Institutions

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Introduction

Corruption is a global concern stemming from its complex and pervasive nature, making it challenging to address and involving all sectors. It has been designated as part of the sub goal 16 of the Sustainable Development Goals (SDGs). Corruption is a global issue because it occurs in every country, regardless of their level of development. It happens in both the public and private sectors, including non-profit organizations or NGOs (National Anti-Corruption Commission Office, in conjunction with the Office of the Basic Education Commission, 2019). The results of the Corruption Perceptions Index (CPI), which measures a country's transparency, by Transparency International (TI), have not improved or have even worsened in Thailand. This indicates that Thailand still faces high levels of corruption that require urgent attention. Thailand's scores and rankings in the CPI from the past to the present are as follows:

Table 1: Corruption Perceptions Index (CPI) in Thailand during the year 2012- 2023

Year	Score (Out of 100)	Rank Number	Countries
2012	37	88	176
2013	35	102	177
2014	38	85	175
2015	38	76	168
2016	35	101	176
2017	37	96	180
2018	36	99	180
2019	36	101	180
2020	36	104	180
2021	35	110	180
2022	36	101	180
2023	35	108	180

Professor Robert Klitgaard, an economist at Claremont Graduate University (CGU) in the United States, proposed the concept of the "Corruption Formula" in his book "Controlling Corruption." This formula outlines the key principles of corruption that occur in many countries. According to Klitgaard, corruption is not primarily a cultural or traditional problem but rather a systemic issue.

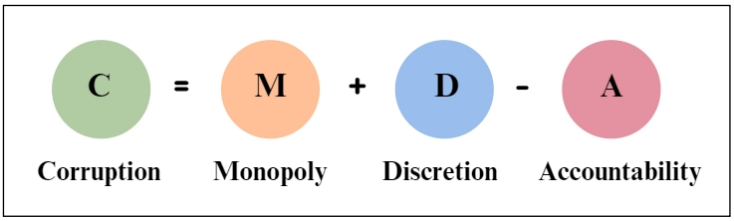


Figure 1: Corruption Formula by Professor Robert Klitgaard

The equation suggests that corruption tends to increase when there is a monopoly in the economic system and excessive discretion. Conversely, increasing accountability reduces the likelihood of corruption (Klitgaard, 1988). In Thailand, most research focuses on corruption within the governmental system, leading to a lack of knowledge about systemic issues. For example, civil society sectors opposing corruption often operate individually without systemic management. Moreover, the asset disclosure and auditing systems lack

effectiveness, as measures to disclose accounts and debts have proven ineffective. While Thailand has many measures to combat corruption, there are gaps in addressing transparency indices (Assoc. Prof. Dr. Thanee Chaiwat, Unveiling the Dynamics: Anti-Corruption Trends and Intriguing Research in 2024, presented at the 2nd National Conference to Promote Potential and Expand Cooperation Networks in Anti-Corruption Efforts at the Regional Level, KRAC, Economic Faculty, Chulalongkorn University on Friday, January 5, 2024).

A system characterized by monopolies creates incentives to pursue "excessive profits," which have long been entrenched. Personal benefits conflict with collective interests, driven by discretion, requiring clear guidelines. Discretion must be exercised appropriately. If economic systems lack adequate management to reduce such excesses, corruption can flourish. Therefore, fostering anti-corruption movements and providing education are crucial. Education can elevate the quality of anti-corruption efforts (Peerapong Techatawat, 2017).

The Constitution of the Kingdom of Thailand, B.E. 2560, stipulates in Section 4 the duties of Thai citizens as follows: "... individuals have the duty not to engage in or support corruption and misconduct in any form." It can be considered the first time that the constitution has designated the prevention and suppression of corruption as the responsibility of all Thai citizens. Furthermore, it clearly outlines in Section 5 the duties of the state that "the state must promote, support, and provide knowledge to the people about the dangers of corruption and misconduct, both in the public and private sectors, and ensure that effective measures and mechanisms are in place to prevent and eliminate corruption and misconduct rigorously. This includes mechanisms to promote the participation of citizens in campaigns to educate against corruption or point out misconduct, with the protection of the state as prescribed by law" (Constitution of the Kingdom of Thailand, B.E. 2560, Article 63).

The National Reform Council, as an organization with roles and powers in reforming mechanisms and performing governmental administrative tasks, has proposed reforms in preventing and combating corruption and misconduct to address these issues systematically, effectively, sustainably, and in line with international standards and Thai society's context. It proposes three strategies to address the problem: 1) "Thai People, No Cheating" Strategy: To reform individuals' consciousness, instill personal responsibility, and cultivate a sense of what is morally right and wrong. Corruption should be perceived as undesirable behavior that degrades society, and society should not tolerate it. 2) "Prevention through Building a Virtuous Society" Strategy: To establish a corruption prevention system akin to building a resilient anti-corruption system across all sectors of society. 3) "Combat Strategy": To reform the system and processes for handling corruption cases to be more effective in prosecuting wrongdoers, instilling fear of consequences for future wrongdoing.

These strategies are part of the National Reform Council's plan to enforce the National Strategy Law within the year 2016, under this government, and to make it mandatory for all state agencies to incorporate various national strategies and development plans into their operational plans and budgets. These national strategies are based on the country's main objectives, focusing on preventing and combating corruption, promoting transparency and accountability in governance across all state agencies, guided by the National Strategy (20-Year National Strategy B.E. 2560-2579).

One important mechanism for preventing corruption is instilling a culture of anti-corruption, fostering civic engagement (Action Citizen), and promoting participation in addressing corruption issues, particularly among students who are becoming significant forces against

corruption. They should be promoted to be aware of the problem and participate in anti-corruption efforts from an early stage, as seen in various examples worldwide where efforts are being made to push and encourage youth participation in expressing opinions on addressing corruption problems and engaging in anti-corruption initiatives within schools and their communities (Torplus Yomnak, 2019). The mobilization of student groups has great potential to lead to positive changes in their communities and contribute to the establishment of sustainable youth networks in the community as well. This is because the work of student groups focuses on a proactive role and involves collaborative bottom-up processes for youth by youth, resulting in equality in expressing opinions. This approach creates a non-judgmental space for fully listening to students' voices (Iwasaki, 2016).

The National Anti-Corruption Strategy Phase 3 (2017-2021) has set the vision 'Clean Thailand, Nation against Corruption' (Zero Tolerance & Clean Thailand) as one of Thailand's strategies to achieve sustainable development goals (SDGs 2030). 'Anti-Corruption Education' has been developed under Strategy 1, 'Building a Society intolerant of Corruption,' focusing on the importance of societal transformation processes to create a culture intolerant of corruption. This begins with socialization processes at all levels of age, starting from early childhood, to instill a culture of anti-corruption and foster values of integrity, discipline, and honesty. This is carried out through institutions or representative groups responsible for socialization processes. Four strategies have been outlined: Strategy 1 focuses on shaping the mindset from an early age to distinguish between self-interest and collective interest. Strategy 2 promotes the establishment of socialization systems and processes to combat corruption. Strategy 3 applies the principles of sufficiency economy as a tool to combat corruption. Strategy 4 strengthens community participation and integration of all sectors to combat corruption. It is mandated to develop curricula, lessons, teaching methods, presentations, and anti-corruption prevention formats, as well as to develop innovations and learning media for all age groups. The National Anti-Corruption Commission (NACC) is the main responsible body, with the Ministry of Justice, Ministry of Education, Office of the Civil Service Commission, Royal Thai Police, and relevant agencies collaborating with the NACC to consider the implementation of this curriculum. The NACC has developed a curriculum or learning materials and supplementary learning media on corruption prevention to be used as standardized content for educational institutions or relevant agencies to consider in teaching for all target groups at all levels (Office of the National Anti-Corruption Commission, in collaboration with the Office of the Basic Education Commission, 2019).

The Anti-Corruption Education curriculum is designed to be implemented in two formats: Curriculum for Teaching Management and Training Curriculum. There are five target groups for the implementation of the curriculum, which include: 1) Basic Education 2) Higher Education 3) Military and Police 4) Civil Servants and State Enterprise Personnel 5) Coaches. These target groups encompass a wide range of educational and professional backgrounds to effectively address anti-corruption education across various sectors and levels.

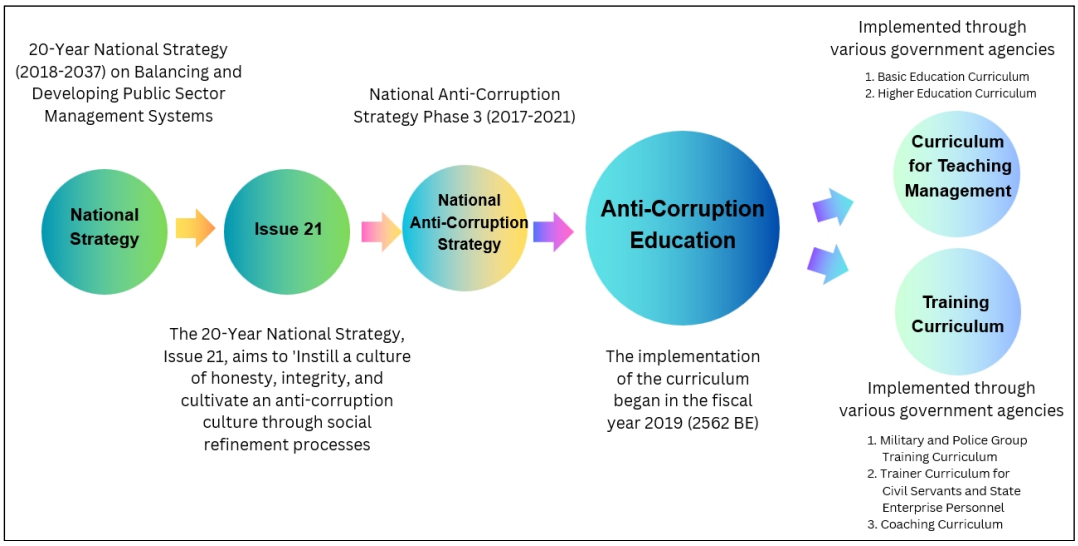


Figure 2: The origin and goal of the Anti-Corruption Education applies in organizing teaching and training

Although efforts to drive the Anti-Corruption Education curriculum have been underway since 2019, the results of the Corruption Perceptions Index (CPI) have not yet improved as targeted by the development objectives. The National Anti-Corruption Commission (NACC), as the main implementing agency, has increasingly pushed for implementation through educational institutions, especially those that provide foundational education for youth development to become responsible citizens of the country. Moreover, this approach is deemed suitable for socialization processes, as education is managed from the primary level to secondary education.

Basic education institutions play a crucial role in sustainable development through education management. It is about empowering students to make informed decisions and take responsible actions towards stability in the environment, economic prosperity, and social justice, while respecting cultural diversity (Kiatrisuda Srisuk et al., 2022).

School administrators, as leaders and managers of educational institutions, are essential because successful leadership involves guiding others towards desired goals or directions. Leadership is vital in every sector; otherwise, moving towards common goals becomes challenging (Witsanu Keruengam, 2014). The changing paradigms and industrial revolutions worldwide necessitate skills and characteristics alignment with the new normal. Consequently, Thailand's education and educational systems must adapt to global changes (Sombat Noparut, 2018). For effective change, educational leaders must prioritize changes beneficial to students and the collective. Additionally, they must adopt a proactive approach, acting swiftly and boldly because contemporary problems are rapidly evolving, unpredictable, and nearly all require swift changes (Phaitoon Sinlarat, 2018).

Given the aforementioned reasons, it becomes a challenge for school administrators in their leadership roles to effectively translate the policy of the Anti-Corruption Education curriculum into practice within educational institutions to foster continuous and sustainable development. Therefore, the researcher conducts a study titled "Analyzing the Implementation of Anti-Corruption Education Curriculum Guidelines in Basic Education Institutions in Thailand." This research aims to achieve two main objectives: 1) Analyzing the alignment of the anti-corruption education curriculum with the National Strategy for

Corruption Prevention and Eradication, Phase 3 (2017-2021), and 2) Synthesizing the implementation of the anti-corruption education curriculum in basic education institutions. The research methodology involves a combination of document analysis and in-depth interviews.

Research Results

Research results: The Analysis of the Implementation of Anti-Corruption Education Curriculum Guidelines in Basic Education Institutions in Thailand is as follows:

1. Analyzing the Anti-corruption Education Curriculum in Line With the National Strategy for Corruption Prevention and Eradication, Phase 3 (2017–2021)

The National Anti-Corruption Commission (NACC) has developed a set of curricula or learning materials and supplementary learning media on corruption prevention to be used as standardized content for educational institutions or relevant agencies. This set includes five curricula: 1) Basic Education Curriculum (Additional Subject: Corruption Prevention) 2) Unified Education Curriculum (Youth with a Clean Heart) 3) Military and Police Group Curriculum (Aligned with Military and Police Guidelines) 4) Speaker Curriculum for NACC/State Personnel and State Enterprises (Creating Leaders of Change for a Society intolerant of Corruption) 5) Coach Curriculum (Coaches for Anti-Corruption Thinking). The content of the Anti-Corruption Education curriculum in the year 2018 (B.E. 2561) consists of four sets of subjects: 1) Differentiating between Personal Benefits and Collective Benefits 2) Shame and Intolerance towards Corruption 3) STRONG: Sufficiency Mindset against Corruption 4) Citizens and Responsibility to Society. Each set of subjects has its underlying principles as follows:

1) Differentiating Between Personal Benefits and Collective Benefits

The National Anti-Corruption Commission (NACC) Thailand provides definitions and explanations for distinguishing between personal benefits and collective benefits as guidelines for developing Anti-Corruption Education.

Conflict of Interest refers to the situation where a public official or personnel of a state entity carries out duties or responsibilities within the scope of their authority or obligations in the affairs of the state or state organization for the benefit of the state or the common good. However, the official gains personal benefits covertly, or is involved in various forms of personal gain or relationships, which influence or are involved in the exercise of authority or discretion in decision-making processes or actions, seeking financial or other benefits for themselves or any other individual.

"Morality" is a broad social framework that forms the basis of ideas related to conflicts of interest between personal and collective benefits and corruption. Actions that violate the law regarding conflicts of interest between personal and collective benefits and corruption are morally wrong. Conversely, actions that violate morality may not necessarily constitute violations of conflicts of interest between personal and collective benefits and corruption. For example, inappropriate personal behavior or infidelity may not directly involve conflicts of interest between personal and collective benefits and corruption.

2) Shame and Intolerance Towards Corruption

The National Anti-Corruption Commission (NACC) Thailand provides definitions and explanations for shame and intolerance towards corruption as guidelines for developing Anti-Corruption Education.

"Sense of Shame" refers to the feeling of reluctance to engage in actions that are improper, inappropriate, or fearful of the consequences of wrongdoing. This reluctance arises from an awareness of the potential punishment or negative repercussions that may result from those actions. Consequently, individuals refrain from engaging in wrongful behavior, thereby preventing themselves from committing wrongdoing. This is what constitutes a sense of shame - a reluctance to act wrongly.

The characteristics of shame can be divided into two levels: primary shame and secondary shame. Primary shame refers to the reluctance to engage in wrongful behavior out of fear of being caught or receiving punishment or backlash from others upon discovery of the wrongdoing. Individuals at this level refrain from wrongdoing due to the fear of consequences. On the other hand, secondary shame, which is at a higher level, involves the reluctance to engage in wrongful behavior even in the absence of external monitoring or consequences. This is because individuals recognize that their actions not only affect themselves but also have repercussions on their families and communities, leading to tarnished reputations for both themselves and their families.

"Intolerance of Corruption" refers to the expression of disapproval towards actions that occur towards oneself, others, and society in a manner that is not accepted or acknowledged. Intolerance can manifest in various forms, including gestures, actions, and words. The degree of intolerance towards corruption varies from person to person, depending on individual conscience and the impact of those actions. This intolerance is often demonstrated through behaviors such as verbal warnings, public announcements, raising awareness, lodging complaints, and organizing protests. Protests are the most intense form of expression, as they involve the gathering of a large number of people and can result in significant damage.

3) STRONG : Building Resilient Minds to Combat Corruption

In developing the curriculum content for the "STRONG: Building Resilient Minds to Combat Corruption" course, NACC Thailand draws on guidelines for preventing corruption from key international organizations such as the United Nations (UN), the Organization for Economic Cooperation and Development (OECD), and the Asian Development Bank (ADB). This analysis serves as a framework for developing a curriculum aimed at building resilient minds to combat corruption, as outlined in the table (Office of the National Anti-Corruption Commission Education Office, 2021).

Table 2: The analysis of the anti-corruption guidelines from the UN, OECD, and ADB by the National Anti-Corruption Commission (NACC) of Thailand

Issues in preventing corruption	International Organizations		
	The United Nations (UN)	The Organization for Economic Cooperation and Development (OECD)	The Asian Development Bank (ADB)
1. Participation of various sectors.	•	•	•
2. Transparency and audibility.	•	•	•
3. Creation of knowledge on corruption prevention.	•	•	•
4. Prevention of conflicts of interest between collective benefits and personal interests.	•	•	•
5. Promotion of ethical conduct of government officials according to ethical principles.	•	•	•
6. Promotion of public awareness of the dangers of corruption.	•	•	•
7. Development of research and policy on corruption prevention.		•	
8. Capacity building for personnel responsible for corruption prevention.		•	

Anti-Corruption Education has emerged from studying the prevention methods of international organizations, by comparing the approaches of UN, OECD and ADB from this study, eight key points have been identified, including studying best practices from countries such as Singapore, South Korea, and Hong Kong.

STRONG Model has been developed as part of the Anti-Corruption Education content, conceptualized by NACC. It applies the sufficiency economy philosophy of His King Ramma 9, to the principles of combating corruption. This model aims to instill a sufficiency mindset as the foundation for anti-corruption attitudes, serving as a guideline for organizational practices and cultural development.

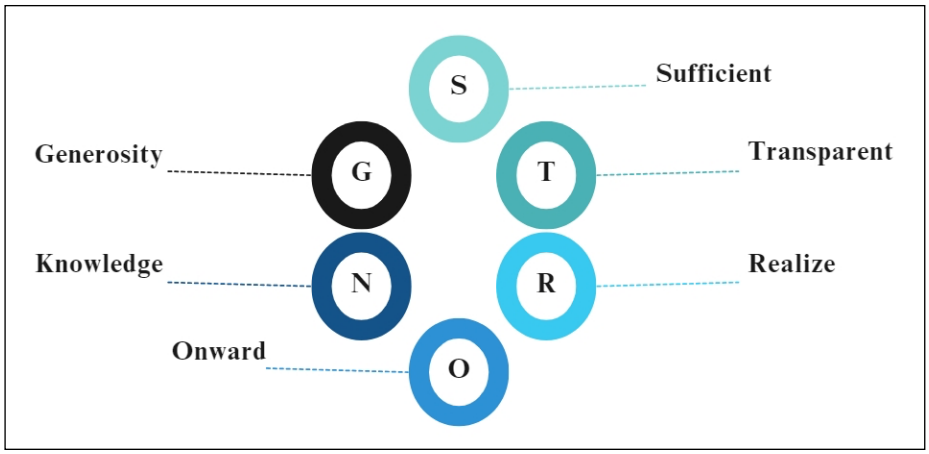


Figure 3: STRONG Model by the National Anti-Corruption Commission (NACC) of Thailand

NACC of Thailand defines the meaning of the STRONG Model as follows:

S (Sufficient): Sufficient means adopting the principles of sustainable development and applying them as the foundation for sustainable work practices and the prevention of corruption.

T (Transparent): Transparent means operating on the basis of transparency, subject to scrutiny in accordance with transparency principles, regulations, codes of conduct, and laws.
R (Realize): Realize means having knowledge, understanding, and awareness of the root causes of corruption issues. Awareness arises when encountering situations that pose a risk of corruption.
O (Onward): Onward means striving for self-improvement and progress based on transparency, sufficiency, and the promotion of a culture of integrity.
N (Knowledge): Knowledge means continuously developing knowledge to keep up with the situation of corruption, applying knowledge to analyze and assess corruption situations.
G (Generosity): Generosity means showing compassion and kindness towards others based on ethics and sufficiency principles, without favoring personal gain or benefiting at the expense of others.

4) Citizenship and Social Responsibility

NACC of Thailand provides definitions and characteristics of citizenship and social responsibility as guidelines for developing Anti-Corruption Education. The characteristics of citizenship and social responsibility are as follows: 1) Respect laws and regulations, social norms, and legal statutes. 2) Be rational and listen to the opinions of others. 3) Accept majority decisions, even if they do not align with one's own beliefs. 4) Have democratic compassion, prioritizing the collective benefit over personal gain. 5) Respect the freedoms of others. 6) Take responsibility for oneself, society, community, and country. 7) Participate in political activities and governance within a democratic framework. 8) Contribute to preventing and solving socio-economic and political problems in the country. 9) Uphold morality, ethics, and religious principles one adheres to.

The office of the National Anti-Corruption Commission (NACC) monitors the progress of implementing anti-corruption education curricula by surveying the number of organizations that have adopted the curricula according to the context of each organization from 2019 to 2022. These organizations fall into five target groups: 1) Basic Education 2) Higher Education 3) Military and Police 2 main agencies 4) Civil servants and state enterprise personnel 5) Coaches, as shown in Figure 4.

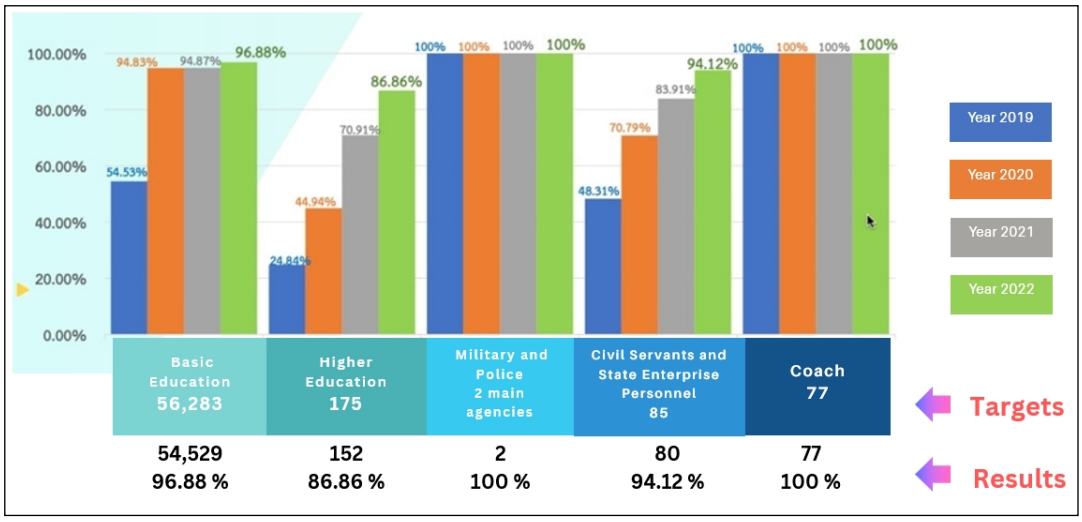


Figure 4: Results of implementing the anti-corruption education curriculum by NACC of Thailand adapted to the context of target groups between 2019-2022

According to data from NACC, the results of implementing anti-corruption education show a nearly 100% utilization trend over the four-year period from 2019 to 2022. Although the effectiveness of implementing the anti-corruption education curriculum has been high in terms of quantity, in terms of quality, it has not yet been able to drive the strategy of building a society intolerant of corruption.

In addition, the NACC office has developed three additional courses in 2021, including: 1) Resisting Corruption in Rapidly Changing Digital Technology Situations (Digital Disruption) 2) Protecting Natural Resources on Land 3) Protecting Water and Underground Water Resources. Then, in 2022, two more courses were developed: 1) Protecting Forest Resources 2) Protecting Marine and Coastal Resources.

A study found that a significant obstacle to implementing the anti-corruption education curriculum is that most teachers are still unable to teach to their full potential due to limitations in knowledge, staffing, and teaching management. Furthermore, there has been no quality assessment of the teaching management for the courses developed in 2017. However, there has been a continuous addition of courses. Therefore, driving the anti-corruption education curriculum remains a systematic challenge that requires qualitative research to develop and improve the curriculum based on research findings.

2. Synthesizing the Implementation of Anti-corruption Education Curriculum in Basic Education Institutions

The NACC office has developed curricula or learning modules and accompanying teaching materials on corruption prevention for use as standardized content for educational institutions or relevant agencies to consider for implementation in teaching across all grade levels. This is aimed at instilling awareness of distinguishing between personal interests and collective benefits, promoting sufficiency mindset, and fostering behaviors that reject and resist corruption. This initiative aligns with the strategy for preventing and combating corruption in phase 3 (2017 - 2021).

The NACC office has developed a curriculum or learning modules and teaching materials focused on corruption prevention. The teaching approach emphasizes the use of learning theories to construct knowledge and understanding, including: 1) Construction Theory 2) Social Constructivism Theory 3) Cognitive Constructivism 4) Information Processing Theory 5) Theory of Multiple Intelligences 6) Cooperative Learning Theory. Overall, the teaching strategy prioritizes student-centered learning, adapting to the differences among individual students. It employs teaching methods such as analytical thinking, synthesis, hands-on practice, project-based learning, and the 5 STEPs learning process: 1) Learning to Question 2) Learning to Search 3) Learning to Construct 4) Learning to Communicate 5) Learning to Serve. Various teaching techniques suitable for different age groups are used, along with learning media and resources related to corruption prevention, such as videos, news clips, stories, cartoons, short films, anti-corruption documents, printed materials, worksheets, and various equipment. Additionally, computer-based learning resources are utilized for research purposes. Assessment of learning outcomes focuses on knowledge, understanding, practical skills, and desired attributes. Assessment tools include questionnaires, performance assessments, and behavioral observation checklists. Students must achieve a minimum of 80% in assessments to be considered successful.

The anti-corruption education curriculum has been piloted in schools participating in the "Ethical Education Enhancement Project" under the supervision of the Basic Education Commission. Furthermore, guidelines for implementing the anti-corruption education curriculum have been proposed for use in basic education institutions nationwide by NACC Thailand, presenting six strategies as shown in Figure 5.

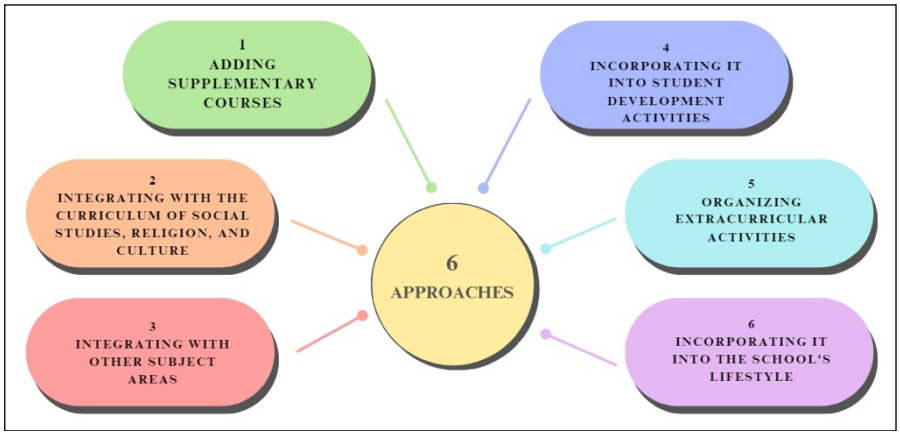


Figure 5: There are six approaches for implementing the curriculum in education institution

There are six approaches for implementing the curriculum in education institution 1) Adding supplementary courses 2) Integrating with the curriculum of social studies, religion, and culture 3) Integrating with other subject areas 4) Incorporating it into student development activities 5) Organizing extracurricular activities 6) Incorporating it into the school's lifestyle.

According to the monitoring report of the NACC for the fiscal year 2022, basic educational institutions are categorized as follows: 1) Basic Education Commission (OBEC) 2) Private Education Commission (OPEC) 3) Department of Local Administration (DLA) 4) Bangkok Metropolitan Administration (BMA). It was found that there was 96.88 percent out of a total of 54,529 schools.

Challenges and Barriers of Implementing Anti-Corruption Education in Basic Education Institutions:

1) The spread of COVID-19, despite the adjustment of teaching formats to On-Site, On-Air, On-Demand, On-Line, and On-Hand, still lacks the continuity of perception and effective curriculum implementation.
2) The content of the anti-corruption education curriculum has been continuously developed. In 2018, it began with 4 sets of courses. In 2021, an additional 3 sets of courses were added, and in 2022, another 2 sets of courses were added. However, educational institutions and teachers still lack sufficient knowledge and understanding for teaching, and there is a shortage of teaching staff.
3) The content of the anti-corruption education curriculum overlaps and resembles some parts of the current curriculum, leading to confusion.
4) Some schools have developed special curricula according to area policies. When additional subjects are added, it affects the structure of the special curriculum, focusing on language and scheduling.
5) Some schools have not received cooperation from parents and communities in the area regarding the perception of corruption as a gray area, as these schools are located in red zones (areas with high corruption rates).

Conclusion

Research findings highlight the challenges and obstacles in implementing anti-corruption education, which require remediation and development.

1) Evaluation of the effectiveness of implementing anti-corruption education in basic education institutions should not only involve quantitative surveys but also require qualitative analysis of each educational institution.
2) Establishing model spaces or leading schools for implementing anti-corruption education curriculum is crucial and should be prioritized, considering the diversity among educational institutions.
3) Social and community readiness in the school's local area is crucial.
4) Anti-corruption education should adopt diverse teaching methodologies, not necessarily confined to traditional classroom instruction. Utilizing formats such as learning camps, e-learning, and emphasizing behavior change-focused learning outcomes assessments is essential.
5) Training for instructional knowledge is paramount. The OBEC should provide training for teachers and school administrators, along with promoting expertise and performance evaluation systems.

Recommendations

Recommendations for Basic education institutions.

1) Educational administrators should create awareness about the significance and importance of adopting the anti-corruption education.
2) Educational institutions should facilitate mutual understanding among educators to minimize redundancy between subjects.
3) Schools should provide support in terms of media, equipment, budget allocation, and extracurricular learning.
4) Educational administrators, teachers, and staff should lead by example and create a positive environment.
5) Schools should establish a collaborative network with relevant organizations for academic and managerial exchange.

Acknowledgements

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Good Methods Could Predict the Future: We Discussed the Teaching Methods of Rural Teachers in Taiwan

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Abstract
Due to the lack of educational resources, students in remote areas needed to turn their lives around through school education. The purpose of this study was to investigate the teaching methods used by Taiwanese teachers in remote areas to enhance students' learning motivation. In this study, we used document analysis to compile the teaching methods that had been implemented by 24 teachers who had received awards in the past four years and summarized five common points: 1. Actively guided students to obtain certifications and participate in skill competitions to boost their confidence; 2. Encouraged students to qualify for special talent admissions exams, thereby increasing their chances of pursuing further education; 3. Arranged off-site internships and visits to enterprises for students so that they could understand the relationship between work and reward; 4. Gave full play to the unique autonomy of remote and rural students to realize the balance of the five education systems; 5. Through the blended teaching method, teachers and students from urban and rural areas synchronized their online learning exchanges, and teachers were also able to stimulate more new teaching methods as a result.

Keywords: Education in Remote Villages, Learning Motivation, Teaching Methods, Localization

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Introduction

Since 1996, CommonWealth Magazine has been producing an annual special issue on education in the hope of becoming the media that guides the new generation of Project Hope. 2023's special issue cover, “Equal Education ~ No Child Left Behind,” lists three problems: 1. The two major international tests, from the 2018 PISA scores in math, science, and reading are all lagging behind Taiwan's children of the same age; and the 2015 TIMSS found that Taiwan's lagging students are in non-mountainous, non-municipal schools. 2. The TIMSS in 2015 found that Taiwan's lagging students are in non-mountain and non-municipal schools.2 Teachers do not study or retire because the Teachers' Act has resulted in a lack of evaluation and elimination, and teachers who are dominant are unable to empathize with the disadvantaged students, and there is a lack of in-service training in the field.3 Most of the students who stay in remote villages are the disadvantaged students; childlessness has caused non-municipal schools to face the result of school cuts and mergers, and the result of the watermelon effect has caused the disadvantaged to stay in the “small watermelon schools” 1. There is also a movie adapted from Wang (2011) first education-related movie in Taiwan, “Teacher, will you come back”, which presents the current situation of education in remote villages. As the media has transparently presented the current situation of education, we should invest in researching ways to improve education in the remote villages, which is the first reason for this study.

The Ministry of Education (MOE) proposed five solutions for education in the remote villages in 2015, hoping to pay attention to remote villages education with policies. Pan (2016) suggests that due to the lack of educational resources at home, the learning and growth of disadvantaged students in remote villages are mostly undertaken by schools. In recent years, the teacher training system of universities has brought prospective teachers to participate in educational internships in the remote areas. The “PASSION Program for Quality Education in the Remote Areas” of the National Taiwan Normal University (NTNU) will bring 35 students to serve in the national middle schools in Huadong in 2023, and the Teacher Training Center of the North University of Science and Technology (NTNU) will bring 20-30 students to perform educational services in the remote schools across the whole of Taiwan each year in the summer vacation from 2022 onwards, so as to allow prospective teachers to see the needs of the children in remote areas and promote the awareness of the value of the work of the teachers. This will help raise teachers' awareness of the value of their work. While there are innovative programs from education policies to school responsibilities and the training of prospective teachers, how effective are the teaching methods in the education of the remote villages? This is the second reason for this study.

According to a study conducted by Prof. Jen-Chia Chang of the Institute of Technical and Vocational Education at the Northern Taiwan University of Science and Technology (NTUST), Taiwan's new student enrollment in professional groups has decreased by 38.6% from 2011 to 2020, and the number of new students in higher vocational schools in the remote areas has decreased by even more than 50%, the key reason for this is not only the lack of funding for education in the remote areas, but also the shortage of regular teachers who have stayed in their posts for a long period of time, which has a direct impact on the new students' willingness to enroll in school. The key reason is not only the lack of funding for education in remote areas, but also the shortage of permanent teachers, which directly affects the willingness of new students to enroll. Therefore, Prof. Renjia and the Xinmiao Education Foundation have worked together to develop a long-term development plan for remote villages, encouraging outstanding technical high school teachers to teach in remote areas, signing an award program for teachers' service in remote areas, and appointing the Teacher Training Center of NKU to handle the

selection of technical high school teachers' service awards. The third reason for this study is to allow civil forces to combine the achievements of excellent teachers to organize meaningful teaching methodology data, which can give remote teachers a direction for learning.

Literature Review

Innovative Local Teaching Methods for the Future of Remote Children

Su (2017) The basis of evaluation for teaching in remote areas should be adjusted to“regional life education” as a reference, which can explore children's talents and make them happy to learn in order to achieve effective teaching. Zhan and Wu (2015) In Europe and the United States, countries focus on the development of unique curricula, innovative teaching, and digital teaching. In recent years, Taiwan has adopted the four major strategies of “teaching innovation/educational experimentation,” “digital integration/virtual-practical co-learning,” “resource matchmaking/social interconnectivity,” and “seeing change/exemplary sharing” to assist migrant students in laying down their basic academic skills, developing their diversified abilities, making good use of digital learning, mastering the local culture, and developing international perspectives. The program is designed to help students in remote areas establish basic academic skills, develop multiple abilities, make good use of digital learning, master local culture, and develop an international perspective. Hong (2019) suggests that local cultures should be used as the content of teaching courses in remote villages to develop a refined and unique basic education. Tsai (2019) interviewed the innovative teaching of Ms. Chia-Hsing Tsai of Kaohsiung's Tianliao Junior High School, who found that getting to know Tianliao through reading can help children improve their ability to express themselves, as well as teach them how to love their hometowns and found that it can help children find their self-confidence. To summarize, teaching methods should be integrated with local culture, and instead of focusing on the effectiveness of further education, teachers should think about how to innovate in teaching methods, and make adjustments to teaching by integrating local conditions and contexts, in order to allow children to learn effectively and happily.

Teaching Program Combining Practical and Theoretical Work Gives Migrant Children a Sense of Achievement and Competitiveness

Lu (2019) interviewed Taipei Muzha Higher Engineering, found that alumni suggested adjusting the flexible teaching content, the establishment of cross-disciplinary integration of business "micro-employer entrepreneurship course", so that students can apply the theory of practical application, to enhance the interest in the future career, but also to increase the students want to go on to college have the ability to diversify the admission, and even the teachers due to the course to do teaching seminars to enhance the ability to teach. Zhan and Chen (2017) reflections on the flip-flopping of remote villages have pointed out that education should focus on the basic knowledge of future talents, not in the boundaries of the standardized textbooks. Goleman and Senge (2014) proposed that the future world needs talents who have the ability to understand themselves and to care for others. Wang (2017) education needs to pay attention to avoiding the learning-use gap, so the proportion of practical courses should be increased, and giving students the opportunity to work with the industry earlier can enhance students' practical ability, and they can also obtain workplace intelligence from the industry, which can be used as reference information for education reform. In summary, when planning curriculum and teaching methods, teachers in remote areas should pay attention to the integration of practical and theoretical aspects, and focus on learning motivation in order to fundamentally improve the effectiveness of learning, and put the needs of future talents into

the curriculum, so that the industry's evaluation of the children will increase, which will enhance the children's sense of achievement, and increase the right to choose the higher education, which is the expectation of parents and teachers.

Use Technological Tools to Generate New Teaching Methods and Revitalize Old Courses Into New Ones

Xiao (2023) interviewed the Minister of Education on the policy of digital learning resources, making good use of digital tools to allow teachers to reduce the differentiation of teaching, and can guide students to have the power of self-learning, but also live broadcasts so that excellent teachers can cross-school teaching, and teachers in remote villages to serve as a counselor to do to supplement the individual differences in the education, to enhance the results of teaching. Peng (2023) found that schools in rural areas with fewer children may only have one or two students at each grade level. Through online co-teaching, small schools can engage in alliance teaching, and teachers can cross-school preparation and support each other, which overcomes many of the problems associated with teaching in rural areas. Chen (2019) Taitung New Life Junior High School has created a group of new entrepreneurs with learning motivation by utilizing technological tools to cultivate students' ability to “do, use, and think”. Lin (2017) Teaching methods can be used to “solve tasks” through the integration of information and technology, which can stimulate students' ideas, generate positive discussions, and then be transformed into their own knowledge to enhance the effectiveness of learning. Bernie and Charles (2011) Digital literacy is a key competency in the twenty-first century that not only allows students to receive learning assistance, but also allows them to communicate effectively with others. In summary, localized teaching methods, teaching methods that combine practice and theory, and teaching methods that incorporate technological tools can enhance learning motivation, generate innovative teaching methods, and give the curriculum a sense of freshness after revitalization to enhance students' interest in learning.

Research Design

According to Berelson (1952) definition, “content analysis is an important research method for describing the content of visible communication in an objective, systematic, and quantitative manner,” so we used the practice projects of remote area education service, which had been selected by Xinmiao Educational Foundation for its quality teaching methodology from 2019 to 2022, as the samples for the document analysis method, and collected, analyzed, summarized, and researched the data for each of the 24 remote area teachers' practice plans in four years, minus the duplicate award winners.

In Chen (2007) qualitative research, the researcher himself is a "research tool", which is crucial to the quality of the research, that is, the combination of one's “experiential knowledge” and “scientific knowledge” is utilized. In addition, by using the practice program of quality remote teachers, the teaching methods of remote teachers in Taiwan were explored.

Results

The purpose of this study is to investigate the teaching methods used by Taiwan's remote and rural teachers to enhance students' motivation to learn, avoiding the teaching methods used in basic subjects, and then to generalize five common points:

1. Actively Guided Students to Obtain Certifications and Participate in Skill Competitions to Boost Their Confidence

- Select students with outstanding skills to participate in the National Skills Competition. Serves as a community instructor and encourages participation in skills competitions and enrollment verification. (A1-201911a, A1-201913a, A2-201911b)
- Provide "Skills Assessment Certificate Enhancement Classes and Certificate Counseling Classes": Certificates can also add points for further education and employment. (B1-201922a, B2-202022a)
- Skills and practices are used to guide students to get their hands dirty so that low academic achievers can increase their confidence. (C1-201912c)
- Assist students in obtaining a Class C license; assist students in obtaining a Class B license to qualify for the Gifted and Talented Program; train Aboriginal students in obtaining a Class B or C license to receive scholarships. (D1-201912d)
- Assisted 100% in obtaining Technician B license with $2,000 incentive. Asked the Office of Academic Affairs for funding to assist in the preparation of students to take the exams and to train industrial students to compete in technical competitions. (E1-201922f, E2-202211e)
- Counsel students in skills certification courses and teach them the skills to obtain licenses in order to participate in the national skills certification. Encourage students to participate in competitions and to use positive encouragement to boost their self-confidence. (F1-201922g, F1-202021h, F3-202011j)
- Instructs students to obtain a Class C Motorized Bicycle Repair Technician license and instructs students to obtain a Class C Automotive Repair Technician license to increase hands-on skills. (G1-202013e)
- To strengthen the counseling for each student to obtain at least one Technician C license before graduation and encourage students to take the initiative to study for a B license. (I1-202221m)

Among the 14 teaching methods proposed by 12 out of 24 teachers, the part of students obtaining licenses and participating in skill competitions to win awards was identified, and this study found that licenses and competitions to win awards are one of the very important teaching methods in migrant education.

2. Encouraged Students to Qualify for Special Talent Admissions Exams, Thereby Increasing Their Chances of Pursuing Further Education

- Assisting students in planning their future direction: choosing to continue their education. (B2-202024a)
- It clearly explains the strategies for students to advance to the next level of education, such as screening and honors, and establishes a goal for students to work towards. In the practice of presentation and interrogation, students will develop their oral expression and critical thinking skills, which will help them to perform well in the interviews for technical

excellence, selection and even job hunting. Cultivate technological expertise and qualify for direct or guaranteed selection through participation in science student competitions. (D1-201914d)

- Encourage students with examples of successful cases from previous seniors to increase motivation. Compare the difficulties in enrollment points with those in the promotion methods such as meritocracy and selection, so as to enhance the motivation. To remind students that they can compete for extra places in the selection process because of their Aboriginal status, which gives them an advantage. (D1-201911d)
- To assist students in obtaining relevant professional licenses and to enhance students' ability to find employment and further their education. (F2-202025i)
- Counseling through the advanced license examination, guidance to enter the mechanical or related industries for employment, aspiring students, enhance the competitiveness of education, and counseling to apply for the four technical colleges and universities for study. (G2-202112l)

Among the six teaching methods suggested by four of the 24 teachers, teachers used various methods to encourage children to develop a desire to go on to higher education, such as the qualification for giftedness, and this study found that encouraging the acquisition of the qualification for giftedness as a way of obtaining the opportunity to go on to higher education is one of the most important teaching methods in the context of remote rural education.

3. Arranged Off-Site Internships and Visits to Enterprises for Students so That They Could Understand the Relationship Between Work and Reward

- Provide work-study internships or service-learning programs: In order to help needy students, we arrange work-study internships and earn the necessary living expenses to realize the spirit of "Learning by Doing". (B1-201924a, B2-202023a)
- Continuously plan and build the necessary internship equipment for the courses, and the teachers collaborate in the teaching and off-campus visit programs to understand the current situation of the workplace and participate in the internship courses, so as to have the relevant knowledge for the future career development and the salary plan. (E1-201923f)
- To nurture junior technical talents in engineering planning and design, engineering surveying and mapping, and geographic information application, so that the development of practical empowerment can keep pace with the industry. (F2-202026i)
- In conjunction with the Ministry of Education's Technical Vocational Re-engineering Program, we provide students with the motivation to learn as well as the ability to support themselves, enhance students' training in ornamental plants and garden construction, and teach students coffee cultivation and roasting techniques and methods, so that students can have a skill. (F3-202013j)
- In conjunction with the needs of local enterprises, we will join hands with them to conduct visits to cultivate talents in research and development of computerized mechanical drawing and machinery manufacturing. (G2-202115l)
- We have developed multi-disciplinary courses, such as the jade grinding course combined with nature exploration and video recording course, and the audio-visual editing course combined with guided tours, to enhance students' practical skills and actively promote industry-academia collaboration opportunities. (I1-202222m)

Among the seven teaching methods proposed by seven of the 24 teachers, teachers actually used the part of school internships and business visits to give students a sense of experiencing

work and rewards, and this study found that workplace experience is one of the very important teaching methods in migrant education.

4. Gave Full Play to the Unique Autonomy of Remote and Rural Students to Realize the Balance of the Five Education Systems

- Students are introduced to their own culture: The undergraduate "Engineering Software Applications" course is integrated into the Aboriginal culture, and in conjunction with the school's ethnic language program, students are introduced to their own families and cultures in their own languages, and at the same time are given the opportunity to identify with their own ethnicity. (B2-202026a)
- Developing students' interests and giving students the stage and space for development in a student-centered model. (C1-201911c)
- Invite tribal dance teachers to train aboriginal music and dance talents, participate in public welfare performances, support tourism development related activities, and participate in international volunteer activities. Expand students' horizons and lead them to participate in national competitions and performances at home and abroad to cultivate their self-confidence and stage performance abilities. (K1-201924a)
- Guiding students from the Islands to develop special talents and sound physical and mental health. (G2-202114l)
- We have begun practical work on the propagation of ornamental aquarium creatures such as Ranchu and Ivory Anemone Snail, and we will continue to plan the curriculum in accordance with the goals of the program. (H2-202112n, H2-202111n)
- Combining the characteristics of local industries, "Jade Polishing" and "Stone Painting" are planned as compulsory courses. To offer a variety of elective courses and to incorporate a flexible curriculum into the new syllabus. (I1-202222m)
- Through the "Workplace Experience" in each semester of the course, in collaboration with the industry, students can go out of the campus to the community and the countryside to experience the fishing villages and to pass on their skills in the course of their studies. (H1-202024k)

Among the 8 teaching methods proposed by 7 of the 24 teachers, all of them used local resources and cultural characteristics as important teaching methods, which is also in line with the current education policy of promoting talents, and this study found that giving full play to the unique autonomy of the migrant students is one of the most important teaching methods in migrant education.

5. Through the Blended Teaching Method, Teachers and Students From Urban and Rural Areas Synchronized Their Online Learning Exchanges, and Teachers Were Also Able to Stimulate More New Teaching Methods as a Result

- Producing online learning programs: Ensuring the quality of teaching and learning, and adding more teaching features to make the curriculum more diversified, so that students can review the curriculum anytime, anywhere. We also conduct cross-campus research and production with other teachers, with the aim of improving the gap between urban and rural areas. (B2-202025a)
- Insisting on professional education and research, utilizing online resources, designing and innovating individual teaching methods, and arranging online cross-school simulation competitions: promoting online teaching platforms, providing a platform for teachers and

students to use online teaching materials, and allowing teachers in urban and rural areas to communicate with and learn from their students. (K1-201922g)

- In addition to guiding students to use credible digital resources, students can also display their work on the platform, increase the exposure of their work through online interactions, and invite teachers from other schools to give guidance and encouragement online. (G3-202013o)
- We advocate the technologization of teaching, combining e-learning, online assignments, and online assessment system tests, so that students can learn anywhere. (G2-202111l)

Four of the 24 teachers suggested four teaching methods, and teachers began to emphasize the teaching method of blended education, which not only shortens the gap between urban and rural areas, but also improves the effectiveness of teachers' exchanges and learning, and this study found that blended education is one of the most important teaching methods in remote rural education.

Conclusions and Recommendations

Education in Remote Villages Needs More Attention.

This study found that the media, academics, the public and education policies have begun to pay attention to the remote villages. Therefore, after organizing good teaching methods, the attention of all sectors can be expanded, so that the snowball effect can reduce the gap between urban and rural areas, so that students in the remote villages will have better development or resources.

Localized Special Education Is the Cornerstone of Culture and the Root of Self-Confidence and Love.

Allowing students to learn from things they like or are familiar with is particularly important for education in the remote areas. This study found that there is no substitute for local culture in remote area education, and through the arrangement of the curriculum, students can be confident in their love for their hometowns and be aware of the strengths of the remote areas, so that the teaching method can stimulate the learning effectiveness of the students in the remote areas.

This Study Can Be Used as a Reference For Parochial Education, But We Should Pay Attention to the Cultural and Resource Constraints of Each Region.

In most schools in Taiwan, there is a strong atmosphere of further education, and the learning incentives for migrant teachers are also based on the incentives for further education, and even the teacher evaluation is based on the rate of further education, which is not applicable to many regions around the world; in addition, the benefits and resources for migrant teachers in Taiwan's education policy are not comparable to those in many countries. This study focuses on the teaching methodology, and it is expected that in the future more research can be conducted in the direction of generating more programs beneficial to migrant education.

The Data for This Study Were Collected During the Epidemic Period and the Results May Not Be Applicable to the General Period.

During the epidemic period, digital teaching methods were not yet popularized, but if research on digital teaching methods can be re-invested after the epidemic, the results should be more useful as a reference for the development of education in remote villages. The period of data collection for this study is from 2019 to 2022. Although many teachers are able to operate digital teaching, due to the sudden arrival of digital teaching, new teaching methods still need to be developed through research, and the planning of the digital curriculum from shallow to deep should also be further studied, even the review of learning effectiveness can be effectively completed online? All of these are worthy of study, and it is recommended that we invest in research in the future, so that our borderless education model can become more mature.

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No Time for Self:
An Investigation of Time Poverty in Different Work Structures

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Abstract
The availability of time is similar for everyone, except its value varies in different work structures, which affects the time use pattern of people differently. Around the World, time poverty is a widespread phenomenon that affects a large segment of people in every corner of the society, mostly; it is much visualized among the employees class due to their higher time devotion to paid and unpaid works, which reduces the time spent on self maintenance activities. The present study tries to establish a relationship between various job places in the education sector and its impact on employee's self-maintenance time. For this purpose we have selected the Punjab state by stratified random sampling, the data has been based on primary and secondary sources collected from various educational institutions viz schools, colleges, and ITI's employees, for measuring the time poverty we use Foster–Greer–Thorbecke (FGT) Index. The results of the study showed that women are much more affected by time poverty than their male counterparts because of unequal distribution of unpaid work among male and females. In addition the nature of job also affects employees' magnitude of time poverty, as it regulate the level of income which determine the time spent on various activities.

Keywords: Gender, Work, Time Poverty, Education

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1. Introduction

Time is a priceless economic resource which is used in a number of ways, in a number of human activities across the sex, caste, categories of employment, professional sets and income levels. There are various aspects of poverty; it is a worldwide phenomena which have been acknowledged by a number of ways (Saboor *et al.,* 2015). One perspective of it is income and the other is time. Poverty is not stated just in monetary terms, it can also be termed in terms of time. Poverty in time use indicates that time is not effectively and adequately used for the well being of the individual self which results in a type of deprivation.

Time poverty is an important concept in which individuals do ot have sufficient time after being engaged in necessary activities and committed actions of paid and unpaid work associated with tasks that build their social and human capital. Time is finite; individuals allocate time to various life tasks to maximize their well-being (Becker, 1965). Consistent with this, Vickery (1977) had defined the concept of time poverty as insufficient time to maintain physical and mental well-being. It is a significant problem which society faces and poses a widespread threat to the well-being and economic development of individuals and society on the whole. It is the minimum amount of time needed to maintain them, and it could be scientifically proven; for example, everyone needs a minimum amount of sleep for smooth body and mind functioning. Thus, a typical definition of time poverty is where some people do not have proper time for rest or leisure, taking into consideration working hours, whether on the job, doing household chores, or being involved in other activities such as collecting water and wood (Blackden & Wodon, 2006).

We know that the principle lesson of economics and social life is the optimum utilization of time and resources. Time is an important indicator of individuals well being and his capacity to do the things. Most of the individuals do not have enough time to meet their necessities of relaxation and leisure because of longer hours of paid and unpaid work. Vickery (1977) called this phenomenon as “time poverty.” Time poverty has negative impact on human wellbeing and capabilities. The lack of adequate rest and personal care can create emotional and physical stress and cause health deterioration. The lack of adequate disposable time adversely affects workers’ abilities to invest in human capital, their social networks, and their time with families, and participation in cultural and political activities.

Time poverty is a multidimensional phenomenon which focuses on a human well being by a number of aspects like ill health, low literacy rate, inadequate housing facilities, gender discrimination, inadequate means to improve the life etc. (Khan *et al.* 2013). The longer working days reduce the time for personal care and relaxation, the estimates of time use poverty in most of the developing and developed countries address the gender related issues, because women are mainly responsible for care of children, cooking and other household tasks regardless the increase in the demand of their time in the labour market.

Employment and household time combined together may lead to time deficit. Double deprivation of time and income poverty was robust on individuals. When they are employed they suffer more of time poverty than those without employment (Antonopoulos and Memis, 2010). The occupation and family structure like shift worker, unsocial hours of work, marriage status have been affected by the time poverty. The unskilled workers, a mother with child and other care responsibilities are also severely affected by the time poverty (Chatzitheochari and Arber, 2012). The job hours may be similar for both sexes but women also bear unpaid work hours greater than men. While the official poverty line ignores the time deficit, the proportion

of women in income and time poverty is generally higher than men due to double bind (Zacharias, 2017).Women try to use their resources efficiently with the help of methods like multitasking, but it increases the time pressure simultaneously (Rose, 2017).

Numerous attempts have been made at the world level to find poverty, but time poverty is still a new phenomenon. In this field, a time-use survey approach is used to find a person's day-to-day routine. It was done in developed nations like the United States of America under the American Time Use Survey (ATUS) in 2003 (Hamermesh et al., 2005), but less developed nations have still been behind in these areas. After becoming the second-largest populated country, India is still far behind in this area of research. Only one time-use survey was conducted by the Indian government in 2019 (Hirway, 2022).

As mentioned in Bardasi and Wodon (2006), there is no established measure to calculate time poverty; however one method is to use a time poverty line that is a multiple of the median number of hours for the all individuals. An alternative is to use a more judgmental approach in setting a time poverty line would be to manually calculate what might be perceived to be a normal working day. Hence, although the definition of time poverty in this context visualize relatively broad after incorporating domestic chores, it is supported both instinctively and by previous work (Ilahi, 2000).

2. Objectives and Methodology

The present study is tried to find the time poverty among the employed working in various educational institution. The study checked the variation of gender-wise time poverty with the status of employment like regular or non regular. The study also revealed the time poverty of employees working in private and government institutions.

To achieve the objective of the study, a pre-determined schedule cum questionnaire method was used. The study covered the educational institutions in the state of Punjab. Punjab is an agrarian state and more than half of their population relies on it for their living but services sector also a major chunk of their GDP. As clearly visualize, Indian government has taken a big step of LPG (liberalization, Privatization and Globalization) policy in 1991 that opens a new opportunities among the all sectors of the economy. Punjab has also passed through this journey of development. In this change among all sectors, service sector played a major role to uplift the GDP of the country. As food bowl state of the country from earlier stages, Punjab has also witnessed of steady growth in the service sector that opens a new opportunities for women to enter the labour market. Among the all occupation of service sector, education is one of the most prominent sector. In Punjab, most of the girls also choosing B.Ed after their graduation (GOP, 2020) that encourages us to check the situation of the women in this higher preferential sector and a comparative analysis show a true picture of the time poverty among gender. The study covered a sample of 400 (160 males and 240 females) employees in education sector from various institutions like schools, colleges and ITI’s of Punjab state of India. The higher ratio of the females in each institution is a reason behind their higher share than males. To check the time poverty FGT index has used.

2.1 FGT Index

FGT (Foster, Greer, and Thorbecke) index deals with income poverty, but after some modification in the structure, it applies to time poverty. It checks the three aspects under the index head count index of poverty, poverty gap, and squared poverty gap. In the time poverty

framework, the head count index of poverty defines the share of time poor population. The time poverty gap shows the distance of respondents from the time poverty line. The squared time poverty gap, it focuses more on those working hours that are too long. It finds these with the squaring of the time poverty gap.

At the starting FGT Index, Head count ratio is to be found with the help of the given formula described here:

$$Head\ Count\ Index\ of\ Time\ Povert = \frac{q}{n}$$

Where, q means respondents who are timely poor and n means total respondents.

To calculate the time poverty index, the time poverty gap is to be found with the help of the formula given below:

$$TPG = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{yi - zi}{zi}\right)$$

Where, TPG is time poverty gap, z_i is the aggregate time consumption by the respondents; and y_i is the time poverty line. It shows the time required by the respondents to get rid of the time poverty. It is the simplest way to estimate the time poverty gap.

By squaring the time poverty gap, we get the squared time poverty gap which shows the severity among the time-poor respondents, which has been described mathematically below:

$$Time\ Squared\ Poverty\ Gap = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{yi - zi}{zi}\right)^2$$

2.2 Time Poverty Line

The time poverty line was drawn from the respondents' collected data by taking the average of the activities they did. It is further classified under three categories. First, the self-maintenance activities that covered the meal of the day, refreshment and freshening up, secondly, entertainment covered watching TV, internet surfing, mobile use, playing games etc. and sleeping time as last category that is consider for the calculation of the time poverty line. On the basis of the average time consumption of the activities mentioned above, a time poverty line is fixed at 685 min (11.25 hrs) a day.

3. Result and Discussion

3.1 Occupational Status

Occupation is an economic activity that directly impacts the financial status of a person. It plays a crucial role in time use patterns in both the genders. The changes in occupational and financial structures transform the time contribution to SNA and extended SNA activities. To illustrate, a higher income enables a person to invest in a new gadget and outsourcing services which

leads to a reduction in time devotion (Bittman et al., 2002). Table 1 has categorised the occupation status of the respondents on the basis of gender under two categories i.e. government and private. Out of the total respondents, nearly 80 per cent of occupied respondents were in the government sector while 20.5 per cent offered their services to the private sector. Among the male respondents, 89.38 per cent were working in government educational institutions like schools, colleges, and other institutions, and the remaining 10.63 per cent were associated with the private institution in education sector. On the other hand, a higher share of females were working in the private educational institutions that was 27 per cent of the total sample i.e. 240 respondents while 72.92 per cent were associated with the government educational institutions. The study has observed that females generally agreed to work at lower income in the private sector than that of their male counterparts, even though they have to bear the burden of the same level of household duties.

Table 1: Occupation Status of Respondents

Occupation Status	Male	Female	Total
Government	143 (89.38)	175 (72.92)	318 (79.50)
Private	17 (10.63)	65 (27.08)	82 (20.50)
Total	160 (100.00)	240 (100.00)	400 (100.00)

Source: Primary Survey: 2019-20
Note: Parenthesis shows the Percentage out of their total.

3.2 Education and Types of Institute

Every institution is governed by its structure of rules and regulations. The difference in the schedule of employees is the result of structural differences among the institutions. These structural differences can result from a pack of social security and other facilities which further impact the schedule of the respondents employed in different institutions. With increasing level of education, people enter the job market which impacts their routine (Bardasi & Wodon, 2006). Table 2 has divided the respondents on the basis of the type of institution and gender. The division has shown that the percentage of the female respondents was more than the male respondents in schools and other higher educational institutions. Higher proportions of people were employed at schools in private and government sectors. In the category of government employees, only 23.62 per cent were serving while 41.09 per cent of private-sector employees were working in colleges. Out of the total sample, only 11.81 per cent of the government employees were working in ITIs whereas less than 2 per cent of females were working in the government sector and the reason behind it was due to lower enrollment under various courses in ITIs. Majority of female respondents (70 per cent) were working in school. In contrast, only 54.24 per cent of males were in government employment and only 30.95 per cent of males were employed in private sector and were working in schools. The higher share of females was working in school due to a significant share of girl's enrollment in B.Ed. course (GOP, 2020). Every institution has different working hours and it affects the employed in different ways, so it is important to show the segregation of respondents according to their work place. In contrast to the earlier mentioned study and with support of other studies, education does not always have an inverse relationship with time poverty (Arora, 2015).

Table 2: Education Institution Wise Gender-based Segregation

Institute Type	Male		Female		Total	
	Govt.	Pvt.	Govt.	Pvt.	Govt.	Pvt.
School	64 (54.24)	13 (30.95)	111 72.55)	63 72.41)	175 64.58)	76 (58.91)
College	24 (20.34)	29 (69.05)	40 (26.14)	24 27.59)	64 (23.62)	53 (41.09)
ITI	30 (25.42)	0 (0.00)	2 (1.31)	0 (0.00)	32 (11.81)	0 (0.00)
Total	118 100.00)	42 (100.00)	153 (100.00)	87 (100.00)	271 (100.00)	129 (100.00)

Source: Primary Survey: 2019-20
Note: Parenthesis shows the Percentage out of their total.

3.3 Types of Job

The economic condition of an employee is highly linked with the type of their job. It is a strong determinant of social and financial security for them. The type of job affects the stability of an employee's life. Due to graver job insecurity, contractual/Adhoc/PTA/guest faculty employees have more burden than the regular faculty (Begum et al., 2022) and that is a reason of greater exploitation at work. Table 3 has described respondents working on different types of job on the basis of gender. About 71.50 per cent of the respondents were working on a regular basis and remaining 28.50 per cent were working on an irregular basis. Majority of the irregular employees were working on an Adhoc basis (13.5 per cent). 70 per cent of males were employed as regular employees whereas 70.42 of females were employed on regular basis. Further, female respondents were more likely to work as contractual and guest faculty than the males their percentage was 9.58 and 2.08 per cent respectively. The reason behind it was that due to some fear associated with social, financial and locational factors, they did not shift far from the areas surrounding their homes.

Table 3: Job Type and Gender Wise Segregation of Respondents

Type of Job	Male	Female	Total
Regular	117 (73.13)	169 (70.42)	286 (71.50)
PTA	8 (5.00)	16 (6.67)	24 (6.00)
Adhoc	27 (16.88)	27 (11.25)	54 (13.50)
Contractual	8 (5.00)	23 (9.58)	31 (7.75)
Guest Faculty	0 (0.00)	5 (2.08)	5 (1.25)
Total	160 (100.00)	240 (100.00)	400 (100.00)

Source: Primary Survey: 2019-20
Note: Parenthesis shows the Percentage out of their total.

3.4 Occupation and Time Poverty

Every occupation is related to a particular time and work structure. It closely deals with the employees' work-life balance that affects their routine. Some persons face higher work pressure than others due to ownership structure differences like government and private, regular and non-regular etc. It also affects gender in different ways because each person is allied with different degree of work pressure. Majority of females are facing higher work burden as they manage jobs along with their household responsibilities. Table 4 has explained that overall time poverty of the sampled respondents was almost similar in both the government and the private sectors; however, females were more timely poor than males. The difference in time poverty was much more prominent in the government sector. Male person have reported to be 11.02 per cent timely poor while 73.2 per cent females happened to be time poor. In private sector, 23.81 per cent males and 77.01 per cent females were facing time poverty. While considering time poverty gap, it was analysed that private sector was more characterized with time issues rather than the government sector with overall difference of 10.74 per cent. Likewise squared time poverty gap was 1.58 in government sector and 4.39 points in the private sector for both the categories of males and females. In the comparison of males and females, females were much pressurized with time constraint than males in both the types of occupation but in private sector both had been facing more time poverty gap than those who were in government occupation. The squared time poverty gap also supported the time poverty gap results that had shown a 7.09 in private occupation and very low value of 1.58 was seen in government occupations.

Table 4: Time Poverty in Occupation-wise

Time Poverty	Male		Female		Total	
	Government	Private	Government	Private	Government	Private
Head Count	11.02	23.81	73.2	77.01	45.32	45.95
Time Poverty Gap	0.81	1.13	12.03	21.35	8.22	18.96
Squared Time Poverty Gap	0.0005	0.18	2.89	7.09	1.58	4.39

Source: Primary Survey, 2019-20

3.5 Type of Job and Time Poverty

The distinction between regular and non-regular jobs differed in terms of working hours, job stability, and access to benefits. In the society, the first job preference of everyone is for regular employment due to job security and also a fixed structured work schedule. It directly attached with their work-life balance and also affects their way of experiencing the time poverty. On the other side, non-regular jobs have been characterised with more insecure employment provision, like part-time or temporary like guest faculty etc. So, these jobs exaggerated working hour's one side and other side simultaneously restricted the benefits and protections as compared to regular employees. These factors attached with non-regular employees also works to increase the time poverty due to the irregularity of their schedules than faced by regular employees (Kim & Lee, 2023). In addition, non-regular employees also have tackled double burden of work due to additional child and elder care, it is only happen with the lake of affordable care system at work place or we can say due to affordability level of these employees which has further contribute to time poverty. Due to job type, there are several factors like employee personal circumstances, policy support and affordable care facility at job places that somehow affects

to their time poverty level. Therefore it is an urge need to check the challenges associated with different job types to understand the time poverty in better sense. Table 5 has elucidated time poverty in the context of the nature of job (Regular and non regular faculty). The data has shown perfect synchronization of findings where again it has shown females suffered from more time poverty in both regular and non-regular jobs. Males were poorer in non-regular jobs than the regular jobs while females were more timely poor in regular jobs also but severity level has shown a different angle. It has shown that females in non-regular type of jobs faced much time poverty due to instability of their income. Approximately 70 per cent of regular and non-regular female employee's children in the age bracket of less than 15 years increased their work burden after the job. It was also observed that females were involved under low salary jobs than males in education sector. The data has clearly shown that out of the total number of respondents approximately 50 per cent regular and non-regular employees faced time poverty. The data has presented the higher time poverty gap and severity level among the non-regular employees than the regular employees. In males and females the same results were seen but comparatively it had shown a huge gap in both types of jobs. There was higher time poverty gap of 21.41 among the females working under non-regular structure of jobs which meant they are more away from time poverty line than the males. In regular type also women suffered more than the men which were only 0.91 point gap than the females' gap of 11.97 points from the time poverty line. It also presented a higher gap of severity level between the males and females. The non-regular female employees faced higher severity than the regular employees and they needed higher time to improve their situation than the males.

Table 5: Time Poverty and Nature of Job

Time Poverty	Male		Female		Total	
	Regular	Non-regular	Regular	Non-regular	Regular	Non-regular
Head Count	10.26	25.58	70.42	76.33	49.3	53.51
Time Poverty Gap	0.91	1.03	11.97	21.41	6.47	11.21
Squared Time Poverty Gap	0.09	0.16	4.95	5.04	2.52	2.60

Source: Primary Survey, 2019-20

3.6 Educational Institutions and Time Poverty

Employees working in schools, colleges, and ITIs (Industrial Training Institutes) indeed experienced time poverty differently due to the nature of their institutional framework, which often involved varying and demanding working hours. The higher working hours left less time with the employees that was to be devoted to other tasks at home. Long working hours after making employees' time poor that restrict their personal development and well-being (Boye, 2009). An institution's framework is different in different countries, but the gender dimension does not have much difference at all. The higher dominance of males in every institution made more difficult for females. The time schedule was also different in the institutions, affecting the routine work and making it more pressurized. The institutions where the job hours were higher impacted females more than their counterparts. Table 6 had shown the situation of time poverty among the respondents working under various types of educational institutions. In overall head count ratio, out of the total respondents those who were working in schools had higher percentage than others. In schools 56.18 per cent of respondents faced the time constraints further 47.01 and 18.75 per cent from college and ITI faced it respectively. The time poverty gap and squared time poverty gap has also supported the head count ratio and

shown the similar results. The higher time poverty and severity level in schools has represented that lower working hours in schools job left higher time with the respondents which diluted in the form of household tasks. In the sample, majority of non-regular female employees were working in schools at low salary and that was a major reason behind working for longer hours after job and inability of purchasing time-saving services. In the comparison of males and females, the latter had given the similar results as the total number of respondents which meant a higher paid work left less time with the females and due to the effect of the income their unpaid work got reduced. Among the male respondents, similar situation was found in case of the schools and ITI but a different situation had emerged in colleges, it had shown a higher time poverty gap and severity level than others due to the various type of employees working in colleges like contractual, guest faculty, PTA basis which these affected their income more than regular ones and as observed under study they were also associated with part-time work like tuition. As Table has clearly shown, females were still more struggling with time constraints than males in every type of educational institution.

Table 6: Institution-wise Time Poverty

Time Poverty	Male			Female			Total		
	School	College	ITI	School	College	ITI	School	College	ITI
Head Count	10.53	18.87	13.33	75.86	70.31	100	56.18	47.01	18.75
Time Poverty Gap	0.43	1.19	0.33	22.68	10.43	0.26	11.56	5.82	3.08
Squared Time Poverty Gap	0.03	0.19	0.03	5.45	4.48	0.05	2.74	2.34	0.04

Source: Primary Survey, 2019-20

3.7 Location-Wise Time Poverty

A place of living has significantly correlated with the time poverty. In Punjab, most person is shifted from rural to urban areas due to easy availability of resources but these resources access not same for everyone due to their economic conditions. The higher cost factor is directly affected their schedule. As per the observation, most of the urban respondents faced time poverty differently than rural areas among male and female respondents. The higher cost structure of the purchasing of goods in urban areas somehow affects their time poverty differently than rural areas but, in both places, females suffer more with time poverty.

Table 7: Location-wise Time Poverty

Time Poverty	Male			Female		
	Rural	Urban	Total	Rural	Urban	Total
Head Count	9.26	21.09	16.47	78.32	81.61	79.60
Time Poverty Gap	1.02	6.14	3.29	24.19	31.36	27.80
Squared Time Poverty Gap	0.36	2.51	1.40	6.24	9.48	7.68

Source: Primary Survey, 2019-20

Table 7 shows that more females are time poor than their male counterparts. We can see that 79.60 per cent of the females and 16.47 per cent of the males have been found to be working for more than11.25 hours a day. If we see the poverty gap among males and females than the data show that poverty gap in females found to be 27.80 per cent where as in case of males it is found just 3.29 per cent. Thus, as compared to males, the females need much greater amount

of free time to be non-poor in terms of time. The square time poverty gap for females is 7.68 per cent where as for males it is just 1.40 per cent which further shows that the time poverty is severer among the females than the males. Further, we can also observe that in urban areas both males and females in the urban areas are more time poor (21.09 per cent males and 81.61 per cent females) as compared to their rural counterparts (9.36 per cent males and 78.32 per cent females). Poverty gap and square of poverty gap are also higher for urban areas than the rural ones for males as well as the females.

So it is clear from the data that not only the women are more time poor than the males in the rural as well as in the urban areas, their time poverty is also severer than the males. The reason for greater time poverty in urban areas is the nature of work structure because most of the women in urban areas are employed so they bear double burden of both paid and unpaid work.

4. Conclusion and Policy Suggestion

In nutshell we can conclude that time poverty is a serious threat for the wellbeing of the society. The employees are working in private institutions faces higher degree of time poverty in both genders but women time poverty situation shows higher severity than men. The nature of job is another affecting variable that shows a variation of time poverty and squared time poverty gap in the case of regular and non-regular employees but due to higher domestic chores clearly presents a wide gap among men and women employees in every educational institutions. So, there is need to curtail the time poverty gap among employees. It is only possible to change to socio and cultural aspects of gender biased society. Income is the major variable that affects the situation of women directly and due to non-consideration of the major junk of work contribution was neglected by the society due to the unaccountability. There is need to estimate the unpaid work by regular time-use surveys at state and national level.

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Motivation to Continue Higher Education: Turning LPDP Scholarship Awardees' Views Into Multi-item Education Policy Recommendations

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Abstract
This study investigates the psycho-social dimensions of motivation among LPDP scholarship recipients in Indonesia, aiming to identify key factors influencing their decision to pursue higher education and provide insights for education policymakers. A mixed-methods approach was employed, including surveys and qualitative interviews with 143 LPDP scholarship recipients. Factor analysis was used to identify factors influencing motivation, and scale development techniques were applied to refine measurement items. The study identified five key factors influencing motivation: social pressures, cultural values, economic considerations, geographic challenges, and academic enthusiasm. While some variables exhibited acceptable reliability and validity, others require further refinement. The findings underscore the importance of considering psycho-social factors in understanding and fostering motivation for higher education. This research provides valuable insights for policymakers and education stakeholders in Indonesia, highlighting the complexities of motivation among LPDP scholarship recipients. By addressing socio-cultural, economic, and geographic barriers, policymakers can develop targeted interventions to enhance educational access and attainment. This study contributes to the limited literature on psycho-social dimensions of motivation for higher education, particularly among LPDP scholarship recipients in Indonesia. By integrating qualitative and quantitative methods, the research offers a comprehensive understanding of motivational factors. The findings emphasize the need for tailored policy interventions, including the establishment of community education centers, career counseling services, and infrastructure development. These recommendations aim to promote educational equity and support the academic aspirations of diverse student populations in Indonesia. Future studies should address limitations such as sample size constraints and measurement refinement, while exploring the effectiveness of proposed policy interventions to inform evidence-based policymaking in the education sector.

Keywords: LPDP Scholarship, Higher Education, Motivation, Psycho-Social

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Introduction

Education is a long-term investment that provides benefits in various aspects. Kooli et al, (2022) suggests that education is able to improve thinking skills and problem solving so that it affects the improvement of the quality of human resources (Kooli et al, 2022), on the other hand, education also influences the increase in community employment opportunities (O'Higgins & Ivanov , 2006) Economic Development (Reza & Widodo, 2013), and Increasing Social Welfare (McMahon, 2000). However, in the case of Indonesia, public interest in continuing higher education is still very low, so that positive benefits from educational integration cannot be obtained. Based on statistical data released by the Directorate General of Population and Civil Registration (Dukcapil), the total population of Indonesia in June 2022 will reach 275.36 million people, of the total population, only 6% are interested in continuing their studies in higher education. In detail, the percentage of continuation of lectures is greater at the Masters to Doctoral levels (13.86%) than the continuation at the Undergraduate to Masters levels (4.46%). The percentage of sustainability that is not large enough, either from undergraduate to master or from master to doctoral level, shows that it is still necessary to continue to encourage the improvement of human resource education qualifications in Indonesia to continue their studies after completing the undergraduate level. If a comparison is made of the number of students at the Doctoral level and Undergraduate level, the number is 0.62 (less than 1%). At a glance, it can be concluded that only around 1% of undergraduate students progress to doctoral level. This has a negative impact on Indonesia's human development index. According to the 2022 List of Countries Report , Indonesia is still ranked 114th in terms of the human development index. Low interest in continuing education is one of the factors that contributes to this position.

As a solution to this problem, since 2012 the Indonesian Government has carried out the mandate of the 1945 Constitution to allocate a budget of at least 20% of the State Revenue and Expenditure Budget (APBN) for educational functions. The Minister of Finance through the Minister of Finance Regulation (PMK) in December 2011 determined the Organization and Governance of the Education Fund Management Institution as a non-echelon institution responsible to the Minister of Finance. Then the 20% APBN budget is managed by the Ministry of Finance as an endowment fund through the LPDP scholarship program for financing studies continue on to Masters programs and Doctoral programs at the best universities at home and abroad. During the 2013-2022 period the number of LPDP scholarship recipients has reached 35,536 students. Around 55.7% studied at domestic universities, while 44.3% studied abroad. However, this solution has not shown significant changes to the human growth index in accordance with the data presented above, so scholarship recipients' views on motivation for continuing higher education are needed as a recommendation for future education policy.

Social cognitive theories about motivation in recent years have emphasized the importance of goals and goal orientation in explaining achievement behavior patterns, but rarely have examined the psycho-social side of a student in obtaining motivation to continue higher education. Especially in Indonesia, LPDP scholarship recipients come from 1,340 different tribes spread across 416 regencies and 98 cities gathered in 34 provinces with a total of 17,001 islands. Of course this is the cause of Indonesia having unique social, cultural, economic, geographical values that are different, so this affects students themselves. There is ample evidence that people from different cultural backgrounds can be motivated by different forces and achieve their goals in different ways (Maehr & Braskamp, 1986; Salili, 1994; Salili & Mak, 1988; Triandis, 1980). Berkel et al's (2010) study of Latino students found that experiences of discrimination related to ethnicity have been associated with poor grades, lower academic self-

efficacy, and more symptoms of internalization (Berkel et al., 2010). Some students face additional stress due to family obligations and responsibilities which can influence academic decisions (Flook & Fuligni, 2008). Not infrequently motivation also arises in students due to pressure, economic conditions, bad experiences and cultural restrictions, but some are motivated because they receive positive support. Furthermore, among students whose mothers have low levels of education, kinship is positively related to grades (Esparza & Sanchez, 2008).

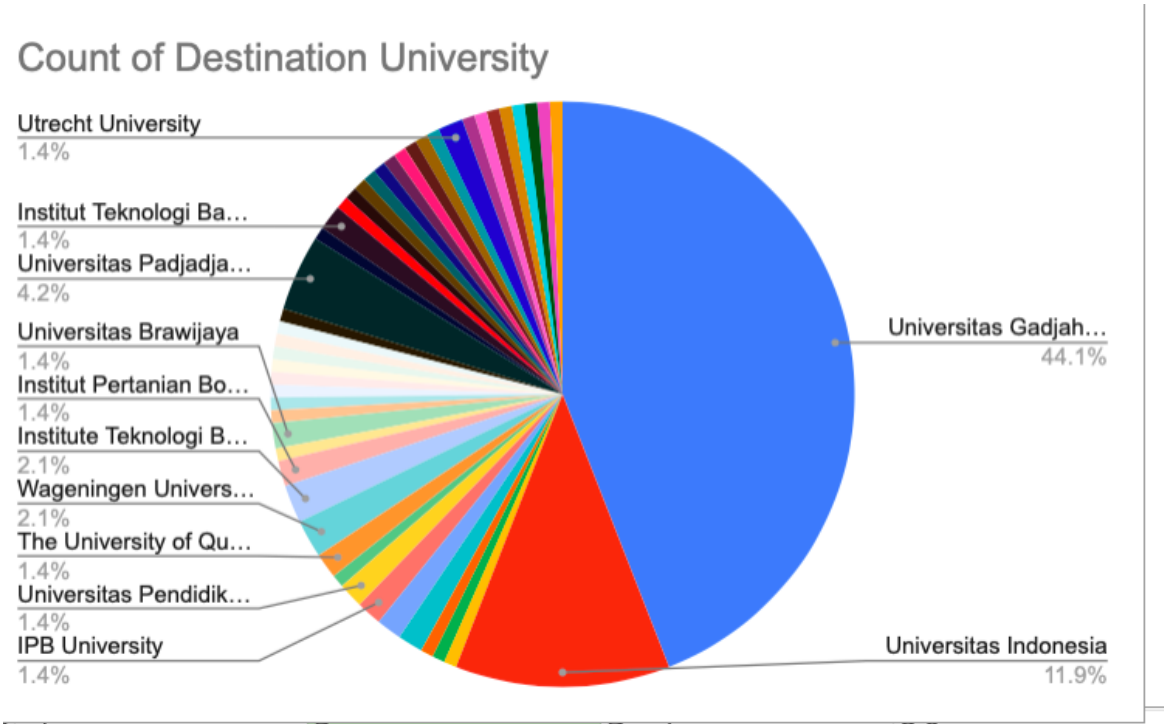
The views of LPDP scholarship recipients are analyzed in depth through their psycho-social experience based on enthusiastic social, cultural, economic, geographical and academic experiences which motivate them to continue higher education, this is necessary to see the uniqueness that occurs in students in each region in Indonesia. The gap between what is culturally appropriate, access to education, socially, economically, cannot be bridged without involving all stakeholders: policy makers and LPDP awardees. While there are limitations to previous studies in generating useful theoretical and conceptual insights into the behavior of scholarship recipients in self-motivation to continue higher education. To our knowledge, there is almost no research contribution to developing constructs related to scholarship recipient students' psycho-social beliefs for motivation in continuing higher education.

Recognizing the above deficiencies, in the extant literature, we seek to gain an in-depth understanding of the perceptual views and attitudes of scholarship recipients. We made a significant contribution from a theoretical perspective by taking an empirical approach to developing various measures of the views of Indonesian LPDP scholarship recipients. In addition, our evidence-based and empirically tested findings inform educators, managers and policy makers about the needs and concerns of scholarship recipients based on their experiences in pursuing higher education. This will certainly assist practitioners in using the information as input for developing more developed education policies.

Research Methodology and Discussion

To fulfill our research, we designed and distributed a survey consisting of 17 questions. Students who received LPDP scholarships were taken as the target population for our research so that screening questions at the start of the survey identified and excluded respondents who were not LPDP scholarship recipients. The sample was not limited to a particular age group, although the majority of our respondents were millennials and Gen Z. This sample was suitable for our research , because the millennial generation and Gen Z are expected to increase higher education rates in Indonesia.

An online survey via Google Form was used to manage response collection. A total of 143 survey respondents came from various provinces with different ethnicities.



Of the 143 respondents, 18 respondents were LPDP scholarship recipients who studied abroad at universities, while the other 125 respondents were domestic LPDP scholarship recipients.

Then to develop a scale to measure the psychological, perceptual and social beliefs of LPDP scholarship recipients, we followed the scale development stages. An exploratory approach was adopted to address the various research questions identified by this research. These findings are used to identify dimensions related to the motivation of LPDP scholarship recipients to continue higher education. We pursued the approach taken by previous researchers to carry out item generation, scale refinement, factor identification and validation (Churchill, 1979; Hollebeek, Glynn, & Brodie, 2014). Exploratory factor analysis was performed to find the initial factor structure, followed by confirmatory factor analysis to validate it through a structural equation model (Arbuckle, 2006) by replicating and confirming using independent samples.

The Likert scale has four or more questions that are combined to form a score or value that represents individual characteristics, for example knowledge, attitudes and behavior. (Setyawan & Atapukan, 2018) This research uses a Likert scale for data measurement. The Likert scale is used to determine the respondent's opinion in the questionnaire, namely 1 strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree. From the data measurements carried out using Smart-Pls 4, each respondent will be analyzed, the variables used get points from the Likert scale interval answers from each respondent.

Phase 1. Item Creation

We generated the initial item pool following the inductive and deductive approaches suggested by Padmavathy et al. (2019). Taking an inductive approach, two focus group discussions were conducted with academic enthusiasm, at this point asking questions including:

"What motivates you to continue higher education?"

"Have you ever had a bitter experience in your life related to education?"

“What do you want in the future after becoming an LPDP scholarship recipient?”

Next, a literature review on motivation to pursue education was conducted to find further items deductively. Following the above process, the author developed a collection of 17 questions regarding the motivation of LPDP scholarship recipients to pursue higher education.

Phase 2. Evaluate the Reflective Measurement Model

The online survey was conducted by posting and distributing the questionnaire link to domestic and overseas LPDP groups for 3 weeks. No incentives are offered for providing information. 143 usable cases were considered for analysis.

The next step is to evaluate the measurement model. The measurement model in this research consists of a reflective measurement model where social variables are measured reflectively. In Hair et al (2021), the evaluation of the reflective measurement model consisted of a loading factor ≥ 0.70, composite reliability ≥ 0.70, cronbach's alpha, and average variance extracted (AVE ≥ 0.50) as well as discriminant evaluations.

Table 1. Outer Loading, Composite Reability and Avarage Variance Extracted

Variable	Measurement Items	Indicator	Outer Loading	Cronbach's alpha	Composite Reliability	AVE
Social (xi)	X1	Social pressure	0.004	0.309	0.575	0.323
	X2	Opinions and positive views of the social environment	0.504			
	X3	Opinions and negative views of the social environment	0.865			
	X4	The role of social support	0.541			
Culture (X2)	X1	Customary cultural values	0.172	0.161	0.577	0.369
	X2	The issue of injustice to cultural values	0.565			
	X3	Efforts to maintain and enrich cultural heritage	0.870			
Economy (X3)	X1	Higher education will provide higher income	0.405	0.275	0.627	0.313
	X2	Family financial condition	0.708			
	X3	Independent desire	0.357			
	X4	Has no further decision to acquire economy after Strata 1	0.677			
Geographic (X4)	X1	Geographical conditions of lack of access to education, such as long distances, access to technology	0.889	0.491	0.790	0.656
	X2	Desire to advance remote areas of birth	0.722			
Academic Enthusiasm (Y)	Y1	Achievement Ambition	0.563	0.236	0.623	0.321
	Y2	Field of Study Interest	0.190			
	Y3	Competitive Spirit	0.695			
	Y4	Bitter experiences trigger motivation	0.671			

The social variable (X1) is measured by 4 measurement items with outer loading between 0.004-0.865, which means that the four measurement items do not reflect the measurement of social motivation. The level of variable reliability has not been acceptable as shown by Cronbach's alpha and composite reliability below 0.70. The level of convergent validity indicated by the AVE value of 0.323 <0.50 does not meet the requirements for good convergent validity. Among the four measurement items, measurement item X3 has the highest outer loading (0.865). So that the social motivation of students receiving LPDP scholarships in

continuing their higher education is highly reflected in terms of negative opinions and views from their social environment. This was also supported by interviews with informants who stated that much of their social environment gave these students a negative view, which became a motivation to prove that they were able to achieve higher education;

> "Being seen as a person with a mediocre economy has motivated me to continue my Masters degree to show them that economic status is not an obstacle in realizing big dreams."

The cultural variable (X2) is measured by 3 measurement items with outer loading between 0.172-0.870, which means that the three measurement items do not reflect the measurement of cultural motivation. The level of variable reliability is not yet acceptable as indicated by Cronbach's alpha and composite reliability below 0.70. The level of convergent validity indicated by the AVE value of 0.369 <0.50 does not meet the requirements for good convergent validity. Among the three measurement items, measurement item X4 has the highest outer loading (0.870). So the cultural motivation of students receiving LPDP scholarships in continuing higher education is strongly reflected in efforts to maintain and enrich cultural heritage. The results of interviews with informants show that there are differences in cultural values and customs, which also influence their motivation and increase academic enthusiasm, such as the custom of the Minang tribe "*Adat Basandi Syarak, Syarak Basandi Kitabullah"* where the philosophy of life held is the only basis or guideline for pattern planning. life following Islamic teachings. Apart from that, the Bugis custom is *"resopantemmangingngi malomoi na lettei pammasena Dewata"* which means "only with hard work and perseverance, it will be easy to get God's blessing."

The economic variable (X3) is measured by 4 measurement items with outer loading between 0.357-0.708, which means that these four items do not reflect the measurement of economic motivation. The level of variable reliability shown by Cronbach's alpha is below 0.70 while composite reliability is above 0.70. The level of convergent validity indicated by the AVE value of 0.313 > 0.50 does not meet the requirements for good convergent validity. Among the four measurement items, measurement item X2 has the highest outer loading (0.708). So the economic motivation of LPDP scholarship recipient students in continuing higher education is greatly reflected in the family's financial condition.

The geographic variable (X4) is measured by 2 measurement items with an outer loading between 0.722-0.889 which means that the four items already reflect geographic motivation measurements. However, the variable reliability level is acceptable as indicated by Cronbach's alpha and composite reliability above 0.70. The level of convergent validity indicated by the AVE value of 0.656 <0.50 already meets the requirements for good convergent validity. The validity of the X4 variable is seen from the 2 measurement items, and the results of interviews with informants from remote areas strengthen this variable;

> “Most people in my village drop out of school at the junior and senior high school levels.”

> “Access to technology is difficult.”
> “Uneven internet network and inadequate accessibility of land transportation routes.”

> "Geographical conditions cause unequal access to health so I need further knowledge and knowledge to be able to determine the right strategy so that all people receive health services."

Meanwhile, the academic enthusiasm variable is measured by 4 measurement items with outer loading between 0.190-0.695, which means that the four measurement items do not reflect the measurement of academic enthusiasm. The level of variable reliability has not been acceptable as shown by Cronbach's alpha and composite reliability below 0.70. The level of convergent validity indicated by the AVE value of 0.321 <0.50 does not meet the requirements for good convergent validity. If seen from the results of interviews with informants, students who received LPDP scholarships had bitter experiences that influenced their decisions and increased their academic enthusiasm;

> "Always stopped going to school during elementary and high school, so it spurred me to catch up with science."

> "Financial constraints and a mother who is seriously ill forced me to become a sandwich generation to solve problems in the family and support my future which I have to bear alone since I am also an only child."

> "I felt like I failed to be the best during my bachelor's degree, so I wanted to continue my master's studies and make achievements."

> "My mother did not have the opportunity to experience higher education when she was young. So I hope to make his dream of success come true."

Phase 3. Discriminant Validity

Next, we checked the discriminant validity of the constructs by comparing the square root of the AVE with the correlations between the constructs.

Table 2. Discriminant Validity

Culture (X2)	0.607				
Economy (X3)	0.321	0.559			
Geographic (X4)	0.258	0.326	0.810		
Social (X1)	0.136	0.291	0.255	0.569	
Academic Enthusiasm (Y)	0.202	0.409	0.278	0.371	0.567

The diagonal value is the root of the AVE and the other values are the correlation

The results presented in table 2 confirm that the root of the AVE variable is greater than the correlation between variables. Cultural, economic and social variables show variable discriminant validity that has not been fulfilled because it is <0.70. While the geographical variable has a root AVE (0.810) which has a greater correlation with social (0.255) and academic enthusiasm (0.278). These results indicate that the discriminant validity of the geographical variable has been met. The results related to the model fit indices and the

reliability and validity of the scale strengthen its replication and use in future studies in the field.

Our research is based on the low enthusiasm of the Indonesian generation to continue their education. The gap between what is culturally appropriate, educational access, social, economic, researchers took a sample of LPDP scholarship recipient students to see and gain an in-depth understanding of the perceptual views and attitudes of scholarship recipient students. Factor analysis was used in this research to analyze the survey results, and identify 5 factors/variables to be taken into account in the research; social, cultural, economic, geographical motivation and academic enthusiasm.

The above outline of the five factors revealed by this research provides a useful basis for further comment, particularly on geographic student conditions. Even though the other variables do not show good validity, the results of interviews with informants and specific questions about each variable are very important. In the next three paragraphs we present several key implications, as well as important contributions to our research.

Theoretical/Research Contributions

This study is one of the earliest attempts to a) conceptualize and operate on the perceptual and psycho-social dimensions of end-users associated with enthusiasm for pursuing higher education, and b) provide new insights into student concerns across a wide range of environmental, economic, cultural and social characteristics. geographic area, has made a significant contribution to relatively new research exploring the relationship between motivation and academic enthusiasm.

The combination of qualitative and quantitative approaches adopted by this study confirmed the reliability and validity of the scale and increased confidence among future researchers.

The five factors uncovered in this study put forward issues that are more subtle than motivational continuing education research. In an era when education should be easy for all groups to obtain, it is still difficult to enjoy and requires extra effort to get a scholarship. Improving education for the Indonesian people will spur the achievement of other goals and targets in the 17 SDGs points, especially increasing Indonesia's human development index. So it is hoped that the role of education will be able to increase Indonesia's competitiveness in supporting the 2030 SDGs.

Practical Implications for Policy Makers (Policy Recommendations)

The five factors presented in the section above have direct implications for education policy makers, especially LPDP scholarship managers. It is very important for scholarship providers to pay more attention to students from social, cultural, economic and geographical conditions who have challenges in continuing higher education. Policy makers need to understand that not all Indonesian children are mentally and psychologically strong and want to continue higher education, and this of course has an impact on Indonesia's human development index and will also have an impact on the future.

The current policy framework for academic enthusiasts requires special attention to geographical variables which are the main problems faced by LPDP scholarship recipients and at the same time become a motivation for them to be able to continue higher education due to

regional limitations. There are various possible directions. From our research, some interesting avenues for further investigation are:

Limitations and implications for Future Research

Despite the contributions of this study, its limitations must be acknowledged. Since the current topic is a new research area, relevant literature is sparse. The sample size (N = 143) may not present a strong picture of the phenomenon under study. Then the measurement results are still very unreliable, so it is hoped that further research can formulate more credible question measurement items for this research. Furthermore, the results of the factor analysis carried out depend on the researcher's decisions and interpretations. Our top priority for future research remains an integrated framework.

- ***Establishment of a Community Education Center***
  This community is managed by students who have received LPDP scholarships in each region and serve as regional LPDP ambassadors under the auspices of the LPDP, the Ministry of Finance and the Ministry of Education and Culture as well as Regional Governments, both remote areas and areas in the metropolitan category. It aims to provide;
  a. *Socialization and assistance in the registration process*
     The socialization aims to provide understanding to every community regarding the conveniences provided by the LPDP for students in remote areas. Then the LPDP ambassador provides private assistance to the student to register for the LPDP until he is declared to have graduated as an LPDP scholarship recipient.
  b. *Providing incentives to prospective applicants by facilitating all costs required in a series of LPDP selection processes*
     The application process to become an LPDP awardee often involves significant costs, such as registration fees, entrance test fees, document delivery fees, and other administrative costs. For some prospective applicants, especially those from low economic backgrounds and domiciled in areas with isolated geographical conditions, the cost burden as described above can be a significant obstacle that discourages potential applicants from continuing their education at a higher level.
  c. *Career counseling*
     LPDP provides career counseling services to people who are constrained by access to information as a result of geographic factors. The establishment of such career services can help people better plan their future. Counselors can provide guidance to people in choosing a major or career path that suits their interests and potential with the help of the LPDP scholarship.

- ***Policy on Special Educational Infrastructure***
  Indonesia does not yet have a priority policy regarding educational infrastructure that can overcome the problem of educational disparities in each different region, especially as Indonesia is a country where each region is separated by 16,771 islands. This is why education is still centered in cities close to the center of the capital city (Java Island). The education gap can also be seen from the Education Fund Management Institute (LPDP) report , the number of LPDP scholarship recipients from 2013 to 2021 who came from West Java was 18.6% of the total. This number is the highest among other provinces in Indonesia. The second largest number of LPDP scholarship recipients came from East Java, namely 13.8%. Then, in third place the most came from DKI Jakarta, namely 11.6%. Still on the island of Java, Central Java and DI Yogyakarta in next place with 10.6% of LPDP scholarship recipients.

Meanwhile, the least number of LPDP scholarship recipients are from North Kalimantan, which is only 0.1%. Above it are Central Kalimantan and the Bangka Belitung Islands with 0.2% and 0.3% respectively. The data shows that LPDP scholarship recipients are still concentrated in Java. This is evident from the top 5 provinces on this list originating from the island of Java.

Conclusion

Motivated by the dynamic field of motivation to continue higher education, the current study represents a step towards a better understanding of the psycho-social gaps felt by LPDP scholarship recipients stemming from real problems in their respective regions. This understanding is very important not only for designing educational programs but also for the sustainability of Indonesia's superior community development index in 2030. In this view, following the research results, it is very important to see the geographical dimension as the main factor in the occurrence of educational disparities in Indonesia which are also indirectly influenced by factors social, economic and cultural.

Given this, in this study we were involved in the process of developing a scientific scale by integrating student motivation in continuing education. by identifying five dimensions/factors: social, cultural, economic, geographical and academic enthusiasm. Moreover, our identification of the five factors has significant implications for education experts and policy makers. This study will draw their attention to the side of the scholarship recipients as the generation that will be the key to the country's future. The contribution of this research is to provide at least two policy recommendations for the establishment of community centers and policies regarding special education infrastructure.

Acknowledgments

This research has produced a number of multi-item policy recommendations and is expected to contribute to improving education policy in Indonesia, especially in the graduation implementation mechanism. In the journey to achieve these results, close collaboration with LPDP as the funder and sponsor has provided an invaluable contribution. We would like to express our sincere thanks to LPDP for its ongoing commitment and support throughout the research process.

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Indonesian Student Graduation Policy: An Analysis of Public and Stakeholder Perceptions as a Social Justice Policies Recommendation for Student

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Abstract
The Indonesian Ministry of Education and Culture issued a policy in the form of Circular Letter Number 14 of 2023 concerning Graduation Activities in Early Childhood, Primary and Secondary Education Units. This policy is a response from the Ministry of Education to the issue of injustice for underprivileged students. However, the policy has drawn pros and cons from the community because there are ambiguous, indecisive and unspecific wording. As a result, there are still loopholes for schools to be able to carry out graduation activities even though they are not required. This is an important concern considering that the implementation of graduation in Indonesia often involves considerable costs. As a result, the issue of injustice arises for students who do not have sufficient financial capacity, and does not answer the current problems that need to be studied comprehensively. This study aims to look at the perceptions of various actors, including education policy observers, child development and education psychologists, 20 general public, 350 twitter netizens, and 20 parents of students. This research uses qualitative methods through literature studies, interview and open ended survey. The results of this study gave birth to two policy recommendations. The first, graduation still exists with the support of a cross-subsidy program. The second, graduation was changed to a program of provision and motivation for students to continue their further education.

Keywords: Education, Policy, Social Justice

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Introduction

Graduation is a moment that marks an extraordinary achievement in the educational journey, which is greeted with enthusiasm and pride by all parties involved (Charmatz, 2019). Furthermore, Sumartini (2018) defines graduation as the final result of the learning process while attending education at the study table. Graduation is also a tangible proof of students' hard work, dedication, and effort during the education period. In the case of Indonesia, the phenomenon of implementing graduation is not only limited to the university level, but also applied at the basic education level such as in Early Childhood Education (PAUD), Kindergarten (TK), Elementary School (SD), Junior High School (SMP), and Senior High School (Tribunnews.com, 2023). These graduation events are often held with a luxurious concept and require considerable costs (bbc.com, 2023). Furthermore, a lecturer at the Faculty of Psychology, Gadjah Mada University, mentioned that abroad, the term *graduation is* used at all levels of education. However, there is a big difference in the implementation of Indonesian graduations, graduations held abroad tend to take place simply without exaggeration. As in the case of Australia, graduation is held simply without any eating and other lavish celebrations. The essence of graduation activities in Australia is as a place of reflection for children and parents regarding the student's journey during education (Ika, 2023).

Meanwhile in Indonesia, in the implementation of graduation at the kindergarten (TK) to elementary school (SD) level, it is not uncommon to have to spend significant costs, due to the various accommodation needs that must be met to make the graduation activities successful. This becomes too much and burdensome for parents and schools (kabarterdepan.com, 2023). One important aspect is the cost of renting or buying a toga that will be worn at the graduation ceremony. In addition, operational costs for performances or performances are also a factor in the expenses required. Furthermore, building rental and consumption costs also contribute to the amount of costs that must be incurred. The National Coordinator of the Education and Teacher Association (P2G), Satriwan Salim said that the average cost that must be incurred by parents in order to participate in graduation activities at the PAUD-TK level reaches Rp.500,000. Meanwhile, the junior high school-high school level is above Rp.1,000,000. The activity is organized and managed by the school or by the teacher, so graduation becomes an academic obligation (detik.com., 2023).

Kuncup Pertiwi Kindergarten in Kendari is one of the schools that held a graduation ceremony at great expense. The graduation ceremony was held in the main room of the Claro Hotel, Kendari, Southeast Sulawesi, one of the few four-star hotels in Southeast Sulawesi. Parents of students must prepare funds of Rp.500,000 per child to be able to join the graduation activities (kompas.id., 2023). On the other hand, in one of the private high schools in East Jakarta, the school planned a graduation event as well as a *study tour for* class XII students with a fee of 2.5 million per child. The graduation planning reaped pros and cons from parents because they did not agree to the required fees, only about 20 percent of the total parents agreed, so the graduation planning with a budget of 2.5 million was canceled. However, the school continued to celebrate the graduation of students at the school where parents could attend with a fee of IDR 750,000 per child, which was still burdensome for parents (kompas.id., 2023).

Some of the phenomena that have been described are only a small part of many other cases that are not described in Indonesia. The organization of graduation activities often creates an additional financial burden for parents, so it is not uncommon for parents to have to borrow

money from others so that their children can participate in graduation activities (bbc.com 2023). Furthermore, as reported by (kompas.com., 2023), there are parents of students who apply to borrow money by pledging the Motor Vehicle Owner's Book (BPKB) in order to be able to finance administrative needs of Rp.800,000 so that their children can take part in graduation activities at the junior high school (SMA) education level. This decision shows how significant and serious the financial burden that some parents have to face in order to provide a memorable graduation experience for their children.

In response to this problem, the Indonesian Ministry of Education and Culture issued a policy in the form of Circular Letter (SE) No. 14 of 2023 concerning Graduation Activities in Early Childhood, Primary and Secondary Education Units. However, the policy has attracted public attention because it is considered ambiguous, especially in the first point of the policy which states "Ensure that graduation is not a mandatory activity and the implementation of graduation should not burden parents". The impact is that schools still have the possibility to carry out graduation activities even though it is not mandatory. However, the other side of the impact then creates new problems for some parties.

This is because the tradition of student graduation in Indonesia often requires considerable costs, which in turn has the potential to create a gap in *social justice* for students who are less financially capable. This needs to be a concern of the government considering that *social justice* is related to the fair distribution of society (Rahardjo, 2006). This is in line with Whitcomb's (2010) view that *social justice* is very important in efforts to overcome social, economic and political inequalities that have intellectual roots in a strong progressive tradition. Furthermore, Dworkin (2011) also underlines the importance of integrating *social justice* principles in law to create a more just and equal society.

The importance of emphasizing *social justice* is also an integral part of social economics, as well as efforts to address inequality as a whole. Therefore, social justice is not only related to the moral aspects of social interaction, but also includes the concept of justice as a whole (Bertens, 2000). The principles relating to procedural justice concern the fairness of the process for determining what is fair, regardless of the outcome. Principles relating to redistributive/compensatory justice relate to the determination of punishment and compensation for wrongs, injuries, and losses. In the context of the United States, social justice is also one of the considerations in policy planning, including in the education sector mentioned in the article. The emphasis on social justice reflects an awareness of social inequalities and an attempt to find equitable solutions in society (Young, I. M, 2011).

Furthermore, *social justice in* the context of graduation policies in Indonesia, initially originated from the pros and cons of the community against the wording of policy sentences that contained ambiguity and indecision. As far as the researchers observed, there were several pro and con critics who expressed their agreement and disagreement with this policy. Based on the results of temporary observations on twitter social media, most people feel ambiguity about the editorial of the policy. This shows that there is an understanding of the meaning that must be emphasized by the government so as not to cause the wrong interpretation from the community and ultimately have a negative impact on the continuity of student education. Therefore, community participation and involvement are needed in the formulation of a policy. This is in accordance with Friedman's (1998) opinion that community participation in the policy planning and decision-making process by the government involves essential interactions between citizens and the government. In this context, there is a mutually influential relationship between the policies decided by the

government and the active participation played by the community. Furthermore, Friedman (1998) also considers that the participatory approach is a political process to obtain mutual agreement through negotiation or crowdsourcing activities between all actors (stakeholders). Community participation is either based on independence or institutionalization organized by policy makers as a form of creating common interests.

Based on the *desk study* that researchers have conducted on the issue of graduation policy, both in terms of public perception and issues of injustice that may arise, researchers realize that until now there has been no academic research that deeply examines this phenomenon. Therefore, it is important to investigate in more depth how the public and stakeholders perceive the issue. The aim is to develop better policy recommendations that favor the principles of social justice for students, based on empirical evidence and in-depth analysis of the root causes that arise in the context of the problems that occur.

Research Methods

This research uses qualitative research methods. Qualitative research will understand thoroughly and deeply about the reality of the object of research (Creswell & Wanqing, 2009). In an effort to get an overview of the phenomena related to social justice in the implementation of graduation activities, researchers used the following data collection techniques:

a. **Literature Study.** Researchers observed various aspects related to the implementation of policies issued by the government. Observations were made on various websites, twitter social media and news articles to obtain accurate data and information about how the graduation policy had an impact on the pros and cons of the community. In this observation, researchers recorded various relevant events, occurrences, and interactions to be further analysed.

   The researcher conducted a literature study using secondary data from texts, archives, literature, twitter mass media, and the internet, as well as laws and regulations related to education in Indonesia. This data collection method involved the study and analysis of relevant literature. The literature study validated research data from interviews and focus group discussion notes to help interpret the texts.

b. **Interview & Open Ended Survey.** The researcher conducted in-depth interviews with various relevant informants who are related and able to provide in-depth information related to the topic under study. To determine the informants, the researcher categorised them into four main categories, namely: Parents of students, the general public, education policy observers, and psychologists who have expertise in the field of education policy and have direct experience in the context of education policy. Within the category of informants from parents, we also categorised informants based on various professions and income levels. The results of the classification can be found in Graph 1. Parents with an income of >4,000,000 are 40%, 1,000,000-1,500,000 are 20%, 1,500,000-2,000,000 are 15%, then parents with an income of 2,000,000-2,500,000 and 3,000,000-4,000,000 are 10% each, the remaining 5% earn 500,000-1,000,000.

Findings and Discussion

The analysis and discussion in this study are based on two main complementary theories, namely the theory of *social justice* by Dworkin (2011) and policy evaluation by William Dunn (2018). The theory of social justice serves as a foundation in understanding how a policy can contribute to creating a more just and equitable social environment. By considering the principles of social justice, policy recommendations can be designed to address social inequalities and provide benefits to the entire community, especially students in the context of graduation policies. Meanwhile, policy evaluation theory helps in measuring the impact of the proposed policy over various time spans. By utilizing policy evaluation tools, this research provides a better understanding of how the implementation of policy recommendations will affect society in the short, medium and long term. The merging of the two theories ultimately aims to formulate policy recommendations that not only have social and ethical relevance within the framework of social justice, but can also be efficiently measured and evaluated over various timescales. This step is crucial in ensuring that the proposed policy can provide sustainable benefits to society.

Social Justice

In the context of social justice issues for students as an implication of the graduation policy through Circular Letter (SE) No. 14 of 2023 by the Ministry of Education, Culture, Research and Technology, researchers adopted Dworkin's theory (2011) as a representation of the concept of social justice in this study. The selection of Dworkin's theory as a representation of social justice provides a strong foundation to measure the extent to which the graduation policy is able to accommodate social justice values for students. By focusing on equality, freedom, fair distribution, and non-discrimination, the graduation policy should be able to create an inclusive school environment and provide opportunities for all students to celebrate their successful academic achievements without unfair restrictions or discrimination. Social justice indicators according to Dworkin consist of 4 aspects, including: Equal opportunity, protection of basic freedoms, fair distribution of resources, and non-discrimination.

Overall, social justice in the context of Indonesia's graduation policy illustrates a number of imbalances that affect various aspects, ranging from equal opportunities to the protection of basic freedoms. The policy creates inequality in its implementation, where students from higher economic backgrounds tend to benefit more than those from lower economic families.

Policy Evaluation

Researchers adopted the policy evaluation theory by William Dunn (2018) as a critical step in the public policy process that helps governments, organizations, and communities to understand the impact of graduation policies by outlining several important dimensions that need to be considered in policy evaluation. The choice of policy evaluation theory as a representation of the assessment of public policy provides a solid foundation for assessing the extent to which the graduation policy has achieved its objectives. Some important dimensions that need to be considered in policy evaluation include: effectiveness, efficiency, adequacy, equity, responsiveness, and accuracy.

Furthermore, in terms of policy evaluation, overall the graduation policy has not achieved the expected effectiveness, and its efficiency has not been optimal, especially in overcoming the problem of high graduation costs for parents. The policy is also inadequate in meeting the

needs of the community as a whole. Then, in terms of psychology, the priority of implementing graduation activities at the education level from kindergarten to high school is not considered urgent, so a wiser and firmer policy is needed to overcome this situation. Furthermore, from the perspective of education policy observers, the clausal flexibility in the graduation policy through the Ministry of Education and Research Circular Letter is designed to maintain a balance of diverse interests, but has implications for the limited firm commitment of the government. Therefore, firmness is needed in the implementation of the policy. Next, in terms of Twitter analysis, the community considers that the graduation policy is still ambiguous and requires a change to a strict ban on graduation activities to address existing inequality issues.

Policy Recommendations

Based on the perceptions of these various stakeholders, the conclusion emphasizes the need for improvements in the graduation policy to achieve more equitable and effective social justice goals. Therefore, researchers recommend four new policy alternatives that can be implemented in the future, namely: Policy/Program of cross-subsidy for underprivileged students, Policy/Program of learning reflection and evaluation during schooling, and Policy/Program of debriefing and providing motivation to continue the next level of education.

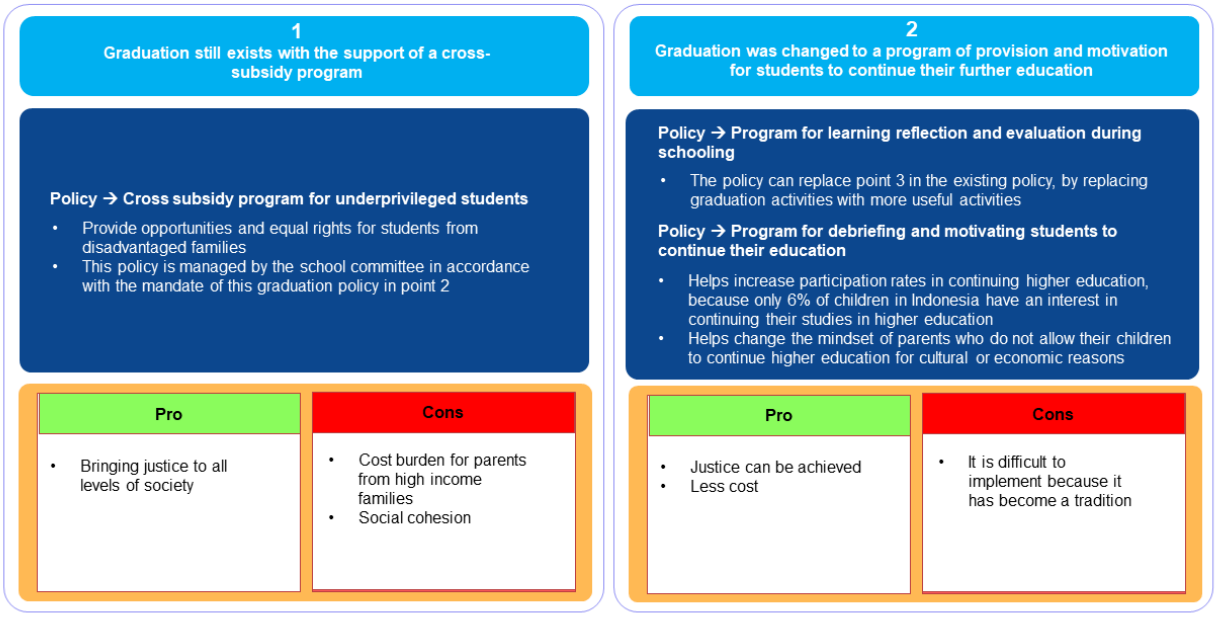


Figure 1. Policy Recommendation Visualization
Source: Processed by Researchers (2023)

First, Graduation still exists with the support of a cross-subsidy program, the cross-subsidy policy/program is intended to provide opportunities and equal rights for students from underprivileged families. Additionally, this program can teach students to empathize with their peers' difficulties, cultivate empathy within students, and teach children the meaning of equal rights. Furthermore, this strengthens the relationship between parents of students, who previously tended to compete with each other. This policy will be managed by the school committee in accordance with the mandate of the graduation policy in point 2, where "this graduation activity must involve the school committee, parents of students, or the students themselves."

This recommendation suggests maintaining the tradition of graduation with the support of a cross-subsidy program. The positive effect is achieving fairness in celebrating academic achievements for all segments of society. However, on the other hand, there are several negative impacts to consider. First, families with high incomes may feel burdened by additional costs that may arise from this subsidy program. Additionally, social cohesion may also be affected by differences in treatment between high and low-income groups.

Second, Graduation was changed to a program of provision and motivation for students to continue their further education. The concept of graduation underwent a transformation, evolving into a program aimed at providing support and motivation for students to pursue further education. This shift signifies a departure from merely celebrating the completion of a phase of education towards actively encouraging and facilitating ongoing academic endeavors. The revised approach emphasizes the importance of continuous learning and personal development beyond the traditional confines of graduation ceremonies. In detail, the Graduation Policy Recommendations which are converted into a provision and motivation program for students to continue their education further are as follows:

The policy/program of reflection on learning and evaluation throughout schooling.
This policy/program can replace point 1 in the existing policy by transforming graduation activities into more beneficial events. This aims to address the perception of the community and parents of students who feel that the current graduation ceremonies are wasteful and merely serve as a platform for parents to showcase their status, thereby discriminating against certain groups. The previous graduation activities seemed forced, leaving less affluent parents with no choice but to follow the majority.

The policy/program of preparation and motivation provision for continuing to the next level of education.
This policy/program can help increase the participation rate in higher education, as only 6% of children in Indonesia have an interest in continuing their education at the higher education level (Directorate General of Population and Civil Registration, 2023). The provision and motivation provided are not only aimed at students but can also help change the mindset of parents who do not allow their children to pursue higher education due to cultural or economic reasons. Schools can also conduct socialization on government scholarships and assist parents in registering their children for these scholarships.

This recommendation suggests changing the concept of graduation into a program that provides support and motivation for students to continue their education. The positive effect is creating equal access to education and reducing the financial burden that students and their families may face. However, this recommendation also presents several challenges, particularly in its implementation. Transforming the tradition of graduation into a new program may be difficult due to resistance from those who uphold old traditions and also because adjustments are needed within the existing education system.

Nevertheless, it is hoped that these policies can create equitable benefits for all parties so that social justice can be realized at all levels of society.

Research Limitations

This research encountered several limitations throughout the study. Firstly, gathering qualitative data from multiple informants through an open-ended survey posed challenges in

ensuring depth and consistency in responses. Additionally, the exploration of social justice aspects and policy evaluation remained somewhat limited, lacking comprehensiveness in their analysis. Moreover, the availability of informants was restricted, potentially impacting the diversity and breadth of perspectives considered in the study. These limitations warrant acknowledgment and may suggest areas for further refinement or expansion in future research endeavors.

Research Future Agenda

For future research agendas, it is recommended to delve deeper by conducting more extensive interviews or focus group discussions involving a broader and more diverse range of informants, aiming to gather richer qualitative data. Moreover, expanding the scope of exploration into social justice and policy evaluation to encompass a wider spectrum of perspectives and factors would be beneficial. Additionally, enhancing the number and diversity of informants is essential to ensure a more comprehensive understanding of the issues under investigation. These strategies would contribute to a more thorough and nuanced analysis, enabling a deeper insight into the subject matter.

Conclusion

Indonesia's graduation policy demonstrates imbalances that lead to disparities in various aspects, especially in educational opportunities and protection of fundamental freedoms. The policy's implementation tends to favor students from higher economic backgrounds, while those from lower-income families feel disadvantaged. Evaluations indicate that the policy has not been effective or efficient in addressing the high costs of graduation. Psychologically, the urgency of implementing graduation activities from kindergarten to high school levels is not considered, and policy flexibility suggests a lack of government commitment. The public also believes that the graduation policy needs to be tightened to address existing uncertainties and inequalities. Therefore, researcher gave birth to two policy recommendations. The first, graduation still exists with the support of a cross-subsidy program. The second, graduation was changed to a program of provision and motivation for students to continue their further education.

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Preserving Academic Integrity in the Age of AI

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Abstract
Integrating Artificial Intelligence (AI) tools into academic writing has the potential to revolutionize the process of composing academic works. As these tools become more prevalent, concerns about academic integrity arise, prompting the need to explore strategies that uphold ethical standards and academic norms. This qualitative study aims to investigate the use of AI tools in academic writing, focusing on three key research questions: (1) what common AI tools are used, (2) what are the perceived benefits of AI tools, and (3) what strategies are employed to preserve academic integrity. This study involved graduate students (n=10) engaged in academic writing, and data collection was conducted through semi-structured interviews with each participant. The interview transcript was then analyzed using thematic analysis. The study revealed that graduate students employed a range of AI tools: Quillbot, Grammarly, ChatGPT, Easy-Peasy AI, Rytr AI, Humata, and DeepL. These tools are used for several writing processes, from generating ideas, drafting, enhancing content, paraphrasing, and grammar checking. Participants acknowledged the positive impact of AI tools on writing quality (grammar and organization improvements) and efficiency (reduced writing time). To preserve academic integrity, participants emphasized the responsible use of AI tools as supportive aids rather than replacements for their efforts. Strategies included editing and proofreading AI-generated content to align with personal writing style, cross-referencing, evaluating AI suggestions, and upholding authentic voice in writing. In conclusion, AI offers valuable benefits but necessitates a thoughtful and responsible approach to maintaining academic integrity. Scholars must balance using AI as supportive tools while preserving the ownership of their academic works.

Keywords: Artificial Intelligence, AI Tools, Academic Writing, Academic Integrity, Ethics

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Introduction

The emergence of artificial intelligence (AI) is not relatively new. The development of AI has been ongoing since amid 20th century, which was primarily started by a British logician and computer pioneer, Alan Mason Turing ana his peers (Marchev & Piryankova, 2022). Nevertheless, the use of AI has just gained significant attention, marked by the release of ChatGPT (Roe et al., 2023). People gain high interest in using such tools that promises automation in various task. 250 million people have used AI tools in 2023, and the number is estimated to triple in the next ten years (Thormundsson, 2023). Public show high interest due to AI's ability to do various task in shorter time, resulting in less effort for getting work done.

The incorporation of AI tools is also happening in the academia, particularly for academic writing. It is a common knowledge that academic writing is challenging to many scholars, moreover to students and novice researchers. The existence of AI tools, such as ChatGPT, Grammarly, and Quill Bot, offers assistance in the laborious of academic writing process. These AI tools are diverse in type, and it can serve as grammar, spelling, and plagiarism checkers, paraphrasers, as well as search engines for academic literature. Previous studies confirmed that the use of AI significantly decreased the time spent to write paper (Bahammam et al., 2023; Cardon et al., 2023;Kacena et al., 2024). AI can search potential sources on the internet and generate easy-to-understand text of certain topic effortlessly and in a very short time (Kacena et al., 2024; Korteling et al., 2021). Other benefits of AI in academic writing include improved consistency and style (Bahammam et al., 2023), better idea generation (Cardon et al., 2023), and better writing quality (Ghufron, 2019).

Despite the many advantages of AI for academic writing, the use of AI has also been linked to academic integrity violations. Kacena et al., (2024) found that the article written with AI-only (ChatGPT) includes 70% of inaccurate citations. ChatGPT is a large language model (LLM) which was trained with a large library of information or text from the internet. The answer or text generated by ChatGPT depends only on its training data; thus, it does not have ability to provide real-time data beyond what has been trained. With this in mind, AI like ChatGPT may present ideas without citing to the source text properly and lead to plagiarism. In addition, AI may also provide false information as a result of limited understanding to certain scientific concept and unintentional prejudices found in the training data (Bahammam et al., 2023). When writers solely count on AI to write, It clearly becomes a serious threat to the accuracy of the information and accountability of the article.

The use of AI for writing scholarly works indeed becomes a controversy. However, looking at the constantly growing number of AI tools users, it is more likely that people will also keep using them to assist academic writing. Given the undeniable potential benefits of AI assistive writing tools, and the absence of rules or certain policies that regulate the use of AI in academic writing. It is essential to investigate on how to use this technology in appropriate ways. Therefore, this study aims to look closely at how AI tool users maximize the potential of AI tools for academic writing while not violating academic integrity. The results of this study will give insight into how to use AI responsibly and how to make sure the benefit of AI outweighs its limitations.

Literature Review

Academic Integrity

In the literature, academic integrity has complex interpretation. The term "academic integrity is often used to describe the conducts of students and the body of the literature mostly also has negative association with this term. It is often linked with unethical practices in academia such as students' misbehaviour or misconduct (i.e.; cheating and plagiarism) (Macfarlane et al., 2014). However, (Turner & Beemsterboer, 2003) emphasized that academic integrity binds everyone in the academia who are involved in the process of ''the teaching and learning of knowledge, skills, and values and the discovery and dissemination of new knowledge." In line with this notion, Jones (2001) defines academic integrity as "a personal choice to act responsibly and to take responsibility for one's actions". Academic integrity serves as a social contract in which people in the academia are bound to follow a set of rules and norms. It is expected that everyone behaves according to these rules to achieve equitable atmosphere.

The next question is, what set of rules to follow to be considered as upholding academic integrity? (Löfström et al., 2015) stated that how academic integrity should be addressed remains subjective. Universities and other institutions may have different policies regarding academic integrity. In addition, Bretag et al., (2014) also emphasized the varied perceptions of what constitutes academic integrity between staffs and students and that this understanding may evolve over time. In their study, (Bretag et al., 2014) also highlight a holistic approach to academic integrity which emphasizes the promotion of integrity in all aspects of academia, from conducting marketing and university admissions, holding staff professional development, to providing support to students for avoiding academic misconducts.

Comparing from six universities' academic integrity policies, they all agree that academic integrity constitutes the principles of honesty and responsibility. Some universities also associate principles of fairness, ethical, respect and trust to academic integrity. When a person does not act with academic integrity, he is considered as committing academic dishonesty (TASC, 2023). Several actions that are categorized as academic dishonesty include plagiarism, using previously submitted assignments/recycling, contract cheating, collusion, facilitating academic misconduct, falsification, fabrication, impersonating someone else, and gratification (Brennecke, 2018; Harwani et al., 2018; Sefcik, 2019; TASC, 2023). These university policies give emphasis on plagiarism issue, and they also include strategies to avoid plagiarism in their students' guidelines. In short, academic integrity-although not limited to this- is closely related to plagiarism issues in doing scholarly works.

Academic Writing

Academic writing has been an integral part of higher education. It is a common form of assignment used to assess university students understanding of certain topics or subjects. The practice of academic writing, however, is far from simple, it requires a complex cognitive activity (Al Badi, 2015). Firstly, students need to navigate the literature, read previous studies, and understand the ideas on the topic being discussed. Then, they need to synthesize their own ideas and write them in their own words and connect and cite from the existing literature. As noted by Al Fadda, (2012), reading and evaluating relevant sources, analyzing the diverse notions existed, and synthesizing them into authentic academic voice are among basic skills needed for success in academic writing. Not only that, but students also need to have other 'technical' writing skills, such as paraphrasing and summarizing (Abdulkareem, 2013), making

outline (Aldabbus & Almansouri, 2022)organizing ideas (Amin Ahmed & Alamin, 2012), and editing (Alsamdani, 2010) to successfully convey their idea into a good piece of writing.

Brennecke (2020) recognizes that academic writing is a challenging task, and it might seem contradictory to students. On one hand, students are asked to search the literature and report it. But they are also required to originally write their paper. Students are needed to bring experts opinion to the paper, but they are demanded to do more than simply reporting. Further, students should learn how to articulate ideas from existing papers, but they need to use their own words when quoting the ideas. Previous studies confirmed that academic writing is perceived difficult by university students worldwide (see (Aldabbus & Almansouri, 2022; AlMarwani, 2020; Chou, 2011; Fadhel, 2019). A study by AlMarwani, (2020) uncovered the challenges of academic writing which sources from three categories: source managing skills, academic writing skills, and language skills. Students report difficulties in evaluating references and using them to create new piece of writing. They also experience difficulty to communicate ideas due to poor language skills. Align with this, Vyncke & Wingate, (2012) added that students generally face difficulties in expressing criticality in academic writing. Several factors behind this includes insufficient subject knowledge, uncertainty of the essay writing requirements, and inability to express authorial voice.

AI-Assistive Writing Tools

With the pitfalls of academic writing, artificial intelligence tools emerge and promise to ease the writing process. To date, there have been various AI-assistive writing tools available on the internet. Roe et al., (2023) divided AI-assistive writing tools into Large Language Model (LLM), Machine Translator, Digital Writing Assistance, and Automated Paraphrasing Tools. Large Language Model are AI tools which are trained with enormous amounts of data and then able to generate text when giving prompt or questions (Kasneci et al., 2023). An example of LLM is ChatGPT which is well-known for its ability to answer questions and perform other language related tasks. Machine translator (MT) is another beneficial tool for writing. It has the ability to translate text between different languages, thus facilitate learners to understand articles written in their non-native language. Common MT which is widely used is Google Translate. Then, there is tool like Grammarly which help edit and proofread written text. This tool can check errors in word spelling, sentence structure, and grammatical errors and provide suggestions that can automatically correct the errors. Lastly, automated paraphrasing tool (APT), like QuillBot, can provide instant paraphrase of a given text.

The use of AI-assistive writing tools is proven to be effective to improve writing quality (Fitria, 2021; Marzuki et al., 2023; Nobles & Paganucci, 2015). However, some concerns regarding ethical issues arises with the use of AI in academic writing. For instance, LLM may give inaccurate information, resulting in unreliability of the paper when incorporated into someone's work. In addition, when using LLM to write, it is more likely that someone copy paste the AI-generated text and claim it as his own writing. This act may lead to plagiarism issue as the writer take credit of the generated text. This case can also occur when someone use MT or APT and then use the translated or paraphrased version without properly citing it the original source. Not to mention other negative impacts caused by AI such as threat to creativity loss, over-reliance on AI tools, and other potential for abuse (Bahammam et al., 2023). Therefore, it is imperative to look for ways of utilizing AI tools properly so that it gives more benefits rather than negative impacts.

Methodology

Research Design

This research is a descriptive qualitative study. Descriptive qualitative study is a type of study aims to describe the existing phenomena as accurately as possible (Atmowardoyoy, 2018). In this type of research, the phenomena are already existed, thus the researchers observe and collect the available data to understand and explain the phenomena. The researcher decided to use descriptive design to investigate and understand the phenomenon through getting information from the students involved in the use of AI for academic writing.

Participant

The participants involved in the study were 10 master students majoring in English Education. The participants consisted of 7 female students and 3 male students. All of the participants are engaged in using AI for writing paper assigned by their lecturers in university.

Data Collection

The data was obtained through semi-structured interviews. The researcher interviewed each participant following the exact same interview guideline. The interview was audio recorded and it lasted for around 20-25 minutes for each interviewee. The recording was then transcribed for analysis.

Data Analysis

Thematic analysis was used to analyse the data obtained from the interviewee. Thematic analysis is a method of discovering patterns or themes of qualitative data (Maguire & Delahunt, 2017)In this study, inductive thematic analysis was employed as the researcher is more driven by the data acquired from the interviews itself. The process of thematic analysis comprises six steps: 1) Familiarization with the data, 2) generating initial code, 3) searching for themes, 4) reviewing themes, 5) defining themes, and 6) writing up (Braun & Clarke, 2006).

Results

RQ 1: What common AI tools were used for academic writing?

Seven AI-assistive writing tools were identified for the common tools used by graduate students for academic writing (Table 1).

No	AI tool	Purpose
1	ChatGPT	*Generating ideas, Drafting, Outlining, Reviewing Article,*
2	Quillbot,	*Paraphrasing, Rewriting, Suggesting Word Choice*
3	Grammarly	*Grammar check, Revising*
4	Easy-Peasy AI	*Generating ideas, outlining, analyzing data, grammar check*
5	Rytr AI	*Generating ideas, outlining, analyzing data, grammar check*
6	Humata	*Summarizing articles*
7	DeepL	*Translation*

Table 1. AI writing tools used by graduate students.

The AI tools were used for various stages of academic writing. Generally, AI tools were employed for pre-writing stages like generating ideas, outlining, and reviewing journal articles. Some others were used for editing phase; to paraphrase, check grammar mistakes and revise

the paper. In addition, some AI tools also offer assistance for data analysis and translation. AI tools like DeepL and Humata are used for specific purpose. While other tools like ChatGPT, Rytr AI, and Easy-Peasy AI can be used for multiple purposes.

RQ 2: What are the impacts of AI tools on academic writing?

Two themes arose in relation to the perceived impact of AI tools on academic writing: impact on efficiency and impact on writing quality. For the second theme, four subthemes were identified.

1. Impact on Efficiency

Students expressed that incorporating AI tools for writing significantly decreased the time needed to finish writing paper:

> *"AI saves my time a lot. I believe that AI tools for academic writing creates a more efficient writing process."* (S4)

> *"I think AI just gives me a chance to save my time."* (S2)

> *"It helps me speed up my writing process."* (S1)

One student echoed that AI could shorten the time spent to write due to its multiple abilities to assist in writing. AI can help from the initial process of writing by suggesting ideas on what to write to the final stage of writing: editing and revising:

> *"I think overtime, students may become more efficient in producing written content, as AI tools can help with tasks like grammar correction, formatting, and generating basic ideas."* (S10)

2. Impact on Writing Quality

a. Word Choice

The participants of this study are English as a Foreign Language (EFL) students, and they stated that writing in English can sometimes be a challenging process. As it is not their native language, students countered difficulty like writing complex sentences and using academic words:

> *"I can only write simple sentences and the AI helps me find and use more advanced vocabulary."* (S8)

One of the beneficial features of AI is its ability to generate text with appropriate language and word use to a specific context. EFL students may lack knowledge on suitable words to use in writing. With the help of AI, students can get suggestion on more suitable words to incorporate:

> *"AI suggest me better word choices."* (S1)

> "*I feel like AI make my writing sounds more academic."* (S4)

Consequently, students see improvement in writing quality as AI offers assistance in the selection of vocabulary within their writing.

b. Grammar and Sentence Accuracy

Students reckoned that AI could serve as proofreading tool. This AI tool makes students notice of the error by detecting which sentences contain grammar and sentence mistakes. The tool makes it possible for students to produce error-free writing:

> *"After using AI, the quality of my writing is improving. For example, my grammar accuracy."* (S6)

> *"AI helps me to correct my sentence error."* (S8)

In addition, students highlighted the ease of use of AI proofreading tool (Grammarly). When sentence error is detected, the tool gives suggestion to correct the error. Students can revise the error only by one click, making it effortless to polish their writing:

> *"When I want to revise the mistakes, I don't need to rewrite but just by clicking the recommendation of Grammarly."* (S6)

c. Content Writing

Students articulated that AI help them in initiating the writing process. Students use AI to generate ideas and get general knowledge on the topic that they will work on.

> *"I use AI To help me in finishing my assignment. Usually when I am stuck and don't know what to write for my assignment."* (S3)

> *"I use AI to get a big picture in relation to imagining what to write."* (S6)

> *"I usually use AI to look for some references and wider view about a problem or topic to work on."* (S2)

Seeing from the above comment. It suggests that AI can inform what has been known in the literature about a certain topic. It then assists students to decide what topic or subtopic to include in the paper.

Students also stated that although they already have some initial ideas on what to write, AI allows them to elaborate their ideas and offer different perspectives about the given topic:

> *"AI helps me a lot with enriching my ideas."* (S1)

> *"AI have been helpful in generating ideas and expanding my thinking process. They can suggest related topics or provide alternative perspectives that I may not have considered initially."* (S7)

d. Writing Structure/Organization

Students uttered that AI aids in organizing their ideas. In the beginning of the writing process, AI allows students to create outlines that become the framework for their content:

> *"It helps me improve the quality of my writing, such as getting more organized."* (S10)

> *"AI have assisted in organizing my thoughts by creating outlines and structuring my writing."* (S7)

In fact, AI is likely assists in ordering the content logically. Therefore, students can visualize the structure of their writing even before they begin to write. AI can also help reorganize the ideas so that the writing becomes more structured and coherent.

RQ3: What strategies are employed to preserve academic integrity?

Students deployed several strategies to maintain academic integrity while using AI for academic writing. The strategies comprise evaluating AI suggestions, cross-referencing, Editing AI-generated content to align with personal writing style, and upholding authentic voice in writing.

1. Evaluating AI Suggestions

Prior to using the content produced by AI, students mostly evaluate if the generated text is relevant to what they want to write:

> *"I usually ensure the suggestions made by AI align with the intended meaning I want."* (S1)

> *"Like in using chat GPT for getting the outlines, I have to really consider whether their suggestion already fills my expectation."* (S6)

> *"I read and reread the text generated by AI, If there is something useful and align with my writing context, I can add it to my writing."* (S9)

From the comments, they reflected how students maintain control over the content and carefully assess the AI-generated text so that it conveys the intended message of the students as the author of the paper. Rather than copy-pasting the AI text, students emphasized the need for critically evaluating them to ensure the message are maintained throughout the writing process.

2. Cross-Referencing

Another strategy implemented by the students are fact-checking the information produced by AI tools. It is imperative to make sure that the information included in the paper is accurate, therefore students cross check them:

> *"I also verify the accuracy and reliability of any information provided by AI tools through independent research and cross-referencing."* (S7)

However, a student showed concern related to the accuracy of information generated by AI. She uttered personal experience in using ChatGPT. She asked ChatGPT to provide references along with the generated text. Unfortunately, the references given were fabricated by ChatGPT:

> *"AI generative can offer good answers, but the answer and description provided are not reliable. It does not provide references, even if we ask it to attach the references, they are often fake references. I checked them on google scholar and they do not exist."* (S10)

Knowing that AI may give bogus citations, a citation to non-existed sources or a citation attributed to inaccurate author, it is highly recommended to always double check the information given. It may become a serious threat to the credibility of the paper written with such inaccuracies.

3. Editing AI-Generated Content to Align With Personal Writing Style

Students reported that they edit and paraphrase the AI-generated content prior to including it in their writing:

> *"I edit and proofread the generated text from AI. I make sure the AI generated content blend with my own writing style."* (S3)

Students show effort to rewrite the generated text with their own writing style to avoid plagiarism. Editing the generated text allows students to incorporate it to their work and seems effective to ensure proper citation. Students also point out that rewriting with authors' own word is an attempt to maintain authorship of the work:

> *"When I use QuillBot, even though this AI let me have an instant paraphrasing, I still need to do my proofreading and editing process to make my 'effort' joining the show."* (S2)

A concern was also raised about hard-to-read sentences produced by AI. Therefore, a student said editing is necessary to make writing more readable:

> *"The generated text sometimes offers sophisticated words/hard to read sentences. I revised it with simple words to make my writing easier to read."* (S4)

4. Upholding Authentic Voice in Writing

Students agreed to make AI only as a writing assistance, rather than a substitute of the author. Students reckoned that they are the author of the paper, thus they are responsible to bring their original viewpoints and arguments to their work. AI is merely tool to help enhance and improve the quality of their writing:

> *"I use ChatGPT wisely, only as my writing assistant. The main idea of my writing is originally from my own thought."* (S10)

> *"We have to keep in mind that the main actor is the author, not the 'machine'. So that, at the writing process, the author has a responsibility to keep their authentic voice."* (S2)

> *"Although AI tools help me make my writing better, I should enhance my point of view, understanding, and critical thinking."* (S4)

All in all, students acknowledged that they have to use their critical thinking and bring their own voice to take ownership of the scholarly work written. This way, students can ensure the use of AI does not dominate their own effort and violate academic integrity.

Discussion

The findings of this study provide insight into the common AI tools used for academic writing. Students employed numerous AI tools which fall into four categories: automatic text generation, automatic writing evaluation (AWE), automatic writing corrective feedback (AWCF), and AI-enabled machine translation (see Alharbi, 2023). These tools were used for different purposes in different parts of the writing process. Notably, students mainly use AI to assist them in the pre-writing stage. AI was employed to get common knowledge, provide a wide picture of a certain topic, and turn them into an outline for their writing. For this kind of purposes, they utilize automatic text generation like ChatGPT, Rytr AI, and Easy-Peasy AI. Students also used Humata, which basically is another automatic text generation, to summarize and extract information from PDF files. This tool also helps students in the pre-writing stage, specifically to collect important information and citations for the paper. AI-enabled machine translation used by students was DeepL. In addition, students also reported that AI tools were primarily used for revising and editing. AI tools employed are AWE and AWCF like Grammarly, and QuillBot.

Among all AI tools used, ChatGPT emerged as the most popular choice as it can help in doing multiple writing tasks. ChatGPT can be used almost in every stage of writing. For pre-writing, it can provide background information of the topic and generate ideas and outlines. During the writing process, it can assist students to elaborate or develop arguments and provide further explanation. It also provides suggestions on the phrasing level, benefiting those students who have language barrier. Once the draft is finished, student can get feedback on the grammar and sentence errors. ChatGPT is also able to reorganize the paragraph, ensuring that they are logically coherent and effective. ChatGPT is like a real-time writing assistance for students. Nevertheless, this AI is limited in terms of the accuracy of information given. ChatGPT cannot provide direct links to sources. When asked to include references, it often supplies users with fake references. Consequently, students cannot rely only on the generated text for writing. Students need to consult academic search engines, like Google Scholar and Scopus, to find reliable information from reputable journals.

Generally, the use of AI writing tools can also promote learning. Students reported that QuillBot as AWCF not only give paraphrased sentences, but also make them learn better word choices. Similarly, text produced by AI becomes a model which show what appropriate words to incorporate in academic writing. Then, Grammarly as AWE highlights common errors in students writing. Students will be more aware of sentence errors the next time they write. As (Nazari et al., 2021) asserted, feedback received from AWE allows students to inspect sentence errors and incorrect writing patterns. It then results in better ability to detect and revise sentence errors which contribute to higher writing autonomy. Scholars have also suggested educators to use AI writing tools for teaching (Ranalli, John and Woll, Pellet and Myers). They believe that these tools will be of great benefits if educators incorporate them in classroom settings.

Regarding the perceived benefits of AI writing tools, the finding of this study is in line with the work of (Marzuki et al., 2023). AI writing tools is proven to be effective to improve students writing quality, specifically for writing content and organizations. These are mostly supported by automatic text generation features of AI which allow students to brainstorm ideas, enhance the content of the written work, and polish the draft of the paper. Incorporating AI for writing does significantly reduce time spent. This key finding supports previous research by Kacena et al., (2024). In addition, the results of this study also added to the literature that AI tools promote better word choice. Students acknowledge that they learned word selection through the feedback received from AWCF.

Chen (2023) pointed out that the role of AI in scientific writing is inevitable. Thus, AI writing tools should be embraced with a holistic perspective. Rather than banning or boycotting these tools, researchers, educators, and students are expected to know how to exploit the tools to help the writing process. Off course, with understanding on how to utilize them without violating academic integrity. The findings from this study revealed several acceptable strategies for maintaining academic integrity with the use of AI for writing. Students need to evaluate the generated text and critically evaluate its accuracy and relevancy with the message that is trying to be delivered. AI generated text can serve as a model or insights on how to write, giving inspiration to novice writers and helping them overcome the writers' block. Again, students need to maintain authorship of the written work and make sure to pay attention to the principle of honesty, respect, and responsibility throughout the writing process.

Conclusion

The results of this study highlight the significant roles of AI-assistive writing tools in academic writing endeavours. While these tools offer benefits in terms of efficiency and writing quality, their integration requires careful consideration of ethical implications. Therefore, the strategies described in this study can be thoughtful ways to preserve academic integrity when writing with AI tools. The author would like to acknowledge the limitations of this study. This study only includes a small number of samples and may not represent other contexts. Future research may reproduce this research with bigger numbers of participants. Further exploration is also needed to address the acceptable strategies according to educational institutions.

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A Portrait of Digital Literacy of Elementary School Students in Coastal Areas

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Abstract
Digital literacy theory has entered the school curriculum in various forms, both as standalone subjects and across the curriculum. Digital literacy become an essential learning objective in many school systems worldwide because the Internet is now a necessary part of children's daily lives. The school's geographical location has influenced the development of digital literacy in the learning process. A school environment with digital literacy will significantly impact the learning process. This study describes the level of digital literacy of elementary school students in coastal areas in the Purworejo district, Central Java, Indonesia, at the general level and per sub-indexed. This research used a quantitative descriptive approach. The data was collected using Google Forms. The 27-item questionnaire was adapted from the Kata Data Insight Center (KIC) under the Indonesian Ministry of Communication and Information (Kemenkominfo). Data analysis in this study used descriptive statistics. One hundred elementary school students (53 from third and 47 from fourth grades) participated in this study. The results showed that the digital literacy level of elementary school students in coastal areas was in the "medium" category with an index of 3.63 (from a scale of 1 to 5). All digital literacy sub-index shows the medium level with the highest average on technological capabilities (3,81) and the lowest on security (3,50). The sub-index of information and data literacy placed, on average, 3,60, while communication and collaboration on 3,72.

Keywords: Digital Literacy, Elementary School, Coastal Areas

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Introduction

Education can be defined as part of the experience of success or failure in developing unique reasoning capacities (Barrow & Woods, 1992). Values in education do not spontaneously exist objectively but grow from the social relationships in society (Bober, 2008). People's lives today cannot be separated from technology; even technology has revolutionized the world of education (Raja & Nagasubramani, 2018). Digital technology has changed education practice and encouraged education systems worldwide to integrate ICT into learning (Timotheou et al., 2022).

Integrating technology in learning activities requires digital literacy, which is the competence and skills needed to navigate the fragmented and complex information ecosystem (Tinmaz et al., 2022). Digital literacy is the recognition of information learners acquire through the internet, where they are exposed to computer networks and experience cognitive information processing (Park et al., 2020). Definitions of digital literacy abound in the educational literature. However, they all go back to the original definition suggested by Gilster (1997), who defined digital literacy as "the ability to understand and use information in multiple formats from multiple sources when that information is presented through a computer" (Gilster & Watson, 1999). Digital literacy is broader than ICT literacy as it comprises the acquisition and use of knowledge, techniques, attitudes, and personal qualities, as well as the ability to plan, execute, and evaluate digital actions in accomplishing life tasks and reflecting on one's digital literacy development (Sulak et al., 2022).

Digital literacy theory enters the school curriculum in various forms, both as standalone subjects and across the curriculum (Uršej, 2019). Digital competency has been an essential learning objective in many school systems worldwide, given that the Internet is now an essential part of children's daily lives (Botturi, 2021). The school's geographical location also influences the development of digital literacy in the learning process (Romadhianti et al., 2021). Various obstacles that may arise from the influence of geographical location are material constraints, human resources, and social constraints, which then hamper the digital-based learning process. A school environment with digital literacy will significantly impact the learning process (Masyhura & Ramadan, 2021).

This study describes the digital literacy portrait of elementary school students in coastal areas in the Purworejo district, Central Java, Indonesia. This study describes the level of digital literacy of elementary school students in general and the level of digital literacy per sub-index that includes information and data literacy, communication and collaboration, security, and digital skills. The questions in this study include:

Q1=What is the digital literacy level of elementary school students in coastal areas?

Q2=What is the level of digital literacy of elementary school students in each sub-index of information and data literacy, communication and collaboration, security, and digital capability?

Literature Review

Digital literacy, according to Wempen (2015) comes from the words digital and literacy. The word "digital" can be defined as computers' binary digits (1 and 0). When something is digital, it consists of numerical values and usually means computerized or related to electronics. The word "literacy" means communicating in a particular language. Digital literacy is a necessity to keep up with the ever-changing world. Digital literacy uses digital technologies,

communication tools, and networks to access, manage, integrate, evaluate, create, and communicate information (Cetf, 2008).

The rise of the digital society and e-business in recent decades has created a digital ecosystem (Grefen, 2021). Information and communication technology (ICT) supported by the Internet has impacted progress and growth in many fields, including education (Reddy et al., 2020). The education sector worldwide has also started integrating digital literacy into the curriculum. Digital literacy for today's students is very important to develop so that students can communicate and express their ideas effectively using digital media (Ray, 2018). Achieving minimum proficiency in digital literacy by the world's population is one of the UN Sustainable Development Goals (Laanpere, 2019).

The international framework "21st Century Competencies" emphasizes the importance of digital competencies as a pivot to improve other competencies (Martínez-Bravo et al., 2022). To develop digital literacy, several important elements must be considered, including (1) Understanding the culture associated with the diverse contexts in which users of the digital world operate; (2) Cognitive, or the capacity for cognitive capacity when evaluating the content; (3) Constructive communication, specifically awareness of networking and communication performance in the digital era, confidence to act responsibly, creativity, critical thinking about content, and social responsibility (Chung & Yoo, 2021).

Although today's students are considered digital natives, they do not yet possess the digital literacy needed to become competent and productive members of the digital society (Erwin & Mohammed, 2022). Low levels of digital literacy can be a major barrier to improving internet user information (Ali & Qazi, 2022). For teachers, the learning process should always involve digital devices because learning with digital devices can improve students' digital literacy skills (Perdana et al., 2019) . The digital literacy-based learning process must be re-integrated into the current curriculum for policymakers.

The current implementation of digital literacy in elementary schools still needs to be improved (Masyhura & Ramadan, 2021). In addition, the buzz about digital literacy in the school environment still needs to be improved, so implementing digital literacy is only limited to understanding. Obstacles experienced include students needing help understanding the material and limited internet quota. In implementing learning, elementary school students still consider teachers as the only source of information (Kailani et al., 2021). Therefore, there is a need for collaboration between teachers, principals, and parents in integrating digital literacy into learning.

Indonesia is one of the countries with the largest number of internet users in the world, and the second largest internet users in Indonesia are elementary school-age students (Wulandari & Fajrin, 2022). On average, they spend five hours a day surfing the web. However, students of primary education age in Indonesia use the internet more often to play online games and open social media than to learn. It is a critical educational challenge, namely children's literacy for digital culture and digital citizenship (Vélez & Zuazua, 2017). Children's general use of ICT today has also expanded the context of interpersonal relationships.

Based on data from the Indonesian Internet Providers Association (APJII), the number of Internet users in Indonesia in 2022 reached 77.02%. This data shows that as many as 210 million Indonesians have access to digital media. The digital literacy index in Indonesia in 2022, released by the Ministry of Communication and Information Technology

(Kemenkominfo) and the Katadata Insight Center (KIC), was at a level of 3.54 points on a scale of 1-5. It means that Indonesian society's digital literacy level is at a moderate level. Digital literacy in Indonesia has been interpreted as the ability to understand and use information from various digital sources, which is related to literacy and the process of thinking and evaluating information from various digital sources. However, various issues are related to this, such as hoaxes, privacy violations, cyberbullying, violent content, and pornography (Nasionalita & Nugroho, 2020).

The digital literacy gap still exists in Indonesia, which is caused by several factors, namely geographical factors, skills and education, government policies, and economic and cultural systems (Marini et al., 2020). The research results show inequality between the younger and older generations in digital literacy competencies in Medan City (Sitepu & Rajagukguk, 2022). This imbalance occurs because of age differences and the culture and technology used in each era. To increase the understanding of digital literacy for the community or parents, one way that can be done is to carry out digital literacy training. The goal is that parents can control and supervise children using digital (Munir et al., 2022).

Based on research conducted on students in coastal areas, character education carried out in schools, homes, and community environments has made students friendly, hardworking, caring for parents, independent, and disciplined (Manaf et al., 2020). These values and characters are formed slowly but through a long process with challenging environmental conditions in coastal areas. The role of the family is very important in transmitting digital literacy, especially for children under the age of 12, because children at that age do not yet have adequate digital skills (Mubarok, 2019). In this era of digitalization, character education through digital literacy can be a strategy to create a capable generation.

Method

This research uses a quantitative descriptive approach with a survey method. Data analysis in this study used descriptive statistics. Descriptive statistics is a branch of statistics that provides recommendations on summarizing research data clearly and simply in tables, figures, charts, or graphs (Rendón-Macías et al., 2016). This study describes the digital literacy condition of elementary school students in coastal areas in Purworejo Regency, Central Java, Indonesia. Furthermore, the survey method or research takes a sample from one population and uses a questionnaire or questionnaire as a data collection tool. Researchers collected data using a questionnaire through Google Forms. The population in this study were 3rd and 4th-grade students from 10 public schools located in coastal areas. The sampling technique used purposive sampling with a total of 100 students. Furthermore, the instrument used to collect data in this study was modified from the digital literacy framework from Unesco (Law et al., 2018).

Respondents

Respondents for this study were 100 primary school students in coastal areas in the southern region of Purworejo Regency, Central Java, broken down by class, age, and gender characteristics, as shown in the table below.

Characteristics	Total number of respondents
Class	
III	53
IV	47
Age	
8	8
9	46
10	43
11	2
12	1
Gender	
Boys	57
Girls	43

Table 1: Respondent Characteristics

Instrument

The instrument used to measure the digital literacy of elementary school students in this study is a questionnaire adopted from the Kata Data Insight Center (KIC), which refers to the Global Framework for Digital Literacy (Law et al., 2018). This instrument was used to measure digital literacy in Indonesia in 2020. A total of 28 items were presented with Google Forms, and students were asked to select one of the answers on a scale of one to five, where one means strongly disagree, two means disagree, three is neutral, four agree, and five strongly agree. The 28 questions are outlined in the table below.

No.	Questions
	Sub-index 1: Information and Data Literacy
1	I can search and access information data and content in digital media as needed.
2	I can filter data, information, and content according to my needs in digital media.
3	I can direct/organize the search for data, information, and content according to my needs in digital media.
4	I can save data, information, and content in digital media
5	I am used to discovering whether the information I find on a website is true or false.
6	I am accustomed to finding out who the author of information is to find out their track record/credibility.
7	I am used to comparing different sources of information to decide if the information is correct.
8	When I talk to someone I meet online, I know how to check if their identity is confirmed.
	Sub-index 2: Communication and Collaboration
9	I can interact through various digital technology communication devices.
10	I can share data and information with others through appropriate digital technologies.
11	I always consider and adapt my communication to the person/people I am addressing.
12	I always consider and realize my friends' cultural, religious, and age diversity on social media when sharing messages/information.
13	I diversely write my opinions using polite language.
14	I am prepared for the consequence that what I write on the internet can be accessed by many people.
15	I always include/ask permission from the work's creator, whether it is writing, design, photo, or image.
16	I do not spread information that contains hate speech, hoaxes, and slander.
	Sub-index 3: Security
17	I can control who can see my posts (my timeline) on my social media accounts.
18	I know how to "report abuse" on social networks if posts contain harmful content or harm me.

No.	Questions
19	I can turn off the option to show my geographical position / GPS (e.g., on Facebook, mobile application)
20	I do not post personal data on social media
21	I use apps/software to find and remove viruses on my phone/computer
22	I can distinguish emails that contain spam/viruses/malware and those that do not
23	I am accustomed to creating secure passwords with a combination of numbers, letters, and punctuation marks
24	I back up or save data in several places, not just one
	Sub-index 4: Technological Capability
25	I can connect my device to a Wi-Fi network
26	I can download files/applications from the internet
27	I can upload files to the internet
28	I can install programs/applications on my device

Table 2: Digital Literacy Questionnaire

Before being distributed to the field, researchers tested the validity of the digital literacy questionnaire by distributing questionnaires via Google form to 30 respondents. After obtaining the answers, the item validity was analyzed using the product moment formula. The results of the validity test of the 28 items are shown in the table below.

Item Number	r-count	r-table	Validity
1	0.482	0.361	Valid
2	0.509	0.361	Valid
3	0.625	0.361	Valid
4	0.562	0.361	Valid
5	0.553	0.361	Valid
6	0.772	0.361	Valid
7	0.592	0.361	Valid
8	0.571	0.361	Valid
9	0.707	0.361	Valid
10	0.584	0.361	Valid
11	0.559	0.361	Valid
12	0.557	0.361	Valid
13	0.715	0.361	Valid
14	0.763	0.361	Valid
15	0.663	0.361	Valid
16	0.264	0.361	Not Valid
17	0.490	0.361	Valid
18	0.609	0.361	Valid
19	0.647	0.361	Valid
20	0.539	0.361	Valid
21	0.713	0.361	Valid
22	0.655	0.361	Valid
23	0.594	0.361	Valid
24	0.836	0.361	Valid
25	0.469	0.361	Valid
26	0.548	0.361	Valid
27	0.690	0.361	Valid
28	0.559	0.361	Valid

Table 3: Validity of the Digital Literacy Questionnaire

The basis for decision-making used to determine the items' validity is based on the value of r count and r table. If the calculated r value (Pearson Correlation) is greater than the r table value, it can be concluded that the item meets the validity criteria. Therefore, in the digital literacy questionnaire distributed to 100 respondents, item number 16 was not used, so the total number of items became 27. In addition to the validity test, a reliability test was also carried out with a benchmark. The questionnaire was declared reliable or consistent if the Cronbach's Alpha value> 0.60. Based on the reliability test on 28 items, the Cronbach's Alpha value is 0.936, meaning the digital literacy questionnaire is reliable.

Findings

Digital Literacy Levels of Elementary School Students in Coastal Areas

Based on a survey conducted using a questionnaire on 100 grade III and grade IV students from 10 schools in coastal areas, an average digital literacy index of 3.63 (from a scale of 1 to 5) was obtained, which means that the level of digital literacy is in the moderate category. In general, the level of digital literacy of students in coastal areas can be seen in Figure 1 below.

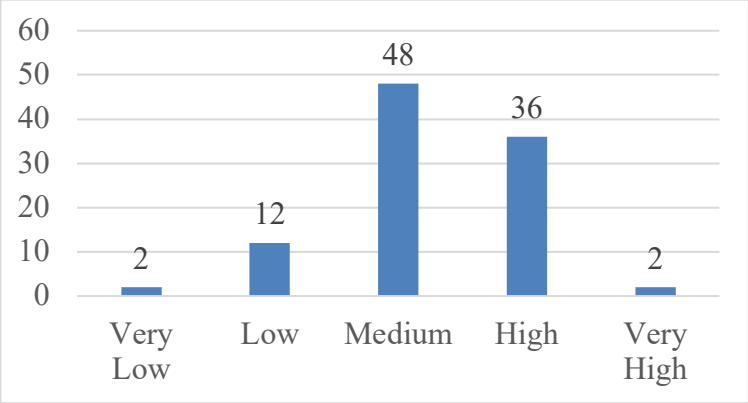


Figure 1: Digital Literacy of Elementary School Students

From the digital literacy diagram, it can be seen that out of a total of 100 students, there are two students in the very low category, 12 students in the low category, 48 students in the medium category, 36 students in the high category, and two students in the very high category.

The Digital Literacy Level of Elementary School Students per Sub-index

This digital literacy survey was also conducted on four sub-indices: information and data literacy, communication and collaboration, security, and technological capabilities. The level of students' digital literacy per sub-index can be seen in Figure 2 below.

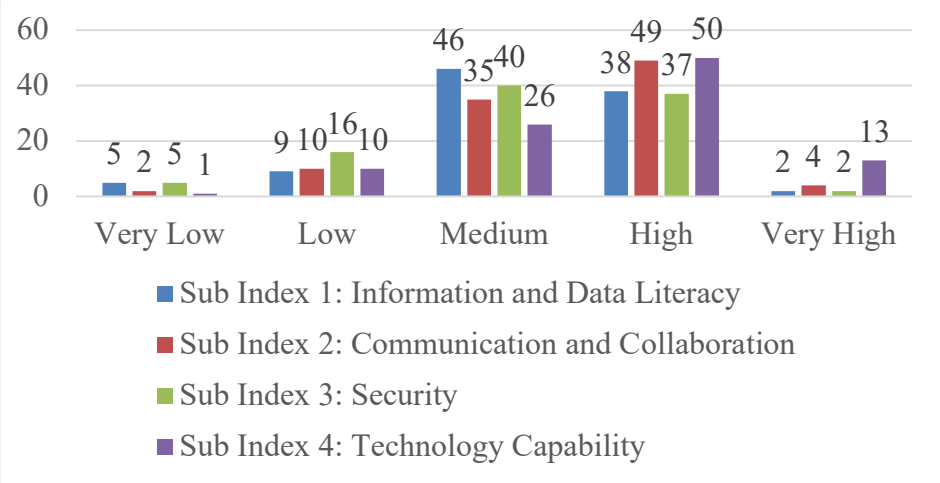


Figure 2: Digital Literacy of Elementary School Students per Sub-index

In sub-index 1 (information index and data literacy), five students were in the very low category, nine in the low category, 46 in the medium category, 38 in the high category, and 2 in the very high category. In sub-index 2 (communication and collaboration), there are two students in the very low category, ten students in the low category, 35 in the medium category, 49 in the high category, and 4 in the very high category. Sub-index 3 (security) places five students in the very low category, 16 in the low category, 40 in the medium category, 37 in the high category, and 2 in the very high category. Furthermore, in sub-index 4 (technological capability), the measurement results show only one student in the very low category, 10 in the low category, 26 in the medium category, 50 in the high category, and 13 in the very high category.

Discussion

Based on a survey conducted from March to April 2023 among 100 primary school students in coastal areas, the students' digital literacy index was 3.63 (on a scale of 1 to 5), meaning that the digital literacy level is in the medium category. The digital literacy index is 0.09 points higher than Indonesia's national digital literacy index in 2022. The digital literacy index released by the Ministry of Communication and Information Technology (Kemenkominfo) and the Katadata Insight Center (KIC) is 3.54 points. It means that the Indonesian people's digital literacy level is at a moderate level. The results of the digital literacy survey per sub-index, namely information and data literacy, communication and collaboration, security, and technological capabilities, produce the following averages.

Sub-Index	Average	Category
Information and data literacy	3,60	Medium
Communication and collaboration	3,72	Medium
Security	3,50	Medium
Technological capabilities	3,81	Medium

Table 4: Digital Literacy Average

Based on the table above, the technological capability sub-index shows the highest average with an index of 3.81 in the medium category. Security is the lowest of the four sub-indices, with an average of 3.50 in the moderate category.

Digital safety in elementary school students can concern teachers and parents. Issues related to digital safety, in this case, include problems accessing inappropriate content, inappropriate contact with others online, sharing personal information, lack of understanding of the dangers of the internet, problems related to cyberbullying behavior and digital footprints, and problems related to digital security and privacy (Martin et al., 2022). Some digital safety measures teachers can take include limiting internet use, monitoring student activities, providing education about digital safety, and support from guidance counselors. Teachers must realize that digital literacy is one of the main protective factors in digital safety (Tomczyk, 2020). Therefore, the development of digital literacy has become one of the main challenges schools face today.

Conclusion

Digital literacy of elementary school students in coastal areas is generally in the moderate category. All four sub-indices of digital literacy are in the moderate category. However, out of the four sub-indices of digital literacy, technological capability occupies the highest average, while security occupies the lowest position. Digital safety is very important for teachers and parents to pay attention to. To improve digital safety, teachers and parents can take steps to limit internet use, monitor student activities, provide education about digital safety, and find counselors for children. The limitation of this study is the small sample size, which is only 100 students from one district located in the southern coastal area of Central Java province. The sample size may not represent the total population of elementary school students in coastal areas in Indonesia.

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Unlocking Metacognitive Potential: A Journey Through the Minds of Androgynous High School Students in Statistical Problem Solving

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Abstract
Metacognitive activities are essential to academic achievement and cognitive development during adolescence. This study aims to investigate the metacognitive activities of androgynous students in solving statistics problems. To deeply uncover the complex interaction between androgynous identity and metacognitive strategies, a qualitative approach with semi-structured in-depth interviews based on a statistics problem-solving task adopted from the Metacognition Awareness Inventory was used. The participants were three high school students with moderate mathematical ability, consisting of one androgynous student and two non-androgynous students as a comparison. The findings of this study revealed a spectrum of metacognitive strategies used by androgynous students. Androgynous students demonstrated cognitive flexibility, smoothly transitioning between analytical and intuitive approaches based on problem characteristics. All participants were empowered with metacognitive knowledge and metacognitive regulation to monitor and adapt cognitive processes during problem-solving, but androgynous students had greater knowledge control. In addition, androgynous students demonstrated goal-oriented planning in breaking down the complexity of statistical problems and aligning metacognitive strategies with goals. This study underscores the influence of gender identity on metacognition. Androgynous students, free from traditional gender-related cognitive stereotypes, utilize a broader range of metacognitive approaches than non-androgynous students. The findings provide valuable insights into the metacognitive potential of androgynous individuals and the complex dynamics between gender identity and cognitive processes in the context of problem-solving. This study contributes to the broader discourse on metacognition, gender, and cognitive development, with implications for educators, policymakers, and researchers who strive to foster inclusive and effective educational environments.

Keywords: Metacognition, Androgynous, High School Student, Statistical Problem-Solving

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Introduction

Metacognition, the ability to think about one's thought processes, has long been considered a fundamental cognitive skill essential for successful learning and problem-solving (Flavell, 1979). The developmental trajectory of metacognition, particularly during the formative years of adolescence, remains the subject of intense scientific research, which yields insights into the critical role of metacognition in academic achievement (Baker, 2016; Schneider & Lockl, 2002). Simultaneously, the understanding of gender identity has evolved beyond the traditional binary paradigm, recognizing its malleability and complexity, especially during adolescence (Archer, 2004; Diamond, 2002). Amidst this evolving landscape, the concept of androgyny has emerged, which encompasses individuals who have a gender identity that combines both masculine and feminine traits (Bem, 1974).

The rationale for this research is threefold. First, most Indonesians only recognize the male gender as masculine and the female gender as feminine, and anything outside of these two genders (androgyny) is abnormal or considered deviant (Belinda, 2022; Sihombing & Rakhmad, 2019). Second, androgyny has a higher level of cognitive flexibility on average, with the ability to change viewpoints and approaches quickly, tend to refuse to stick to one way of thinking and remain open to new ideas and concepts (Moshman, 2018). Third, metacognitive skills have a significant influence on students' success in problem-solving (Güner & Erbay, 2021), with the concept of problem-solving triggering students' metacognition (Kim et al., 2013). Interestingly, the intersection between metacognition and androgyny remains relatively uncharted in educational psychology and cognitive development.

As adolescents embark on a critical journey of self-discovery, the interplay between their evolving gender identity and metacognitive processes warrants closer examination. The notion of androgyny, which encompasses a balanced blend of traditionally masculine and feminine traits (Bem, 1974), introduces an exciting dimension to the discourse surrounding cognitive processes and problem-solving abilities. Although much research has been conducted to study middle school students' metacognitive development and gender (Hines & Kritsonis, 2011), little attention has been directed towards understanding how androgynous individuals utilize their unique blend of gender traits to enhance metacognitive strategies in solving mathematical problems, particularly in statistics.

As they encounter academic complexity, such as problem-solving tasks, secondary school students will be at a critical point in their cognitive maturation. Uncovering the metacognitive mechanisms used by androgynous secondary school students in the context of problem-solving is critical to advancing theoretical understanding and informing targeted educational interventions. This research is significant in several ways. First, it contributes to the growing discourse on metacognition and gender by shedding light on how androgynous high school students deal with cognitive challenges. Second, the findings can provide valuable insights for educators and educational policymakers to tailor pedagogical practices that tap into the metacognitive potential of not only feminine and masculine-gendered students but also androgynous students. Moreover, this research aligns with broader efforts to promote inclusivity and diversity in educational settings.

In summary, this research aims to unlock the metacognitive potential within the minds of androgynous high school students. By investigating the complex interplay between gender identity and metacognition, we aim to illuminate the path towards more effective cognitive

development strategies, ultimately enriching the educational experience for these students and advancing our understanding of metacognitive processes during adolescence.

Literature Review

Metacognition, often called "thinking about thinking" (Flavell, 1979), is a multifaceted cognitive skill that includes awareness and regulation of one's cognitive processes. The importance of metacognition in education and cognitive development is well established. Adolescence, characterized by profound cognitive, emotional and social changes, is an essential period in the maturation of metacognitive abilities (Baker, 2016; Schneider & Lockl, 2002). During this stage, individuals acquire the capacity to monitor and regulate their thinking, thereby improving their problem-solving abilities and academic performance (Schraw & Moshman, 1995).

Metacognitive development in adolescence is closely related to the acquisition of self-regulation skills (Schunk & Zimmerman, 2013). Self-regulation involves setting goals, planning strategies to achieve them, monitoring progress, and making necessary adjustments (Zimmerman, 2013). As adolescents navigate the complexities of their academic endeavors, metacognitive strategies such as goal setting, self-assessment, and self-reflection become integral to their learning process (Efklides, 2011). However, this developmental trajectory is unique, with many individual differences. Variability in metacognitive abilities among adolescents can be attributed to cognitive development, motivation, and personality traits (Efklides, 2011). In addition, emerging research suggests that gender identity and expression may also play a role in shaping metacognitive development during adolescence.

Androgyny, a term introduced by Sandra Bem in 1974, challenges the traditional binary classification of gender identity. Androgynous individuals exhibit masculine and feminine traits that transcend conventional gender norms (Bem, 1974). Adolescence is a critical period in exploring and developing one's gender identity, characterized by increased fluidity and openness to diverse gender expressions (Archer, 2004).

The concept of androgyny has opened new avenues for understanding the complexity of gender identity in adolescents. It recognizes that gender is not an immutable binary construct but a dynamic and evolving aspect of individual identity (Gupta et al., 2009). Although previous research has explored various aspects of androgyny, such as its impact on self-esteem and psychological well-being (Spence & Helmreich, 1978), its intersection with metacognition remains relatively uncharted.

The influence of gender on metacognition has become an increasingly interesting topic in educational psychology. While early research showed gender differences in metacognitive behaviour, more recent research has emphasized the complexity of this relationship (Veenman et al., 2006). In particular, gender identity, which includes traditionally defined dimensions of masculinity and femininity, has been investigated as a potential modifier of metacognitive processes. Androgyny, a concept introduced by Bem (1974), characterizes individuals who exhibit a balanced blend of masculine and feminine traits, suggesting that they can employ various cognitive strategies in problem-solving contexts.

Previous research has explored metacognition in secondary school students, often focusing on gender as a variable of interest (Hart et al., 2008). These studies yielded mixed findings. Some studies suggest that females may exhibit higher levels of metacognitive awareness (Efklides et

al., 2018), while other studies have found no significant gender differences (Efklides, 2006). The variability in research results highlights the need for a more nuanced examination of gender-related factors, including statistical problem-solving ability in metacognitive processes among secondary school students.

The concept of androgyny offers a promising avenue to investigate the relationship between gender identity and metacognition. Androgynous individuals, characterized by their ability to draw on traditionally masculine and feminine traits, may have high cognitive flexibility that allows them to adapt their metacognitive strategies to different problem-solving contexts. This adaptability is potentially a unique metacognitive advantage in secondary school students, allowing them to meet challenges with various cognitive tools.

Methodology

Research Design

This research adopted a case study design with a qualitative descriptive approach to understanding the metacognitive processes used by androgynous high school students in statistical problem-solving (Creswell & Poth, 2016).

Participant

A total of 61 students were involved in selecting participants in this study. Participants for this study were drawn from science high schools within the same demographic range of math ability (medium) to ensure equal subjects in terms of math ability. The gender criteria of androgyny as the main subject and non-androgyny (masculine and feminine) as the comparison subject were identified based on the Bem Sex-Role Inventory (see Table 1). A purposive sampling technique was used to select participants who met these criteria to ensure the focus of the study was on androgynous individuals. Based on the math ability test and gender questionnaire, one androgynous student and two non-androgynous students (masculine and feminine) were selected. For the gender of androgynous students, more males than females were taken, while masculine students were taken with male gender and feminine students were taken with female gender (see Table 2).

Table 1. Gender distribution based on BSRI questionnaire results

Gender	Sex		%
	Male	Female	
Androgini	10	8	29.6
Maskulin	19	0	31.1
Feminin	1	23	39.3

Table 2. Participants selected based on TKM and BSRI

Subject	TKM Score	BSRI Score	Gender
S-1	78	$4{,}80_{\bar{M}} > 4{,}76_{\bar{F}} > 3{,}90_{\bar{N}}$	Androgynous student
S-2	77	$5{,}10_{\bar{M}} > 4{,}30_{\bar{F}} < 4{,}70_{\bar{N}}$	Non-androgynous student-1 (Masculine)
S-3	78	$3{,}80_{\bar{M}} < 4{,}98_{\bar{F}} > 4{,}20_{\bar{N}}$	Non-androgynous student-2 (Feminine)

Data Collection Method

The primary data collection method was semi-structured interviews based on a statistical problem-solving task. This approach allows for open-ended questions, allowing participants to articulate their metacognitive experiences and strategies freely (Bogdan & Biklen, 1997). Interview questions were designed according to predetermined indicators from the theoretical framework to elicit narratives of students' statistical problem-solving experiences, metacognitive awareness, and reflections on their androgynous identity about cognitive processes (see Table 3).

Table 3. Metacognitive Activity Indicators

Component	Subcomponent	Indicators
Metacognitive Knowledge	Declarative Knowledge	Explaining the difficulty level of the problem (DK)
	Procedural Knowledge	Explaining the strategy, method, formula or steps that will be used in solving the problem (PK)
	Conditional Knowledge	Explaining the reasons why and when to use a strategy, method, formula or steps in solving problems (CK)
Metacognitive Regulation	Planning	Explaining how to identify known and questionable information (P1) Finding the relationship between the problem and problems that have been solved before (P2) Determining the goal to be achieved (P3) Obtaining strategies, methods, formulas, or problem-solving steps (P4)
	Monitoring	Believing the strategy, method, formula, or steps chosen are correct (M1) Checking the correctness of the chosen strategy, method, formula, or steps (M2) Looking at the problem differently (M3) Checking the suitability between the plan made and the implementation (M4)
	Evaluating	Solving the problem differently. (E1) Checking whether the chosen strategy, method, formula, or steps can be applied to other problems or issues (E2) Assessing the way of thinking and working (E3) Assessing the achievement of goals (E4)

Data Analysis

This study used thematic analysis to identify, code, and analyze recurring themes and patterns in the interview transcripts (Miles et al., 2018). This process will involve coding the first-cycle code and the second-cycle code, followed by the development of themes and sub-themes based on the theoretical framework that has been built in metacognition indicators. Data triangulation was conducted during the interview and observation time to ensure the credibility and validity of the findings (Creswell & Creswell, 2017).

Research Results

Androgynous Student

The results of androgynous students' statistical problem-solving were based on the interview. Androgynous students guessed the value of x by following the known data pattern, so it is assumed that x = 80. A test is done to ensure it is correct by calculating the mean value, which must be the same as the median. Because the mean and median results are equal to 50, it is concluded that the value of x is 80. Furthermore, in the variance value claim, androgynous students use the variance formula for population data. There was a monitoring activity of the formula used, which initially used the divisor n, then changed to n-1, but in the end, it returned to n. In claiming the standard deviation value, androgynous students appear to use the formula correctly. However, because the previous variance value claim was wrong, the standard deviation value claim was wrong. Although the final result was wrong, metacognitive knowledge and metacognitive regulation activities appeared at this stage (see Figure 1).

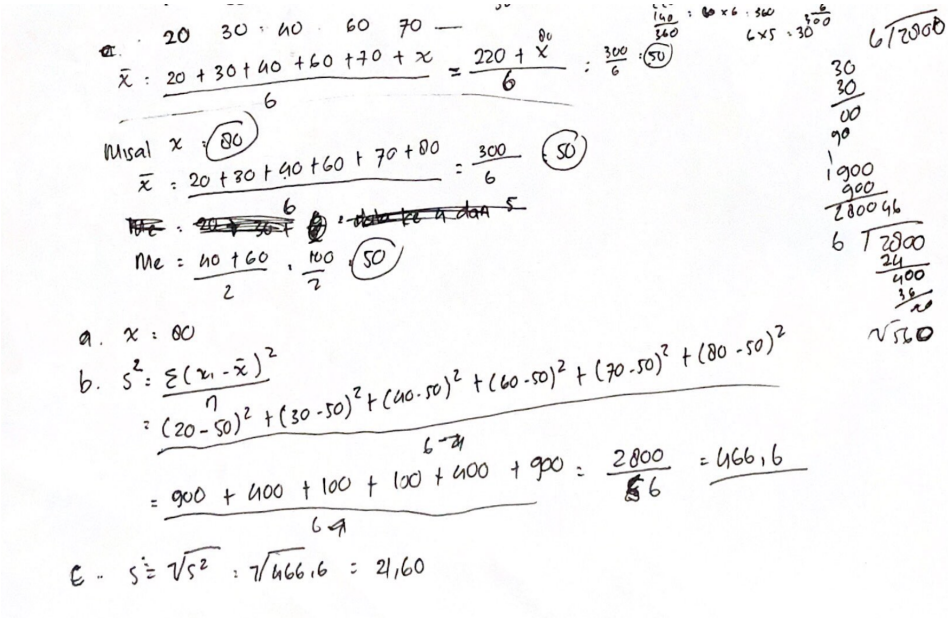


Figure 1: Statistics problem solving results of androgynous students

Since this research is a case study in problem-solving, we analyzed each problem-solving stage by code. When understanding the problem, androgynous students use metacognition knowledge and metacognition regulation at the metacognition knowledge of androgynous students' declarative knowledge that codes with their awareness of the problem's difficulty level and their understanding of the material according to their abilities. On procedural knowledge, the rest of the androgyny realized that the procedures needed were variance and standard deviation. In conditional knowledge, androgynous students realize why to use the mean and median formulas. In metacognition regulation activity at this stage, androgynous students realize the information of coin height data (see Figure 2).

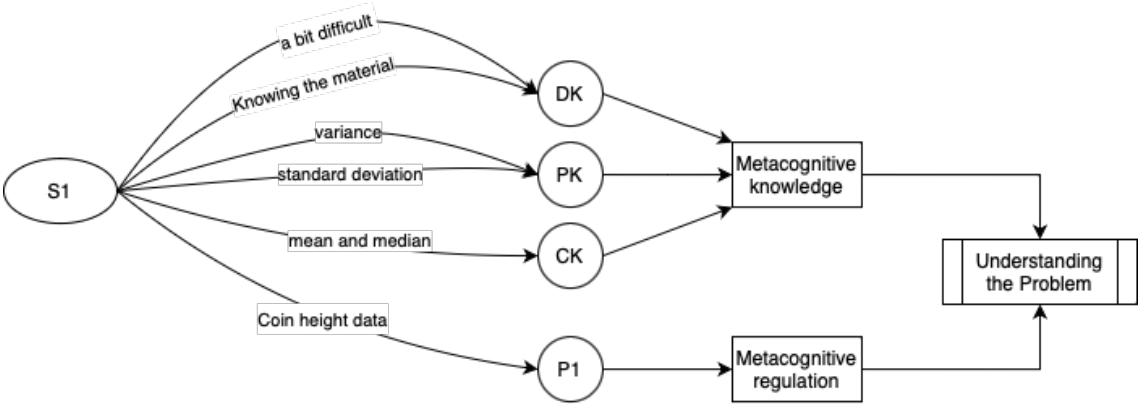


Figure 2: Metacognitive activities of androgynous student in understanding the problems

After the problem-understanding stage, we continued to explore the plans that androgynous students thought of to solve the problem. Metacognitive knowledge was used at this stage. Androgynous students explained their plan to use the variance formula and standard deviation. This is procedural knowledge. Androgynous students also explain why the mean and median formulas are needed in this problem, which is part of conditional knowledge. In addition, metacognitive regulation also plays a role in controlling the plans made. Androgynous students realize that this material has been studied before, and essential information in the problem can be used to answer the three problem questions. The formula and strategy to be used are also explained. This activity is part of the planning indicator. In addition, the planned strategy is adjusted to the requirements of the problem, so the monitoring activity indicator also appears at this stage (see Figure 3).

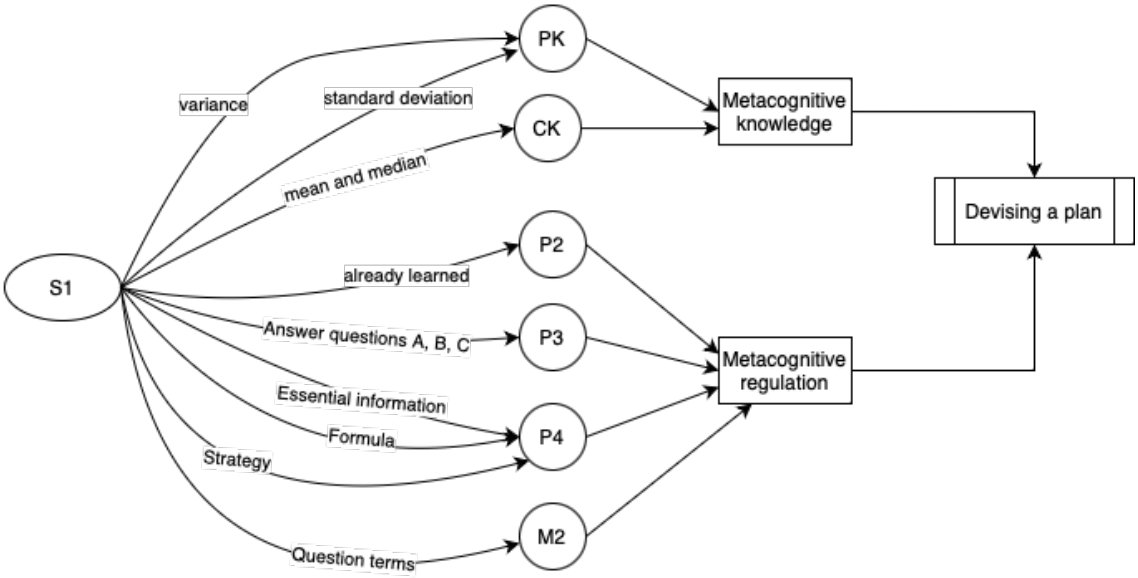


Figure 3: Metacognitive activity of androgynous student in devising a plan

The coding of interview data based on the problem-solving results at the plan implementation stage can be seen in this figure. Androgynous students are seen using all components of metacognitive knowledge when solving problems. Metacognitive regulation is also used. Androgynous students use all sub-indicators in planning (P1, P2, P3, P4). Androgynous students directly monitor their cognitive activities. This can be seen when three monitoring sub-indicators are confirmed during the interview (M1, M2, M4) (see Figure 4).

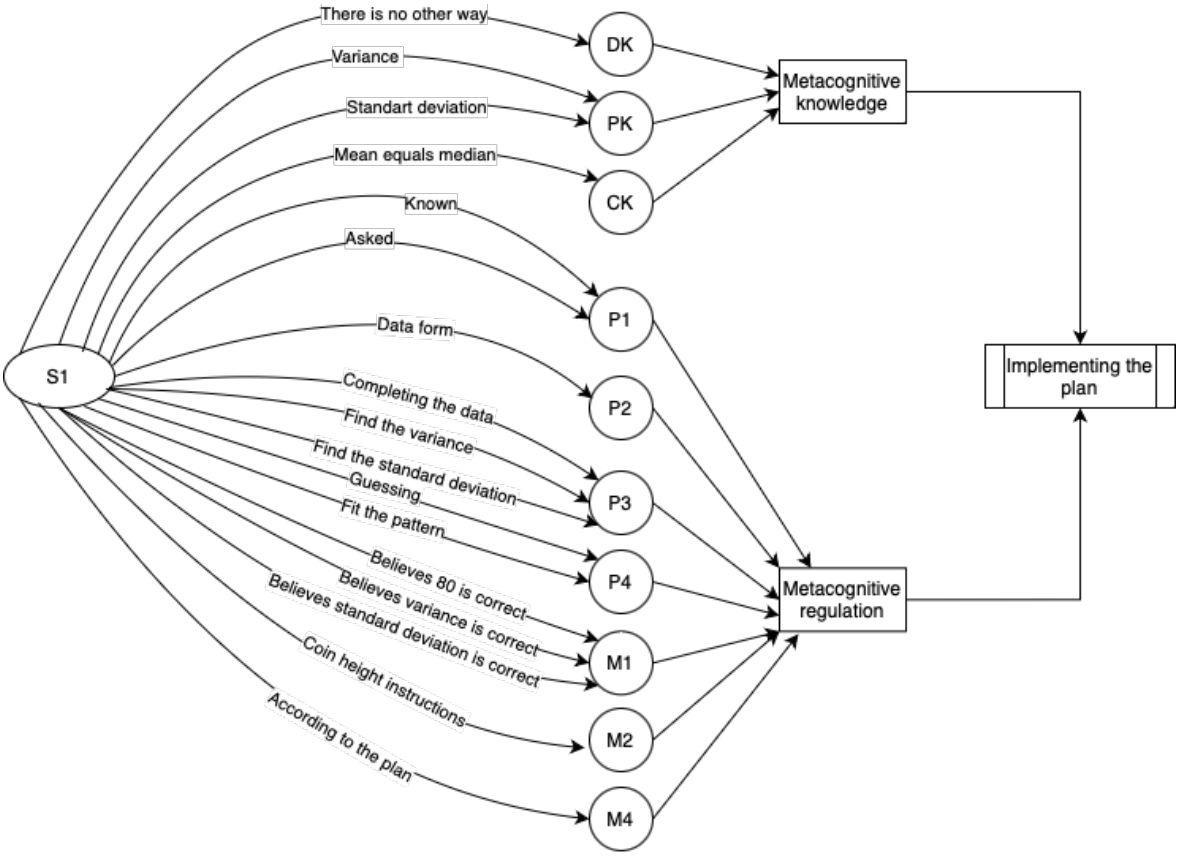


Figure 4: Metacognitive activity of androgynous student in implementing the plan

After solving the problem, androgynous students look back at the results of their work based on interviews; androgynous students realize that the method used is simple. This illustrates declarative knowledge. Androgynous students also check the suitability of the initial plan by looking back at the data and formulas used. This is a monitoring activity of metacognition regulation. The activity of rechecking the mean and median formulas, assessing the results of thinking that are good enough and according to plan, and the goals achieved are also carried out. This activity is part of the evaluation of metacognitive regulation (see Figure 5).

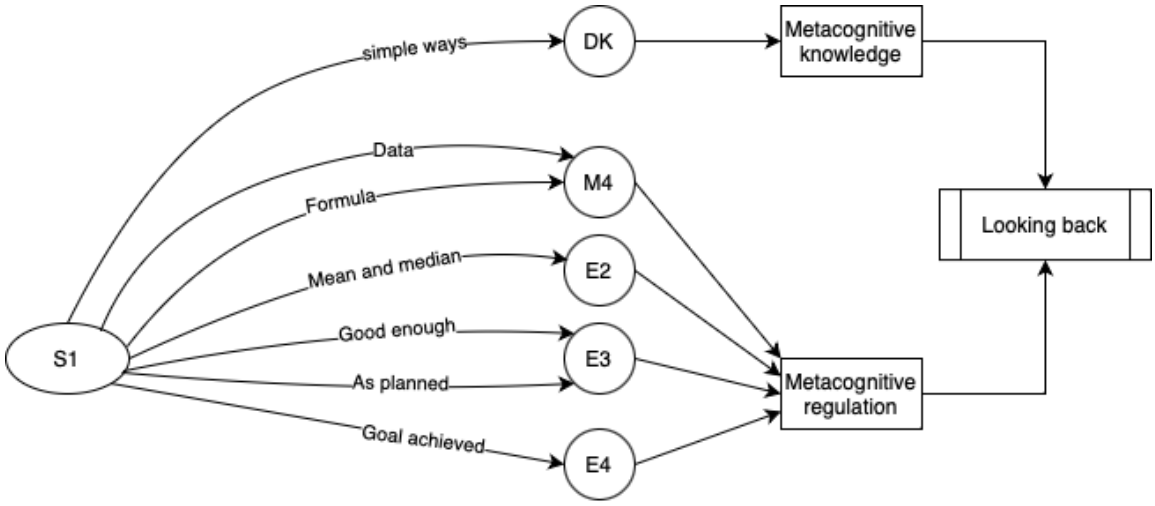


Figure 5: Metacognitive activity of androgynous student in looking back

As a comparison data of androgynous students' metacognition activities, we also analyzed the activity code of non-androgynous students based on the results of interviews based on the same statistical problem-solving task as the problem given to androgynous students. We present the results of the metacognitive activities of non-androgynous students in the form of a brief scheme to see the differences and similarities. So that the results are obtained as follows.

Non-androgynous Student-1

At the understanding of the problem stage, there was no difference in metacognition activities between androgynous and non-androgynous student-1. Non-androgynous student-1 used their declarative, procedural, and conditional knowledge. To control their cognition and understanding of the problem, non-androgynous student-1 use Planning (P1) (see Figure 6. a). In the devising a planning stage, there is a slight difference in metacognitive regulation; androgynous students use planning (P2), while non-androgynous student-1 do not use it. P2 is about seeing the relationship between the problem and the problem found before (see Figure 6. b).

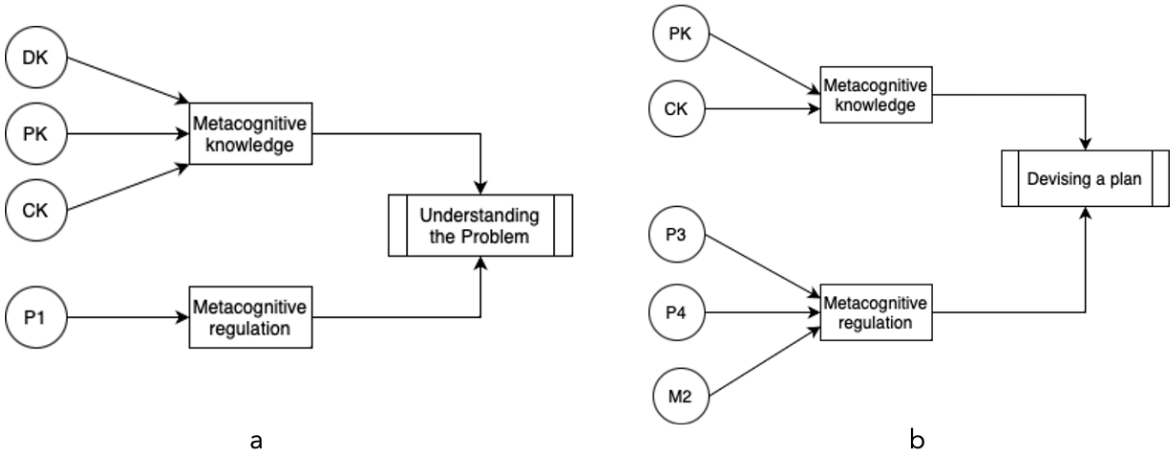


Figure 6: Metacognitive activities of non-androgynous student-1 in understanding the problem and devising a plan

In implementing the plan, there are differences in metacognitive activities in androgynous and non-androgynous student-1. Non-androgynous student-1 do not use their declarative knowledge, while androgynous students use declarative knowledge. This knowledge is an awareness of their problem-solving abilities and weaknesses (see Figure 7. a). Likewise, non-androgynous student-1 do not use planning (P2) when organizing cognition, while androgynous students use planning (P2) when looking at the single data form in the problem. Looking backstage, there is no difference; both use declarative knowledge, monitoring (M4), and evaluation (E2), (E3) and (E4) (see Figure 7. b).

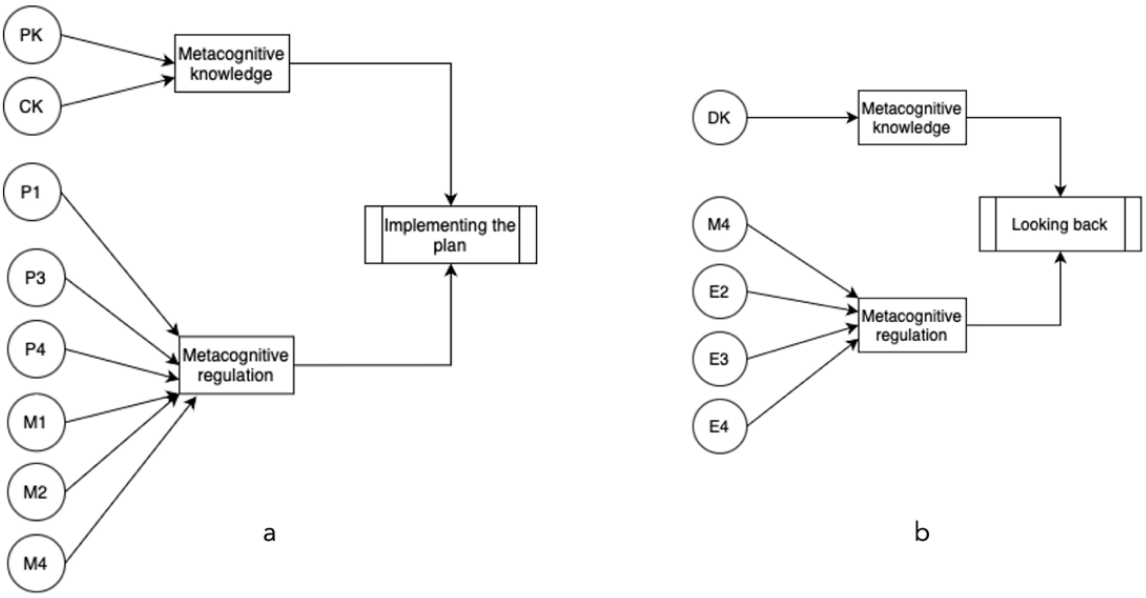


Figure 7: Metacognitive activities of non-androgynous student-1 in implementing the plan and looking back

Non-androgynous Student-2

At the stage of understanding the problem, there are differences in the metacognitive activities of non-androgynous student-2 and androgynous students, especially in metacognitive regulation. Non-androgynous student-2 use planning (P1, P2, P4) and monitoring (M4), while androgynous students only use planning (P1) (see Figure 8. a). At the devising a planning stage, there is a slight difference in metacognitive knowledge; non-androgynous student-2 only use conditional knowledge, while androgynous students use procedural and conditional knowledge (see Figure 8. b).

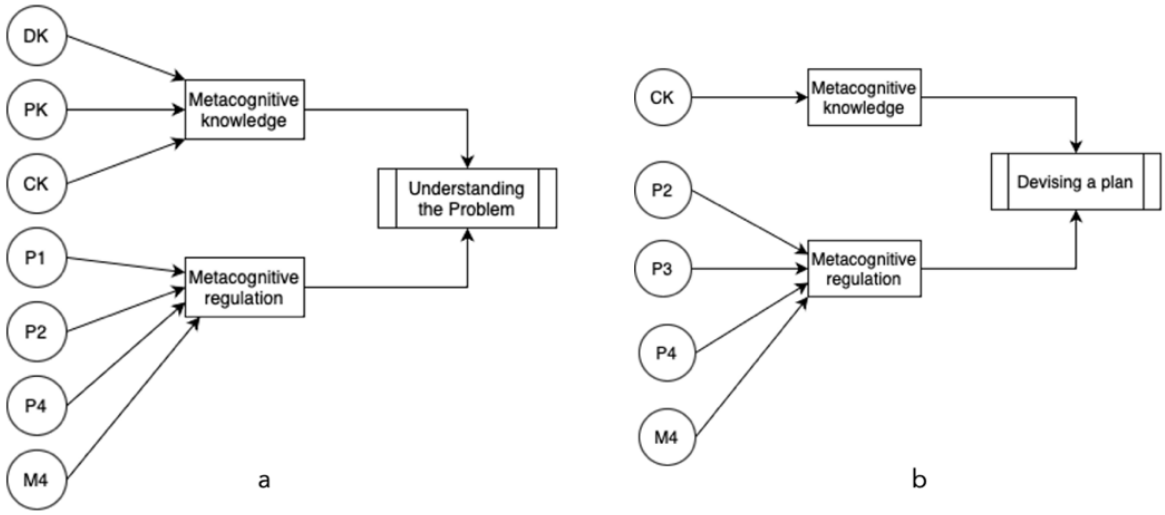


Figure 8: Metacognitive activities of non-androgynous student-2 in understanding the problem and devising a plan

In implementing the plan, there are differences in the metacognitive regulation activities of non-androgynous student-2 and androgynous students. Non-androgynous student-2 do not use planning (P2), while androgynous students use planning (P2). The next difference is that non-

androgynous student-2 use evaluation (E4) while androgynous students do not use evaluation (E4) (see Figure 9. a). Looking backstage, there is no difference. Both use declarative knowledge, monitoring (M4), and evaluation (E2), (E3) and (E4) (see Figure 9. b).

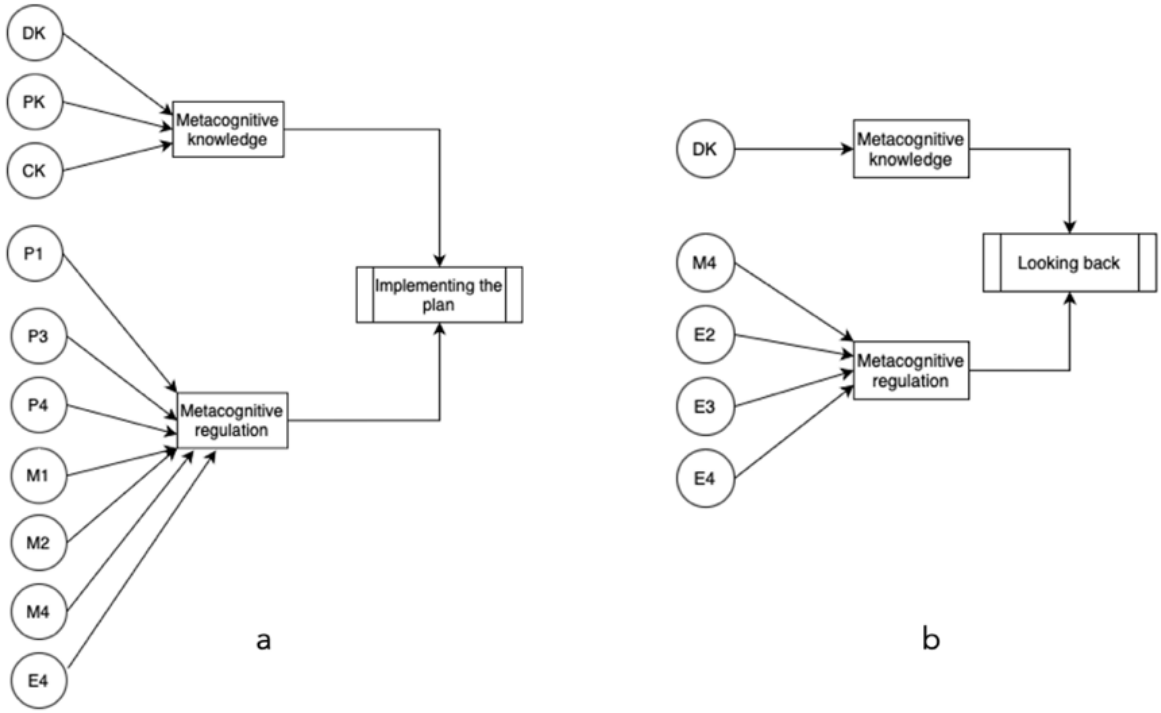


Figure 9: Metacognitive activities of non-androgynous student-2 in implementing the plan and looking back

Discussion

Although previous research has explored metacognitive processes in various contexts, little research specifically focuses on the relationship between androgyny and metacognition. Our findings align with previous research suggesting that metacognitive strategies are essential for academic success, especially in mathematical problem-solving (Schunk & Zimmerman, 2012). In addition, our study extends the existing literature by highlighting the potential influence of androgynous identity on metacognitive processes, shedding light on a previously under-explored area. Androgynous students can exercise reasonable cognitive control when solving math problems (Kark, 2020).

The androgynous students were able to maximize their declarative knowledge, procedural knowledge, and conditional knowledge abilities when understanding the problem, as well as the two non-androgynous students. This metacognitive knowledge seems connected and plays a role in understanding mathematical problems for androgynous and non-androgynous students (Braithwaite & Sprague, 2021).

The planning and monitoring that androgynous students do when solving problems provides a good transition of cognition, such as when planning to use the mean and median formulas to determine the unknown value of x and monitoring the pattern of data available to determine the solution, compared to non-androgynous students who use trial and error and guessing. All studies on gender role identity and resilience agree on the positive effects created by androgynous gender role identity on resilient behavior (Chakraborty & Das, 2013). Research

on cognitive errors shows that non-resilient individuals maintain more cognitive errors. Thus, metacognitive regulation catalyzes resilient behavior (Kazdin, 2000).

The findings of this study have several implications for educators, curriculum developers and policymakers. First, understanding the metacognitive strategies used by androgynous students can inform the design of instructional approaches that meet their unique cognitive needs. By incorporating metacognitive skill-building activities into the curriculum, educators can empower androgynous students to become more effective problem solvers and critical thinkers. By unlocking the metacognitive potential of androgynous students, educators can create more inclusive learning environments that promote academic success and cognitive growth for all students, regardless of their gender identity.

Conclusion

This study highlights the metacognitive potential of androgynous secondary school students in the context of statistical problem-solving. The findings show that androgynous students have cognitive flexibility, smoothly transitioning between analytical and intuitive approaches based on problem characteristics. This is evidenced by metacognitive regulation activities (P3) analyzing data conditions and using guessing strategies (P4). All participants empowered metacognitive knowledge and metacognitive regulation to monitor and adapt cognitive processes during problem-solving, but androgynous students had greater control of metacognitive knowledge. This can be seen at each problem-solving stage; androgynous students use more metacognitive knowledge activities.

Androgynous students also showed goal-oriented planning in deciphering the complexity of statistical problems and aligning metacognitive strategies with goals. This can be seen in the interrelated activities between planning (P3, P4) and monitoring (M1, M2, M4) of metacognitive regulation. Planning is seen when androgynous students explain the data that must be completed to do this task, strategies to complete the data by guessing and seeing data patterns, and monitoring each work result based on the coin height requirement. Androgynous students are free from traditional cognitive stereotypes related to gender. This is evident because androgynous students can use a broader metacognitive approach than non-androgynous, incredibly non-androgynous student-1. In this regard, there are similarities with non-androgynous student-2, but the metacognitive activities of androgynous students in this study have illustrated that gender stereotypes against androgyny do not apply.

The findings of this study underscore the importance of recognizing and accommodating diverse gender identities in educational settings. Understanding the unique cognitive needs of androgynous students, educators can tailor instructional approaches to encourage the development of metacognitive skills. This study contributes to our understanding of metacognition and androgyny by shedding light on the metacognitive strategies used by androgynous high school students.

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Interactive Multimedia Learning: An Instructional Technology Innovation to Improve Elementary School Students' Understanding

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Abstract
This research aimed to 1) develop interactive multimedia learning to improve elementary school students' understanding of The Solar System materials, 2) reveal the feasibility of the developed interactive multimedia learning, 3) reveal the effectiveness of the developed interactive multimedia learning in improving elementary school students' understanding in The Solar System materials. This research and development consisted of planning, design, and development phases. The product test consisted of the product's feasibility tests were alpha test and beta test, and the product's effectiveness test. The data were collected through interviews, questionnaires, rating scales, and tests. The data were analyzed through qualitative descriptive and quantitative techniques. The product of this research is an interactive multimedia learning application for Solar System materials in elementary school. The developed is proved to be highly feasible to improve students' understanding of Solar System materials in terms of media aspects, material aspects, teacher and students' responses. The developed interactive multimedia learning also has a high level of effectiveness in improving students' understanding, gain score of 0.722.

Keywords: Interactive Multimedia Learning, Elementary School Students, Students Understanding, Solar System Materials

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Introduction

Natural Science in elementary school is a subject related to natural knowledge and a process of discovery, so it is not just concepts, facts, and principles. Science learning is learning based on the principles and processes that can foster students' scientific attitudes toward science (Luthfi et al., 2023). Several kinds of material can be studied in science learning, including solar system material. The solar system is one of the materials in natural science contained in the elementary school curriculum (Nugraha & Hidayat, 2019). The solar system is an arrangement of celestial bodies with the sun as its center and the planets, meteoroids, comets, and asteroids that orbit around the sun, and all objects are bound by their gravity (Nuqisari & Sudarmilah, 2019). These objects are the known planets with elliptical orbits, dwarf planets with elliptical orbits, natural satellites, and millions of celestial bodies (meteors, asteroids, and comets) that have been identified (Maura Widyaningsih & Wulandari, 2019). The solar system consists of the sun, planets, satellites, comets, meteors, and asteroids, just one of millions of stars in a group known as galaxies. In this universe, there are thousands of galaxies with enormous distances, each large in size (Ripansyah et al., 2021).

This solar system material is one of the materials that can be considered quite challenging to learn without the help of learning media or supporting materials. However, many students have difficulty understanding and memorizing material about the solar system because each planet possesses many different characteristics. This happens because of the limited learning media provided by the teacher when doing practicum. Many of the solar system learning methods applied today are still manual. In contrast, solar system material is challenging to find in everyday life, so students find it difficult to imagine the existence of planets in the solar system being studied (Nuqisari & Sudarmilah, 2019). In addition, students also find it difficult to distinguish between one planet and another in accordance with the characteristics of each planet.

Many students forgot the material that was taught, both easy and difficult. In addition, students also did not look active in group discussions, and only a few students looked active. The causes of low learning outcomes and student activeness on the solar system materials are many factors, namely the teachers' methods and students' thinking abilities (Safii, 2020). The method used by the teacher is too monotonous, namely only by lecturing. In addition, the teaching aids used are less attractive. This caused students to be less enthusiastic in receiving lessons. Meanwhile, when viewed in terms of student potential, the average student is less active and lazy in science lessons on the solar system material.

From the observations of science learning activities, it is known that in the learning process at SDN Paron 1 in learning science material about the solar system, teachers still use learning methods that have not varied. Teachers have not used a teaching aid or learning media to carry out the classroom learning process. The interaction between teachers and students is still limited to questions and answers because the learning is still teacher-centered and centered on the teaching materials provided by the school and the government. Science learning still tends to be teacher-centered, which does not give more space for students to play an active role. This causes students to be less active in the learning process, and answers from interviews show that students are quickly bored with the learning activities. From the exposure to these observations, it is known that many students still do not explore the material or understand solar system material, especially in science subjects.

Furthermore, interviews with teachers revealed that Natural Sciences is a detailed and complex subject, so it is included in the topics considered difficult by students. The pre-survey results showed that 80% of students stated that science is a complex subject. The results of students' science scores are also reasonably low. About 50% of 6th-grade elementary school students have cognitive knowledge scores below the minimum score criteria 70 for science lessons.

The learning media used in learning science at elementary schools are textbooks from the government and sometimes student worksheets. According to the teacher, the textbook media is insufficient to help students learn and understand solar system material. Learning solar system material also requires a teacher as a guide to understand the complexity of solar system material, even though students only meet with teachers at school. Therefore, students find it challenging to learn solar system material independently if they only rely on textbooks and teacher explanations at school. Thus, according to the teacher, there is a need for other media that reduces students' difficulty in understanding the content of science lessons and can be used independently by students and accompanied by repeated exercises.

Based on the problems expressed, it is necessary to improve the performance of all elements of education that play an active role in the teaching and learning process. Therefore, in an age of increasingly advanced technological developments such as today, in overcoming the problems faced, especially in solar system material, it would be nice if the existing technological developments could be utilized by producing various types of innovations that are interesting and fun, as well as interactive, to make students more active, happier, more interested and more highly motivated in learning, which of course is expected to support and have a positive impact on the learning process carried out (Khatimah et al., 2023).

The needs analysis (pre-survey) results also showed that 85% of students agreed to add other media in learning science, namely interactive multimedia learning. As many as 88% of students agree that there is science learning with multimedia learning on complex solar system material. Therefore, science lesson materials can be packaged in an interactive and exciting multimedia application and user-friendly so that material that is considered difficult will be easier to understand. Through multimedia, students learn faster and have a more robust retention rate.

Based on the background of the problems that have been presented, this study aimed to (1) produce appropriate learning multimedia products to improve student understanding of solar system material in elementary schools, (2) determine the feasibility of learning multimedia to improve student understanding in solar system material in elementary schools (3) determine the effectiveness of learning multimedia to improve student understanding in solar system material in elementary schools.

Conclusion

Result and Discussion

The Planning

The subject matter for this interactive multimedia learning is the solar system. Interactive multimedia learning is developed with PowerPoint. The interactive multimedia learning developed has an attractive appearance and technical media, facilitates independent student learning, and provides exercises that can be done repeatedly.

The Design

Developing initial content based on the results in the planning stage, making material scripts, multimedia learning flowcharts of solar system material, and storyboards.

The Development

Text, image, audio, and video content are prepared. All components that have been designed are combined and made into a screen display using PowerPoint. An example of the title page of the developed interactive multimedia learning can be seen in Figure 1.



Figure 1. Title Page of Multimedia Learning Solar System Material

Alpha Test Results and Revisions

The media expert conducted a product feasibility assessment. Media assessment focuses on interactive multimedia learning aspects, namely parts of program introduction, information presentation, developer identity, assistance, student control, and interactivity. The evaluation results from the media expert on each element can be seen in Table 1.

Table 1. Media Assessment Results Average of Each Aspect

No.	Assessment Aspect	Score	Criteria
1	Program Introduction	3.75	very feasible
2	Information Presentation	3.59	very feasible
3	Developer Identity	4	very feasible
4	Provision of Assistance	4	very feasible
5	Student Control	3.61	very feasible
6	Interactivity	3.5	very feasible
	Mean	3.65	
	Media Quality Criteria by Media Expert	very feasible	

Based on Table 1, the overall results of the Media Expert assessment obtained an average evaluation of 3.65 with the results of the Highly Appropriate criteria. The acquisition of this value indicates that the science interactive multimedia learning as a support for learning solar system material developed has met the requirements for good multimedia according to the

specified assessment aspects and is suitable use for learning by making improvements according to suggestions and comments from media expert.

The improvements and suggestions given by the media expert include the following: placing the next and back buttons close together to facilitate student navigation control, adding an answer key at the end of the question in the evaluation menu, renaming the evaluation menu options to test menu options, and deleting the response to each test item and only providing feedback on the final test assessment.

Material expert assessment is focused on learning aspects and material aspects. The results of the material expert assessment can be seen in Table 2.

Table 2. Material Expert Assessment Results

No	Assessment Aspect	Score
Instructional		
1	Appropriateness of objectives, materials, exercises, and evaluation	4
2	Clarity of target users	4
3	Appropriateness of material delivery strategy	4
4	The attractiveness of the material content	4
Material		
5	Clarity and conciseness of material content	4
6	Correctness and depth of material content	3.5
7	Clarity of examples and accuracy of multimedia elements	3.7
8	Language suitability	4
9	Accuracy of emphasizing important points	4
10	Clarity and suitability of exercise questions and evaluation questions	3.75
Mean		3.84
Multimedia Quality Criteria By Material Expert		Very feasible

Table 2 shows the average assessment given by the material expert is 3.84 on a scale of 4, with the results of the Very Feasible criteria. The acquisition of this value indicates that the interactive multimedia learning developed in terms of learning and material is suitable for use for learning by making improvements according to the suggestions of the material expert. The improvements and suggestions given by the material experts include the following modification of video supporting material directly at the point of discussion, simplification of questions on exercises by the competence of 6th-grade elementary school students as target users, and made according to work instructions.

Then the teacher assessment results can be seen in Table 3.

Table 3. Teacher Assessment Results

No	Assessment Aspect	Score
1	Suitability of objectives with learning indicators	4
2	Suitability of material with essential competencies	4
3	Suitability of exercises and evaluations with the material	4
4	Correctness of material content	4
5	The suitability of the delivery strategy with the characteristics of the material	3
6	The ability to learn multimedia to motivate students	4
7	The ability to learn multimedia to involve students	4
8	Students can understand the presentation of the material	4
9	Appropriateness of using multimedia components	4
10	Accuracy of writing	3
11	The ability of multimedia to increase student understanding	4
12	Learning multimedia helps students learn independently	4
13	The appearance of this multimedia is attractive and suitable for target	4
14	Multimedia already contains navigation that is easy for students	4
15	The accuracy of the instructions for exercises and evaluation question	4
Mean		3.87
Multimedia Quality Criteria by Teacher		very feasible

Based on Table 3, the average result of the teacher's assessment is 3.87 on a scale of 4 with the results of the Very Feasible criteria. This value shows that the teacher responds positively to interactive multimedia learning, which is suitable for learning. The teacher's comments after using science interactive multimedia learning as a support for learning solar system material are that learning science solar system material using learning multimedia helps students master the material studied. Students do not feel bored and are more excited about learning science.

Beta Test Results

In the beta test, this interactive multimedia learning assessment was carried out from the students' responses. Students gave responses regarding the presentation of learning multimedia information and usage. The results of the response or assessment by students can be seen in Table 4.

Table 4. Average Student Assessment Results

No	Assessment Aspect	Mean	Criteria
1.	Ease of multimedia access	4	Very Feasible
2.	Image quality	3.83	Very Feasible
3.	Video quality	4	Very Feasible
4.	Ease of language	3.67	Very Feasible
5.	Attractiveness of display	4	Very Feasible
6.	Readability of letters	3.50	Very Feasible
7.	Color harmony	3.67	Very Feasible
8.	Sound quality	3.83	Very Feasible
9.	Ease of practice and evaluation question	3.5	Very Feasible
10.	Ease of understanding the solar system materials	4	Very Feasible
Mean		3.8	Very Feasible
Multimedia Quality Criteria by Students		Very Feasible	

Based on Table 4, the average of the assessment results from students is 3.8 on a scale of 4 with the results of the Very Feasible criteria. This value shows that students respond well to interactive multimedia learning, which is suitable for use in learning. Students' comments after using science interactive multimedia learning as a support for learning solar system material are that learning science using multimedia is very interesting, the multimedia developed is also attractive, learning the solar system materials is not monotonous, students understand more about solar system material, especially accompanied by exercises that can be done repeatedly.

Effectiveness Test Results

The effectiveness test phase lasted for three face-to-face learning sessions. The first meeting began by giving an initial test (pretest) to determine the initial cognitive abilities of students regarding solar system material. After the pretest was conducted, students were invited to the computer laboratory room to take part in learning using interactive multimedia learning. This process lasted until the third meeting, when the end of the lesson was given a final test (posttest) to determine students' abilities after participating in learning with multimedia. In both stages of the test, students were given 20 questions with different cognitive levels. The statistical calculation results of the average pretest and post-test scores can be seen in Table 5.

Table 5. Mean Score of Pretest and Posttest

	N	Minimum	Maximum	Mean
PRE	20	40.00	80.00	53.25
POST	20	75.00	100.00	87.00

Table 5 shows that the mean pretest score is 53.25, with a lowest score of 40.00 and a highest score of 80.00. The mean posttest score is 87.00, with a lowest score of 75.00 and a highest score of 100.00. Meanwhile, the frequency distribution of pretest and posttest scores can be seen in Figure 2 and Figure 3.

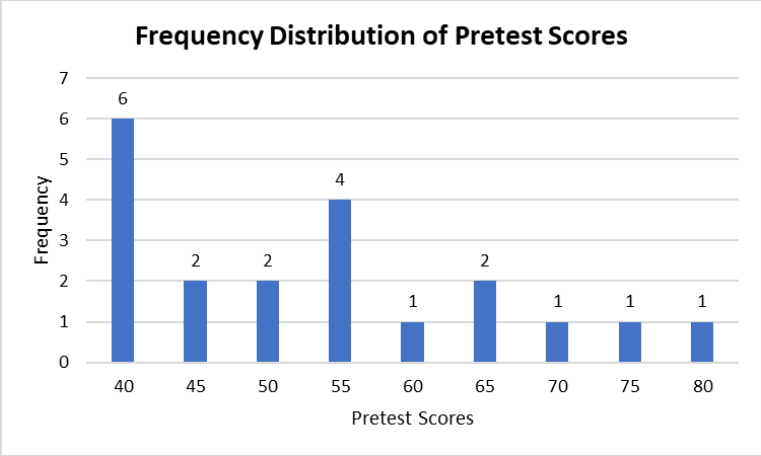


Figure 2. Frequency Distribution of Pretest Scores

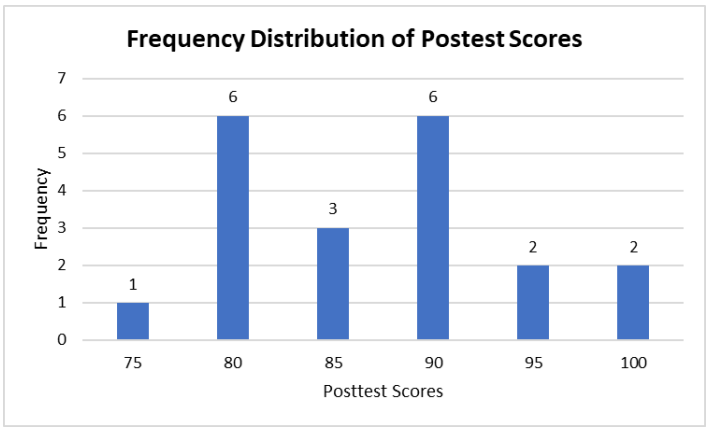


Figure 3. Frequency Distribution of Posttest Scores

In this study, a significance analysis was also carried out using the Paired Sample t-test statistical test. The results of the significance analysis are shown in Table 6.

Table 6. Pretest and Posttest Correlation

		N	Correlation	Sig.
Pair 1	PRE & POST	20	0.784	0.000

In Table 6, a significance value smaller than the significance level (p-value <0.05) is obtained, p-value = 0.00, which means that there is a significant difference between before and after using interactive multimedia learning.

The last stage of the effectiveness test data analysis is to test the effectiveness level of interactive multimedia learning products. Referring to students' average cognitive learning outcomes before and after using interactive multimedia learning, the calculation of effectiveness using the Normalised Gain formula is as follows.

$$g = \frac{Posttest\ Score - Pretest\ Score}{Highest\ Score - Pretest\ Score}$$

$$g = \frac{87.00 - 53.25}{100{,}00 - 53.25}$$

$$g = \frac{33.75}{46.75}$$

$$g = 0.722$$

The N. Gain result obtained 0.722, which is included in the "High" criteria (g> 0.7). The N. Gain shows that there is an increase in students' cognitive learning outcomes scores before using interactive multimedia learning and after using interactive multimedia learning. This indicates that developed science interactive multimedia learning products as support for learning solar system material are highly effective in improving student understanding of solar system material.

Conclusions

The results of this development research were in the form of science interactive multimedia learning applications to support learning solar system material in elementary schools. Interactive multimedia learning facilitates student learning on solar system material independently, compiles using inductive learning methods, involves students in learning with high enough interactivity, contains mechanical exercises accompanied by correct and incorrect answer warnings, and has an attractive appearance and technical media and by the characteristics of grade vi elementary school students. This interactive multimedia learning development model consists of three stages: planning, design, and development, accompanied by attributes always present in each stage, namely standards, ongoing evaluation, and project management.

This interactive multimedia learning product is "Very Feasible" to be used in learning solar system science material for 6th-grade elementary school students based on a review of the assessment results of media aspects, material aspects, teacher responses, and students. The average results of the feasibility assessment obtained by interactive multimedia learning on a scale of 4, from the media aspect of 3.65, from the material aspect of 3.84, teacher response of 3.87, and student responses of 3.80. This interactive multimedia learning was proven effective in improving students' understanding of solar system science material. It was confirmed by an increase in the average achievement of students' cognitive learning outcomes after learning that there was a significant difference in cognitive learning outcomes before and after using multimedia and a "High" level of effectiveness, with a gain value of 0.722.

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Enhancing Global Citizenship Education in Japan's K-12 Curriculum: Exploring Lessons and Opportunities for Growth

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Abstract
This study explores the efficacy of K-12 Global Citizenship Education (GCE) in Japan, evaluating its impact on personal empowerment and elucidating the challenges and prospects associated with the GCE curriculum. Aligned with the United Nations Educational, Scientific, and Cultural Organization (UNESCO) framework, which envisions GCE as a means to instill respect for human rights, social justice, diversity, gender equality, and environmental sustainability while nurturing responsible global citizenship, our research pursues two primary inquiries: (1) To what extent does the GCE curriculum empower students? and (2) How do the duration and consistency of GCE implementation influence empowerment levels? To answer these pivotal questions, we conducted in-depth interviews with educators from selected UNESCO Associated Schools in Japan and graduates of those schools currently attending college in the United States. This interdisciplinary approach yielded insights from six teachers and six students, all proficient in English as native speakers or bilinguals. Employing semi-structured one-on-one interviews conducted via online videoconferencing, we encouraged the conversational exploration of GCE topics while collecting data on specific facets. Our study aspires to enrich comprehension regarding the integration of GCE within the Japanese educational landscape and its potential to foster personal empowerment. The outcomes of this research also hold the potential to inform and shape GCE policies and practices in Japan, offering invaluable insights into the nuances of its implementation and the challenges it may encounter in this unique context.

Keywords: Global Citizenship Education (GCE), UNESCO Associated Schools, Empowerment, K-12 Curriculum, Japanese Education

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Introduction

In Japan today, pressing educational challenges, such as student disengagement, anxiety-driven absenteeism, and a distressing suicide rate among youth, emphasize the critical need for educational empowerment. Powerlessness is a significant health risk factor, and many crises, such as the current state of the education system, underscore the importance of education for empowerment (Bergsma, 2004; Kirk et al., 2015; Leivas, 2018). Concurrently, the global landscape confronts unprecedented challenges amid the pandemic, accentuating the demand for education that empowers individuals to drive positive change.

This study focuses on Global Citizenship Education (GCE), an approach recognized for fostering individual empowerment and leadership in the context of social contribution (Esquivel & Ikeda, 2018; Reimers, 2016). Since the end of the world wars, UNESCO has been implementing various initiatives to promote GCE, including establishing and expanding the Associated Schools Project Network (ASPnet). Japan, boasting the world's largest number of UNESCO Associated Schools (1,120 schools as of 2019), offers a unique setting for examining how GCE is implemented and its impact on personal empowerment (UNESCO, 2019).

While GCE has the potential to empower individuals, little is known about how GCE is implemented in Japanese educational settings and how it contributes to personal empowerment. Considering this, the present study addressed two primary questions:

- To what extent does the GCE curriculum empower K-12 students?
- How does the duration and consistency of GCE curriculum delivery influence empowerment?

In this study, the key terms were defined as follows:

1. Global citizenship education (GCE): It equips learners with values, knowledge, and skills grounded in human rights, social justice, diversity, gender equality, and environmental sustainability, empowering them to be responsible global citizens (UNESCO, 2018).
2. Empowerment: It realizes unbounded potentialities within one's life (Ikeda, 2016).
3. Youths: K-12 students

Literature Review

Numerous educational challenges have garnered significant attention in Japan, including the troubling phenomenon of students abstaining from school due to apathy and anxiety, as reported by the Japanese Ministry of Education, Culture, Sports, Science, and Technology (MEXT) in 2020 (MEXT, 2020). Alarmingly, Japan stands as the sole G7 nation where suicide ranks as the leading cause of death among young people, with school-related issues exacerbating this grave concern, as underscored by a 2019 report from the Japanese Ministry of Health, Labour, and Welfare (Ministry of Health, Labour, and Welfare, 2019).

Furthermore, today's global landscape is marred by the looming specter of pressing global challenges and an unstable international milieu, intensified by the rapid pace of competition amidst the ongoing pandemic. United Nations (UN) Secretary-General Antonio Guterres, in his visionary statement at the Transforming Education Summit convened at the United Nations in September 2022, called for a profound examination of how curricula and pedagogical approaches can empower learners to drive transformative change (Guterres, 2022). In this crisis era, a critical question arises: What form of education can equip young individuals to confront

society's formidable challenges and fundamentally address the present predicament? GCE, championing individual empowerment and leadership for societal contribution, has garnered significant recognition in recent years.

The imperative of curriculum development for GCE is increasingly pronounced, echoed by the UN's Global Education First Initiative and embedded in the Sustainable Development Goals (SDGs). A retrospective look at Japan's history of educational internationalization underscores the contemporary significance of GCE. From the Meiji era (1868–1912) onwards, Japan actively promoted the exchange of its students abroad and embraced Western culture (Ninomiya et al., 2009). Subsequently, in the 1980s, the Japanese government initiated programs such as the "Japan Exchange and Teaching (JET) Program" to bolster foreign language education and international exchange (Ninomiya et al., 2009). Throughout the 20th century, UNESCO's concept of Education for International Understanding gained prominence in Japan (Ninomiya et al., 2009). Since 1953, UNESCO has expanded the Associated Schools Project Network (ASPnet). More recently, Japan has launched government initiatives like the Super Global High School and Super Global University projects. However, as highlighted by global citizenship education expert Makoto Kobayashi of Tamagawa University and other researchers, a cohesive and systematic GCE curriculum remains elusive in Japan (Kobayashi, 2018). Thus, a compelling need arises for the development and promotion of an educational curriculum that can empower young individuals in Japanese schools, fostering their capacity to actively contribute to society with optimism and purpose.

UNESCO Associated School Project Network (ASPnet)

As of March 2023, Japan boasts an impressive count of 1,115 UNESCO Associated Schools, constituting approximately 10% of the global ASPnet membership. Spanning more than 180 countries, the network encompasses a wide spectrum of educational institutions, including preschools, elementary, junior high, and senior high schools, as well as teacher training colleges (UNESCO, 2019). At its core, ASPnet centers its educational mission on three pivotal themes: 1) Education for Sustainable Development (ESD), 2) Global Citizenship Education Development (GCED), and 3) Intercultural Learning (UNESCO, 2019).

These schools are ardently committed to fostering international understanding and peace education through various initiatives, including international student exchanges, teacher training programs, and collaborative projects. In doing so, they champion UNESCO's values of peace, tolerance, and respect for cultural and ethnic diversity. ASPnet operates under the auspices of UNESCO, enjoying support from governments, educational institutions, organizations, and individuals worldwide. Furthermore, participating schools actively engage in international conferences, seminars, and assorted activities to propagate the ideals of peace, tolerance, and cultural diversity. They serve as conduits for the sharing of best practices, resources, and knowledge while also facilitating collaborative educational endeavors.

ASPnet extends an open invitation to primary and secondary schools that share a dedication to UNESCO's objectives and the ASPnet program's vision. Schools seeking membership must submit applications to UNESCO and undergo a rigorous self-assessment process. Once accepted into the network, schools commit to periodic reporting to demonstrate alignment with the network's overarching objectives.

Empowerment constitutes a central tenet and aspiration within global citizenship education. According to Reimers (2016), the core of the global competence cultivated through global

citizenship education resides in the concept of "empowerment"—the belief in individuals' capacity to effect meaningful change and fulfill their leadership roles. This transformative journey requires a continuous curriculum from kindergarten through high school (K-12) to instill the essential skills in each student. Global citizenship education is often intertwined with empowerment, and numerous definitions of "empowerment" emanate from education, psychology, and other disciplines (Bergsma, 2004; Ikeda, 2002, 2012, 2016; Kirk et al., 2015; Zimmerman, 1995).

It is frequently asserted that empowerment must manifest in action, translating into concrete leadership efforts (Bergsma, 2004; Ikeda, 2012, 2016; Kirk et al., 2015). As articulated in Ikeda's proposal titled "For a Sustainable Global Society: Learning for Empowerment and Leadership" (2012), education must not merely kindle empowerment but also drive tangible transformation (p. 10). Ikeda (2016) delineates four interdependent processes within global citizenship education: learning and understanding societal issues, reflection on one's way of life, empowerment through realizing one's potential, and the exercise of transformative leadership within the community.

Courage, according to Ikeda (2012, 2021), represents a cornerstone in ensuring that empowerment transcends rhetoric and translates into purposeful action. He contends that education should imbue individuals with the courage to act and persevere in the face of adversity (Ikeda, 2016). Specifically, Ikeda champions global citizenship education as a means to embolden students with the courage to act and harness the potential of each human being (Ikeda, 2014, 2016).

Ikeda's commitment to global citizenship education emerged from his deep involvement with the Soka movement, nurtured by his association with Josei Toda in the post-World War II era. The Soka movement, a beacon of peace, culture, and education in 20th-century Japan, staunchly opposed exclusionary ethno-religious identity and ultra-nationalism (Goulah, 2020). Tsunesaburo Makiguchi, Toda's mentor and the movement's founder, introduced cosmopolitanism to Japan and championed global citizenship, transcending narrow nationalism (Makiguchi, 1981, p. 15). Josei Toda further honed the concept, responding to global events like the Korean War to foster a sense of shared humanity beyond racial and national divides. He emphasized global citizenship education to nurture individuals capable of challenging national authority based on the dignity of life.

Ikeda carries forward this legacy, aiming to unlock every individual's potential while dismantling barriers of prejudice, collective egoism, and discrimination. His advocacy is evident in significant documents, including his 1996 address at Columbia University Teachers College titled "Thoughts on Education for Global Citizenship" and his 2018 joint statement with Nobel Peace Prize Laureate Adolfo Pérez Esquivel, titled "To the Youth of the World: An Appeal for Resilience and Hope." This commitment is underscored by the forty annual peace proposals submitted to the UN since 1983. Central to Ikeda's global citizenship concept is the courage to engage in dialogue, transcending fear of differences and affirming the inherent goodness in everyone.

The philosophy of global citizenship profoundly shapes the curriculum of educational institutions founded by Ikeda, including Soka University of America, whose mission centers on cultivating a steady stream of global citizens dedicated to a contributive life. The Soka schools, spanning kindergarten to university level, are firmly rooted in Seka's humanistic philosophy, derived from Buddhism. They instill values of respect for the individual, self-

challenge, and personal transformation. These institutions emphasize critical thinking, self-expression, and an appreciation for beauty and nature while nurturing dialogues on the world's most pressing moral and ethical concerns. Through these experiences, students grasp the significance of action and its potential to drive positive change. Furthermore, Soka schools offer diverse extracurricular activities such as music, sports, and service learning, fostering physical and mental well-being, creativity, and social responsibility. Ultimately, these schools serve as living embodiments of Daisaku Ikeda's vision, forging a global community founded on peace, creative coexistence, and mutual understanding. Guided by Ikeda's educational philosophy, they seek to empower individuals as active agents of transformation.

Methodology

Participants

The participants for providing information to our research questions were: (1) teachers at UNESCO Associated Schools designated for GCE—Soka Schools in Tokyo and Osaka, and Colegio Soka do Brasil in Sao Paulo; and (2) students who graduated from Soka Schools in Tokyo and Osaka and are currently second-year students at Soka University of America (SUA) in the United States (U.S.). Six teachers and six students participated (see Tables 1 and 2 for their demographic data). All participants were proficient in English as native speakers or bilinguals.

Table 1: Participants—Teachers

	School Where Teaching or Taught (Years Taught at the School)	Gender	Educational Background
Teacher A	Kansai Soka Elementary, Junior High, and High School (6 years); Tokyo Soka Junior High and High School (10 years)	F	MA TESOL from U.S.
Teacher B	Tokyo Soka High School (4 years)	F	BA in Liberal Arts from U.S. BA in Education from Japan
Teacher C	Kansai Soka Elementary, Junior High, and High School (20 years)	F	MA TESOL from U.S.
Teacher D	Kansai Soka High School (16 years) Kansai Soka Jr. High School (5 years)	M	MA TESOL from U.S.
Teacher E	Brazil Soka High School (1/2 year)	F	MA TESOL from U.S.
Teacher F	Tokyo Soka Jr. High School (3 years) Tokyo Soka High School (3 years) Brazil Soka Schools (5 years)	F	MA TESOL from U.S.

Table 2: Participants—Students

	School(s) Graduated	Gender	Total No. of Years Attended the School(s)
Student A	Kansai Soka High School	F	3
Student B	Kansai Soka High School	M	3
Student C	Kansai Soka High School	M	3
Student D	Kansai Soka Elementary School Kansai Soka Junior High School Kansai Soka High School	F	12
Student E	Tokyo Soka Elementary School Tokyo Soka Junior High School Tokyo Soka High School	M	12
Student F	Tokyo Soka Elementary School Tokyo Soka Junior High School Tokyo Soka High School	M	12

Data Collection Procedures

Our data collection process involved semi-structured one-on-one interviews conducted via online videoconferencing—Zoom. This approach facilitated a conversational exploration of GCE topics while ensuring the collection of precise data on relevant subjects. Each interview was audio recorded, transcribed, and analyzed through thematic analysis.

For our interviews, we engaged with participants, posing a series of interview questions related to GCE. Teachers were invited to share insights on the GCE curriculum, offering their perspectives on its potential and challenges. In contrast, students provided valuable information on how the GCE curriculum influenced their personal empowerment.

Our data collection process commenced after receiving Institutional Review Board (IRB) approval in December 2022, with interviews conducted throughout January and February 2023. Each interview spanned approximately 40 to 60 minutes and was recorded using Zoom's recording function. In cases where a participant declined to be recorded, detailed notes were taken. All interviews were conducted in English. Our data collection efforts encompassed audio recordings (complemented by supplementary notes) and the subsequent transcription of each interview.

Data Analysis

We conducted a thematic analysis of the data obtained from interviews. This involved reading through the transcripts of the interviews, coding and identifying key themes, and writing up a detailed description of the findings. We then used the themes to interpret the data and draw conclusions from the results.

Findings

GCE's Contribution to Student Empowerment and Leadership

All participants, including both students and teachers, expressed strong positive responses to Research Question 1, which sought to assess the extent to which the GCE curriculum contributes to student empowerment and leadership. Their insights revealed various avenues through which GCE fosters empowerment:

- Curriculum impact: GCE instilled confidence in students that they could contribute meaningfully to addressing societal challenges. It expanded their knowledge base and awareness and bolstered their proficiency in skills like public speaking.
- Environmental factors: Beyond the curriculum, participants acknowledged the significance of the learning environment. Interactions with passionate teachers and their role models, as well as engagement with classmates, played pivotal roles in empowerment.
- Student leadership within the realm of GCE was also evident through a range of initiatives.
- Involvement in school events: Students took the initiative in organizing school events, donation campaigns, and exhibitions addressing social issues.
- Public speaking: GCE gave students the confidence to speak before large audiences.
- Knowledge confidence: Students felt more self-assured in their understanding of global issues.
- Influence of guest speakers: Interactions with guest speakers were cited as particularly empowering.

In addition to these curricular elements and the supportive role of teachers, friendships, and camaraderie among students were highlighted as essential environmental factors that bolstered empowerment. These relationships fostered a warm atmosphere, encouraging students who may have been reserved to open up.

Furthermore, participants recognized that GCE extends beyond empowerment, contributing significantly to student leadership:

- Initiatives and campaigns: Students initiated donation campaigns, created exhibits to address environmental concerns, and organized school events, including public speaking opportunities.
- Projects beyond school: Students actively communicated their GCE knowledge to the wider community.
- Long-term impact: While some effects may not be immediately apparent, participants acknowledged that GCE could shape students' future choices, both in terms of their education and careers.

Notably, participants identified various factors that contribute to empowerment and leadership in the broader school experience, extending beyond the elements covered in the GCE curriculum:

- Dialogue-friendly environment: Opportunities for open dialogue and discussion nurtured empowerment by allowing students to share concerns and goals.
- Extracurricular activities: Engagement in extracurricular activities, such as the school's open campus events, bolstered students' confidence and interpersonal skills.

- Leadership opportunities: School events provided platforms for students to take leadership roles within the community.
- Teacher role models: Positive examples set by caring and supportive teachers had a significant impact on students' leadership and behavior.

Overall, participants identified diverse elements in the general school experience that contribute to empowerment and leadership, which may not necessarily be covered in the GCE curriculum. These multifaceted factors collectively shape students' growth, self-assurance, and leadership capabilities within and beyond the classroom.

Duration and Consistency of GCE Influencing Empowerment

Participants provided diverse perspectives on the relationship between the length of the GCE curriculum and the degree of empowerment and leadership it fosters: five of the 12 participants were positive, four were ambivalent, one was negative, and two had no direct response. A summary of responses is provided in Table 3.

Table 3: Summary of Responses to RQ2

Affirmative	Ambivalent	Negative	No mention
Student B	Student A	Student C	Teacher E
Student D	Student E		Teacher F
Teacher B	Student F		
Teacher C	Teacher A		
Teacher D			

Those who believed in a connection between curriculum length and empowerment highlighted the following impacts of a longer curriculum:

- Increased commitment to caring for and respecting others (Teachers B, C, and D).
- Enhanced student activity and engagement (Student D).
- Deeper personal growth and development (Student B).

However, ambivalent participants emphasized individual factors such as determination and mindset as key influencers of empowerment and leadership (Students E and F, Teacher A). They suggested that these aspects were more critical than the curriculum's length and that the true extent of empowerment might only become evident in the future (Student A).

Student C, who denied a direct relationship between curriculum length and empowerment, also stressed the importance of students' commitment and highlighted the timing of empowerment as more significant than the curriculum's duration. Additionally, Student B, who believed in the connection, noted the relevance of the location where GCE occurs, emphasizing the value of addressing real-world problems in the educational setting.

Regarding the importance of consistency in the K-12 GCE curriculum, all participants expressed its significance. However, they also identified challenges in achieving this consistency:

- Some schools, like Tokyo Soka Schools and Kansai Soka Schools, are actively working to address curriculum consistency by organizing meetings among elementary, middle, and high school teachers to share insights and practices (Teachers B and D).

- Participants emphasized the importance of maintaining curricular coherence across grade levels, benefiting current and future students (Student D).
- Students appreciated the continuity of education across different levels, noting the transition from knowledge acquisition in elementary school to leadership development in middle school (Students D and F).
- English curriculum consistency received particular attention and praise (Student F and Teacher D).
- However, difficulties in implementing a consistent curriculum were also acknowledged.
- Scheduling disparities between elementary, middle, and high school teachers hindered collaborative discussions (Teacher A).
- Variations in teaching styles among the same teachers over different years posed challenges to achieving uniformity (Student A).
- Cross-curricular alignment, not just within grade levels but across subject areas, was deemed essential (Teacher C).

In sum, participants recognized the importance of curriculum consistency in GCE but acknowledged the complexities and obstacles in achieving it. These varied responses highlight the multifaceted nature of curriculum design and implementation in the context of empowerment and leadership development.

Participants' Familiarity With UNESCO Associated Schools

Five of the 12 participants had prior knowledge of UNESCO Associated Schools, while the remaining seven were unfamiliar with them and did not explicitly mention them. The participants who were acquainted with UNESCO Associated Schools shared their insights into the benefits and potential drawbacks of these programs as follows:

- Teacher B highlighted the opportunity these schools provide for individuals who may not initially be interested in global issues to broaden their horizons and learn about the world.
- Teacher C emphasized that UNESCO Associated Schools offer students a platform for personal growth, enabling them to contribute more effectively to their communities.
- Teacher F underscored the value of these schools as a source of cross-school learning opportunities for teachers. They also emphasized the importance of school leadership in maximizing the utility of UNESCO Associated Schools.
- Drawbacks of UNESCO Associated Schools.
- Teacher F also pointed out that UNESCO Associated Schools projects can sometimes become bureaucratic, suggesting that the effectiveness of such initiatives may depend on the leadership within individual schools.
- Examples of GCE Curricula: Participants shared examples of GCE curricula from their respective schools, providing insights into the diverse approaches taken.
- Tokyo Soka High School offers a three-year program called "Global Citizenship Inquiry Studies (GCIS)," aimed at developing problem-solving, research, and collaborative skills. They also provide various activities, including overseas language training.
- Kansai Soka High School provides the "Global Research and Inquiry Time (GRIT)," a three-year curriculum to enhance research, discussion, and leadership skills. The school also offers activities such as debates and Model United Nations simulations.
- Participants from both schools discussed their involvement in the Super Global High Schools (SGH) program accredited by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) in Japan. Student D highlighted how the SGH

program ignited her passion for English, while Student E noted limitations regarding the program's accessibility.
- Teacher A highlighted the challenges of teaching about the world beyond one's own country, even with a curriculum in place.
- International Baccalaureate (IB) and Global Citizen Diploma: Teachers from Brazil Soka Schools discussed their incorporation of the International Baccalaureate (IB) program and its advantages and disadvantages.
- According to Teacher F, the IB program raises student achievement and academic standards but can place a burden on both students and teachers. They emphasized the importance of flexibility, similar to the Global Citizen Diploma, another framework for global citizenship education.

In summary, the discussion revealed a multitude of voices and perspectives regarding the unique circumstances and approaches of each school's GCE curriculum, as well as the advantages and challenges associated with UNESCO Associated Schools and other educational frameworks.

Discussion

In pursuing a more effective GCE curriculum that fosters student empowerment and leadership, the series of interviews has unearthed key elements that warrant attention. These elements, drawn from the participants' valuable insights, are essential in shaping a robust GCE curriculum. They encompass curricular content and the broader educational environment, often overlooked but essential in nurturing empowered leaders of tomorrow.

The participants responded positively to Research Question 1 regarding the GCE curriculum's contribution to student empowerment and leadership. They found that it gave them confidence, new learning and awareness, and the ability to speak in front of others. The environmental setting, including interactions with teachers and peers, also contributed to their empowerment. Examples of student leadership included initiatives at school events, donation campaigns, and career choices. Factors that contribute to empowerment and leadership in general, not just in GCE, include an environment that promotes dialogue, extracurricular activities, and language/study abroad programs.

The responses to Research Question 2 about the relationship between the length of the GCE curriculum and the degree of empowering leadership were varied. Those who were positive noted the impact of the curriculum in terms of growth, understanding, and commitment. At the same time, those who were ambivalent explained that the degree of empowerment depends on the individual and their determination and mindset. The opposing participant said that the degree depends on the student's determination and that timing is more important than length. The participants in the study found that achieving consistency in the K-12 GCE curriculum was important for students, citing continuity of English education and cross-curricular approaches. However, they admitted it was difficult to complete due to different teaching styles and scheduling conflicts among teachers. More research is needed to maximize GCE's impact and develop and implement a robust curriculum for empowerment and leadership that can replace methods such as studying abroad.

Most participants indicated that the longer the GCE curriculum, the better. However, it cannot be entirely ruled out that the length is necessarily causally related to the degree of student empowerment and leadership. The earlier the students begin taking the GCE curriculum, the

greater the degree of student empowerment and leadership may be, as several pointed out that the timing of when students start taking the curriculum is also essential. At the same time, the quality of the GCE curriculum may be important, and length and timing may not be absolute factors since the degree of empowerment and leadership could be ultimately highly dependent on the determination and mindset of each student. Nevertheless, according to the responses of most participants, the degree and likelihood of empowerment and leadership tend to increase when students are exposed to the GCE curriculum early and for a more extended period of time.

The importance of consistency in the GCE curriculum is evident according to the participants and is an area being researched today. As with curriculum, it is vital to refer to Ikeda's (2016) GCE framework and use the interplay between empowerment and leadership to embed continuity and interconnectedness in the curriculum at different educational levels. The effectiveness of linking subjects together and achieving a cross-curricular curriculum will also need to be investigated in the future. The need for consistency may provide an opportunity to consider initiatives and systems that allow teachers to interact and create curricula together in solidarity in a way that leads to their own empowerment.

It will be important in the future to investigate what efforts and approaches are essential to make the process of learning and action in empowerment and leadership sustainable rather than temporary. This will require research on how to maximize the impact of the GCE well into the future, considering Einstein's famously saying that education is what remains after one has forgotten what one has learned in school. In addition to such a temporal challenge, GCE, by its nature, entails geographically tricky tasks, as it assumes that students will learn about issues happening elsewhere without traveling. There is a need to continue to develop and implement a robust curriculum for empowerment and leadership that can replace methods such as studying abroad. Nonetheless, the findings through this series of interviews may indicate that there is potential for GCE despite such hurdles as these.

Conclusion

This research examined how K-12 Global Citizenship Education (GCE) in Japan could contribute to personal empowerment and what potential and challenges the curriculum had. We interviewed teachers and students from several UNESCO Associated Schools to assess how much the curriculum could empower students. This study aimed to understand the implementation of GCE in Japan and how it could empower youth. The results of this research can provide insight into the potential and challenges of GCE in Japan as well as GCE policies and practices in Japan.

The world has faced various educational challenges recently, such as increasing student apathy and anxiety. Global citizenship education is increasingly seen as a potential solution to these issues, as it promotes individual empowerment and action to exercise transformative leadership for social contribution. GCE has been a part of the Japanese education system since the Meiji era, but there is still a need for a more systematic curriculum to be established. GCE is a vital tool in fostering empowerment and leadership in individuals.

Empowerment is a central aspect and goal of GCE, and it is essential to accompany empowerment by action, such as exercising leadership. Ikeda (2014, 2016) has long advocated for GCE, which can empower students with the courage to take action. This concept was originally developed by Tsunesaburo Makiguchi and Josei Toda, who proposed a

cosmopolitanism that is neither narrow-minded nationalism nor vacuous globalism and education for global citizenship to challenge national authority. Through this, Ikeda hopes to empower youth to develop their potential and create a more peaceful world. Ikeda's Soka educational institutions, which include kindergartens, elementary, middle, high schools, and universities, are based on the humanistic philosophy of Soka derived from Buddhism. Ikeda's vision of creating a global community of peace, creative coexistence, and mutual understanding through education empowers individuals to become active change agents.

This study's findings provide valuable insights into the effectiveness of GCE curricula in schools. It shows that not only the curriculum itself but also the human factors— such as interaction with teachers, teacher role models, and classmates—stand out as elements that accelerate the process of empowerment and action. It also suggests that the schools provide learning that leads to empowerment and transformative action, regardless of the length or consistency of the curriculum. It also indicates the possibilities of a curriculum to encourage learning that can lead to actual action, such as school event initiatives, donation activities, career choices, the creation of exhibits on social issues, and presentations of what students have learned outside of school.

However, there are possible improvements in schools with existing GCE curricula that were the subject of this study. Modifications may be needed to develop and implement a more effective curriculum to empower students and the action process. One of the ways to do this is to create a coherent curriculum and system from elementary through high school. Another important aspect is to design a curriculum that reflects the voices of teachers in the field. Even if there are clear curriculum objectives, there are contents and curricula that are difficult to teach and implement due to various constraints such as culture. It is also important to note the possible limitations of this study. This research is a descriptive study, and its findings and conclusions lack statistical significance. The nationality of the students who agreed to be interviewed was limited to one, so the scope of the study needs to be further expanded. Moreover, there is a need to conduct a study to see the differences in views of the curriculum for both teachers and students, which was not the focus of this study, and to conduct a study specifically on the students' perspectives.

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Students' Expectations and Perceptions of Service Quality: An Analysis

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Abstract
This descriptive quantitative study explores the expectations and perceptions of students from Antipolo City regarding the quality of service they receive from their college. The 804 student respondents enrolled in the seven (7) degree programs are described in terms of sex, age, and their degree programs. An online survey was conducted using a modified SERVQUAL Questionnaire with five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. The structured SERVQUAL instrument was modified to align with the set-up of the college. To determine the reliability and validity of the modified instrument, the Cronbach alpha test was conducted, and the result indicated that the instrument is reliable and valid with a Cronbach alpha result of more than 0.90. The generated data were analyzed using descriptive statistics to determine the level of students' expectations and perceptions. One-way ANOVA was used to determine if there was a significant difference in their responses when grouped according to their demographic profile. A paired t-test was used to test the significant differences between students' perceptions and expectations. Results show that students' expectations are higher than their perceptions regarding assurance, empathy, and reliability. Students' perception is high in service quality when they are grouped according to their demographic profile. Findings also revealed a gap between students' expectations and perceptions. Based on these findings, the management should take additional steps to raise service quality, thus, an effective intervention program to address this gap is necessary.

Keywords: Service Quality, Expectations, Perceptions, Gap

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1. Introduction

In the present-day educational scenario, students are akin to discerning customers who approach their educational journey with thoughtfulness and selectivity. They prioritize quality and carefully evaluate their options to make informed decisions. They tend to critically assess information, consider diverse perspectives, and seek out opportunities that align with their goals. They believe that academic institutions should create and maintain a positive educational environment that values, respects, and understands students cultivating a culture of kindness and addressing students' perceptions of the quality of service provided by the college. Overall, their approach toward education is characterized by thoughtfulness, deliberation, and a focus on quality. As a result, higher education institutions use various parameters and indicators to evaluate the quality of services they provide.

Students' perceptions are considered an important tool for the improvement of educational service quality since students provide reliable feedback and comments about the service quality as well as their experiences in the College. One of the most crucial factors in maintaining the reputation and standards of an HEI is the quality of its services (Li, Asimiran, Yusitno (2018). Mestrovic (2017) mentioned that any higher education institution's existence depends on student happiness as measured by both academic and non-academic factors. In another study, Sibal, et al (2021) stated that perceiving service quality positively greatly impacts student satisfaction and that satisfied students tend to attract more through word-of-mouth recommendations. Therefore, to achieve service quality, they must match or exceed expectations (Camilleri, 2021). However, when expectations are not met, a gap in service quality emerges.

Thus, this descriptive quantitative study explores the expectations and perceptions of students from De La Salle - College of Saint Benilde, Antipolo regarding the quality of service they receive from their college. The 804 student respondents enrolled in the seven (7) degree programs namely, Tourism Management (TM), Hospitality Management (HM), Accountancy (BSA), Marketing (BSBA), Psychology (BSPS), Communications (COM), and Teacher Education (BSE) were described in terms of sex, age, and degree programs. An online survey was conducted using a modified SERVQUAL Questionnaire with five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. Students were tasked with assessing the institution's service quality by evaluating it using various parameters and indicators of the SERVQUAL questionnaire. To validate the data gathered using the instrument, an unstructured interview was also conducted. The outcome of this evaluation will be used as a foundation for future planning and decision-making to improve the quality of education, enhance student satisfaction, and stay competitive in the marketplace.

2. Dimensions of Service Quality

Service quality is a tool that measures the type of service provided by an organization. This assessment often includes evaluating students' overall experiences in the classroom, interactions with associates, faculty, and staff, as well as the quality of facilities. Students expect to receive quality service, in that case, the school must conform to their expectations. To assess service quality, the researchers employed Parasuraman and Berry's (1988) five dimensions of service quality namely [1] tangibles, [2] reliability, [3] responsiveness, [4] assurance, and [5] empathy. Demi and Guven as cited by Jaf (2019) referred to tangibles as physical facilities, equipment, staff, and communication materials. It is about making outstanding and excellent first impressions. Tangible as a dimension of service quality

demands HEIs to utilize state-of-the-art technologies in classes, laboratories, and staff offices, as well as personnel appearance and how they present themselves, and having modern, clean, and tidy buildings and other offices. Reliability is the ability to provide promised services consistently and accurately. Responsiveness refers to the willingness of an organization or individual to promptly assist customers or students by providing effective solutions to complaints and offering timely advice. Assurance refers to the knowledge, skills, and courteous behavior of employees which inspires trust and confidence in their ability to perform their job, encompassing competence, confidence, credibility, and security, as well as the display of politeness and professionalism. According to Jaf (2019), the knowledge, politeness, and skills of personnel are key factors in building trust and confidence with customers or clients. Lastly, empathy is the act of showing care and individualized attention. It involves the ability to provide personalized attention and care to others, even if they are students or customers.

Without a doubt, service quality is one of the most important aspects in HEIs to keep their reputation and maintain standards (Li, Asimiran, and Yusitno, 2018). Likewise, Cayanan (2017) mentioned that meeting student service quality expectations and perceptions attracts and retains them. According to Parasuraman, Zeithaml & Berry (1991), a service is of high quality when it meets or exceeds customers' expectations; however, a service quality gap occurs if expectations are not satisfied. When there is a disparity between students' expectations and what they get, a service quality gap emerges.

3. Findings

Table 1. Demographic Profile of the Respondents

Demographic Profile		Frequency (N=804)	Percentage
Gender	Male	297	36.90
	Female	507	63.10
Age	21-25	343	42.7
	above 25	11	1.40
	below 20	450	56.0
Degree Program	Accountancy	118	14.70
	Communication	122	15.20
	Education	31	3.90
	Hospitality	72	9.00
	Marketing	294	36.60
	Psychology	69	8.60
	Tourism	98	12.20

The data show that females (63.10%) outnumbered the male respondents (36.90%). In terms of age, the majority (56%) of the respondents belong to below 20 age groups. For the degree program, it can be viewed that the great majority, (36.6%) of the respondents were from Marketing Management, while the Teacher Education program had the least respondents (3.9%).

Table 2. Students Expectations and Perceptions of Tangibles

	Expectations					Perceptions				
Tangibles	Mean	SD	CV	Rank	Remarks	Mean	SD	CV	Rank	Remarks
1.The institution provides up-to-date equipment.	3.48	0.672	19.3	3.0	High	3.38	0.706	20.9	3.0	High
2. The institution has adequate and necessary visually appealing physical facilities.	3.44	0.677	19.7	4.0	High	3.35	0.684	20.4	5.0	High
3. The institution has associates who are well dressed and appear neat.	3.66	0.716	19.6	1.0	Very High	3.40	0.689	20.3	2.0	High
4.The institution has visually appealing physical facilities associated with the type of service provided.	3.43	0.693	20.2	5.0	High	3.37	0.687	20.4	4.0	High
5.The institution has a record management system.	3.53	0.643	18.2	2.0	Very High	3.45	0.678	19.7	1.0	High

In terms of students' expectations and perceptions of tangibles, the data reveals that the students believed that the college has associates who are well dressed and appear neat having the highest rank. However, the data also shows that the students perceived that "the institution has a record management system" with the highest rank. During the interview, students mentioned that the college has a good records management system that ensures efficient operations, and compliance with legal requirements. In contrast, in terms of "institution's adequate and necessary visually appealing physical facilities, it got the lowest rank. This indicates that students have witnessed that there is a lack of equipment in some of the laboratories. This is particularly observed in the Communications program as revealed in the unstructured interview. The average coefficient of variation of 19.3% and 20.2%, respectively suggests that students have relatively consistent perceptions about the college's physical evidence.

Table 3. Students Expectations and Perceptions of Reliability

	Expectations					Perceptions				
Reliability	Mean	SD	CV	Rank	Remarks	Mean	SD	CV	Rank	Remarks
1.The institution provides immediate and prompt services.	3.52	0.654	18.6	3.5	Very High	3.36	0.701	20.9	4.5	High
2.The associates are sympathetic and reassuring when you have problems	3.56	0.662	18.6	1.0	Very High	3.40	0.694	20.4	2.0	High
3.The associates are dependable.	3.51	0.672	19.1	5.0	Very High	3.37	0.708	21.0	3.0	High
4.The associates provide its services at the time it promises to do so.	3.53	0.653	18.5	2.0	Very High	3.36	0.712	21.2	4.5	High
5.The teaching associates have available time for student consultation.	3.52	0.653	18.6	3.5	Very High	3.41	0.701	20.6	1.0	High

In reliability, students believed that all items were rated Very High. However, the lowest rank showed that the institutions, and associates, both teaching and non-teaching, can deliver the promised service precisely and consistently. On the other hand, students believe that the associates are sympathetic and reassuring when they have problems. This suggests that associates are highly sympathetic which compels them to reach out and offer help to students.

On students' perception, data shows that generally, students rated reliability as High./ However item 5, "the teaching associates have available time for student consultation got the highest mean. Conversely, item 1 "the institution provides immediate and prompt services" and item 4 "the associates providing its services at the time it promises to do so "received the lowest mean score (M = 3.36, SD=.712). A low CV of 19.4% and 20.82%, respectively in the reliability dimension suggests that students have relatively consistent perceptions about the associate's dependability, punctuality, and ability to fulfill promises.

Table 4. Students' Expectations and Perceptions of Responsiveness

	Expectations					Perceptions				
	Mean	SD	CV	Rank	Remarks	Mean	SD	CV	Rank	Remarks
1. The associates tell its stakeholders' exactly when the services will be performed	3.48	0.657	18.9	4.5	High	3.36	0.683	20.3	4.0	High
2.The associates provide you with prompt service.	3.50	0.644	18.4	2.0	Very High	3.40	0.683	20.1	2.0	High
3.The associates are always willing to help stakeholders	3.49	0.650	18.6	3.0	High	3.39	0.681	20.1	3.0	High
4.The associates are always available to respond to stakeholder requests promptly	3.46	0.652	18.8	6.0	High	3.35	0.685	20.4	5.5	High
5.The teaching associate is always ready to provide assistance to my requests	3.48	0.666	19.1	4.5	High	3.35	0.684	20.4	5.5	High
6.The associates communicate well in the classroom.	3.55	0.655	18.5	1.0	Very High	3.41	0.694	20.4	1.0	High

Responsiveness, In terms of expectation, it shows that students strongly agree that item 6 "the associates communicate well in the classroom" got the highest mean (M=3.55, SD=.655) while item 4 "the associates are always available to respond to stakeholder requests promptly" with a mean (M=3.46, SD=.666) got the lowest score. For students' perception, they agree that item 5, " the associates communicate well in the classroom " received the highest mean (M = 3.41, SD=.694) likewise, they agree that item 4, "the associates are always available to respond to stakeholders requests promptly" and "the item 5, "teaching associate is always ready to assist with my requests" received the lowest score (M = 3.35, SD=.685). A low CV in the responsiveness dimension averaging 18.72% and 20.28%, respectively indicates that students' opinions of the associate's promptness, attentiveness, and willingness to assist are generally consistent. This suggests that the institution has been effective in building a solid responsive reputation.

Table 5. Students' Expectations and Perceptions of Assurance

	Expectations					Perceptions				
	Mean	SD	CV	Rank	Remarks	Mean	SD	CV	Rank	Remarks
1. The associates can be trusted.	3.59	0.647	18.0	1.0	Very High	3.42	0.694	20.3	3	High
2. The associates provide safe and secured transactions with stakeholders	3.58	0.643	18.0	2.5	Very High	3.43	0.684	19.9	1.5	High
3. The associates are polite	3.58	0.643	18.0	2.5	Very High	3.43	0.689	20.1	1.5	High
4. The associates have the knowledge to answer stakeholders' inquiries	3.54	0.656	18.5	5.0	Very High	3.41	0.670	19.6	4.0	High
5. The teaching associates provide feedback on students' progress	3.57	0.660	18.5	4.0	Very High	3.39	0.696	20.5	5.0	High

Assurance, To meet the expectations of the customers, every member of the organization must demonstrate competence, confidence, courtesy, credibility, and security (Jaf, 2019). /The data reveals that the dimensions of assurance were rated very high. Item 1 "The associates can be trusted got the highest mean (M=3.59, SD=.647). This implies that the students agree that the knowledge, skills, and politeness of every associate as well as the teaching force can build trust and confidence. On the other hand, Item 4 "The associates have the knowledge to answer stakeholders' inquiries" got the lowest mean (M=3.54, SD=.656). On perception, the result shows that the five items for assurance were rated High, therefore they agree that they can demonstrate the knowledge, competence, and skills that inspire trust and confidence. Looking at the mean, item 2, the associates provide safe and secured transactions (M=3.43, SD=.689), and item 3, "considered polite (M=3.43, SD=.684) got the highest. This implies that associates consistently show courtesy to students. However, the following points were discussed during the unstructured interview, "they experienced a staff who was not able to deliver his/her duties properly"; "some staff was inconsiderate"; not ready to guide and answer students' questions "; not so friendly" and no adequate knowledge on rules and procedures". A low CV of 18.2% and 20.08%, respectively in the assurance dimension suggests that customers have relatively consistent perceptions about the college's competence, courtesy, and credibility. Students typically report comparable experiences with assurance, indicating dependable and consistent interactions.

Table 6. Students' Expectations and Perceptions of Empathy

	Expectations					Perceptions				
Empathy	Mean	SD	CV	Rank	Remarks	Mean	SD	CV	Rank	Remarks
1. The associates give individual/personal attention to stakeholders	3.46	0.671	19.4	4.0	High	3.56	0.648	19.3	4.0	High
2. The associates know the needs of the students	3.55	0.665	18.7	3.0	Very High	3.39	0.711	21.0	3.0	High
3. The associates know the best interests of the students at heart	3.57	0.675	18.9	2.0	Very High	3.40	0.715	21.0	1.5	High
4. The associates are sincerely interested in solving student's concerns.	3.58	0.665	18.6	1.0	Very High	3.40	0.718	21.1	1.5	High

Empathy is the ability to provide individualized care and attention (Jaf, 2019). In terms of expectations, the majority of the students rated the associates Very High in items 2, 3 & 4. /Item 4 associates are sincerely interested in solving students' concerns" got the highest mean (M=3.58, SD=.665)./ This implies that associates of both teaching and non-teaching staff were sincere in helping out the students in solving their concerns. The other dimensions for empathy were rated high./ Item 1 "the associates give individual /personal attention to stakeholders" got the lowest mean score (M=3.46, SD=.671). On perceptions, empathy dimensions were rated High./ Item 3 "associates know the best interest of the students (M=3.40, SD=.715), and Item 4 "associates are sincerely interested in solving student's concerns" (M=3.40, SD=.718) were rated the highest. Employees who want to demonstrate empathy for students must be aware of their needs and ready to effectively satisfy them. During the unstructured interview, students mentioned that " the administration considers the students' best interest", and "school is fair and unbiased in their treatment of individual students. In contrast, some students experienced questions, and feedback that were not listened to, responded to, and properly attended to as immediately as possible. A low CV averaging 18.90% and 20.60% in the empathy dimension suggests that customers have relatively consistent perceptions about the college's ability to understand and share their feelings.

Table 7. Comparison of Expectations and Perceptions of Service Quality: by Sex

Service Quality	Expectations					Perceptions			
	Sex	Mean	p-value	Remarks	Decision	Mean	p-value	Remarks	Decision
Tangibility	Male	3.34	0.000	Very Significant	Reject Ho	3.27	0.000	Very Significant	Reject Ho
	Female	3.52				3.46			
Reliability	Male	3.41	0.000	Very Significant	Reject Ho	3.28	0.001	Very Significant	Reject Ho
	Female	3.60				3.44			
Responsiveness	Male	3.39	0.000	Very Significant	Reject Ho	3.28	0.001	Very Significant	Reject Ho
	Female	3.56				3.43			
Assurance	Male	3.46	0.000	Very Significant	Reject Ho	3.30	0.000	Very Significant	Reject Ho
	Female	3.64				3.39			
Empathy	Male	3.42	0.000	Very Significant	Reject Ho	3.29	0.001	Very Significant	Reject Ho
	Female	3.62				3.45			

Legend: p value<.05 if the p-value is lesser than the level of significance 0.05

It can be gleaned that there is a very significant difference between the genders in terms of tangibles, dependability, responsiveness, assurance, and empathy in both expectations and perceptions.

Table 8. Comparison of Expectations and Perceptions of Service Quality: by age

Service Quality	Expectations					Perceptions			
	Age	Mean	p-value	Remarks	Decision	Mean	p-value	Remarks	Decision
Tangibility	21-25 above	3.49	0.245	Not Significant	Accept Ho	3.35	0.000	Very Significant	Reject Ho
	25 below 20	3.49				3.56			
		3.42				3.41			
Reliability	21-25 above	3.55	0.272	Not Significant	Accept Ho	3.34	0.001	Very Significant	Reject Ho
	25 below 20	3.75				3.53			
		3.50				3.40			
Responsiveness	21-25 above	3.53	0.363	Not Significant	Accept Ho	3.34	0.001	Very Significant	Reject Ho
	25 below 20	3.55				3.46			
		3.47				3.40			
Assurance	21-25 above	3.60	0.502	Not Significant	Accept Ho	3.39	0.000	Very Significant	Reject Ho
	25 below 20	3.66				3.44			
		3.55				3.44			
Empathy	21-25 above	3.57	0.263	Not Significant	Accept Ho	3.37	0.001	Very Significant	Reject Ho
	25 below 20	3.73				3.43			
		3.51				3.40			

Legend: p value<.05 if the p-value is lesser than the level of significance 0.05

Students' expectations show that there is no significant difference in terms of age and service quality. On the contrary, students' perception reveals that there is a very significant difference in terms of service quality depending on age group. This implies that age is a factor in the perception of the respondents about service quality. This suggests that the demographic age variable plays a significant role in perceptions.

In terms of tangibles and responsiveness, Table 9 below revealed there is no significant difference while reliability, assurance, and empathy, appeared that there is a significant difference in terms of degree programs based on their expectations. Looking at the individual responses of the students enrolled in different programs showed that assurance has the highest mean score. This implies that the students believe that the college demonstrates confidence, courtesy, credibility, safety, and security. In addition to assurance, students enrolled in the

hospitality program assumed that the college considered the fifth dimension which is empathy. This implies that the associates can create an emotional relationship with the customer, and can provide care and individualized attention to students.

The dimension tangibles are seen to be lowest in Accountancy, Education, and Marketing while the dimension Responsiveness is seen as lowest in Communication and Psychology. However, for Hospitality and Tourism Management tangibles and responsiveness are seen as the lowest. Moreover, reliability was also considered the lowest in Hospitality.

Table 9. Comparison of Expectations and Perceptions of Service Quality: by Degree Program

Service Quality		Expectations				Perceptions			
	Degree Program	Mean	p-value	Remarks	Decision	Mean	p-value	Remarks	Decision
Tangibility	Accountancy	3.52	0.365	Not	Accept	3.48	0.43	Not	Accept
	Communication	3.49		Significant	Ho	3.40		Significant	Ho
	Education	3.56				3.48			
	Hospitality	3.38				3.33			
	Marketing	3.40				3.34			
	Psychology	3.46				3.39			
	Tourism	3.48				3.43			
Reliability	Accountancy	3.61	0.026	Significant	Reject	3.517		Not	Accept
	Communication	3.63			Ho	3.397	0.076	Significant	Ho
	Education	3.65				3.548			
	Hospitality	3.38				3.278			
	Marketing	3.48				3.344			
	Psychology	3.50				3.304			
	Tourism	3.52				3.371			
Responsiveness	Accountancy	3.61	.063	Not	Accept	3.506		Not	Accept
	Communication	3.58		Significant	Ho	3.373	0.129	Significant	Ho
	Education	3.58				3.537			
	Hospitality	3.38				3.313			
	Marketing	3.46				3.342			
	Psychology	3.41				3.292			
	Tourism	3.48				3.390			
Assurance	Accountancy	3.67	.009	Very	Reject	3.524		Not	Accept
	Communication	3.69		Significant	Ho	3.436	0.160	Significant	Ho
	Education	3.71				3.581			
	Hospitality	3.43				3.322			
	Marketing	3.51				3.379			
	Psychology	3.57				3.348			
	Tourism	3.58				3.449			
Empathy	Accountancy	3.64	.042	Significant	Reject	3.502		Not	Accept
	Communication	3.67			Ho	3.414	0.337	Significant	Ho
	Education	3.57				3.443			
	Hospitality	3.43				3.274			
	Marketing	3.49				3.361			
	Psychology	3.50				3.344			
	Tourism	3.54				3.393			

Legend: p value<.05 *if the p-value is lesser than the level of significance 0.05*

As per the perceptions, students in all degree programs and the service quality showed a significant difference. This shows that all the service quality variables have no significant difference with all the school degree programs. Looking at the individual responses of the students enrolled in Communication, Education, Marketing and Tourism showed that assurance has the highest mean score while Hospitality and Psychology tangibles are seen to

be the highest. However, in Accountancy assurance and reliability have the highest mean. The dimension tangibles are seen to be lowest in Accountancy and Marketing, empathy for Education and Hospitality, responsiveness for Communication and Psychology, and reliability for Tourism. Recognizing the gathered results, the administration is now on the task of prioritizing the improvement of the college services in terms of quality dimensions. Further improvement in certain constructs under empathy, assurance, tangibility, and reliability must be revisited.

Table 10. Difference between Expectations and Perceptions

Service Quality Dimension	Expectations	Perceptions	MP-PE
Tangibility	3.43	3.41	-0.02
Reliability	3.50	3.41	-0.09
Responsiveness	3.47	3.40	-0.07
Assurance	3.55	3.44	-0.11
Empathy	3.52	3.42	-0.10
Average	3.49	3.42	-0.08

Results showed that the expectations of students in all dimensions were higher than the perception. The highest mean score in expectations was for the assurance dimension (3.55) and the lowest mean score was related to the tangibles dimension (3.43). The highest mean score in perceptions was for the assurance dimension (3.44) and the lowest mean scores were related to responsiveness (3.40). The difference between the mean scores of expectations (ideal) and perceptions (actual), a gap in all dimensions was noticed. The highest negative score gap was in the assurance dimension (–0.11) and the lowest gap was in the tangibles dimension (-–0.02). In all items, the quality gap values between students' perception and expectation are negative, indicating that students do not perceive that the actual services provided by the institution meet their expectations. With the results, somehow these students were able to receive what was expected from the school. With the -.08 value we can capitalize on improving these areas. A low service quality gap means that the customer's perception of the service closely matches their initial expectations. In this case, the service provided was satisfactory, and the customer is likely to have a positive experience.

4. Conclusions

[1] The majority of respondents were female under the age of 20, with the largest group coming from the Marketing Management program.
[2] Students have noticed that the institution maintains a professional appearance and has a reliable record management system.
[3] Students have high expectations that their institution and teaching staff can consistently deliver the promised services with accuracy. However, when it comes to the actual services they receive, students agree that the institution, its associates, and teaching staff can address their concerns, queries, and all other related services consistently.
[4] Responsiveness Students expect and perceive that the institution, associates, and teaching assistants are responsive and willing to help with prompt services. They are attentive to students' needs, requests, questions, complaints, and problems, which shows flexibility and the ability to provide immediate attention.
[5] Assurance refers to the ability to demonstrate expertise, confidence, courtesy, credibility, and safety. When it comes to students' expectations, they strongly agree that the staff members are polite and trustworthy and provide constructive feedback on their progress.

Students also believe that the institution, staff, and teachers ensure that they can deliver high-quality services as expected.

[6] The associates can provide individualized attention and empathy, according to students.

[7] There is a very significant difference in the expectations of quality service in terms of gender, however, there is no significant difference in terms of age. Students' expectations in terms of degree programs show significant differences in terms of reliability, assurance, and empathy, while there is no significant difference in terms of tangibility and responsiveness.

[8] There is a very significant difference in the perceptions of quality service in terms of gender, and age. In terms of degree programs, all the five dimensions showed no significant difference.

[9] The findings reveal that there exists a minimal gap between expectations and perceptions. The gap scores represent the difference between the perception and expectation which is used to assess whether the expected service is the service they get from the institution. The higher the perceived level of quality, the closer perceptions are to expectations.

5. Recommendations

[1] Prioritize the improvement of the laboratory and procure the necessary materials and equipment.

[2] Provide frequent updates and be open to receiving feedback.

[3] Ensure prompt assistance by implementing a system that allows customers to receive quick support.

[4] Prioritize customer satisfaction and ensure they feel taken care of. Always aim to exceed their expectations.

[5] Find solutions that can effectively address the needs of students.

[6] Conduct validation of findings and benchmarking by comparing the results of the SEVQUAL Model with other service HEIs.

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Using Dramatic Arts and Storytelling in Creating Effective Learning Outcome

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Abstract
The outcome of effective teaching and learning is when the learners can apply, analyze, evaluate, or create something new from the knowledge they receive. Failed learning is when the gained knowledge cannot be transformed but remains just information that later is lost from the learners' minds and understanding. For learners, to be engaged many times they must get emotionally involved with the knowledge that they are learning. This research is therefore an attempt to reveal how using dramatic arts and storytelling can be such an effective tool in making learning successful. This is since the learners will be fully captivated through their feelings throughout the learning journey. And with their emotion engaged with the class, all learnt theory and information can be absorbed through their brains easily and they can understand easier and can remember for the longer period. The study is conducted through a live class in a hybrid format to train the financial advisors on wealth transfer. The class is done through switching back and forth between the hard knowledge on rules and information of wealth transfer by the professional financial trainer and the screening of the short thriller film where the investigators in the film also appear as the narrator of the whole class on site in the classroom. The research is done in collaboration with the financial training institutes CMSK and TMB Thanachart bank public company limited of Thailand.

Keywords: Dramatic Arts, Storytelling, Successful Learning, Emotional Engagement in Learning

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Introduction

Using entertainment media for adult learning is not new. It has been popularly employed in teaching various disciplines from humanities and social science to economic and medicine (Abidi et al., 2017, p. 38). The entertainment media was used for socially desirable purposes and received increasing attention since the 1990s (Kincaid, 2022, p.136). In Ryerson's research (2008, p. 1-4), he declares the significant role of entertainment media in adult learning by showcasing examples from Mexico where *Telenova* used melodramatic social content to teach people to study in order to get out of poverty; India where the usage of soap opera of *Hum Log* successfully changed the audiences' mindset on family planning and elevation of women status; and Tanzania where the serial drama had stimulated audiences' behavioral changes related to HIV/AIDS prevention and family planning. The idea of using entertainment media such as soap operas and films comes from the scientific evidence that memories which were formed through the emotional experiences that happens while watching a film, last longer and can be recalled more readily. It seems that films can help learners study some difficult subjects that might otherwise be challenging to understand with the traditional/ cognitive teaching methods.

However, the question emerges. What is it in cinematic films and soap operas that creates emotion within the audiences? To answer this, the researcher studies back into the foundation of drama as a platform of storytelling. Drama, according to Kincaid (2002, p. 139) "has more effect on an audience than many other forms of communication because it tells an engaging story, it involves the audiences emotionally, and it depicts change in characters with whom the audience identifies". Hence, cognitive, and emotional involvement is the result of watching dramatic storytelling and it is the main reason why drama has greater effects on audience than other forms of communication.

What is Drama?

Drama is "somebody wants something badly and is having difficulty getting it" (Kincaid, 2002, p. 138). In Aristotle's Poetics, he outlined the basis for the creation and the function of drama as an art form which he viewed the process as an imitation (mimesis) of real situations of human actions in which it distinguishes humans from animals (Mazur, 2020, p. 57). For him, the issue of interest is in the tragedy in which emotional responses from audiences come from pity and fear. Pity is "feeling of pain, destructive … which befalls one who does not deserve it and which we might expect to … befalls us soon" (Mazur, 2020, p. 58). Many times, the main character is, on the one hand, innocent, and, on the other hand, in a situation that causes a destructive case of unavoidable suffering. Fear is "a person's natural response to situations" (Mazur, 2020, p. 63). Many times it refers to the audience's response. At the end, pity and fear leads to catharsis or purification of the soul. For Aristotle, the purpose of drama is to create in the audiences the feeling of pity and fear, and to remove this emotion, thereby making people stronger emotionally. For him, the feelings of pity and fear are not the only range of feelings in the dramatic arts, however, to experience purification of the soul without this, tragedy is pointless.

A captivating story in drama will make audience create the bonding and empathize with the characters, and care about what happens to them. To create this, the feeling of pity must emerge when the characters face uncertainty in life. According to De Fossard in Kincaid (2002, p. 138), the audience needs to empathize with the characters in drama and sympathize with what happens to them. With this process, the audience will turn into the active participant of the

whole dramatic experience and full participatory involvement emerges. To get the audience's sympathy, the character must face challenges or confrontation. For Kincaid, "the essence of drama is confrontation, which generates emotion. Emotion is the motivational force that drives the action of the character, leading to conflict and its resolution. By means of involvement and identification, the confrontation and emotional response of the characters generate a corresponding emotional response in the audience" (Kincaid, 2002, p. 150). As a result, the empathic response in the audience emerges. The whole thing above goes hand in hand with Aristotle's Poetics where for him "the basis for tragedy is a plot which reveals human drama, and this in turn is indicated by feeling of pity and fear. Those feelings are a psychological response on the part of the audience to the tragedy of the character (Mazur, 2020, p. 61). Aristotle specified 6 key elements of drama namely action/plot, character, thought, language, music/ song, and spectacle. In all elements, the plot is the one that is related to the confrontation which generates the captivating story most. Plot is the pattern of events. It is the main structure and purpose of drama. The plot builds towards an inciting incident in which the characters confront obstacles and threats. The plot creates an ascending dramatic tension which leads to climax before resolution is reached in which the story is concluded. In this circumstance, the confrontation is climatic.

Taking the above into account, the uncertainty from the obstacles, conflicts and confrontations in the character's life keeps the audience emotionally involved. According to Kincaid, "a good story is balanced between 2 equally plausible outcomes: what the audience hopes will happen and what it fears might happen" (2002, p.138). With this the anticipation will create suspense. The intense desire of the main character will keep the audience absorbed and arouse a strong emotional response.

Emotion has a substantial influence on the cognitive processes in humans. It has a strong influence on attention and behavior. This attentional control is intimately linked to the learning process (Tyng et al., 2017, p.1). Moreover, the attentional and motivational components of emotion have been linked to heightened learning and memory. Therefore, the emotional experiences appear to be remembered clearly and with great resilience over time.

The Inheritance Puzzle



Figure 1: Atmosphere in the hybrid training class

In the class, the film that was screened as the main storyline for teaching is “the Inheritance Puzzle”. It is the story of the Charoenchai Family. A Thai Chinese wealthy family with vast number of members.

The story starts with the sudden death of grandmom Jai who did not write the will. Hence, all her inheritance of 300 million baht is divided equally among all heirs. However, with grandad Chai’s health is deteriorating from the death of his wife, now he writes his own will (400 million baht of personnel asset and 400 million baht of marital asset) which is the ignition of all conflicts. He states in his will that once he passes away, his inheritance will only be given to his 2 sons i.e. Pao and Ting in which if one dies first, the inheritance will go to the one that is still alive. However, he disregards his only daughter, Hong, who used to be grandmom Jai’s favourite and is the one that work hardest in the Charoenchai’s family business. Grandad Chai, nevertheless, dislikes Hong’s partner who came from the enemy family. Thus, he cut Hong out from his will. Once the will was written and announced, Pao, the oldest son is dead abruptly. With the whole inheritance will go straight to Ting according to the will, the rumour begins of who will possibly be a murderer who killed Pao. While everyone is looking at Ting for the cause of Pao’s death, one day Ting is found dead alone in his house with suspected suicide as concluded by the police. Who exactly is the cause of death of Pao and Ting? Will it be Hong who lost all with her dad’s will? Or the sons, daughters, and spouses of the family.

The main character of the whole situation is the investigator who is not only the main narrator in the film but also must find the true killer, but he also appears in the training classroom to bridge between the hard knowledge of wealth transfer in each chapter delivered by the financial plan trainer, and the crime story showed on screen. The students in class follow his journey to find the true killer, and to learn about wealth transfer knowledge to search how to propose the effective wealth transfer products which will prevent the deaths and crimes within the family.



Figure 2: Diagram of family structure of the Charoenchai family starting with grandmom Jai and granddad Chai on top

Aristotle's Dramatic Arts Structure

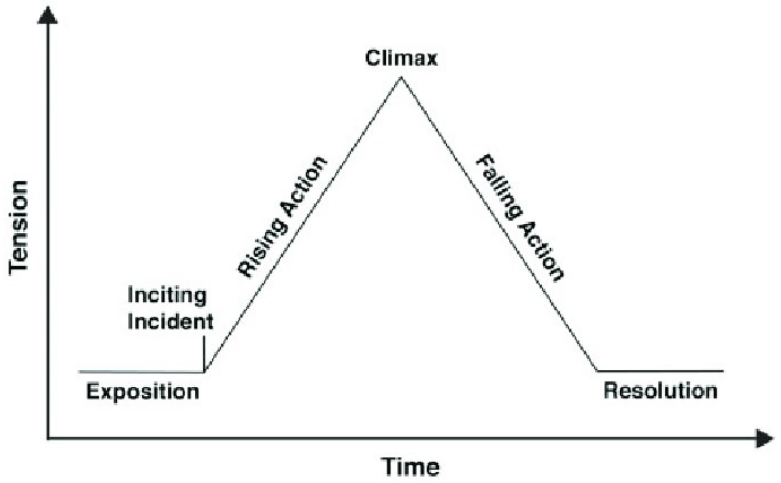


Figure 3: Dramatic Arc or Freytag's pyramid as analysed from Aristotle's Poetic (Elshafie, 2018, p. 1216)

According to Aristotle's dramatic arts structure above, the exposition of the story begins with the narration of the Charoenchai family's vast structure of member and their wealth. The inciting incident happens with the death of grandmom Jai. Throughout every step in the plot journey, audiences are designated to follow the struggle of the Charoenchai's family private investigator. Under this circumstance, the story is designed to create the bonding and empathy between the audiences who are the wealth transfer students and the investigator who are the main narrator of the story. The audiences' empathy is produced through the sympathy of difficulty and the struggle that the investigator must go through to unlock the mystery of the Charoenchai's family conflicts. Episodes of the rising actions are the series of always becoming bigger challenges i.e. rising action 1 is when grandad Chai whose health is deteriorating caused by the death of his wife, writes his own will and states that his inheritance will only be given to his 2 sons and disregards his only daughter, Hong; rising action 2 happens with the accidently death of Pao, the oldest son of grandad Chai; with rumors and confusion happen within the family, rising action 3 emerges with the shocking death of Ting, the only remaining son of grandad Chai. The climax is thus generated. This is since not only the investigator cannot resolve the death of Pao, but also with Ting's death, the investigator now is confronted with 2 huge dilemmas with no solution. Regarding to the death of Pao, the oldest son, all the speculation and suspicion comes to Ting, the younger son, as he is the sole benefactor of the whole circumstance. Nevertheless, with Ting's death, especially with the police's conclusion of suspected suicide, the case becomes deadened. With Ting's death, the only suspicion will go to Hong's the only daughter whose granddad Chai cut out from the inheritance.

Throughout the plot of storytelling, other characters are introduced along the way to increase the challenge and conflicts of finding the true murderer of the investigation for example Nam, the ex-wife of Pao, grandad Chai's oldest son, and Chin, Nam and Pao' son who discovered Ting's, the remaining son of grandad Chai, death. Moreover Pao also remarries with Fah, and they have Ananda and Amm as their descendants. With several heirs being introduced, this create the complexity of unlocking the mystery of who the killer is. This is since all of them has the tendency to be the benefactor of the death of Pao and Ting. It could be said that the greater number of heirs and the closer to the dead person they are, the bigger obstacles they create to the storyline for the investigator to resolve.

Training

In the training, once the exposition of the story starts, before introducing any inciting incident or conflict, the knowledge on what the inheritance is, i.e. asset and debts, and the estate e.g. personal and marital asset, introduced to be Module 1: the foundation theory of wealth transfer. Then, once grandad Chai's will episode is established, the knowledge on inheritance i.e. the statutory heir and the testator is informed as Module 2. At this moment, various categories of will, and tax and fee on inheritance management is informed in the class. Later, when the death of Pao, the oldest son of grandad Chai is occurred, Module 3: knowledge on strategies inheritance management and planning to pass on an inheritance is established. It seems that the delivered knowledge part is to offer solution to the learners that if they must prevent death and crime from happening in this family what would be the financial products that they can purchase. The training ends with Module 4: health insurance and mutual fund, and the significance of family charter, the holding company and trust as the alternative solutions of the family crime.

The training is from 9.00-16.00 (6 hours in total). There are 50 participants in class on site at TMB Thanachart bank public company limited of Thailand headquarter in Bangkok. Before attending the training, all participants are required to do a pre-learning test to evaluate their knowledge and understanding of wealth transfer. Then in each module training, there are several real-time quizzes and games for the participants to conduct. And after each module ends, there will be a group assignment for the participants to do regarding the knowledge part of the training. Once the whole training ends, each participant will be required to submit an individual plan and strategies in proposing the financial products on wealth transfer and management to the designated group of customers with individual and different needs. Then each participant will be given a coaching session and private feedback after the assignment submission from the professional financial planner at the final step.

The evaluation from the participants is 85% of the learners agree that a short film helps with knowledge application, 90% of the learners agree that activities help with knowledge assessment and 85% of the learners agree that case studies from the film helps enhance knowledge retention. From this result, it is the confirmation that dramatic arts and storytelling which are the keys in creating learners' captivation through emotion, are the main mechanism and the principal key success for media to be used as a successful tool for teaching and learning of all kinds of knowledge i.e. from the hard science of medicine to finance to more human fields of literature and society.

Conclusion

Dramatic arts are used as a tool to create successful storytelling in entertainment media. Although the dramatic arc of Aristotle is proven to be a success formula in creating captivating plot and storyline that can engage audience's emotions. It is not an easy one and there is no definite 'how to' of implementing it. This is since to put the hard skill content and create the successful plot that runs under the framework of the dramatic arc, this needs not only lots of creativity and imagination to come up with the scenario, characters, and their actions, but also the deep understanding of the knowledge and its content to apply into the storyline believingly and entertainingly for the audience.

There is room for further discussion and research in the above field of knowledge. If one succeeds, there will be steps and processes that will enable all kinds of hard knowledge to be

learned easier and faster through the entertainment media and its storytelling. This will make all kinds of teaching and learning fun and successful.

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The Environment for Rod Puppet Performance in Thailand From 2014–2023

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Abstract
The research for this paper aimed to explore the environment for rod puppet performances in Thailand from 2014-2023. Rod puppet performances were analyzed by examining the existence of various troupes and the occasions such troupes hold performances. Rod puppet troupes can be classified into three types: 1) traditional folk rod puppet troupes; 2) contemporary rod puppet troupes and; 3) applied rod puppet troupes. The occasions for which rod puppet performances are held indicate that the functions of such performances has shifted from entertainment to a form of cultural heritage that needed to be preserved. Losing the function as entertainment has had a significant impact on traditional folk rod puppet troupes in that they are no longer hired to perform, thus many have disbanded. Whereas, contemporary rod puppet troupes have revamped their puppet performances to be more interesting by adjusting the method to present the puppets, expanded the stories used for performance and used special techniques in puppet shows. This has provided the opportunity to perform on special occasions, for example, royal funerals, the royal coronation ceremony of the king, as well as other kinds of performances, such as *khon*-masked dance plays and *lakorn* classic dance plays as for applied rod puppet troupes, which includes puppetry clubs in schools and universities, such troupes have adjusted the functions of the puppets to present local or cultural content of each community and, thus, have been able to perform more constantly.

Keywords: Rod Puppet, Puppet Performance, Function of Puppet Performance, Cultural Heritage Preservation

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Introduction

Puppet art of Thailand has been recorded since the Ayutthaya period (14th-18th century), with puppet performances becoming immensely popular in the reign of King Rama V (1868-1910). In the past, the classification of "full body" puppets were categorized into three types: *hun luang* (royal string puppets), *hun wang na* (small-sized royal string puppets) and *hun lakorn lek* (small size stick puppets); as well as "head and hand" only puppets called *hun krabok* (rod puppets) (*Contemporary Thai Puppet*, 2017, p.13).

This research focuses on *hun krabok*, "… (rod puppets) have only heads and hands. The bodies can be any kind of rods, mostly either bamboo or PVC, covered with cloth sacks that are finely decorated as costumes (Prasarnvinijchai, 2019, p.177). Rod puppet performances originated in the northern part of Thailand during the reign of King Rama V and became popular both in Bangkok, the capital, and other large cities. Owing to its popularity, there were quite a number of well-known puppet troupes owned by elites in the court and common people in the local areas. However, the popularity of rod puppet performances has gradually diminished because of the new forms of entertainment (Pannengpetch, 1992, p.E-F).

In 2010, rod puppets were recorded as Intangible Cultural Heritage (hereafter ICH) at the national level and was described as being a "widespread practice" (Department of Cultural Promotion, [n.d.]). Furthermore, many puppet performance events have been held in Thailand, including, in 2014 at Bangkok and Chaing Mai; in 2017 at Kanchanaburi; in 2018 at Phuket; and in 2022 at Phetchaburi. Holding puppet events in tourist destinations corresponds with Watanasawad's (2012) suggestion that puppet performances should be developed for cultural tourism. However, the effect of such puppet events on the preservation of puppet performances has not been studied.

A vast body of research about rod puppet performances indicates that the situation of many rod puppet troupes has gradually diminished since rod puppet performances have declined in popularity (Pannengpetch, 1992; Hemsrichart, 2002; Juntarakam, 2007; Maicharoen, 2009; Klaisubin, 2011; Somsri,2014 and Sitivong 2017). These findings would not seem to comport with the description of rod puppet performance as "a widespread practice", thereby the environment for rod puppets needs to be examined, especially in the aspect of the relationship between holding events and the continued existence of rod puppet performances. Based on this concept, 2014 is used as the starting point for the scope of time for the research. Accordingly, this research has examined rod puppet performance by exploring the following questions: What is the environment for the rod puppet performance in Thailand between 2014-2023?

Research Objectives

1) To explore the environment of rod puppet performances in Thailand between 2014-2023.

Literature Review

Rod puppetry is an important performance art and has been used as a subject in many pieces of research, however, some research topics overlap. The relevant research can be divided into four groups:

1) The history of a rod puppet troupe or rod puppet troupes in some areas. Most research has studied the history of one rod puppet troupe and suggested approaches to retaining the knowledge of each puppet troupe (Hemsrichart,2002; Juntarakam, 2007; Klaisubin, 2011; Sitivong 2017). Pannengpetch (1992); Maicharoen (2009) and Sripen (2014) studied the history of puppet troupes in the western part of Thailand, central Thailand and in the Bangkok area, respectively. Pannengpetch (1992) and Maicharoen (2009) investigated the relationship of rod puppet troupes in each area and discussed the factors leading to the discontinuance of rod puppet performances. Apart from the studies of puppet performance in one area, Phooyathip and Maneewattana (2019) studied the transformation of puppet shows of the central region and the northeastern region.

2) Elements in rod puppet performances. Rod puppet performances consist of many kinds of arts, including, singing, puppet making, music composing and play writing. A large amount of research has selected *Chakrabhand* puppets as a research subject, such as Imsuwanvitaya (2013), Uejitmet (1998) and Dinprang (2002), examining the approach to constructing the Chakrabhand puppets, as well as the songs in the puppet performances**.** Ratchatakorntakoon (2021 and 2022) studied the relationship between songs and plays, as well as the techniques used in play writing. Eimprakongsilp (2008) analyzed the story of Phra Aphaimani for puppet plays of the *Chucherdchumnansilp* and *Poh Chang* troupes. Kerdwara and Nakpee, (2017) studied music used in the puppet performances of the *Mae Chawang Onlamai* troupe. Finally, Leanglue (2021) studied Master Kanjanapakorn's vocal techniques found in his performance of the story of Phra Aphaimani.

3) The adaptation of rod puppet performances. As a puppet troupe owner and researcher, Waevsamana, (2015; 2018; 2021 A; and 2021 B) investigated the results of mixing new techniques, using an umbrella as a stage and high technology, 3D print scenes, in his puppet shows. Waevsamana's research is similar to Svetsreni's study (2010) that focused on the adaptation of puppet performance by blending traditional performances with Thai northern cultures. Sitthupahan (2016) discussed contemporary tradition-based practices of puppet theatre, both shadow, figure and rod puppets, and the efforts of practitioners to preserve and develop this performance form.

4) The use of rod puppet performance for cultural tourism purpose. Watanasawad (2012) studied the possibility of the development of rod puppetry for cultural tourism with the concept of intangible cultural heritage. This study built on the findings of previous studies that rod puppet performances have declined in popularity, so rod puppetry should be adapted for cultural tourism purposes.

These four groups of relevant research reflect two analysis paradigms of rod puppet performance. First is the preservation of puppet performances through an emphasis on the history of puppet troupes and the approaches to preserve them. Second is the adaptation or the development of puppet performances, especially elements of puppet shows that have new functions for the performance. This research tries to fill the gap of previous research by exploring and analyzing rod puppetry under the paradigms of both preservation and adaptation.

Research Method

Qualitative research was adopted, including documentary review, participant observation in puppet classes and rod puppet shows, as well as in-depth interviews.

Findings

The Environment for Puppet Performances in Thailand From 2014-2023

A profound and broad understanding of the environment for rod puppetry contributes to effective approaches that can be proposed to sustain this type of performance. The current environment for rod puppet performances can be analyzed in the aspect of the current existence and the occasions for performances.

The Existence of Rod Puppet Performance in Thailand From 2014–2023

Using the characteristics of performance formats as the criteria, rod puppet troupes can be classified into three groups: 1) traditional folk rod puppet troupes; 2) contemporary rod puppet troupes and 3) applied rod puppet troupes.

1) Traditional folk rod puppet troupes are troupes located in local provinces founded more than 50 years. The most significant feature indicating a traditional folk characteristic is the heads of the puppets that are carved from lightweight wood. Due to the complicated creation process of a puppet's head, traditional folk puppet troupes have only 10-15 puppets, for which wigs or clothes can be changed in order to change their roles in a performance. However, some traditional folk puppet troupes have changed from wooden headed puppets to paper or resin headed puppets in order to have a more beautiful appearance.



Figure 1: Wooden head puppets of the *Chor Charoensilp* and *Darunee Si Phi Nong* troupes
Source: Researcher: left (2023, March 23) right (2023, March 10)

Apart from the puppets, some standard features can be noted during a traditional rod puppet performance, such as a translucent screen, the performers sitting when they manipulate puppets, the style of story narration and the type of music ensemble.



Figure 2: Performer sitting behind a screen during a puppet performance of the *Chucherdchumnansilp* troupe
Source: Apichart Inyong (20 May 2023)

Figure 2 shows a performer sitting behind a screen during a puppet performance of the *Chucherdchumnansilp* troupe, which shows many features of a traditional folk rod puppet performance. First is that the screen is made from transparent fabric or is a bamboo curtain.

> "The puppet performers can see the number and the reaction of the audience through the transparent screen, and the director of puppet performance will extend or shorten the puppet show depending on whether the puppet show retains the attention of the audience." (heir, personal communication, May 6, 2023)

Second, the performer is sitting when manipulating the puppet.

> "However, some traditional folk rod puppet troupes stand when performers manipulate puppets because manipulating the puppets while standing enhances the movement of the puppets and the performers are sometimes too old to sit for a long period." (heir, personal communication, May 18, 2023)

> "Most of the popular stories for puppetry are those that have been performed in dramas, except Inao and Unarut, which are slow-paced dramas. The favorite stories used for puppetry include Phra Aphaimani, Laksanawong, Kawi, Suwannahong, Chaichet, Graithong, Khun Chang Khun Phaen, Wongsawan Chantawas and Phra Pinthong. But only some episodes of the stories are selected and adapted into a presentation." (Posayakrit 1986, p.102-103)

The most famous episode is about Phra Aphaimani, the scene when the hero flees from his wife giant, Phisue Samut, since this scene makes audiences experience emotions such as suffering; love and humor (heir, personal communication, May 3, 2023).

Apart from these well-known stories, the *Chucherdchumnansilp* troupe created its own stories, for instance, *Kumarakaiyasit; Mongkutphet Mongkutkaew; Rakakaew; Sritsuriyong,* and *Kontothong* (Hemsrichart,2002, abstract); similarly, the *Mae Chaweng Onlamai* troupe had owned its own stories, for instance*, Phra phrot namaeo*; *Wen yom sanong wen; Phrachaimongkhon* and *Phraiwan ton prap asun* (Klaisubin, 2011, p.99). Creating their own stories for rod puppet performances reflects the high popularity of such performances in the past in that famous puppet troupes had their own unique stories to attract audiences to their performances. These stories had similar plots as existing puppetry literature, presenting an adventure and the love of princes and princesses. "The main stories will continue by the

narration of the director of the puppet performance with intermittent singing because the characteristic of 'folk entertainment' focuses on the quick and fun continuation of stories" (heir, personal communication, May 25, 2023). This also indicates the wisdom of the director of the puppet performance who organizes the limit number of rod puppets to perform a large number of stories.

2) Contemporary rod puppet troupes are troupes in Bangkok and Nonthaburi that started performing between 1975-2000. The characteristics of contemporary rod puppet troupes are that while they still perform for entertainment, some elements have been adjusted to make the rod puppet performances more modern and attractive. The most well-known contemporary rod puppet troupe is that of Chakrabhand Posayakrit, a famous artist whose puppet performances have been admired for their use of beautiful puppets and other elements. Chakrabhand has had a strong influence on the puppet industry. Sitthupahan (2016, p.53) analyzed the effect of Chakrabhand's work on other puppet troupes:

> Following in Chakrabhand Posayakrit's footsteps, younger generations of puppeteers have been shaping contemporary *hun krabok*. At one end of the spectrum, there are practitioners who are developing their practices within the framework of conventional forms. At the other end, there are those who have chosen to adapt elements from other cultures and integrate new idioms and techniques with what they have drawn from traditional Thai forms.

Apart from the influence of Chakrabhand Posayakrit, the development of rod puppetry has been influenced by the creative ideas of all puppet performers whose experiences have played a significant role in the adaption of puppet performances to meet the satisfaction of audiences. The adaptations of puppet performance to a contemporary style can be classified into three characteristics, as follows:

2.1) Methods to present puppets. The limitation of rod puppets is that they cannot move in delicate and beautiful ways as performers can, so some contemporary puppet troupes have adjusted their method by adding the role of live performers. Some troupes have changed the role of the puppeteers to performers by having puppeteers come from behind the screen to in front of the screen, whereby the elegant movement of puppeteers is similar to dancing. Another method that is used in many contemporary puppet troupes is switching between puppet and performer. This method is so famous that the technical term - *Hun Krabok Ook Tua* (puppet coming alive) was coined.



Figure 3: *Hun Krabok Ook Tua*, the rod puppet switch characters, of Khun Rat Puppet Troupe
Source: captured from the record entitled, *Hun Krabok Ook Tua* the story of *Phra Aphai Mani*, the episode of War of Nine Armies

Figure 3 shows the role of *Phra Aphaimani*, the hero of the story, being performed by both a puppet and an actor. In order to make the audience understand that the puppet and actor play the same role, the costume and the decorations of the actor and the puppet are similar. "*Hun Krabok Ook Tua* originated from the lack of experienced puppeteers in some troupes, so the beautiful dancing of performers was inserted to compensate for the puppet show. Nonetheless, *Hun Krabok Ook Tua* attracts some audiences who want to see their beloved performers in puppet performances" (heir, personal communication, May 25, 2023 and performer, personal communication, June 8, 2023).

2.2) Stories used for performances. Some contemporary puppet troupes have expanded the stories for puppet performance from drama stories to historical literature such as *Taleng Phai*, the elephant battle between King Naresuan of Ayutthaya and Mingyi Swa, the heir apparent to the Burmese throne (Ratchatakorntrakoon, 2022) and *Punthai Norasingh*, the honest helmsman who insists on receiving the death penalty because he broke the bow of the Ekkachai Royal barge. Moreover, the performances of contemporary puppet troupes strictly follow the printed script rather than allow for improvisation by the director of the puppet performance. However, the scripts of contemporary puppet troupes also reflect the tradition of puppet performances, namely, beginning with an invocation, the traditional style of puppetry songs and the insertion of jokes (performers, personal communication, June 8, 2023).

2.3) Special techniques. As a result of a change of the location of contemporary puppet performances from a puppet stage to a theater, special techniques have been added to make puppet performance more interesting. For example, *Taleng Phai* of the Chakrabhand Posayakrit troupe uses smoke, lighting techniques, both spot lighting and intensity adjustment, and changes of settings and distance illusion to create atmosphere (Ratchatakorntrakoon, 2022). While, *Punthai Norasingh the Musical Puppet Show* employs new technologies, including animation, contemporary music, 3D modeling scenery and modern lighting (Waevsamana, 2015).



Figure 4: Special techniques in *Taleng Phai* and *Punthai Norasingh the Musical Puppet Show*
Source (left)**:** captured from *"Video clips of rehearsal for Taleng Phai*" published on https://chakrabhand.org/puppetry/index05_eng.as
(right) retrieved 11 August 2023 from https://i.pinimg.com/originals/c6/9d/03/c69d032f35cb1b06b3df5e6b919cbc0d.jpg

3) Applied rod puppet troupes are puppetry clubs in many academic institutions, both schools and universities. "Teaching and learning Thai performance is one of the missions of

academic institutions; that is the role to preserve arts and culture" (instructors, personal communication, May 9, 2023). A characteristic of an applied rod puppet troupe is that they use puppets as media to communicate a message, i.e., admire the king or royal family members, or present the tradition of ethics, rather than strictly to entertain the audience. For this reason, there is no puppet stage in the show and the duration is quite short, only 10-15 minutes. "In order to make the show more elegant, another kind of puppetry art, such as skin puppet (*nang talung)*, is integrated" (instructors, personal communication, June 23,2023).



Figure 5: The puppet shows of *Pluluangwittaya* School and the Lao Wiang ethnic puppet of *Khon Ruk Hoon* troupe (*Takhli Prachasun School*)
Source: (left) researcher (21 March 2023); (right) Sarut Janganan (9 June 2023)

Figure 5 shows the characters of an applied puppet show where the puppeteers perform without a stage. These shows are often included in local events, such as the annual festival of Tak province in remembrance of King Taksin, the Baan Takhli walking street in Nakhon Sawan province. This demonstrates both the role of academic institutions and puppet performances in sustaining art and culture, in this case, puppetry.

An analysis of these rod puppet troupes indicates that the kind of rod puppet troupe that probably are in the scope of "widespread practice", according to the Department of Cultural Promotion, are contemporary rod puppet troupes, mostly inspired by the *Chakrabhand* rod puppets, and the applied rod puppet troupe, which have dramatically increased in educational institutions. Many researchers have reported that a large number of rod puppet troupes have gradually discontinued because their research data is focused only on traditional folk rod puppet troupes (Pannengpetch 1992; Hemsrichart,2002.; Juntarakam, 2007; Maicharoen, 2009; Klaisubin, 2011; Sitivong 2017). However, the Department of Cultural Promotion's description of rod puppet performances indicates that the situation of each kind of rod puppet troupe is more complicated.

The Occasions for Rod Puppet Performances: A Reflection of Rod Puppetry's Function

During the Rattanakosin period (18th c to present), rod puppetry has been one kind of entertainment that has been held during royal events, along with other types of performances, such as *khon* and *lakhorn*.[1] These events include ceremonial events on public holidays and royal funerals. For the general public, rod puppet troupes were hired to perform at funerals, as well as in the past in casinos to lure men into gambling (Posayakrit, 1986, p.106).

[1] *Khon* and *lakhorn* are two types of Thai classical performances.

In the 1950s, rod puppet troupes were hired to perform at temple fairs, nowadays *likay*[2] troupes have replaced rod puppet troupes since audiences seem to enjoy watching *likay* (heir, personal communication, 25 May 2023). A number of supporters have noted that, as compared with other types of performance arts, such as *khon* and *lakhorn*, puppetry, especially rod puppetry, is underrated. They reveal that, "as organizers of the event about cultural preservation, *khon* is recommended to demonstrate in the event as the representative of Thai traditional performance because *khon* is familiar to audiences" (personal communication, 31 May and 27 June, 2023). Based on information from heirs and supporters, it seems evident that the interest of the audience in traditional rod puppet performances has declined. This is a strong reason why there are only two traditional folk rod puppet troupes remain, *Chor Charoensilp* and *Chucherdchumnansilp*, and they are only hired to perform once or twice a year.

Losing the function as a popular entertainment media has had a significant effect on traditional folk rod puppet troupes. However, because some contemporary rod puppet troupes have revamped their performances to become more interesting, they have received the opportunity to show on special occasions, most noteworthy, at royal funerals and the royal coronation ceremony of the king. Furthermore, on 2 April, Thai Cultural Preservation Day, which is the birthday of Her Royal Highness Princess Maha Chakri Sirindhorn, and the celebrations of King Rama II, which is held every February at King Rama 2 Memorial Park in Samut Songkhram province, both traditional folk rod puppet troupes and contemporary rod puppet troupes perform, along with *khon* and *lakhorn* with the support of the Department of Fine Arts.

Apart from royal occasions, some contemporary rod puppet troupes perform puppets on special occasions, for example, at the foundational day of Poh-Chang Academy of Arts, Rajamangala University of Technology Rattanakosin, the Thai traditional music and performance support project of Chulalongkorn University, Chulawathis. For Chulawathis, the traditional folk rod puppet troupe, *Chucherdchumnansilp*, has sometimes been invited to perform. One of the most well-known episodes of puppet performances is *Phra Aphaimani* fleeing from his giantess wife. *Phra Aphaimani* was written by Sunthorn Phu, a renowned poet in the early Rattanakosin period. For this reason, puppet performances are included in many activities held on the Remembrance Day of Sunthorn Phu.

The occasions detailed above for rod puppet performances reflect that the functions of puppetry have gradually shifted from entertainment to preservation of cultural heritage. Accordingly, puppet performances are reserved to cultural preservation events held by the government or education sector. It can be said that the Chakrabhand Posayakrit troupe's presentation of *Taleng Phai* from January to February 2019 has been the only significant puppet performance that is strictly entertainment. However, the number people attending the performances of *Taleng Phai* was very limited since the puppet performances were sponsored by a number of private sponsors and the tickets were not sold to the general public.

On the one hand, reservation of the function of puppet performance to cultural preservation has the advantage that puppet performances are supported by the government; on the other hand, only some of the rod puppet troupes have been selected for support. That means the other troupes, especially the traditional folk rod puppet troupes, not only have lost their function as entertainment, but also do not meet the criteria to be supported by the

[2] Folk singing performance presented by characters with sparkling dresses.

government, which has tended to be considered “contemporary” puppet troupes as a “widespread practice”, rather than traditional folk rod puppet troupes.

One aspect of survival for the traditional folk rod puppet troupes is by transferring their knowledge to a school in a nearby area. For instance, the *Sangwansilp* troupe passed its know-how to manipulate puppets to the *Pluluangwittaya* School troupe in Tak province and the inheritor of the *Chucherdchumnansilp* troupe is a music teacher in Amphawan School in Samut Songkhram province. The teaching and learning of puppet know-how in schools or universities has made the format of puppet shows change: “Owing to the limited time to practice, the puppet shows of the *Pluluangwittaya* School troupe are quite short scenes, rather than an episode of a story” (instructors, personal communication, March 21, 2023). However, it should be noted that short scenes are more suitable for the occasion of the annual festival of Tak province as mentioned above.

Conclusion

In order to expand the occasions for puppet performances, both national and international puppet festivals have been held in tourist destinations, such as Bangkok, Chiang Mai, Kanchanaburi, Phuket and Phetchaburi. Such puppet festivals not only open up an opportunity for many puppet troupes to perform, but also help build connections among puppet troupes. Nevertheless, the frequency of these puppet festivals is not enough to sustain some puppet troupes, since the festivals are only held every other year. Moreover, if puppet events are organized in tourist provinces where there is no established puppet troupe, such as Kanchanaburi and Phuket, it cannot be expected that there will be long-term and sustainable advantages for those puppet troupes where their bases are in other provinces.

The classification of puppet troupes indicates the dynamic environment for puppetry in Thailand in that puppet troupe founders and heirs have been trying to develop their puppet shows to be more interesting, as well as to create new functions for puppet performance, that is, using puppets as a medium to convey cultural content. The traditional folk rod puppet troupes have been in a delicate situation, except for the *Chucherdchumnansilp* troupe that has clear heirs, both descendants and inheritors, and is originated and located in Samut Songkhram province where many cultural activities are supported.

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Intentional and Unintentional Exclusion: The Roles of Lecturers on Pedagogical Inclusion of Students With Visual Impairments in Higher Education

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Abstract
This study investigated lecturers' perspectives on the pedagogical inclusion of Students with Visual Impairments (SVI) in higher education institutions in Namibia. Access to higher education remains a privilege for individuals with disabilities rather than a human right. Intentional and unintentional exclusion is still prevalent in higher education, with more adversity than a celebration of diversity. Despite the crucial roles played by university lecturers in ensuring education for all, there is limited literature on their perspectives regarding the pedagogical inclusion of SVI. The researcher used a phenomenological research design to explore lecturers' experiences and their roles in SVI inclusion. Twelve lecturers from three participating institutions who taught SVI students were purposefully selected and individually interviewed. Lecturers emphasised the importance of creating a conducive learning environment, developing and adapting content, and motivating students to ensure inclusion. However, they highlighted several challenges, including a rigid curriculum, lack of support and collaboration, inconsistent policy implementation, and inadequate resources and advanced technology. Therefore, the study recommends continuous reviews of inclusive education policies, curriculum reviews, and transformations in higher education towards inclusivity. The study suggests that institutions should adopt Universal Design for Learning (UDL) and Differentiated Instruction (DI), allowing for planning and anticipating all students' needs.

Keywords: Inclusive Education, Visual Impairments, Pedagogical Inclusion, Intentional and Unintentional Exclusion

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1. Introduction

Article 26 of the Universal Declaration of Human Rights of 1948 emphasises the right to education for all individuals and asserts that equitable access to higher education should be ensured (Peterson, 2010). In 1994, the World Conference on Special Needs Education, which took place in Salamanca, Spain, expanded the goals of Education For All (EFA) to encompass a transformative policy shift towards promoting inclusive education (United Nations Educational Scientific and Cultural Organisation [UNESCO], 1994). The Salamanca declaration reaffirmed and urged the participating countries to acknowledge inclusive education (Josua, 2013). Consequently, as a signatory to the statement, Namibia embraced the principles of inclusive education (Josua, 2013). According to UNESCO (2008), inclusive education addresses and caters to the diverse needs of students by fostering participation, eliminating exclusion, and strengthening the education system to encompass all individuals (UNESCO, 2008).

Namibia has developed a Sector Policy on Inclusive Education (Ministry of Education, 2013) to guide inclusive practices in all educational institutions. The policy mandates that government institutions and government-subsidised institutions responsible for all levels of education adhere to the principles of inclusive education (Ministry of Education, 2013). It also calls for curriculum reviews and transformation to better cater to the diverse learning needs of all students. Additionally, the policy encourages institutional changes and highlights the importance of shifting educational policies and practices to meet the needs and aspirations of all learners in different school settings (Ministry of Education, 2013).

As a result, the call for inclusive education extends to primary, secondary and higher education institutions. At the same time, Namibia aims to achieve Goal 4 of the Sustainable Development Goals (SDGs), which emphasises providing inclusive and quality education (Boeren, 2019). According to the intercensal survey report 2016, Namibia is home to 31,968 individuals with visual impairments, accounting for 29.3% of the disabled population (Namibian Statistics Agency, 2017). Researchers have observed an increase in the number of students with visual impairments in higher education institutions (HEIs) in Namibia (Haihambo, 2010; Garaz, 2014; Sheyapo, 2017).

Including students with visual impairments (SVI) in higher education can be accomplished through curriculum, pedagogical policies, and institutional transformation. Despite numerous efforts to address exclusion in Namibia through curriculum changes and evaluations, SVI students continue to be excluded from higher education (Jones & Hodgson, 2004; Alqaryouti, 2010). There have been numerous calls for the inclusion of students with disabilities, particularly SVI students, but they still face various challenges in higher education (Josua, 2013; Haihambo, 2010). While lecturers play a crucial role in facilitating learning, limited literature exists on their perspectives regarding including SVI students in the Namibian context. Therefore, this paper aims to examine the roles of lecturers and institutions in the pedagogical inclusion of SVI students and identify the intentional and unintentional factors contributing to their exclusion from the lecturers' perspectives. Additionally, this paper proposes best practices to enhance inclusion in higher education.

2. Literature Reviews

Mushome and Monobe (2013) and Mwakyeja (2013) revealed several challenges lecturers face, such as heavy workloads and teaching in large venues with many students. Lecturers are

the facilitators of learning and must adapt their teaching to inclusive pedagogies to meet the needs of students with visual impairments (Molina, Rodrıguez, Aguilar, Fernandez, & Mori~na, 2016). Molina et al. (2016) conducted a biographical narrative to explore lecturers' roles in an inclusive setting and analyse the impact of lecturers' attitudes on the performance of students with disabilities. They found that lecturers made curriculum adaptations in a spirit of goodwill rather than as a university policy regulation. Moreover, Molina et al. (2016) noted more barriers in higher education institutions than bridges, mainly stemming from lecturers' attitudes, lack of information and lack of training on best teaching practices to cater to the diverse needs of SVI. According to Ashraf and Ishaq (2020), the key to SVI success in an inclusive setting is appropriate change and curriculum and classroom activities modification. Hewett, Douglas, McLinden, and Keal (2017) acknowledge adjustments made by HEIs for SVI to access courses but reported that lack of anticipatory adjustments created barriers and led to exclusion.

Similarly, Lamichhane (2017) affirms that educators adjust teaching styles to include SVI. However, she stresses many unresolved questions and concerns about whether the adjustments are sufficient to meet the diverse needs of SVI. According to da Silva and Pimentel (2021), how universities are structured physically and pedagogically deprives students of many opportunities for their study dynamics and creates barriers capable of interfering with their academic endeavours.

Meanwhile, Firat (2021) used semi-structured interviews to explore factors that facilitate and complicate the higher education process for SVI. He indicates that lecturers have limited awareness of the barriers faced by SVI and insufficient academic support. Likewise, Athanasios et al. (2009) found a lack of infrastructure and challenges in practical activities as barriers to learning. Moreover, Ball et al. (2021) indicate that educators purposely excluded students from lessons because they were unaware of effective strategies to meet their needs. Therefore, Athanasios et al. (2009) suggest that educators must be aware of their students' diverse needs. In another study, Simui et al. (2018) explored enablers and disablers of the academic success of SVI in HE. They highlighted positive attitude, self-advocacy and innovativeness as the primary enablers. On the contrary, negative attitudes, a lack of inclusive policy, inaccessible learning environments and instructional materials, exclusive pedagogy and a lack of orientation and mobility were underscored as disablers of the academic excellence of SVI in HE.

Alqaryouti (2010) recommends sufficient learning materials, appropriate learning activities that enhance effective interaction, well-qualified staff that recognise students' needs, and awareness about challenges faced by SVI. In addition, Bishop and Rhind (2011) emphasise staff empowerment on best practices to include SVI as beneficial to every institution. At the same time, Miyauchi (2020) pointed to UDL as a strategy and tool that facilitates inclusive learning. Similarly, Häggblom (2020) affirms that UDL is a concept and a framework aimed to maximise student-centred teaching and learning in higher education and widen participation.

The study was built through a lens of the Humanistic theory of learning, which believes in student-centred education and encourages personalised instructions that cater to individual needs (Karthikeyan, 2013a). The humanistic approach to learning is based on the principles of humanism from the work of Abraham Maslow in 1954 and Carl Rogers in 1959 (Karthikeyan, 2013b). In this theory, the role of lecturers as (facilitators of learning) is to ensure that the learning environment, instructional methods, learning materials, classroom activities and assessments are student-centred and inclusive (Karthikeyan, 2013b). The theory expected

lecturers to be concerned about how each student feels about learning. It supports Universal Design for Learning (UDL), which guides all instructional planning and designing, as well as Differentiate Instructional Strategies (DIS) that enable educators to plan teaching methods that meet the diverse needs of students (Lintangsari & Emaliana, 2020).

Teaching Excellence in Adult Learning [TEAL] (2010) underscored two main benefits of using UDL: a flexible curriculum and various instructional practices, materials and learning activities. They posit that UDL enables lecturers to use multiple strategies in their plans to present content, use various instructional materials, provide cognitive and affective support, and employ varied learning styles and flexible assessment methods. Furthermore, UDL allows lecturers to know and understand their students, adapt to the learning environment and prevent barriers to effective learning for all (TEAL, 2010). While UDL advocates for various teaching methods that develop the full potential for all, it also guides the development of a supportive and responsive curriculum for all students.

3. Methodology

The study utilised a qualitative phenomenological design to gather insights from lecturers regarding the pedagogical inclusion of students with visual impairments (SVI) in three Higher Education institutions in Namibia. A purposive sampling approach was employed to select twelve lecturers, with four lecturers chosen from each institution, who had experience teaching SVI. These participants were individually interviewed using a semi-structured interview format. Additionally, lecturers' classroom lectures were observed to ascertain their roles in facilitating the pedagogical inclusion of SVI in Higher Education in Namibia. Prior permission and informed consent were obtained from both the participating institutions and the lecturers. Interpretive Phenomenological Analysis was employed to explore the individual and subjective narratives surrounding both intentional and unintentional exclusion of SVI in Higher Education in Namibia.

4. Results and Discussions

The study found that many factors contribute to SVI's intentional and unintentional exclusion in higher education. As revealed from the study, deliberate exclusion of SVI emanates from lecturers' negative attitudes, where they label, differentiate, reject, deny and discriminate against students because of their disabilities. In addition, the study concludes that lecturers' lack of interest, willingness, and effort leads to the intentional exclusion of SVI. Consequently, lecturers do not anticipate the needs of SVI, resulting from a lack of anticipatory adjustments to meet the needs of SVI, as noted by (Hewett et al. 2017). Moreover, lecturers' lack of skills and knowledge on inclusive strategies and a lack of an inclusive framework to guide inclusive practices in higher education made them reluctant and feel not responsible for catering to their needs (Ball et al., 2021).

Based on the observations, it was evident that no provisions were made to accommodate the needs of Students with Visually Impaired (SVI). There were no adjustments or descriptions to the images displayed on the PowerPoint presentations, and no provision of notes to SVI in Braille or notes with adjusted font prior to the lessons was lacking. Furthermore, most lectures were conducted in large venues with large student populations, resulting in lecturers showing little attention or anticipation towards catering to the needs of SVI students. These findings contradict the recommendations made by Lamichhane (2017), who emphasised the importance of educators adapting their teaching styles, methods, and materials to accommodate SVI

students. Consequently, the study identified a lack of a guiding framework for lecturers to prepare inclusive lectures, adjust teaching methods and adopt learning materials for all students.

Moreover, the study discovered that unintentional exclusion stems from a lack of institutional preparedness in terms of facilities, resources, and institutional and professional support to cater to the needs of SVI. Moreover, adjustments to include SVI were based on lecturers' free will and attitudes and were not guided by inclusive institutional policies. Participant “L2” stated, "Before registering such students, try to ensure everything is in place.” The narrative echoes feelings of unpreparedness, shifting responsibilities, and differentiating and rejecting the SVI. Similar findings were echoed by da Silva and Pimentel (2021), who said that ensuring access to higher education by SVI is not enough if the environment is not ready and facilities and materials are unsuitable to support students throughout their study in HE.

The study also found that HEIs call for inclusive practices but remain silent on “how” lecturers could maximise the pedagogical inclusion of SVI in their lectures. Another participant, “L4”, indicated, “I can try as much as possible, but I know I would not be doing enough for this person.” This narrative echoes feelings of incompetence on the “how” to meet the needs of SVI, a lack of willingness, some sorts of rejections, discrimination, denials, and a sense of fear. These made lecturers reluctant and made them feel unaccountable for catering to SVI.

“At this stage, the curriculum development does not make provision for students with special needs”(Participant L8). Despite the many curriculum transformations, lecturers still felt limited in adapting the curriculum as they perceived it as inflexible and not responsive to inclusive practices. The study found that, on the one hand, lecturers lack the knowledge and skills to modify and adjust the curriculum, but on the other hand, they lack the willingness to accept and include SVI (Hewett et al., 2017). Similar findings were echoed by (Simui et al., 2018).

Furthermore, based on the interviews, the study observed that not all lecturers possess a background in education accompanied by training in teaching pedagogies. Consequently, individuals with a background in education exhibited confidence in implementing inclusive education. Conversely, those with non-education backgrounds displayed a limited comprehension of the responsibilities assumed by educators in an inclusive environment. Therefore, findings suggest a need for higher education institutions (HEIs) to allocate resources and avail training programs that enhance the capacity of lecturers in inclusive education and diverse pedagogical approaches.

Participant L1 stated, “I had a late notification that there was an SVI in my class; he did not identify himself either” Another participant, L3, concurred, “You might be told that there is a student of this nature in your class. Sadly, there is no support on how to handle them.” Participants shared their feelings of helplessness, concern, and frustration regarding a lack of communication and support. Their narratives also highlighted the support needs that lecturers anticipated but were not provided. These findings support Firat's (2021) claim that some lecturers in higher education institutions have limited awareness of the challenges faced by individuals with sensory and visual impairments (SVI). Findings uncovered a deficiency in academic support for the lecturers. Bishop and Rhind (2011) stressed the significance of empowering staff to adopt best practices. They pointed out the need for ongoing support to enable lecturers to meet the needs of all students, particularly those with SVI.

Furthermore, the findings reveal shortcomings in institutions' and lecturers' preparedness and readiness to include SVI. Lecturers and institutions were found to be more reactive than proactive to students' needs with visual impairments. The study found that besides a lack of support and preparedness from the institutions, it also noted some reluctance among some lecturers in taking the lead to self-empowerment in areas of inclusive education, in seeking support and advocating for inclusion in higher education institutions.

5. Conclusions and Recommendations

The role of higher education institutions (HEIs) in preventing unintentional exclusion should be to prepare the institutional environment by providing facilities, resources, technology, and policies. This point was also emphasised by Lourens and Swartz (2021), who stressed the importance of monitoring policy implementation. In addition, HEIs should establish an inclusive framework for designing and developing a curriculum that guides lecturers in their inclusive practices. Furthermore, HEIs must support students and lecturers and raise awareness about inclusive practices, as highlighted by (Molina et al., 2016). To prevent the intentional exclusion of students with visual impairments (SVI) in higher education, it is the institution's responsibility to develop an inclusive education framework and for lecturers to adopt the frameworks and strategies in their preparation and teaching. These frameworks and strategies should enable them to adjust, modify, and utilise various instructional methods, materials, learning activities, and flexible assessment opportunities that reduce exclusion. The humanistic approach to learning emphasises learner-centred education; therefore, lecturers should create an inclusive learning environment (less restrictive) where individual students can thrive and maximise their potential. The study affirms that some participating institutions significantly advocate for inclusivity despite the challenges and obstacles.

Based on the findings, the study concludes that the lack of inclusive frameworks in higher education in Namibia exacerbates intentional and unintentional exclusion. It also finds that a lack of awareness, communication, coordination, and collaboration among lecturers, administrators, and students can contribute to intentionally excluding students with visual impairments.

Furthermore, based on the findings, the study recommends continuous reviews of inclusive education policies and improved communication and collaboration among stakeholders within and beyond higher education institutions (HEIs).

Due to the lack of an inclusive education frame to guide lecturers on the pedagogical inclusion of SVI, the study suggests that HEIs in Namibia should adopt inclusive frameworks such as Universal Design for Learning (UDL) and Differentiated Instruction (DI) during curriculum reviews and transformation. Griful-Freixenet et al. (2017) argue that the UDL framework holds excellent potential for meeting the learning needs of students with disabilities and improving inclusive practices in higher education. Additionally, the study recommends the implementation of flexible, adaptable, and responsive curricula to meet the needs of all students. Drawing on a humanistic approach to learning, the study proposes embedding UDL and DI training in orientation programs for newly appointed lecturers in various professional development programs for lecturers. Furthermore, the study emphasises the need to redefine inclusive education as a pedagogical approach rather than solely a field of study. Finally, the study proposes the need for additional research on stakeholders' viewpoints in higher education institutions (HEIs), specifically, management, administrative staff, and the ministry regarding the inclusion of SVI impairments into higher education.

This present study had some limitations. The study mainly focused on the viewpoints of lecturers as its primary sample. Although this approach was considered appropriate for addressing the research questions, incorporating input from diverse stakeholders, such as administrative staff, management, and students, could enhance triangulation and provide more comprehensive insights into this phenomenon. The participants were individually interviewed, and future research endeavours should consider supplementing structured interviews with focus group discussions.

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Never Too Old to Learn – Lifelong Learning Strategies for Volunteers of Digital Art Exhibition

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Abstract
In 1972, United Nations Educational Scientific and Cultural Organization proposed《Faure Report-Learning to Be》and promoted lifelong education as the highest guiding principle of education. Lifelong learning strategies become an important idea that tackles the challenges, impacts and changes facing the emerging information society. In Taiwan, volunteer group is one form that provides adults lifelong learning recurrently. In this paper, learning strategies for volunteers of digital art exhibition is concerned. As digital art has gained popularity among audiences, various types of art exhibitions feature this kind of works nowadays. However, the volunteers working at such digital art exhibitions are often amateurs or retirees in reality. They are usually unfamiliar with operations of digital devices, the essence of modern art, and the ways to appreciate digital artworks. All these difficulties make it more challenging for them to provide visitors with proper guidance and services. This study explored volunteers' willingness to participate, current involvement, and challenges encountered in digital art exhibitions. Six interviews were conducted with artist, curator, exhibition staffs, and volunteers from the Hsinchu 241 Art Space in Taiwan. According to the interviews, it suggested collaborative learning as a strategy for integrating lifelong learning through multidimensional discussions, which aims to encourage volunteers to learn together, engage emotionally, and better understand digital art. The collaborative learning makes it easier to turn artistic ideas into tangible content and boost volunteers' confidence. The conclusion drawn from this study can be provided to exhibition organizers, curatorial teams, and volunteer groups for lifelong learning.

Keywords: Lifelong Learning, Digital Art, Volunteer, Collaborative Learning

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I. Introduction

Digital art is a form of artistic expression that combines technology and art. In comparison to traditional art creation, digital art encompasses a wider range of types, including digital audio and video, digital photography and imaging, CD-ROM, computer art, interactive computer graphics, net art, software art, virtual reality, and more. Digital art can also be expressed through various mediums, such as virtual reality technology, mechanical arms, and others. Today, digital art, through the use of multimedia, interactive devices, virtual reality, and other technologies, breaks through the limitations of traditional art media, providing audiences with a more diverse and varied artistic experience.

In addition, digital artworks often explore the impact of technology on humanity and society, prompting reflection and deep contemplation on technological progress. In the post-pandemic era, many artists frequently use their works to delve into topics such as religious beliefs and the human experience within society. For example, the artist Huang Hsin-Chien explores themes such as human life, consciousness, trauma, and destiny via his VR works. He won the Best VR Experience award in the VR Virtual Reality Competition at the 74th Venice Film Festival. The award-winning work "Room in the Sand" consists of eight rooms, presented in a three-dimensional abstract manner through a series of charcoal drawings or by recording and transforming the participant's voice into 3D virtual objects. The immense blackboard in the piece symbolizes human memory, and the artist Huang Hsin-Chien allows viewers to enter this virtual space through VR technology, essentially immersing them in an emotional memory constructed by the artist (Huang Hsin-Chien, 2017).

Since 2002, the digital artist Tseng Yu-Chuan, who began creating internet art, has actively participated in international digital art curation. In 2012, as part of the Leonardo International Journal's project on writing a white paper for international digital art, she curated a theme focusing on the intersection of female art and digital art. In July 2023, at the 241 Art Space in Hsinchu, a curated exhibition titled "Always On - Net Art Exhibition" was presented by Tseng Yu-Chuan. Through four distinct themes, the exhibition aimed to encourage the audience to contemplate technological ethics through the works of artists, regain decision-making abilities, and be more aware of the presence of online manipulation Hsinchu City as Museum (2023).

However, with the flourishing development of digital art, volunteer tour guides within the exhibition space have become an indispensable part of showcasing institutions. They contribute significantly to the successful organization of exhibitions and the enhancement of audience experiences. Volunteer recruitment often targets retirees, individuals aged between 50 and 80 years old. Therefore, their motivation and learning speed for acquiring new knowledge may be relatively slower compared with younger individuals.

The major author joined the Hsinchu 241 Art Space as a volunteer in 2018. According to the five years' experience of the authors, it is for sure that through guided tours, visitors are able to gain a deeper understanding of digital art pieces and foster a sense of enjoyment in attending exhibitions. However elderly volunteers, when facing digital art guidance, may encounter the following challenges:

1. Artistic Interpretation: Technology artworks often possess multiple layers of meaning. Volunteer tour guides may need to conduct in-depth research and understanding of the artworks then could effectively convey them to the audiences.

2. Interactive Experience: Technology artworks typically involve interactivity and experiential elements. Volunteer tour guides need to assist visitors in engaging with the interactive aspects of the artworks. This often requires specialized knowledge and skills.
3. Technical Operation: Technology artworks frequently involve complex technological equipment and devices. Volunteer tour guides may encounter challenges due to a lack of familiarity with technical systems, resulting in difficulties in correct operation and troubleshooting.

In short, digital art exhibition guides need to have rich knowledge and skills to provide professional services to the audience, thereby enhancing the appreciation and experience of technological art works. However, existing volunteer tour guide training usually only introduces exhibition content. If some volunteers want to learn more about professional knowledge, they only can look up information on their own. This is obviously not enough. Therefore, constructing learning strategies for volunteers of digital art exhibition is an urgent concern. In this paper, volunteers' willingness to participate, current involvement, and challenges are reviewed for further learning strategies. The detailed research objectives are outlined as follows:

1. Understanding the current training status and challenges faced by elderly volunteer tour guides in the field of digital art exhibitions.
2. Exploring the needs of a learning organization for digital art volunteer training.
3. Preliminarily constructing the strategy of group learning.

II. Literature Review

(1) Elderly Individuals and Technology Learning

When discussing the technology learning of elderly individuals, the digital divide is a frequently mentioned topic. The digital divide refers to the differences that arise among different groups in using information and communication technologies due to various factors such as region, age, income, education, etc. It results in inequality and the exclusion of certain groups from basic rights. In a broad sense, the digital divide extends to digital technologies accessible in daily life, such as digital television and smartphones (Lin, Y.-H., & Lin, S.-J. 2009). Are elderly individuals accepting or rejecting new technology? According to a survey conducted by Chuang, Y.-T., Wei, H.-C., & Huang, C.-S. (2008), computer information courses ranked third among the preferred types for domestic elderly individuals, with about 30% expressing interest. However, the actual participation rate was only 20%, which the researchers attribute to the limited availability of computer information courses in domestic elderly education institutions and the attitudes of elderly individuals. The survey also indicated that the psychological factor of "I am afraid of learning courses that involve new technology" ranked first as a reason for elderly individuals not participating in learning activities (Chuang, Y.-T., Wei, H.-C., & Huang, C.-S. 2008). In other words, the psychological barrier of elderly individuals towards new technology remains an unresolved issue.

In the research on adult learning, psychological barriers to participating in learning activities can be divided into two categories: negative evaluation of learning activities and lack of self-confidence. The former involves a negative evaluation of the appropriateness and enjoyment of activities, while the latter reflects a lack of confidence in oneself (Huang, F.-S. 2002). In a two-stage study involving interviews and questionnaire surveys in 2003, Purdie and Boulton-

Lewis (Purdie Boulton-Lewis, G.N.&. 2003) investigated the learning needs of Australian elderly individuals. In the first stage, nearly 50% of participants agreed that technology was an important area for new learning. However, the analysis of the second-stage questionnaire surprisingly revealed a low perceived need for elderly individuals to learn new technology. The authors identified four possible reasons: elderly individuals do not believe that information and communication technology is useful for them, economic factors, memory decline, and difficulty in transportation are reasons they do not want to learn new technology. The most significant reason is the lack of confidence among elderly individuals in learning and using high technology. Purdie and Boulton-Lewis (Purdie Boulton-Lewis, G.N.&. 2003) suggested that elderly individuals may view technology-related activities as unimportant due to a lack of ability in these activities, leading to a self-defense consciousness. The literature mentioned above indicates that elderly individuals, while acknowledging and expressing a willingness to learn new technology and computer operations, are hesitant due to insufficient relevant courses and psychological barriers.

Furthermore, providing a suitable learning environment for elderly individuals is crucial. This includes adjusting course speed and enhancing flexibility. Regarding course content, it is essential to understand the established attitudes of elderly individuals towards technology, such as uncertainty about the internet. Most importantly, elderly individuals should feel needed by society and be given goals and meaning in life.

(2) Learning Organization and Development

A learning organization is a form of organization that centers around learning, aiming to enhance its competitiveness through continuous learning and improvement. In 1990, Peter Senge's book (Senge, 1990) "The Fifth Discipline: The Art and Practice of the Learning Organization" sparked a global learning revolution. Governments (such as the Dutch and Singaporean governments) and businesses (such as AT&T, Intel, Ford) have actively implemented the five disciplines—systems thinking, personal mastery, mental models, shared vision, and team learning—hoping to transform and excel.

The starting point of learning in a learning organization can be individual members, work teams, the entire organization, or even communities interacting with the organization. Learning is a continuous, strategic process integrated with the daily work of organizational members. The outcomes of organizational learning may result in changes in the knowledge, attitudes, and behaviors of organizational members, thereby enhancing the driving force for organizational innovation and growth (Sun B. C., 1995). In summary, a learning organization is a dynamic organization that continually learns, transforms, and adapts to cope with a constantly changing environment. It is a journey to achieve a culture of continuous learning and improvement, rather than a fixed state.

There have been several years of development in the theory and practice of learning organizations in academia. Since the 1990s, many scholars and experts, both domestically and internationally, have conducted in-depth research and discussions on learning organizations, mainly exploring issues related to their constituent elements, construction and development, and effectiveness assessment. For example, Wu Qingshan (1997) advocates that a learning organization should continuously engage in learning, applying systematic thinking to experimentation and problem-solving, in order to enhance individual knowledge and experience. This approach aims to transform the entire organizational behavior, thereby strengthening the organization's capacity for change and innovation. Marquardt M. J. (1996)

asserts that a learning organization is one that effectively and collectively learns, achieving common success through continuous knowledge gathering, management, and utilization. This process facilitates ongoing improvement and transformation.

In the business world, the concept of a learning organization has been widely applied. Many enterprises like Intel, FORD, etc. consider learning as a crucial strategy, continuously providing internal training and development for employees to enhance their professional skills and knowledge. Simultaneously, many businesses actively explore and practice the creation of learning organizations to improve their innovation capabilities and competitiveness.

In the practice of learning organizations, emphasis is placed on establishing a shared vision and values, and inspiring members' creativity and enthusiasm for learning. Additionally, there is a focus on changing the organization's structure and systems to create a more open, collaborative, and innovative organizational culture.

Dr. Donald M. Berwick, a pioneer in applying quality and learning organization concepts in healthcare, emphasized the need for healthcare leaders to successfully build learning organizations for healthcare system reform. He believed that relying solely on political means would not lead to successful reform (Chia, J. L. 1995).

In March 1998, the Ministry of Education in Taiwan issued the "Towards a Learning Society" white paper, proposing that social learning would be the vision and goal of education reform and social development in Taiwan in the 21st century. It explicitly stated that the future society would inevitably be a learning society. The white paper also clearly pointed out that the main task of developing learning organizations is to promote learning organizations in public services, enterprises, families, society, and correctional institutions (HSPI).

III. Research Design

(1) Research Structure

This study is conducted at the 241 Art Space in Hsinchu City, primarily utilizing in-depth interviews with digital artists, curators, and gallery staff. The goal is to understand their needs and suggestions concerning digital art volunteer tour guides, as well as their recommendations for training in a learning organization. The research framework is illustrated in Figure 1 below, which includes the following steps:

1. Confirm research topic, motivation and goal;
2. Investigate volunteer tour guide learning progress and encountered problems;
3. Proposed research method;
4. Design interview questions;
5. Invite interviewees and conduct interviews;
6. Design collaborative learning strategy;
7. Data organization and analysis;
8. Research conclusion and recommendations.

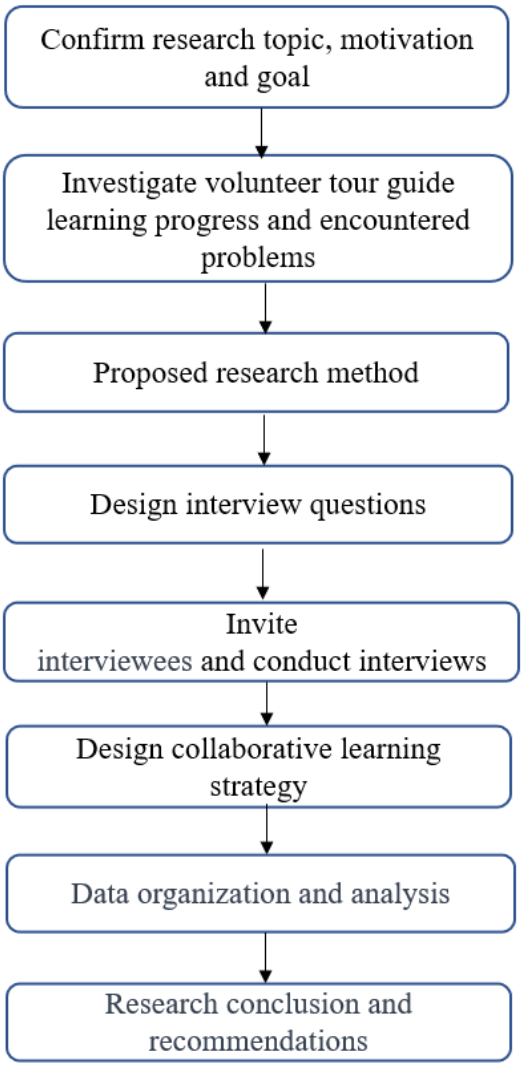


Figure 1: Proposed research framework

(2) Research Method

This study adopts an in-depth interview approach to interview individuals relevant to the study, with different sets of questions designed for each participant. Referring to Chapter 8 of the book "Research Design Methods" (Guan, X. S., 2018), in-depth interviews involve pre-determined questions, and the interviewer engages in a relatively relaxed conversation with the interviewee. The interviewee can freely express their thoughts, and the interviewer guides the conversation with a few questions. This approach allows for a deeper understanding of the interviewee's motivations, thoughts, attitudes, etc., providing a more comprehensive insight. The authors aim to conduct interviews with individuals related to the exhibition to understand their needs and expectations for volunteer tour guides. Additionally, insights into ways to assist volunteer tour guides in addressing challenges will be gathered. The gathered thoughts and experiences will be summarized as a reference for forming the strategy of group learning. This research is based on Hsinchu 241 Art Space and interviews include digital artist, digital art curator, on-site staff and tour guide volunteers. Details of the interviewees are shown in Table 1.

Interviewee	Gender	Seniority	Expertise	Date of interview
A (digital artist)	Male	13	Digital art creation, origami art, programming, teaching	2023/8/16
B (Curator)	Female	20	Artist, teaching, curation	2023/5/27
C (Hsinchu Cultural bureau administrator)	Female	4	Exhibition, promotion, educational specialization	2023/6/12
D (On-site staff)	Female	2	Artistic specialization, administration	2023/5/27
E (Volunteer tour guide B)	Female	5	Home maker, volunteer tour guide	2023/6/30
F (Volunteer tour guide A)	Female	28	Teaching, volunteer tour guide	2023/6/28

Table 1. Details of the interviewees

The questions for the interviewees are designed as the tables below:

Aspect	Questions
Expectations for volunteer tour guides	● Do you consider the interaction between artists and volunteer tour guides important? ● Do you think volunteer tour guides need to possess literacy in technology-based art, including hardware, operational skills, conceptual understanding, and other abilities? How can these capabilities be cultivated? ● In what ways can volunteers learn to understand technology-based art pieces? ● What is your opinion on the necessity of having artists conduct educational training?

Table 2. Designed questions for the Digital Artist

Aspect	Questions
Expectations for volunteer tour guides	● What expectations do you have for volunteers during the exhibition? ● What abilities or qualities do you expect from volunteers, or what specific needs do you have for them? ● Technology-based art can be challenging for volunteers who may lack understanding or experience in certain techniques. It might be difficult to convey the emotional impact to the audience. In situations where training alone may not be sufficient, could you provide any additional resources or recommendations in this regard?

Table 3. Designed questions for the Curator

Aspect	Questions
Expectations for volunteer tour guides	● Do you have any expectations or requirements for tour guides? ● How does the institution ensure that tour guides have an adequate understanding and knowledge of the exhibition and artworks?” ● Is it possible to organize more specialized courses specifically for our volunteers?

Table 4. Designed questions for the Hsinchu Cultural bureau administrator

Aspect	Questions
Expectations for volunteer tour guides	● When volunteers are providing guided explanations, what kind of performance do you expect from them? ● What knowledge areas would you suggest volunteers explore further to enhance their abilities and qualities? ● Are there any specific requirements for volunteers in terms of their abilities when it comes to digital art exhibitions? ● Does the organizer hope that volunteers can convey the joy or emotional involvement of viewing technology-based art pieces? ● What abilities are needed for guiding through digital art, and how can they be cultivated? ● What kind of attitude do you expect from volunteers while on duty at the exhibition? Are you willing to assist volunteers with any questions they may have?

Table 5. Designed questions for the on-site staff

Aspects	Questions
Guided tour experience and challenges	● What is your purpose and core values in participating as a volunteer tour guide? ● What experiences do you have in providing exhibition tours? How have these experiences contributed to your growth and development? ● In your opinion, what abilities should a volunteer tour guide possess for exhibition tours? How do you cultivate and enhance these abilities? ● What learning difficulties do you encounter as a volunteer tour guide?
Learning needs of volunteer tour guides and expectations for the cultural space of Hsinchu city	● What training methods do you believe are helpful for the learning of volunteer tour guides? ● Are the learning resources provided by the institution sufficient for you? What aspects of learning do you expect the institution to provide? ● How does the exchange of experiences and interactive learning among volunteer tour guides benefit you? ● Do you agree that group learning is more effective than individual learning? Does participation in a learning organization boost your confidence in learning?

Table 6. Designed questions for the volunteer tour guides

(3) Research Scope and Limitations

Due to the limitations in time, manpower, and resources, this study is confined to the scope of the 241 Art Space in Hsinchu City. The 241 Art Space, under the jurisdiction of the Hsinchu City Government's Cultural Affairs Bureau, was inaugurated in March 2017. Located next to the Big City Shopping Center, it is currently the largest art exhibition space in Hsinchu City. Under the concept of "Art is Life," the space organizes diverse thematic exhibitions, parent-child workshops, and aesthetic lectures, creating an art space with the themes of "Highlighting the Values of Hsinchu as a Technology City," "Integration of Technology and Art," "Interpretation by Cutting-edge Artists," and "Parent-Child Art Exploration." The goal is to provide a comprehensive artistic experience to the public. Through the cultivation of innovative art, the venue aims to establish a unique spatial character rooted in art, cultivate young cultural and artistic talents, and broaden the artistic horizon of the citizens (Hsinchu City Cultural Affairs Bureau, 2018).

Regarding research limitations, since the training of volunteer tour guides is a long-term effort, this study cannot reflect long-term impacts. In addition, the subjects of the study are primarily the on-duty volunteers at the Hsinchu 241 Art Space, and the background of volunteer participants may vary, including factors such as age and education level, which could influence the research results. To address this, the study, considering limited resources and environmental factors, chooses volunteers with diverse backgrounds and conditions to participate in interviews to ensure the objective presentation of research outcomes.

IV. Research Results

The following content is excerpted from interviews with key personnel in the exhibition venue. The discussion is organized based on the interview results with relevant individuals in sequential order. These interview findings will also serve as a reference for the subsequent learning organization study.

The results of interviews are organized from two perspectives. Firstly, examining the expectations of digital artists, curators, cultural bureau administrators, and 241 Art Space on-site staff towards digital art volunteer tour guides. Secondly, exploring the perceptions of digital art volunteer tour guides regarding the necessity of their assistance for exhibition organizers and digital artists. Through cross-referencing these two aspects, the authors aim to deduce specific directions for the interview results and improvement opportunities. From the interview results shown in Appendix Table A-1 and Table A-2, the authors summarize the interviews below:

(1) Summary of Digital Artist Interview

When presenting their artwork, digital artists incorporate technological methods they have explored or learned about to express their design concepts. Therefore, implementing appropriate measures to help volunteer tour guides understand the design concepts of digital artists is crucial. Besides having artists participate in explaining exhibits during public presentations, suitable methods are needed to further enable volunteer tour guides to comprehend and articulate a comprehensive introduction to the artworks of digital artists. A suggested:

> *It is essential to have an educational training activity, dedicating a specific timeframe for this purpose during each exhibition. I believe it is essential to treat tour guides as learners and provide educational training through artists. I consider this approach to be the most effective and fundamental method. Your perception and perhaps your mood are intertwined with the entire exhibition space, waiting for encounters and serendipity with incoming visitors, generating more interpretations. This is what I anticipate the most.*

The mentioned methods include educational training and the group learning approach discussed in this thesis. However, the support and promotion of exhibition organizers are also essential.

(2) Summary of Curator Interview

Curators play a pivotal role in planning digital art exhibitions, understanding the artistic concepts of digital artists, and aligning the exhibition content with the objectives of the organizing institution within budget constraints. To ensure that audiences of all ages comprehend the essence of digital art exhibits, curators, drawing from their experiences, devise exhibitions that are approachable and easily understandable from various perspectives. To effectively convey the curator's intentions, volunteer tour guides serve as bridges of information between curators, artists, and visitors. Hence, the significance of pre-educational training and preparation for volunteer tour guides in the context of digital art is highlighted. Of particular note is how to ignite the interest and passion of volunteer tour guides. B regards volunteers as “audience members, entering the space to view, perceive, and engage with the

exhibition". The fundamental aspect is their appreciation for art and the exhibition, maintaining this mindset, rather than merely being assistants.

This study aims to promote effective learning methods for volunteer tour guides through organizational learning, such as book-reading clubs or discussion forums. It aspires to kindle the enthusiasm of volunteer tour guides for digital art interpretation through group activities, interaction, and collaborative learning, ultimately achieving the goals of organizing digital art exhibitions. B suggested:

> *Enhancing foundational knowledge in art history is crucial. With a background knowledge, understanding becomes more comprehensive, enabling easier interaction and a deeper comprehension of the artworks, possibly surpassing the understanding of the artists themselves. Book clubs, in my opinion, would be an excellent format for continuous learning. You could select books that facilitate discussions among volunteers, allowing them to exchange thoughts and ideas.*

(3) Summary of Interview With Hsinchu Cultural Bureau Administrator

The organizers of the digital art exhibition play a pivotal role as the driving force behind the scenes, providing both funding and venues. They have set goals for planning, aiming to transform their city (Hsinchu City) from not just a technological hub but also into a hub for digital art. The objective is to imbue all residents in this city with a blend of technological and artistic sensibilities. Therefore, in terms of strategic implementation, it is crucial to organize suitable digital art exhibitions based on the positioning of the exhibition space (Hsinchu 241 Art Space). Additionally, establishing a strategic advisory committee, allocating funds, and planning for long-term initiatives are necessary to sustain this endeavor effectively.

In the context of hosting digital art exhibitions, C believes that *"having guided tours in an exhibition adds significant value, especially in contemporary art exhibitions*". It is important that having passionate, eager-to-learn, and actively engaged tour guides. Such guides are essential for effectively and proactively presenting the curated digital art exhibits to visitors, allowing them to comprehend the artistic concepts envisioned by the artists and curators. However, tour guides are volunteers, and motivating them to be passionate learners and actively involved in guiding, without monetary incentives or workplace obligations, is a focal point that organizers need to contemplate and plan.

The authors suggest that organizers need to better understand why tour guides volunteer for this role. Collecting insights from tour guides on the educational training, learning resources, and preferred learning methods required for participating in digital art tours is crucial. The budget should be taken into account on the resources needed for tour guide training programs or the operation of learning-oriented organizations composed of volunteers. This approach aligns with the organizers' initial goal of fostering citizens with a dual proficiency in both technology and art. C agreed and said*:*

> *If there is funding available, we can invite professional instructors to conduct courses.*

(4) Summary of Interview With On-Site Staff

On-site staff is the front-line workers hired by organizers to facilitate and drive the execution of digital art exhibitions. They are the key individuals interfacing with artists, curators, and volunteer tour guides, making them pivotal in ensuring the smooth progress of digital art exhibitions. With a requirement for highly responsive and communicative abilities, on-site staff need to handle various potential contingencies during the exhibition. Throughout this process, they rely on the assistance of volunteer tour guides to successfully complete tasks. On-site staff expect volunteer tour guides, who contribute on a voluntary basis, to possess sufficient understanding and presentation skills related to the background and operation of digital art exhibits. They rely on volunteer tour guides to assist visitors in appreciating and interacting with the exhibits. D said:

> *If you want to gain a deeper understanding of the theme, visiting contemporary art exhibitions more often can turn your interests into experiences. Alternatively, through the learning format of a book club, everyone can share their thoughts*.

This collaboration underscores the importance of volunteer tour guides continuously improving their understanding and presentation skills through group organizational learning, sharing insights, and experiences with fellow guides, ultimately enhancing their effectiveness in guiding visitors through digital art exhibitions.

(5) Summary of Volunteer Tour Guide Interview

Volunteer tour guides are crucial to serve as the frontline communicators between digital art exhibitions and the visiting public. They are responsible for conveying the artistic concepts of digital art pieces in an engaging and effective manner. To achieve this goal, volunteer tour guides need to invest time in learning and understanding the theme of digital art exhibitions, details about the exhibited pieces, the artists' design philosophies, and the curators' presentation approaches. However, as volunteers, addressing how to meet these expectations with limited resources becomes a noteworthy topic for discussion and resolution.

From the insights shared by two volunteer tour guides of different age groups during the interviews, E said:

> *I hope to have more outdoor visits with scheduled guided tours.*

And F said:

> *I hope curators or the institution, in addition to training, will provide more assistance in understanding computer technology.*

It is evident that, besides relying on the self-discipline and expectations of the volunteers themselves, there is a strong desire for event organizers to provide more diverse educational training, opportunities for activity visits, and resources for group learning. Both interviewees agreed that mutual discussions among volunteers, group learning, and sharing experiences are effective ways to enhance the capabilities and effectiveness of volunteer tour guides. F expressed that:

> *The learning method of our book club involves each member adopting a new artwork, then providing explanation and sharing insights, whether it's about the artist, details of the artwork, or references. This approach is very effective and beneficial. It not only enhances the knowledge level of volunteers but also brings volunteers closer together.*

In conclusion, it is recommended that, with more comprehensive support mechanisms, the expectations for digital art volunteer tour guides could be realized more effectively.

(6) Interview Summary in All

Based on the interviews conducted with artist, curator, Hsinchu Cultural bureau administrator, on-site staff, and representative volunteer tour guides, the following summarization is provided:

1. There is an expectation for volunteer tour guides to have sufficient understanding and interpretative skills regarding digital art pieces. This is deemed crucial for effectively enhancing the impact of digital art exhibitions and promoting better understanding among the visiting public.
2. Group learning, educational training, and sharing experiences are recognized as helpful elements in elevating the comprehension of digital art pieces, improving guiding capabilities, and enhancing the overall effectiveness of guided tours.
3. The continuous promotion of a learning-oriented approach can assist volunteer tour guides in gradually cultivating an interest in digital art, refining guiding skills, and fostering enthusiasm for digital art tours.

V. Conclusion

Based on insights gleaned from interviews with the digital artist, curator, Hsinchu Cultural Bureau administrator, and staff, a shared consensus emerged. They collectively underscored the importance of integrating educational training activities into the exhibition framework. Specifically, they advocated for allocating dedicated time during each exhibition for such initiatives, utilizing a book club format. This approach was considered highly effective in promoting continuous learning, enabling participants to share their perspectives on exploring digital artworks.

Moreover, interviews with volunteer tour guides revealed their desire for a thorough understanding and interpretative proficiency in dealing with digital art pieces. They stressed the significance of these skills in effectively enhancing the impact of digital art exhibitions and fostering a deeper understanding among the visiting public.

Following these interviews, this study concludes that volunteer tour guides at Hsinchu 241 Art Space exhibit motivation and passion. As indicated in the research motivation, most gallery volunteers are retirees or hobbyists, finding guiding digital art more challenging than traditional art. Challenges may arise from interpreting artworks, handling equipment, and the fact that current training methods primarily focus on introducing exhibition content. Volunteer tour guides acknowledged these challenges during interviews and expressed the need to independently seek professional knowledge due to time and experience limitations.

This research delves into the establishment of a learning-oriented organization among like-minded volunteer tour guides, planning self-training activities to collectively enhance

knowledge. Given the study's limitations regarding the scope confined to Hsinchu 241 Art Space and time constraints, the results offer a comprehensive conclusion. It is affirmed that participants exhibit strong motivation to learn, maintain harmonious interactions with peers, and confirm that participation in a learning-oriented organization enhances volunteer tour guides' learning effectiveness in the digital art field, contributing to the promotion of digital art.

In summary, the authors hope that the gallery will provide support in professional courses, actively improve both soft and hard facilities, and address the needs of volunteers to establish itself as a benchmark exhibition venue. The effectiveness and experiences of the learning-oriented organization developed in this study can serve as a reference for other galleries.

Appendices

Interviewees	Questions	Answers	Key points
A (Digital artist)	Do you believe that tour guides need to possess proficiency in various aspects of digital art, including hardware, operational skills, and conceptual understanding? How can these competencies be cultivated?	The tour guides need to explain to the general public, so they must have some understanding of these terms and their functions. This knowledge is crucial for providing appropriate answers when visitors ask questions. It is essential to have an educational training activity, dedicating a specific timeframe for this purpose during each exhibition.	Tour guides need to have appropriate and sufficient educational training.
	How can volunteers learn to understand digital artworks?	I believe it is essential to treat tour guides as learners and provide educational training through artists. I consider this approach to be the most effective and fundamental method.	
B (Curator)	What expectations do you have for volunteers during the exhibition period?	Volunteers are frontline personnel at the exhibition site, intricately connected with the exhibition. I see volunteers as audience members, entering the space to view, perceive, and engage with the exhibition. The fundamental aspect is their appreciation for art and the exhibition, maintaining this mindset, rather than merely being assistants. I believe that approach would be more ideal and beneficial.	It is most ideal if tour guides genuinely appreciate the artworks they are guiding.
	What abilities do you expect from volunteers, or what specific requirements do you have for them?	I am very grateful for the volunteers, and my heart is full of appreciation. I believe that liking the artwork, enjoying the exhibition, and being with these works is already wonderful. Your perception and perhaps your mood are intertwined with the entire exhibition space, waiting for encounters and serendipity with incoming visitors, generating more interpretations. This is what I anticipate the most.	
	The realm of digital art can be somewhat	“I believe, first and foremost, it is essential for volunteers to have	Tour guides must possess a certain

	challenging for volunteers. There are aspects they may not fully grasp, and finding that emotional connection can be difficult. Lack of exposure to certain techniques may lead to feelings of inadequacy when explaining to the public. Relying solely on training might not be sufficient. Could you provide reference resources in this regard?	established knowledge about the conceptual ideas and thoughts behind the artworks. In more formal guided tours, guides have a responsibility to convey the artist's ideas accurately and avoid excessive personal interpretation. Additionally, enhancing foundational knowledge in art history is crucial. With a background knowledge, understanding becomes more comprehensive, enabling easier interaction and a deeper comprehension of the artworks, possibly surpassing the understanding of the artists themselves. The training programs provided by the institution should not only focus on introducing the specific exhibition but also cover some basic knowledge in art history. This could include guidance on how volunteers can introduce artworks to the audience. Book clubs, in my opinion, would be an excellent format for continuous learning. You could select books that facilitate discussions among volunteers, allowing them to exchange thoughts and ideas."	level of background knowledge in digital art, and this can be fostered through book clubs where mutual exchange and learning can take place.
C (Hsinchu Cultural bureau administrator)	Do you have any expectations or requirements for tour guides?	I believe having guided tours in an exhibition adds significant value, especially in contemporary art exhibitions. My expectations for tour guides are, firstly, to be passionate, secondly, to be eager learners, and thirdly, to be curious and capable of approaching visitors proactively rather than passively waiting for inquiries. I think the requirement for volunteers is to possess a high degree of initiative and enthusiasm.	I hope that tour guides possess enthusiasm, a willingness to learn, proactiveness, and curiosity.
	How does the institution ensure that tour guides have an adequate understanding and knowledge of the exhibition and artworks?"	In this aspect, indeed, we lack a mechanism for review. It is suggested that on-site staffs engage in timely discussions with volunteers about the artworks during their duty hours, which is a promising idea. Considering the development of relevant schemes is advisable.	The exhibition venue needs to allocate budget for training tour guides to understand the exhibited artworks.
	Is it possible to organize more specialized courses	If there is funding available, we can invite professional instructors	

	specifically for our volunteers?	to conduct courses.	
D (241 Art Space on-site staff)	Do you have any specific opinions when it comes to volunteer-guided explanations? What kind of performance do you expect from them?	In general, the key points are sufficient, but for a detailed explanation, especially for artworks with special techniques or installations, it's essential to highlight the conceptual aspects. Volunteers can adjust the tour accordingly based on this during the guided tour.	Tour guides are not only expected to introduce artworks but also to articulate the artist's creative concepts.
	Do you have any suggestions on what aspects our reading club can further explore to enhance our abilities and knowledge?	If you want to gain a deeper understanding of the theme, visiting contemporary art exhibitions can turn your interests into experiences. Alternatively, through the learning format of a book club, everyone can share their thoughts. In this sharing process, it's important to be open-minded and accept each person's opinions, as artworks are inherently subjective, and individuals focus on different aspects.	Tour guides can enhance their knowledge by visiting other art exhibitions and engaging in mutual sharing, discussions, and learning through book club sessions.

Table A-1. Interview results on the expectation to the volunteer tour guides

Interviewees	Questions	Answers	Key points
E (Volunteer tour guide A)	What assistance do you expect the exhibition venue or curators to provide for volunteers?	I hope to have more outdoor visits with scheduled guided tours. If there could be an additional half an hour credit counted for transportation of the round trips during a one-hour duty, it would be a great encouragement for us.	More outdoor visits with scheduled guided tours.
	How would the exchange of experiences and interactive learning among tour guides benefit you?	It can reduce preparation time as others introduce artworks, allowing me to better grasp the artist's background and the significance of their work.	Group learning can expedite the understanding of artworks in the exhibition.
	Do you agree that group learning is more effective than individual learning? Can participation in a learning-oriented organization boost confidence in learning?	Agree, it can.	Group learning can increase confidence in learning.
F (Volunteer tour guide B)	What assistance do you expect the exhibition venue or curators to provide for volunteers?	I feel that observation is crucial, and there is a need for new courses and encouragement. I hope curators or the institution, in addition to training, will provide more assistance in understanding computer technology. I look forward to the cultural and art exhibition venue putting effort into enhancing the depth of the exhibits. I hope there will be more events similar to the 'Old Clothes Puppet Workshop' for volunteers, and I anticipate the venue to create videos using photos from volunteer activities.	I hope there will be more training courses and visit activities organized for volunteer tour guides.
	How would the exchange of experiences and interactive learning among tour guides benefit you?	The learning method of our book club involves each member adopting a new artwork, then providing explanations and sharing insights, whether it's about the artist, details of the artwork, or references. This approach is very effective and beneficial. It not only enhances the knowledge level of volunteers but also brings volunteers closer together.	Group learning can expedite the understanding of artworks in the exhibition and bring volunteers closer together.
	Do you agree that group learning is more effective than individual learning? Can participation in a learning-oriented organization boost confidence in learning?	Yes, individual experiences are not sufficient, so we need the power of the group. Group learning can brainstorm ideas, facilitate teamwork, achieve more with less effort, pool collective efforts, and result in comprehensive success.	Group learning can boost confidence and effectiveness in learning.

Table A-2: Interview results from the volunteer tour guides

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Examining System Level Policy for School as Learning Organization: A Case Study in Cambodia

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Abstract
In the midst of uncertain and constantly changing environment, schools today are argued to transform themselves to learning organizations. Kools & Stoll (2016) conceptualized the Integrated Model of School as Learning Organization to offer a framework for schools to prepare the transformation process. Cambodian schools have been through several phases of rigorous reforms. The MoEYS, through Education Strategic Plan 2019-2023 and Cambodia Education 2030 Roadmap, aimed to transform schools into learning organizations. Following these initiatives of MoEYS for SLO, researcher conducted a content analysis of ten extant Cambodian national policies and strategies for education to examine whether the MoEYS' policies and strategies support school as learning organization. We developed a conceptual framework outlining four dimensions and fourteen subsets as the criteria for data collection. Researcher collected the secondary data through the ten policy and strategy documents of the RGC and the MOEYS. We organized the data under the four dimensions and fourteen subsets on the spreadsheet for analysis. As a result, we found that the MoEYS' policies and strategies, which are aligned with the Royal Government of Cambodia national strategies, support school as learning organization. However, researcher recommends a coherent leadership policy for school directors, DOE and POE officials. Since leadership has proven to impact on school transformation, we argue for the coherent leadership policy to integrate transformational leadership, instructional leadership, distributed and learning leadership. Another important recommendation is further reform in decentralization and de-concentration to reduce the school governance layers to narrow the gaps between MoEYS and school levels.

Keywords: School as Learning Organization, Education Policies, System Level

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Introduction

The school of tomorrow may be a need of many scholars, educators and policy makers who long for the preparedness and responsiveness of an uncertain, complex and constantly changing environment. School was conceptualized as a Professional Learning Community (Moore, 2009; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006) and as a Professional Development School (Harris, & van Tassell, 2005). Bowen, Ware, Rose & Powers (2007) proposed a School Success Profile-Learning Organization to measure learning school. Another popular LO model of Dimension of Learning Organization Questionnaire (Watkins & Marsick, 1997) has been tested in multiple contexts including schools. Having tested the DLOQ model in education context, Kools & Stoll (2016) reconceptualized the Integrated Model of School as Learning Organization grounded on the theoretical DLOQ model (Watkins & Marsick, 1997).

Cambodia has long sustained from the tragic genocide event since 1975. After regaining the second kingdom in 1993, Cambodia has emerged as one of the fastest growing economic countries in the world (World Bank, 2024). In addition, Cambodia has achieved lower-middle income country status since 2015 and the annual economic growth rate is 7% or around 5% due to Covid. According to the Pentagonal Strategy-Phase 1 of the Royal Government of Cambodia, which integrated the Cambodian Sustainable Development Goals(CSDG) 2016-2030, Cambodia aims to reach the status of upper-middle income country in 2030 and high-income country in 2050 (Royal Government of Cambodia, 2023). To achieve the CSDG on education roadmap 2030, the Ministry of Education, Youth and Sport (MoEYS) has developed an Education Strategic Plan (ESP) for 5 years from 2019-2023 (MoEYS, 2019) that outlines concrete strategic policy reforms and actions to achieve the goals in ESP per se and also in National Strategic Development Plan (NSDP) 2019-2023(Royal Government of Cambodia, 2019). According to the ESP (MoEYS, 2019) and Cambodia's Education 2030 Roadmap (MoEYS, 2019), Cambodian schools are envisioned to transform to learning organizations.

Having conducted a descriptive review of the Integrated Model of School as Learning Organization (Kools & Stoll, 2016), we found that the SLO model is more applicable in European contexts than in East Asian nations like China. Cambodia is one among the South East Asian countries, where social norms, high cultural settings, power distance affect the management and leadership (Jones & Nagel, 2022; Kovačević, & Hallinger, 2019; Hallinger & Bryant, 2013; Walker, Hallinger & Qian, 2007; Hallinger, 1998). Since Cambodian education is on another strategic education reform phase where the current ESP 2019-2023 is due to end soon, it is more compelling for the research to examine the system level supports and initiatives for schools to transform to learning organization in Cambodia. The findings would contribute to the MoEYS' education strategic planning 2024-2028 for realizing the Cambodian school as learning organization.

Conceptual Framework

The Integrated Model of School as Learning Organization (Kools & Stoll, 2016) was proposed by OECD and UNICEF through a joint working paper to offer an SLO framework for policy makers, scholars, practitioners to apply respectively in their country contexts. Kools & Stoll (2016) conceptualized 7 action-oriented dimensions for school as a learning organization. Each seven dimension is followed by 49 key subsets that elaborate further on how to effectively implement each dimension as below.

- Developing a shared vision centered on the learning of all students
- Promoting and supporting continuous professional learning for all staff

- Promoting team learning and collaboration among all staff
- Establishing a culture of inquiry, exploration and innovation
- Embedding a system for collecting and exchanging knowledge and learning
- Learning with and from the external environment and larger system
- Modelling and growing learning leadership

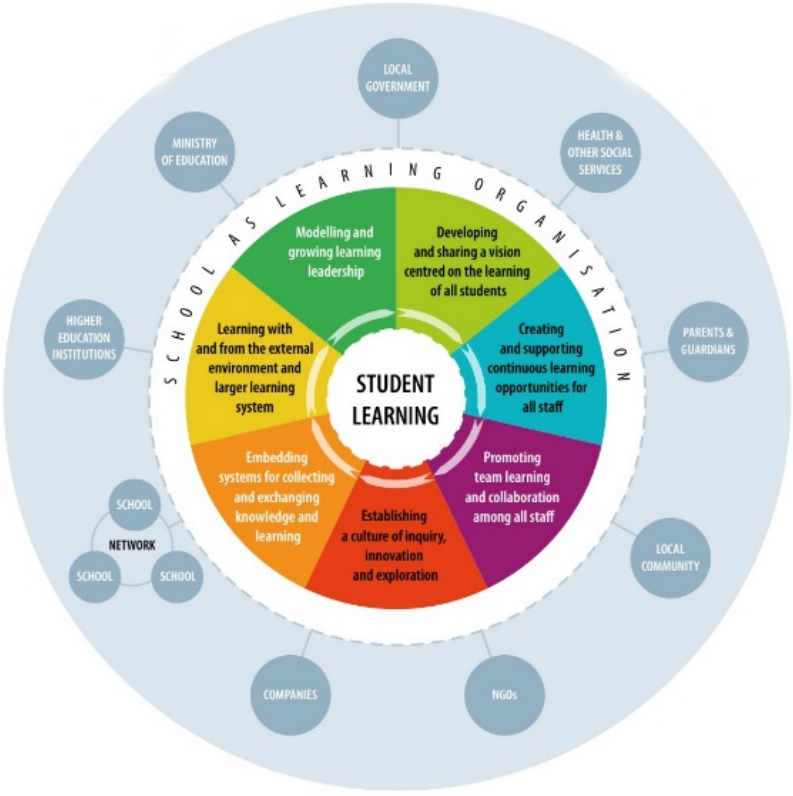


Figure 1: The Integrated Model of School as Learning Organization
Adapted from Kools & Stoll (2016)

The model was tested in mostly European countries, namely Wales (Harris, Elder, Jones & Cooze, 2022; Kools, Stoll, George, Steijn, Bekkers & Gouëdard, 2020; Kools, Gouëdard, George, Steijn, Bekkers & Stoll, 2019), Greece (Papazoglou & Koutouzis, 2022; Papazoglou & Koutouzis, 2020), Romania (Paraschiva, Draghici & Mihaila, 2019), Latvia (Lavrinoviča, Linde, Siliņa-Jasjukeviča & Lūsēna-Ezera, 2023) and in Asia like China (Tan, 2020).

In Wales, Kools, Pont, Gouëdard, Rodriguez, Stoll & George (2018) conducted a thorough research to help Welsh schools transform to learning organizations adopting the Integrated Model of School as Learning Organization. In their published book, there was a review of system level policies to enable or to hinder the transformation process of school as learning organization. Kools et al. (2018) conceptualized three dimensions for reviewing the system level policies of Welsh education to support the transformation of schools to learning organization as below:

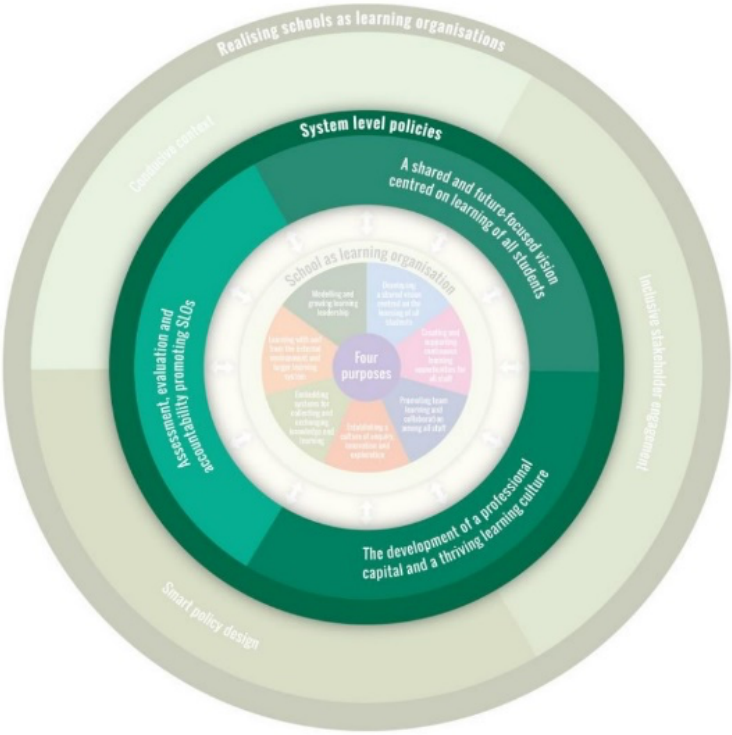


Figure 2: System level policies for developing school as learning organizations
Adapted from Kools et al. (2018)

- A shared and future-focused vision centered on learning of all students

The dimension argues for developing a national policy that converges a vision from national level to provincial/ middle tier / district level and to school level. The linkage of one vision centered on student's learning outcomes to be shared between the national level and school level will motivate schools to align with the national goals and strategies. Kools et al. (2018) also recommended the vision to be inclusive of the disadvantaged / minority students and elevate equity in education.

- The development of a professional capital and a thriving learning culture

The dimension pinpointed a significant process of maintaining professional capitals following the seminal work of Hargreaves & Fullan (2015) and Fullan & Hargreaves (2012) that system level policies in Wales should consider. The professional capital was proposed to compose of human capital, where individual motivation and engagement is argued to happen, social capital which values networking, teamwork, collegiality and relationship between leader and teacher and teacher with teachers, and decisional capital that focuses on interwoven leadership where leaders can interact together to improve decision making in uncertain and complex working environment. Campbell, Lieberman & Yashkina (2016) and Tong & Razniak (2017) recommended the national level policy to amend their approach to teacher's professional development, motivation, teacher's benefits, working conditions and collaborative working environment to foster professional capital that is drawn from their research evidence of the Ontario's teacher learning and leadership program. Likewise, Kools et al. (2018) proposed five subsets for policy makers in Wales to foster professional capitals and learning cultures.

- Assessment, evaluation and accountability promoting SLO

In the dimension, it is argued for national policies to include school evaluation criteria and procedures where inspection criteria such as the Estyn system must be rigorously done at school level. Kools et al. (2018) argued for an articulated monitoring and evaluation system to be drafted in the policies. The policies for monitoring and evaluation must hold the school level to be accountable for developing the school as learning organization.

In Greece, Papazoglou & Koutouzis (2020) conducted a research with 418 primary schools in Greece and found that only six dimensions of the integrated model of SLO were fit with the Greek school contexts. Schools' size affected the transformation while geographical difference did not challenge the process. According to Papazoglou & Koutouzis (2022), there should be a reform of policy to decentralize school principal's more autonomy and authority to improve teacher's continuous professional learning. Teachers should be granted more autonomies and professional learning opportunities.

In Latvia, Lavrinoviča, Linde, Siliņa-Jasjukeviča & Lūsēna-Ezera (2023) reviewed the extant literatures of SLO models by Kools & Stoll (2016) and other international published papers to conceptualize the theory and practice of SLO. The research has found key barriers, lack of knowledge and skill in learning leadership, a centralized system, lack of time, lack of support from upper management, lack of financial support and sustainability. School autonomy and leadership are key enablers to make positive transformation toward learning organization.

Having reviewed the recommendation of policies to support transformation of SLO in Wales by Kools et al. (2018) and some effects and impediments of Greece's and Latvia's case studies, researcher will conceptualize the framework based on these findings to review the system level policy to support SLO in Cambodia. We will adopt the three main dimensions of policy review in Wales and add another dimension, namely decentralization of authority and funds following the strong argument from the SLO research findings in Greece and Latvia. Decentralization can come in many forms, namely de-concentration, delegation of semi-autonomous corporations, devolution to local government and transfer of functions to nongovernmental organizations (Rondinelli, Nellis & Cheema,1983). Decentralization is still a debatable issue of implementation between the central government and local authority (Caldwell, 2005; Parry, 1997; Rondinelli, McCullough & Johnson, 1989). In education, decentralization is a school management strategy called School-Based Management (SBM) where devolution of authority to school level is argued to raise effective school management, teacher motivation and learning outcomes (Faguet & Sanchez, 2008; Sawada & Ragatz, 2005). As argued in Caldwell (2005), SBM must build the professional capacity of teachers and school leaders through the transferred autonomy and authority from central authority to impact directly on student's learning outcomes. There are varied forms of SBM (Wohlstetter & Odden, 1992). However, Leithwood & Menzies (1998) argued for four forms of SBM, namely administrative control, professional control, community control and balanced control (professional and community control). Decentralization, through SBM, will promote school autonomy and accountability for learning. Therefore, researcher will integrate the decentralization dimension as other criteria to review the system level policy of Cambodian SLO.

Criteria	
Dimension	**Key Subsets**
Shared and future focused vision centered on learning of all students	- consolidating inclusive visions across the national, middle tier and school level - Central focus on equity and well-being
The development of professional capital and a thriving learning culture	- Basing selection into initial teacher education on a mix of criteria and methods - Prioritizing professional learning in certain areas - A coherent leadership strategy (learning leadership, transformational leadership, instructional leadership and distributed leadership) - Greater support for secondary school leaders - Promoting collaborations between schools and teacher education institutions
Assessment, evaluation and accountability promoting SLOs	- School inspection - A participatory self-evaluation process - National criteria for school evaluation - Monitoring system through student's assessment results, school inspection report and school evaluation report - Aligning performance measure to the new curriculum
Decentralization of authority	- School level decision-making autonomy - Transfer of funds and resources to school levels

Table 1: Criteria for examining system level policy in Cambodia

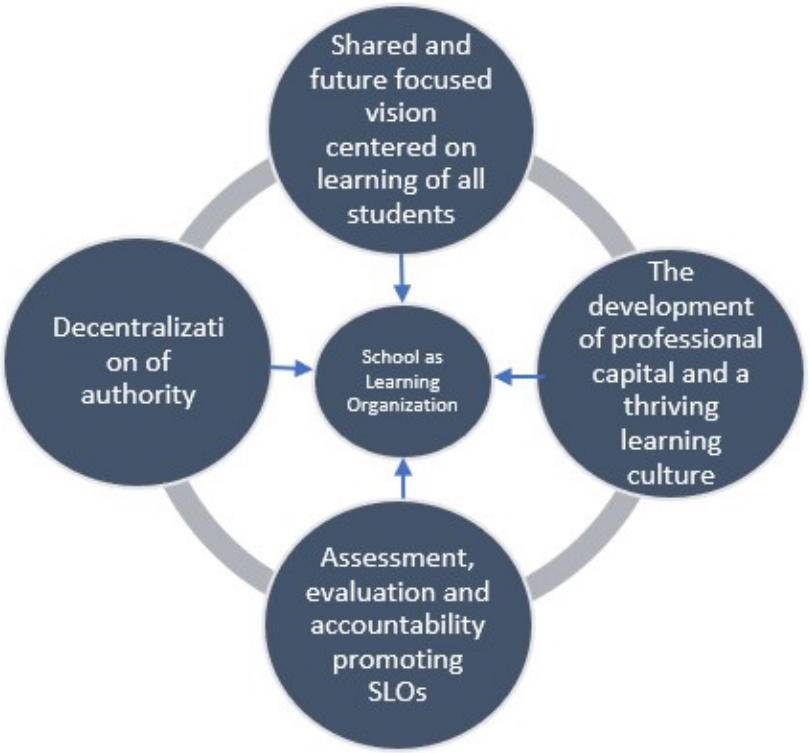


Figure 3: Conceptual framework of system level support for SLO

Research Questions

In order to examine the system level policies that support the schools as learning organization in Cambodia, researcher will raise one key question as below to frame the research design and analysis.

1. Do Cambodian national and educational policies support schools as learning organizations?

Research Method

Researcher applies a qualitative case study research to examine the system level policies to support the SLO development in Cambodia. Researcher will apply a purposeful sampling (Creswell, 2012) to collect the secondary data from key relevant educational policies and strategies published and adopted by MoEYS for content analysis. First, we locate official documents from the MoEYS website, the Open Development Cambodia, Ministry of Economics and Finance and other RGC websites. Researchers will only collect the published RGC's national policy that is relevant to education, namely National Policy for Lifelong Learning(NPLL) and National Strategic Development Plan 2019-2023(NSDP), and MoEYS's strategies and policies for analysis and discussion, namely Education Strategic Plan 2019-2023, Continuous Professional Development Framework for Teachers and School Directors(CPDFTSD), Cambodia Education 2030 Roadmap (CER), Capacity Development Master Plan in Education Sector(CDMPES), Teacher Policy Action Plan(TPAP), Cambodia Secondary Education Blueprint 2030(CSEB) and School Inspection Handbook(SIH).

To conduct data analysis, researcher will group the collected secondary data from above official documents based on the four dimensions which are the main themes for our research. We create a spreadsheet with each theme and organize the collected data from RGC's and MoEYS policies and strategies under each theme. The analysis will follow each key subset of the main themes or dimensions to deliver answers as the findings from our research questions.

Findings

Having conducted a cross sectional data analysis through each dimension and its subsets of the ten published policies and strategies of Royal Government of Cambodia (RGC) and the Ministry of Education, Youth and Sport (MoEYS), researcher has found the results of Cambodian national and educational policies and strategies to support school as learning organization as below.

Dimension: Shared and future focused vision centered on learning of all students
Subset: Consolidating inclusive visions across the national, middle tier and school level
In this dimension, the key policies and strategies focus on inclusive vision cascading from national level, namely RGC to MoEYS, to provincial/district and to school levels. Equity and well-being are also integrated into the criteria for the interconnected vision from national level. RGC, through the National Strategic Development Plan (RGC, 2019) has laid out a national vision to become an upper middle-income country in 2030 and a high-income country in 2050. This vision was echoed and supported by the Educational Strategic Plan (MoEYS, 2019) that envisions for the development of high-quality human resources in the knowledge society of Cambodia.

Another vision alignment is laid in the Cambodia's Education 2030 Roadman (MoEYS, 2019) which aims to transform Cambodian schools to learning organizations to provide high quality education for all students. According to the MoEYS's Capacity Development Master Plan in Education Sector 2020-2024 (MoEYS, 2021), we spotted a legal framework for all policies to be implemented from central to Provincial Office of Education (POE), to District Office of Education (DOE) and to school level.

Subset: Central focus on equity and well-being

The national vision is argued to support the equitable access to quality education and student's well-being (Kools et al, 2018). In this subset, we found the overarching goal of Cambodia's Education 2030 Roadmap (MoEYS, 2019) was to ensure inclusive and equitable quality education to promote lifelong learning for all. Equity is also addressed in the Education Strategic Plan 2019-2023 (MoEYS, 2019) to provide equitable access to quality education of all children and youth for socio-economic development. In addition, the MoEYS also set the key strategic goals for their ESP 2019-2023 to promote student's enrollment in basic education (from grade 1 to 9). Secondary enrollment and retention are also stated in the strategic reform. However, student's well-being is slightly stated in the ESP 2019-2023 and it is merely for physical health like water, sanitation and hygiene (WASH) at schools.

Dimension: Development of professional capital and a thriving learning culture

Subset: Basing selection into initial teacher education on a mix of criteria and methods

We found four policies to lay out criteria for reforms of the recruitment of pre-service teachers, namely Continuous Professional Development Framework for Teachers and School Directors (MoEYS, 2019), Education Strategic Plan 2019-2023 (MoEYS, 2019), Capacity Development Master Plan in Education Sector 2020-2024 (MoEYS, 2021) and Teacher Policy Action Plan (MoEYS, 2015). According to the Teacher Policy Action Plan (TPAP), the graduated high school students with grade A, B and C in the Bac II, school leaving examination, will be eligible to apply for a pedagogical education at any teacher education institutions, namely Provincial Teacher Training Center (PTTC), National Institute of Education (NIE) and Phnom Penh Teacher Education College (PPTEC). The pathway will reform the PRESET qualification from 12 + 2 pedagogical education to 12 + 4, which the student-teachers are qualified for a bachelor degree from the teacher education college (TEC, a new upgrade from PTTC and PPTEC). The TPAP also offered a new pathway for any bachelor holder from private and public universities to acquire a teaching license which will reduce shortage of licensed teachers to provide education services at public schools.

Subset: Prioritizing professional learning in certain areas

In this subset, we found the MoEYS aimed to develop professional capacities of education personnel, school directors and specialist teachers in different functions and roles. There were four policies and strategies, namely ESP 2019-2023, CPDFTSD , CDMPES 2020-2024 and Cambodia's Education 2030 Roadmap (CER) to guide the implementation of capacity development. School-based management and instructional leadership were the most cited in the ESP in the CER. Specialist teachers were also planned for improvement in their professional knowledge, skills and competences to improve student's learning outcomes and changes in classrooms.

Subset: A coherent leadership strategy (learning leadership, transformational leadership, instructional leadership and distributed leadership)

In this subset, leadership development strategies were found mostly to improve instructional leadership of school directors. Those leadership development programs were stated in three

policy documents, namely ESP 2019-2023, CER and CDMPES 2020-2024. According to the ESP 2.3, the MoEYS aimed to transform Cambodian schools to learning organizations through autonomous management and visionary and instructional leadership.

> *"CER 4.5.5.A: develop management and instructional leadership ability of school directors or heads."*

Subset: Greater support for secondary school leaders

The MoEYS, through the Cambodia Secondary Education Blueprint 2030 (MoEYS, 2021), laid out the support for secondary school leaders from building instructional leadership and management to devolving authority to school level in teacher recruitment, development, retention and dismissal. The strategy was also to equip POE and DOE officials, as the supervisors of school directors, with necessary supervisory skills, namely performance appraisal, monitoring and evaluation, and coaching skills to support the secondary school leaders to achieve the MoEYS's strategic goals.

Subset: Promoting collaborations between schools and teacher education institutions

The collaboration between schools and teacher education institutions is seen in the policy document of MoEYS' ESP 4.4 , CPDFTSD 1.2 & 3.2-3.6 and TPAP 6.2. The policies outline key cooperation between Teacher Education Institutions (TEIs) and schools where PRESETs and INSETs receive pedagogical training to be qualified for teaching and to improve their teaching. The policies also initiated a professional learning community (PLC) in school and in TEIs to foster the didactic learning between school directors, homeroom teachers and specialist teachers together with teacher education trainers. The TPAP 6.2. also proposed on-site teacher support by the TEIs, where teacher trainers will conduct pedagogical training at school and provide feedback to improve teaching.

Pre-School Teacher Training College	Provincial Teacher Training Colleges	Regional Teacher Training Colleges	E-TEC (Phnom Penh & Battambang)	National Institute of Education
Early childhood education	Grades 1-6	Grades 7-9	Grades 1-9	• Grades 10-12 • ELM PRESET • Inspector INSET (EQAD)

Figure 4: Teacher Education Institutions
Adapted from Continuous Professional Development Framework for Teachers and School Directors (MoEYS, 2019)

Dimension: Assessment, evaluation and accountability promoting SLOs

Subset: School inspection

School inspection is argued to be one of the quality control or assurance tools for ensuring the accountability of schools in teaching and learning (Gustafsson, Ehren, Conyngham, McNamara, Altrichter & O'Hara, 2015). Hofer, Holzberger & Reiss (2020) defined school inspection as a systemic, goal-oriented and criteria-based process conducted by external / national authorities. In this subset, researcher found a school inspection handbook (MoEYS, EQAD) as a practical guide for school directors, DOE and POE officials to implement systemic inspection. The systemic inspection involves two types of internal inspection (school self-evaluation) and external inspection (thematic and regular inspection). In the school inspection process, we spotted ESP 4.2. and CER 6.1 to improve the school self-evaluation process and the external inspection by DOE and POE officials.

Subset: A participatory self-evaluation process
In this subset, there is no proper policy statement of MoEYS to support the participatory self-evaluation process. We could find only ESP 3.3 that the MoEYS aimed to train the school directors in school self-assessment.

Subset: National criteria for school evaluation
In this subset, researcher could not find the MoEYS' policies or strategies to outline national criteria for school evaluation. We could see the statement for school self-evaluation in the school inspection handbook where most of the key evaluation laid foundation in leadership and management, teaching and learning and student achievements.

Subset: Monitoring system through student's assessment results, school inspection report and school evaluation report
In this subset, through the ESP 4.2 and CPDFTSD 6-b and CER 4.5.5 & 6.1, MoEYS aims to build a robust Educational Management Information System (EMIS) where all data of the school inspections both internal school self-evaluation and external DOE & POE 's evaluation is securely and timely retained. The MoEYS also initiated the capacity development of POE and DOE officials in monitoring and evaluation of schools. ESP of MoEYS also intended to use the inspection results to inform the performance of schools and PRESET & INSET education programs.

Subset: Aligning performance measure to the new curriculum
Performance measurement will ensure the school's accountability and productivity (Courty, Heinrich & Marschke, 2005). Performance measurement can come in different types, namely outputs, learning outcomes, teaching quality, management and leadership and so forth (Nicholson-Crotty, Theobald & Nicholson-Crotty, 2006). In this subset, researcher found only one ESP 3.3.5 of MoEYS to develop a professional development policy to align with the new curriculum framework. As an implication, we assume the MoEYS to have no explicit curriculum reform for the schools.

Dimension: Decentralization of Authority
Subset: School level decision making autonomy
It has been a decade that the MoEYS has stepped up their ESP to promote school decentralization and de-concentration of functions and resources to school levels. Researchers have found a solid objective of ESP 2019-2023 in 4.10 that aimed to reform the decentralization and de-concentration of functions and resources from national level, the MoEYS to POEs, DOEs and to school levels. A recent progress of decentralization reform from the RGC and the MoEYS was seen through a sub-degree No.213 to transfer education, youth and sport functions of MoEYS to municipal/district/Khan administration through a unified administration. In the CER 4.5.5.A, there was a statement that aim to establish the financially and administratively independent SBM schools as below:

> *"CER 2030-4.5.5 A: In the above context, MoEYS is moving towards school-based management which entails developing schools as autonomous institutions administratively and financially. This would also mean local actors (teachers, parents, community members) are involved in decision-making on issues that are important for school development, and decision-making is located closer to school."*

In the CER 5.1.1a, the MoEYS also strategically intended to develop a national strategy for education decentralization to devolve more authority and autonomy to school levels.

Subset: Transfer of funds and resources

The transfer of funds and resources is necessary to be transparent, relevant and accessible. School resources are also important for effective learning and insufficient resource allocation to schools will impact on learning outcomes (Levačić, 2007). Mingat (2007) mentioned three types of resources for education which the central government uses to sponsor schools. The transfer of funds and resources in Cambodia may be less intriguing as the MoEYS could not secure sufficient funding for the education expenditures as stated in the ESP annex 4.C and in the CER 5.2.

Items	2016	2019	2023	2028	2030
Total resource available for education (US$ million)	546	915	1,159	1,464	1,586
ESP financial requirement	764	1,040	1,260	1,564	1,682
Education PIP	106	105	101	101	101
Shortfall	-112	-20	-25	-35	-45
Funding gap as % of total financial requirement	14.7%	1.92%	1.98%	2.23%	2.67%

Figure 5: Funding gaps of MoEYS
Adapted from the Cambodia Education Roadmap 2030 (MoEYS, 2019)

The monetary resources for schools keep increasing from every strategic plan cycle and the projection draws on funding gaps resulting from the smaller size of GDP allocation for the education sector. From the ESP, the expenditure of education consumes only 3.10% of the country's GDP or equal to 4,925,415 billion Riels in 2023.

Available resource estimate (in million Riels)	2019	2020	2021	2022	2023
GDP	108,590,444	119,033,548	130,915,822	144,168,348	158,884,368
Real GDP growth rate	7.1%	6.5%	7.0%	7.0%	7.0%
GDP per capita	6.8	7.4	7.9	8.7	9.5
Government expenditure on education	3,229,604	3,577,655	3,975,988	4,423,847	4,925,415
Recurrent	*3,219,604*	*3,567,655*	*3,965,988*	*4,413,847*	*4,915,415*
Capital	*10,000*	*10,000*	*10,000*	*10,000*	*10,000*
As % of GDP	2.97%	3.01%	3.04%	3.07%	3.10%
Education budget as % of government expenditure	18.4%	18.6%	18.8%	18.9%	19.1%

Figure 6: Royal Government of Cambodia expenditure on education
Adapted from the Education Strategic Plan 2019-2023(MoEYS, 2019)

For the mechanism to transfer funds and resources to school level, researcher found the ESP of MoEYS to improve the process of delivering direct funding from the national treasury to schools. The MoEYS also operates the school bank accounts process to minimize risks of leakages and corruption spilled from the in-person cash delivery. Besides, the MoEYS also set monitoring and evaluation of budget planning and expenditures at school levels to ensure the transparency and accountability of using funds. In this subset, the MoEYS seems to prove the reform of funds and resource allocation process through its ESP.

Discussion

To answer our question if Cambodian national and educational policies support the school as learning organization, we found that MoEYS, in alignment with RGC vision and strategies for socio-economic growth, has sufficient policies and strategies to transform schools to learning organizations. For the first dimension of shared and inclusive vision centered on the learning, the MoEYS, through its ESP, has developed sufficient inclusive vision for equitable access to education and quality human resources. However, the process of sharing visions between national and sub-national authorities should be articulated and structured as the top-down approach, which requires a mechanism for POE and DOE officials to bring aspiring MoEYS' vision to school levels. According to Senge (1990), team's mental model needs to align with the organization vision to realize a shared vision. If the POE and DOE officials, who are the supervisors of the schools, hardly align their mental models with the MoEYS' vision, it will result in failure to share the vision with school directors. School directors must align their mental model to adopt the shared vision from MoEYS and inspire teachers and school personnels to align their performance with the MoEYS' vision.

In the dimension of development of professional capital and a thriving learning culture, the MoEYS seems to focus on providing instructional leadership and relevant managerial skills to school directors as well as DOE officials. Learning leadership as argued in the Integrated Model of School as Learning Organization (Kools & Stoll, 2016) should leverage the capacity of school leaders to uphold learning culture and inspire learning at all levels in schools. Transformational leadership and distributed leaders were also argued to combine together for effective school leadership (Papazoglou & Koutouzis, 2022). Hargreaves, Halasz & Pont (2007), through their study of school leadership for systemic improvement in Finland, argued the systemic leadership for a coherent leadership development from national level to school level for the real impact on teaching and learning. To institutionalize these leadership capacities at all levels, the MoEYS should develop a coherent leadership development policy that integrates all four leadership in the capacity development of POE & DOE officials and school directors.

The final suggestion for national policy to support school as learning organization is reducing hierarchical systemwide structure and securing sufficient funds and resources for school levels. From the findings, MoEYS raised concern about the funding gaps to implement their strategic plan effectively and also their education roadmap 2030. According to Mok (2006), the impact of globalization will shift the strategies and policies of government from a single source of education provider and funders to involvement with non-state actors like family, private and non-government entities. Public-Private Partnership model (Mok, 2006) would be ideal for meeting the educational funding gap where the involvement of families in financing education is argued to enhance the quality provision of education and school accountability for student's learning.

Cambodian education, through MoEYS, has leapfrogged major reforms in public school system. The development of education strategic plan every 5 years and the mechanism to monitor and evaluate the strategic plan was also firmly implemented from national level to sub-national and to school level, as reported in the Mid-Term Review of Education Strategic Plan 2019-2023 (MoEYS, 2021). In the critical reform era, Cambodia would need a direction and a clear paradigm of school effectiveness to uphold in the next cycle of its strategic plan 2024-2028. Through its CER 2030 and ESP 2019-2023, MoEYS intended to transform schools into learning organizations. It was quite obvious that the MoEYS aimed to re-conceptualize school

effectiveness through the len of school as learning organization model. Therefore, the MoEYS should articulate their next cycle of strategic plan to conduct several studies of the Integrated Model of School as Learning Organization, theorized by Kools & Stoll (2016).

Conclusion

Quality education is becoming a global agenda for every country to strive for in their local contexts. Schools in the 21st century are argued to transform into learning organizations to prepare students for the uncertain, complex, and constantly changing environment. The Integrated Model of School as Learning Organization (Kools & Stoll, 2016) was conceptualized to offer a framework for transforming schools to learning organization through seven dimensions. Many schools in Europe have tested the model and Wales was the piloting country to apply the model in their school reform system.

The Royal Government of Cambodia has adopted national rectangular strategies in four phases and the newly adopted Pentagonal Strategy-phase 1, which aims to achieve the United Nation Sustainable Development Goal 2030 through growing human capitals for social-economic development. Having conducted a thorough content analysis of the national level policies and strategies, researcher found that the MoEYS' policies and strategies for educational reform support the school transformation to learning organizations, despite an ambiguity in defining school as learning organization in the policy and strategy documents. The MoEYS has indicated its motivation and deliberation in improving school governance through its clear supporting ESP 2019-2023, Cambodia Education 2030 Roadmap, CDMPES, CSEB 2030 and CPDFTSD. The integrated leadership, namely transformational leadership, instructional leadership and distributed leadership (Papazoglou & Koutouzis, 2022) and learning leadership (Kools & Stoll, 2016) was argued to equip school leaders to effectively lead school transformation to learning organization. Therefore, the MoEYS should have a coherent leadership development policy to equip all educational leaders- POE, DOE officials and school directors with the integrated leadership skills. Moreover, we also recommend further decentralization and de-concentration reforms to reduce multi-layers of education administration from the national level- MoEYS to POE, to DOE and to school levels. Finally, the MoEYS should conduct feasibility study of the Integrated Model of School as Learning Organization in their next education strategic plan 2024-2028 to pave a way for developing Cambodian schools as learning organizations.

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Appendix

Abbreviation	Definition
POE	Provincial Office of Education
NSDP	National Strategic Development Plan
ESP	Education Strategic Plan
MoEYS	Ministry of Education, Youth and Sports
CSDG	Cambodian Sustainable Development Goal
RGC	Royal Government of Cambodia
RS-PIV	Rectangular Strategy-Phase IV
PS-PI	Pentagonal Strategy-Phase I
CER	Cambodia's Education 2030 Roadmap
SLO	School as Learning Organization
NPLL	National Policy for Lifelong Learning
CPDFTSD	Continuous Professional Development Framework for Teachers and School Directors
CDMPES	Capacity Development Masterplan in Education Sector
TPAP	Teacher Policy Action Plan
CSEB	Cambodia Secondary Education Blueprint 2030
SIH	School Inspection Handbook
DOE	District Office of Education
PRESET	Pre-Service Teacher
PTTC	Provincial Teacher Training Center
NIE	National Institute of Education
PPTEC	Phnom Penh Teacher Education College
PRESET	Pre-Service Teacher Training
INSET	In-Service Teacher Training
CPD	Continuous Professional Development
TEI	Teacher Education Institutions
CQA	Concept of Quality Assurance

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The Effects of Psychological Adjustment on First-Year Students: A Case of the University of Namibia, Hifikepunye Pohamba (HP) Campus

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Abstract
This study investigated the psychological adjustment issues that first-year students encounter at the University of Namibia's Hifikepunye Pohamba (HP) campus, as well as its impact on academic achievement. The study sought to explore the psychological adjustment issues that first-year students had, how these challenges affected their academic performance and the techniques they used to overcome those challenges. Data from eighty students (80) were collected, analysed, and integrated using a mixed methods approach based on the convergent parallel design. The methodology included focus group discussions and a web-based survey with closed and open-ended questions. The study used concurrent data-collecting method to better understand the challenges that students face, their tactics for overcoming these challenges, and the consequences for their academic endeavours. The data show that students encountered a variety of psychological and academic issues, such as self-harming, sadness, anxiety, and stress. Students also reported poor attention, difficulty participating in class discussions, frequent forgetfulness, recognizing a drop in academic performance, feeling unhappy when attending classes, missing classes, and experiencing memory loss. The statistics imply that psychological adjustment has a considerable impact on first-year students' academic success. These findings have significant implications for university management, emphasizing the need to restructure operational processes to improve stability, dependability, and effectiveness. Universities can improve overall academic achievements and foster better conditions for learning by addressing psychological adjustment difficulties and promoting student well-being.

Keywords: Adjustment, Stress, Depression, Anxiety, Higher Education

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Introduction

The study investigated the psychological adjustment issues that first-year students confront at the University of Namibia's Hifikepunye Pohamba (HP) campus. It aims to understand how these issues affect students' academic performance and to investigate the tactics used by students to overcome them. The study's focus on the convergence of psychological adjustment, academic performance, and coping mechanisms attempts to provide insights into the elements that influence the educational experiences of first-year university students in this environment. Statistics show that between 2015 and 2022, 11 suicides, 60 suicidal ideations, and over 65 mental health cases were documented. During the same period, over 1856 students sought help with personal and social issues at the student counsellor's office (Asino & Shipena, 2015-2022 report). According to Amakali-Nauiseb et al. (2021), students at universities in many parts of the world suffer from stress, depression, and anxiety regularly, which can harm their quality of life and academic performance. An increasing body of evidence suggests that the majority of students find their first year of university difficult (Majumdar & Ray, 2010; Friedlander et al., 2007; Buote, 2006 & Aderi et al., 2013).

Furthermore, students appeared to experience the psychological side effects of stress, such as anxiety, despair, concern, and tension. The transition from high school to university is both thrilling and worrying for first-year students (Yau et al., 2012; Topper, 2007). Individuals' lives are automatically adjusted during life transitions, which include new experiences and adjustments. They experience several challenges that require them to develop the skills needed to negotiate their new circumstances (Farooq et al., 2011; Fateel, 2019; Malefo, 2000). Adjusting first-year students' psychological and academic experiences may result in challenges that affect their academic performance and achievement. The majority of first-year students report that the transfer to school is the most stressful adjustment period in their lives because it occurs during a critical developmental time [adolescence]. Jackson (2013) emphasizes that the failure to regulate transition concerns may result in higher psychological pain. The figure below depicts that the majority of students engage in self-harming behaviours, sadness, difficulty sleeping, tension, and hopelessness.

Theoretical Framework

To better comprehend first-year students' psychological adjustment to university life, the study used Albert Bandura's (1977) Social Cognitive Theory (SCT). The Social Cognitive Theory holds that learning is influenced by cognitive, behavioural, and contextual aspects (Bandura, 2001). Bandura argues that learning takes place in a social context, such as a university setting, where the individual, environment, and behaviour interact dynamically and reciprocally. As a result, SCT is deemed appropriate for this study because, through observational learning and engagement with counselling unit staff and peers, first-year students can be encouraged to make healthy adjustments and positive improvements in their lives.

Psychological Adjustment Issues Among First-Year Students

Scholars have extensively researched psychological adjustment challenges, and they have identified stress, depression, anxiety, nervousness, tension, pain in the neck or shoulders, migraine headaches, insufficient resources, financial problems, fear of failure, and academic overload, such as tests and assignments (Aderi et al., 2013; Yau et al., 2021; & Fateel, 2019). In Hako and Shikongo's (2019) study, a sizable proportion of students (42.4%) reported a lack of stress management skills, which hampered their academic success. Students believed that

worry distracted them from learning and ultimately harmed their academic progress. In a similar case in South Africa, Sommer and Dumont (2011) and Malefo (2000) identified motivation, self-esteem, stress and their capabilities as psychological factors that impede learning. Though the relationship between university adjustment and turnover is critical, a focus on developing and monitoring university adjustment indicators is required if they are to serve as an effective warning system for higher education institutions.

The Impact of Psychological Adaptations on Academic Achievement

Mahmood and Iqbal (2015), Malik and Khalid (2012), and Nazli and Irfan (2009) used the Reynolds Adolescents Adjustment Screening Inventory (RAASI) to investigate young students' psychological and behavioural issues that are directly related to their academic achievement. The findings revealed a negative and significant relationship between psychological adjustment and academic achievement among students who passed the O' level. These results contradict multiple studies that have found a strong positive link between psychological adjustment and academic achievement in kids (Gold, 1978; Larson & Richards, 1991; Searle & Ward, 1990; Hallinan & Kubitschek, 1991).

Strategies to Reduce Adjustment Problems Among First-Year Students at Universities

There have been several initiatives to assist students with the psychological process that they go through during their first year of university. Hazard and Carter (2018) recommend that first-year students change their behaviours and mental processes to achieve academically, culturally, emotionally, financially, cognitively, and socially. According to Majumdar and Ray (2010) and Tuna (2003), university students are expected to engage in greater amounts of learning than they did in secondary school. As a result, students must evaluate how they will adapt to meet the rising requirements of higher education. Having the necessary skills and information is critical for success with this transition. University students appear to interact with people of varied nationalities, religious beliefs, ages, and physical abilities in a variety of settings. These variables will vary from social to intellectual to personal. The extent to which a student benefits from these multicultural connections is determined by their ability to adjust to new cultures; one way to embrace diversity in higher education is to be open and accepting of differences.

Methodology

This study adopted a mixed methods approach through a convergent parallel. The method involved collecting, analysing and integrating quantitative and qualitative data (Creswell & Plano-Clark, 2018). The data were collected concurrently using focus group discussions and a questionnaire with both closed and open-ended questions. The questionnaire was sent through Moodle to all first-year students [2023 cohort: 280] which constitutes the population of the study. The total number of students who completed the questionnaire online was (80): 28.5% and a portion of 21 students purposively sampled participated in the two focus groups administered by the student counsellors. Both male and female students participated in the study. However, the majority were female (72.5%), while the male (27.5%) were primarily first-time university students. The age group varied from 18 to 30 years (18-20=57.5%; 21-25=33.8%; 26-30=7.5%; 30+=1.2%). The Secondary department had the most participants (57.5%), followed by Upper Primary (28.7%) and Lower Primary (13.8%).

Data Analysis

The researchers transcribed and analysed the data from both approaches, identifying parallels and differences. The quantitative data analysis was carried out using a Microsoft Excel spreadsheet, while the qualitative data analysis was done using theme analysis. The five interrelated procedures of theme analysis led to the examination of qualitative data: (1) familiarization; (2) eliciting topics; (3) coding; (4) elaboration; and (5) interpretation and checking. This enabled the findings from the triangulation of quantitative and qualitative databases to be validated and supported one another. This allowed us to confirm and reinforce the conclusions drawn from the triangulation of quantitative and qualitative databases (Creswell & Plano-Clark, 2018).

Research Ethics and Procedures

The Decentralized Ethics Committee (DEC) of the University of Namibia was contacted to request an ethical clearance certificate. Permission to gather data was obtained from the University of Namibia's Research Ethics Committee (UREC). After receiving approval to conduct the study, the researchers sent a letter to prospective participants detailing the study's objective and conditions. The first-year students provided consent to participate in the study. First-year students were advised that their participation was voluntary, that they could withdraw at any moment if necessary, and that the information they supplied would be kept strictly confidential. Participating in this study would have no negative consequences for students. Students were told that their names would not be disclosed throughout the study. The acquired data would be saved in an encrypted file and erased after five years.

Conclusion

Findings: Quantitative Results

Feelings That Students Experienced

According to the report, 40% of students said they were excited to be at university, 38% were enthusiastic, 15% were nervous, and 5.6% were terrified. As seen in Table 1, a significant proportion reported engaging in self-harming behaviour (12), with a minor number (3) suggesting it was a consistent occurrence. Similarly, a substantial number of students (8) stated that they felt depressed, although a bigger proportion (45) reported having such symptoms on occasion. Anxiety, uneasiness, and tension were common among participants, with a significant proportion (48) identifying these sensations as consistent. Furthermore, the students discussed a variety of psychological obstacles they encountered during their first year at university. This included anxiety about getting great grades and feeling overwhelmed by academic pressure. Many students described emotions of loneliness, social anxiety, pressure from professors, and peer pressure as a result of their newfound independence. Common sensations were fear of coping and failing tests, as well as emotions of powerlessness when unable to handle difficulties. Some students reported feeling emotionally unstable and unhappy as a result of the new environment, whereas others lost interest in their academics and were humiliated by security officials and senior students. These findings are consistent with previous research, indicating that psychological problems are widespread among first-year university students (Majumdar & Ray, 2010; Friedlander et al., 2007; Buote, 2006 & Aderi et al., 2013). Such findings highlight the necessity of addressing mental health concerns and implementing support mechanisms in university settings to promote student well-being and academic success.

Overall, these difficulties left many students feeling dissatisfied with the unfamiliarity of university life and new methods of doing things. Table 1 below displays students' feelings.

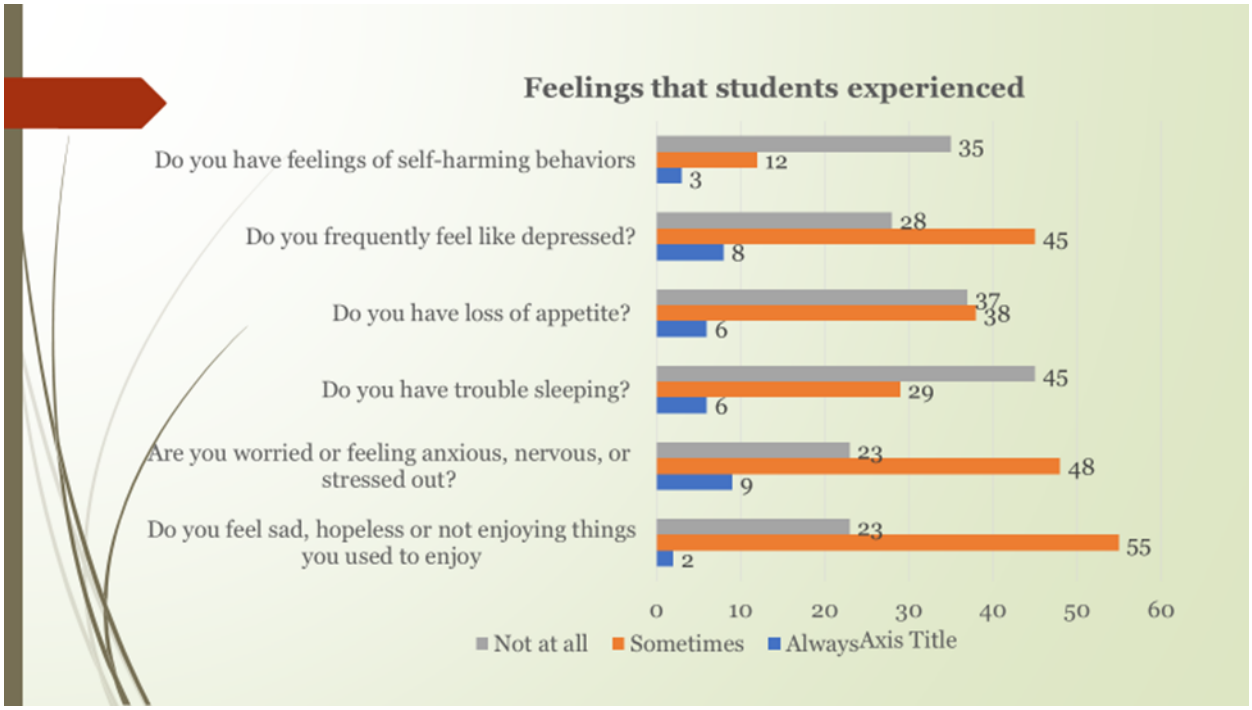


Table 1 displays the students' responses to the questions about their feelings throughout the transition to the university setting.

Academic Aspects That Influence Student Achievement

As shown in the table below, a considerable number of students reported difficulty maintaining consistent study habits. While some reported always difficulty (3), a considerably greater number (42) admitted to having similar issues sometimes. This shows that developing successful study routines could be a common challenge. Furthermore, 9 students reported feeling overwhelmed while studying regularly, with another 45 experiencing it on occasion. Furthermore, forgetting information readily was a common challenge, with both "always" (9) and "sometimes" (51) respondents emphasizing the issue. These characteristics could have a substantial impact on students' capacity to recall and apply information. Furthermore, the study found a disturbing tendency of students failing to attend all classes (7 always) and having difficulty concentrating in class (12 always, 46 occasionally). These flaws could cause large gaps in their grasp of the content. This disengagement may be evident in the large proportion of students (13 consistently, 45 occasionally) who reported a decline in academic performance. Finally, and perhaps most troubling, a significant proportion of students (17) reported never participating in class discussions, indicating a lack of involvement or confidence. Furthermore, a significant number (10) claimed that they had never felt joyful attending lessons, which could point to a larger problem with motivation or the learning environment itself.

Table 2 below illustrates academic factors that influence students' transition to university.

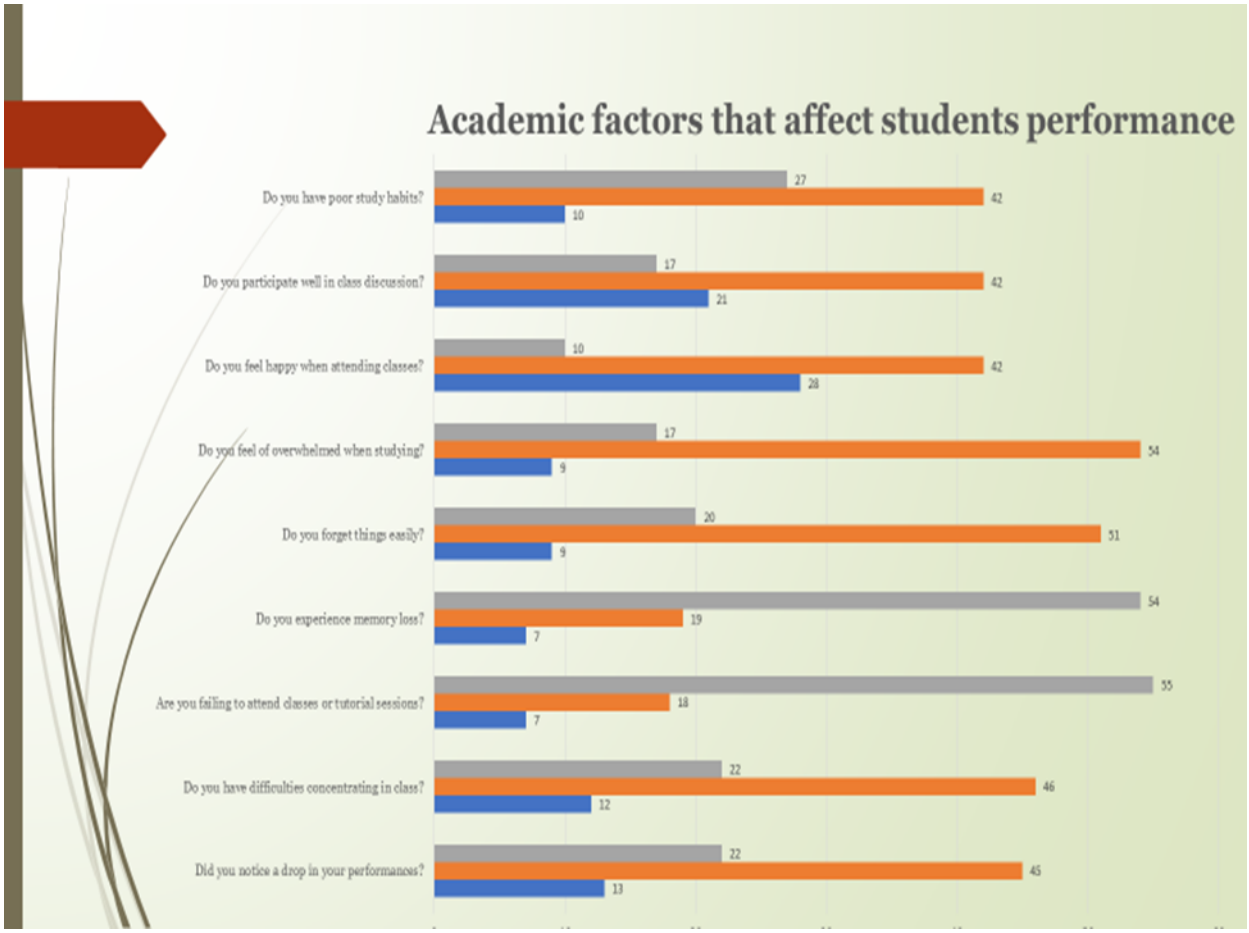


Table 2 displays the students' responses to the questions about academic factors that affect their academic achievement.

Qualitative Results

Psychological Challenges

According to the study, a large proportion of students reported having difficulties that could have an impact on their academic performance. Some students experience emotional instability and depression as a result of their new environment. They are stressed because they have too much independence, and peer pressure, and are concerned about acquiring a student loan to pay for their studies. These obstacles were divided into three categories, as detailed below: stress and anxiety: A considerable proportion of students expressed concern about earning higher grades. Student #4 stated,

> *"I am so scared, you guys." When I applied here, I wanted biology and chemistry, you know? That's what I chose. But then they assigned me chemistry and physics! Physics! I've never touched the stuff! What if I just...? fail? I mean, I have never failed anything before. "Ugh, this is terrifying."*

Many students reported feeling overwhelmed by academic pressure and helpless when they couldn't figure something out. Students expressed feelings of loneliness, social anxiety, and pressure from lecturers.
One student said,

> "*This place is fantastic, don't get me wrong, but man, it's lonely." Being surrounded by people might be smothering at times, but when you're alone, it hits hard. This social anxiety is my worst enemy. I want to make friends, I do, but talking to new people feels like giving a lecture to a large group of people."* [Student #10]

Some students also reported feeling emotionally unstable and depressed in their new setting. Students had difficulty adapting to new situations and losing interest in their schoolwork. Another individual commented,

> *"Ohhh...mmmm... On top of that, the lecturers are piling on the pressure." It feels like there's an endless pile of work to be done, and they expect us to somehow magically know how to accomplish everything. Ugh!* [Student #11]

On the same topic, one student stated,

> "*And don't even get me started on this whole 'independence' thing." Sure, having independence is great, but sometimes I miss having someone tell me exactly what to do. It's all a little overwhelming, you know? The university is meant to be fun, but lately, it has seemed stressful."* [Student #19]

Academic Factors

The findings show that students are dealing with many technology-related concerns that may jeopardize their academic performance. One student commented,

> *"Ugh, grades are worrying me out! Every time I think about them, I feel as if I am drowning in studies. It's as if there's a vast mountain of information to study and not enough time to tackle it. The worst part is that I'm afraid of failing. What if I do not perform well? How will I explain that to my parents? They demand so lot from me, and the thought of disappointing them kills me. I just wish there was a way to feel less overwhelmed and more in control."* [Student #8]

A large proportion of students reported problems using university online platforms such as Moodle or the school site. One student mentioned that:

> "*the university environment is already tough enough, you know?" But lately, it seems like there's a whole new hurdle and struggle with technology! Ugh, I swear I am not good with them. For example, I struggle to complete and submit assignments online and make deadlines when I can't even figure out how to save a document."* [Student #16]

These challenges included finding class notes and having trouble using printing services. The results revealed that several students lacked fundamental computer skills. This made it difficult to complete homework and take quizzes or tests online. Another one said,

> "*And don't even get me started on online tests!" I get so worried that the computer kicks me out before I finish. It happened once before, and I can assure you that scrambling to log back in while the clock ticks down are not fun. I simply wish I was more tech-savvy. Maybe then the university wouldn't seem so overwhelming."* [Student #20]

Students also expressed anxiety over online examinations and quizzes, maybe due to new formats or technological issues. In other situations, students reported marks missing from the online portal, which could be related to technical issues with university systems.

Strategies to Avoid Adjustment Problems Among First-Year Students

The study attempted to uncover solutions for the university to assist students in adjusting to their new surroundings. Several solutions aimed to directly address student worries and challenges. These included mandated counselling sessions to help students cope with academic and social pressures. Motivational speakers were also suggested to inspire and encourage pupils. Furthermore, unfettered Wi-Fi connectivity would enable them to use online tutoring materials. One student stated,

> *"It is difficult for us to obtain information on time, especially since those of us who do not have smartphones do not join WhatsApp groups for information exchange. Therefore, it is better if the information is communicated both online and in print (Poster and notice board)."* [Student #14]

The recommendations further emphasized creating a supportive and inclusive campus environment. Activities and events fostering connections among students were suggested. Open communication channels were also highlighted, including suggestion boxes, designated support staff, and online resources. This would ensure students feel comfortable seeking help when needed. Another one added:

> *"It is really important to have different ways for us students to speak up or get help when we need it. Like, Suggestions boxes are cool because we can drop our thoughts or worries there without feeling awkward. And having support staff, like counsellors, who we know are there to listen and help us out, that's reassuring. Oh, and online stuff too, you know? Sometimes it is easier to type out what has become in our minds rather than saying it out loud. Making sure there are all these options makes us feel like it is okay to ask for help when we need it.*" [Student #13]

Finally, the study proposed promoting student well-being through information on healthy habits like exercise, stress management, and healthy eating, empowering students to take charge of their physical and mental health.

Implications of the Study

This study reveals a concerning trend of psychological challenges like stress, anxiety, depression, and loneliness among first-year students. Recognizing these issues is critical, as they can significantly impact academic performance. Students struggling emotionally may find it difficult to concentrate, participate, or maintain consistent study habits, leading to a decline in grades. Universities must prioritize student well-being by providing readily available counselling services and fostering a supportive campus environment. Organizing activities to build connections, offering stress management and healthy habit resources, and ensuring open communication channels are all crucial. Additionally, improving access to academic resources like library materials, technology, and basic computer skill support is essential. The study also highlights the need for policy review. Instances of student mistreatment warrant revising university practices to promote a respectful and inclusive environment. Finally, the research suggests implementing tailored support strategies like mandatory counselling, motivational

speakers, and improved Wi-Fi access for online resources. By offering multiple avenues for help, universities can empower first-year students to thrive. All in all, the implications of the study emphasize the importance of addressing psychological adjustment challenges and providing holistic support to promote the well-being and academic success of first-year university students.

Limitations of the Study

This study, like any other, has limitations. The use of self-reported questionnaires may be affected by participants' desire to give socially desirable answers or difficulty recalling experiences. Furthermore, the findings may not apply to other universities due to the unique environment of the HP campus and its cultural context. Finally, the study focused on the HP campus and may not reflect the experiences of first-year students across the University of Namibia. Hence, limits the generalizations of findings to other contexts.

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Cultivating a Research-Fostering Culture in Higher Education Institutions: The Importance and Best Practices of Quality Assurance

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Abstract
In the context of national higher education systems, institutions play a pivotal role in advancing research agendas and fostering innovation, thus contributing substantially to societal progress. Central to this endeavor is the cultivation of an institutional ethos that prioritizes research as a cornerstone of academic excellence. This research endeavors to illuminate the critical importance of nurturing such a culture within higher education institutions, emphasizing its profound implications for national development. Through an exploration of quality assurance practices, this study elucidates the mechanisms by which leading institutions establish and sustain a research-centric environment. By delving into the nuanced strategies employed by these institutions, this research not only highlights the pivotal role of research in generating novel insights and addressing societal challenges but also underscores its significance as a catalyst for transformative change. The findings of this study hold substantive implications for policymakers, institutional leaders, and stakeholders within the higher education landscape. By disseminating these insights, this research equips stakeholders with empirically grounded strategies and best practices for fostering a robust research culture within their respective institutions. In doing so, institutions can position themselves as vanguards of academic excellence, poised to drive innovation and contribute meaningfully to national and global discourse. This research serves as a scholarly beacon guiding higher education institutions toward the cultivation of a research environment characterized by rigor, innovation, and societal relevance. By embracing the insights garnered from this study, institutions can chart a course toward excellence, furthering their impact on the academic landscape and advancing the frontiers of knowledge dissemination and discovery.

Keywords: Quality Assurance, Higher Education Institutions, Research, Innovation, Institutional Culture

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Introduction

Research in higher education institutions contributes to the growth of knowledge by generating new insights, theories, and discoveries, as well as validating existing knowledge and theories, which provides a solid foundation for further development (Acero, 2017). Furthermore, it catalyzes innovation by fostering the development of new ideas, technologies, and solutions that can address societal challenges and drive economic growth (Клімова, 2019). Thus, higher education institutions must create a culture that fosters research.

However, cultivating this kind of environment is not a simple task. It requires the collaboration and commitment of various stakeholders within the institution, along with the implementation of effective practices and quality assurance mechanisms. One effective approach is using quality assurance frameworks (Abbo & Bashir, 2020), which are vital for the growth and survival of higher education institutions.

Quality Assurance Measures for Research

To ensure the quality of research in higher education institutions, it is essential to have a robust quality assurance framework in place. This framework should include evaluation, self-evaluation, and peer review processes (Thondhlana & Garwe, 2021).

Evaluation of research practices is crucial to identifying areas of strength and weakness. Self-evaluation allows institutions to reflect on their research practices, find gaps, and develop strategies for improvement. Peer review involves the assessment of research by external experts in the field to ensure its quality and rigor (Lu et al., 2018).

In their study, Garwe et al. highlight the importance of national quality assurance frameworks in promoting valuable research and innovation. Their research suggests that self-evaluation and peer review can enhance the quantity and quality of research and development within higher education institutions (Garwe et al., 2015).

Impact of Research Quality on University Reputation

Research plays a crucial role in a university’s reputation. It demonstrates intellectual vitality; academic excellence; and the institution's commitment to advancing knowledge, pushing boundaries, and making significant contributions to society (Dill, 2009).

According to Vernon and Momani (2018), research output and impact are two components of university rankings (Vernon & Momani, 2018). Therefore, institutions that prioritize research and foster a culture that supports it are more likely to excel in these rankings. By developing a repository of effective research practices, institutions can improve their ranking (Vernon & Momani, 2018).

Additionally, research performance has a significant impact on funding (Attalla et al., 2022). Universities with a strong research track record are more likely to attract external funding and investments, which can further support and enhance their research endeavors. In countries like the United Kingdom and New Zealand, research quality frameworks have become an integral part of funding allocation and building a university's reputation. These frameworks assess the impact and effectiveness of research conducted within the institution, ensuring that it meets

high standards of quality. As governmental demands for accountability in education increase, the importance of research quality becomes paramount (Frey & Rost, 2010).

Research Aims and Objectives

This research aims to shed light on the best practices for creating a culture that fosters research in higher education institutions. The objectives of this research are as follows:

1. Identify the key elements of an institutional culture that promotes and supports research.
2. Evaluate the effectiveness of quality assurance measures: key performance indicators (KPIs).
3. Analyze the challenges and obstacles faced by higher education institutions in cultivating a research-friendly culture.
4. Examine the strategies and initiatives implemented by successful higher education institutions to foster a culture of research.
5. Demonstrate best practices and effective approaches to developing a research culture.

Methodology

This research will adopt a qualitative research method. Qualitative research allows for an in-depth exploration of the subject matter and provides a deeper understanding of the experiences, perspectives, and behaviors of individuals within higher education institutions. To meet research aims and objectives, an in-depth analysis of the literature on institutional culture and research practices will be conducted. This will provide a comprehensive understanding of the current state of research in this area.

Furthermore, the research will analyze the transparency of research culture through examining the research practices of institutions. Institutional culture plays a crucial role in supporting and promoting research within higher education institutions. By examining the strategies and initiatives implemented by successful institutions, we can identify best practices and effective approaches that can be adopted by other institutions.

The findings of this research will contribute to the development of a repository of effective practices for creating a culture that fosters research in higher education institutions and provides valuable insights for higher education institutions looking to enhance their research culture.

Findings

1. Key Elements of an Institutional Culture That Fosters Research

Based on the research findings, several key elements were identified that contribute to an institutional culture that promotes and supports research.

Adherence to the Research Quality Framework

One important aspect of cultivating an institutional culture that fosters research is the establishment of a research quality framework. This framework provides a set of guidelines, standards, and processes that ensure the quality and integrity of research conducted within the institution (Rivera et al., 2017). Research quality frameworks are essential for promoting research excellence and innovation in higher education institutions. These frameworks serve

as a roadmap for researchers, providing clear expectations and guidelines for conducting high-quality research (Kiparoglou et al., 2021).

Research quality frameworks should achieve the following:

- Establish clear criteria for evaluating the quality of research, such as methodological rigor, relevance, and impact.
- Implement a peer review process for research evaluation, involving external experts in the field to provide objective assessments.
- Incorporate mechanisms for ongoing evaluation and improvement of research practices.
- Recognize the role of institutional culture in driving research quality and fostering a supportive environment for researchers (Alves & Pinheiro, 2022).

It is essential to adhere to a framework as it helps ensure consistency and transparency in the research process. This, in turn, builds trust and confidence among researchers, institutional stakeholders, and the wider academic community. Furthermore, the implementation of a research quality framework can lead to improvements in the quantity and quality of research and development in higher education institutions (Thondhlana & Garwe, 2021).

National quality assurance frameworks play a crucial role in promoting research and innovation in higher education institutions. Not only do these frameworks ensure the credibility and reliability of research conducted, but they also play a significant role in funding decisions, reputation building, and career advancement for researchers and institutions. In addition, the incorporation of a peer review process in research evaluation adds an extra layer of objectivity and rigor. Furthermore, a research quality framework should not be seen as a static document, but rather as a dynamic tool that evolves and adapts to the changing needs and advancements in the research landscape (Konar & Hussain, 2018).

Resources Available to Faculty Members

To create a research-focused culture, universities must empower their faculty members and recognize their role in driving research activities. Faculty members are at the forefront of research initiatives, and their expertise and dedication are essential for fostering a culture that prioritizes research. Universities should provide resources and support for faculty members to engage in research activities, such as offering grants and funding opportunities, providing access to state-of-the-art facilities and equipment, and facilitating collaborations with industry partners and external research institutions. By investing in faculty development programs, universities can enhance the research capabilities of their faculty and encourage them to pursue innovative research projects.

In addition, universities should create a supportive environment that nurtures collaboration and knowledge sharing among faculty members (Yang, 2007). This can be achieved through organizing research forums, conferences, and seminars where faculty members can present their work and exchange ideas with colleagues from diverse disciplines.

Building research-related skills and promoting career success are other ways to cultivate a research-focused culture by ensuring that academics have the necessary skills and support to successfully carry out their research (Srivastava et al., 2016). This includes providing training and professional development opportunities for faculty members to enhance their research skills, such as research methodology, data analysis, and writing research proposals. By investing in development programs, universities can help their faculty members stay up to date

with emerging research methodologies and technologies (Kataoka et al., 2017). Furthermore, universities should create reward systems that recognize and applaud research achievements. By incentivizing research through awards, grants, and promotion opportunities, universities can encourage faculty members to engage in research activities and strive for excellence (Crowe & Boe, 2019).

Universities should view the management of academics' research careers as an institutional responsibility. This means encouraging them to pursue high-quality research projects and providing guidance on publication strategies and research project management. By creating interdisciplinary research centers and research seminars, universities can provide a platform for faculty members to present their work, exchange ideas, and collaborate on multidisciplinary projects. This not only enhances the research culture within the institution but also promotes collaboration and knowledge sharing among researchers (Sari & Muam, 2020).

Clear Policies and Procedures

Institutional policies and procedures are also crucial in fostering a research culture. Clear and transparent policies regarding research expectations, funding opportunities, grants, and ethical considerations provide a framework for faculty members to engage in research activities. These policies should minimize barriers and support faculty in their research endeavors, such as by providing teaching relief for research-active faculty, offering competitive research grants, and streamlining administrative processes related to research activities (Sasson, 2014).

Infrastructure and Resources

Investing in infrastructure and resources includes providing state-of-the-art research facilities, equipment, and technology that support various types of research methodologies. By developing these research practices and initiatives, institutions can create an environment that values and supports research excellence (Makkar et al., 2015).

Additionally, a research repository serves as a central hub for documenting and sharing successful research practices and initiatives (Sterman & Clark, 2017). This repository can include a variety of resources such as faculty learning activities, practice sharing program exercises, open and discoverable content, research data for sharing and re-use, and scholarly output. By establishing such a repository, institutions can provide their faculty and staff with easy access to valuable information and resources that can enhance their research endeavors (Sterman & Clark, 2017).

Research Support Services

By offering robust support services, institutions demonstrate their commitment to supporting and facilitating research, making it easier for faculty members to excel in their endeavors. Examples of these services include:

- Research assistance: Institutions can offer dedicated research librarians who can help researchers navigate and access relevant literature, databases, and other resources needed for their research.
- Grant support: Institutions can aid with grant applications, including guidance on finding and applying for funding opportunities, as well as help with budgeting and completing application forms (Lopes et al., 2021).

- Research ethics support: Institutions can establish ethics review boards or committees to ensure that research projects adhere to ethical guidelines and regulations.
- Data management support: With the increasing importance of data-driven research, institutions can offer training and resources to help researchers effectively manage and store their data (Goddiksen et al., 2023).
- Publication support: Institutions can provide resources and guidance on publishing research findings, including assistance with manuscript preparation, journal selection, and navigating the peer review process (Jahan et al., 2018).

Student Involvement in Research Initiatives

Student involvement in research initiatives is vital for cultivating a research culture within higher education institutions. By involving students in research activities, institutions can foster a sense of curiosity, critical thinking, and intellectual growth among their student body. Moreover, student involvement in research initiatives provides them with valuable hands-on experience and the opportunity to apply their theoretical knowledge to real-world problems (Hanna-Benson et al., 2020).

This engagement not only enhances their learning experience but also helps to develop a pipeline of future researchers and innovators. To effectively involve students in research initiatives, higher education institutions should consider implementing the following strategies:

- Create opportunities for undergraduate and graduate students to participate in research projects alongside faculty members. This can be achieved through research internships, undergraduate research programs, and graduate assistantships.
- Design research-focused courses or modules that involve students in conducting independent research studies or collaborating on ongoing research projects.
- Establish a mentorship program where experienced researchers or faculty members guide and support students in their research journey.
- Provide resources and support for students to present their research findings at conferences or publish their work in academic journals.
- Implement a reward and recognition system to acknowledge and celebrate student contributions to research (Levin, 2004).

2. Evaluating the Effectiveness of Quality Assurance Measures: Key Performance Indicators (KPIs)

Evaluating the effectiveness of quality assurance measures in cultivating a research culture requires the use of key performance indicators to help measure and monitor the progress and impact of research activities within higher education institutions (Ball and Halwachi, 1987). Some KPIs that can be used to evaluate the effectiveness of quality assurance measures in fostering a research culture include:

- Number of research publications: This KPI measures the quantity of research publications produced by faculty and students.
- Research funding: This KPI tracks the amount of external research funding secured by the institution and its faculty.
- Percentage of faculty and students engaged in research: This KPI assesses the level of involvement and participation in research activities among faculty and students.

- Number of collaborations and partnerships: This KPI measures the extent to which faculty members and institutions engage in collaborative research efforts with external partners.
- Research impact: This KPI evaluates the tangible outcomes and societal impact of research conducted by faculty and students, such as citations, patents, and real-world applications (Jager et al., 2017).

3. Obstacles to Cultivating a Research-Friendly Culture

While the importance of research quality in higher education institutions is well-established, there are several challenges and obstacles that these institutions face in creating a culture that fosters research, including:

- Limited funding: Adequate funding is crucial for conducting research and ensuring its quality. Higher education institutions often have limited financial resources, which can restrict the scope and impact of research activities.
- Limited resources and infrastructure: Higher education institutions must provide researchers with the necessary resources and infrastructure to carry out their work effectively. Insufficient laboratory equipment, outdated technology, and limited access to research databases can hinder research productivity (Shewchuk & Cooper, 2018).
- Heavy teaching and administrative loads: Faculty members are often burdened with heavy teaching loads and administrative responsibilities, leaving them with limited time and energy to dedicate to their research.
- Inadequate incentives and recognition: While research is an integral part of an academic's career, the supporting policies and incentives may not be powerful enough to encourage academics to fully engage in research activities.
- Competition and lack of collaboration: The competitive nature of the higher education sector can create a culture where academics prioritize their success over collaborative research efforts. To overcome these challenges, higher education institutions must develop a repository of effective practices for promoting a culture that fosters research (Landicho, 2020).

4. Strategies Implemented by Successful Institutions

To cultivate a research culture, higher education institutions can adopt several best practices and effective approaches from other universities. Here we will examine institutions that have successfully created a research culture.

A. Standford University: Stanford has prioritized cultivating a research culture by providing extensive research support practices and resources. They offer research funding, grants, and fellowships to support faculty and student research projects. In addition, Stanford University hosts research presentations and symposiums, where researchers can showcase their work and engage in discussions with peers (Makkar et al., 2023).
B. Harvard University: Harvard is known for its strong research culture and commitment to fostering innovative research across disciplines through various initiatives, such as research training and workshops, research symposiums and conferences, and collaborations with industry partners. They also encourage public scholarship and engagement by organizing public lectures, forums, and exhibitions to disseminate research findings to a wider audience (Julie, 2015).
C. Massachusetts Institute of Technology: MIT has a renowned research culture, driven by its commitment to innovation and interdisciplinary collaboration. This is done through

efforts such as promoting research engagement through seminars, workshops, and conferences; providing research support services and resources; and fostering collaboration between researchers and industry partners (Dowson, 2016).

D. University of California, Berkeley: UC Berkeley is dedicated to cultivating a research culture that fosters interdisciplinary collaboration and innovation. They have established research centers and institutes that facilitate collaboration across different departments and disciplines. These research centers provide a platform for researchers to come together, share ideas, and collaborate on projects of mutual interest (Li, 2017).
E. University of Oxford: Oxford's strong research culture is ingrained in its institutional fabric. The university places a high value on research excellence and supports researchers through various initiatives, including research funding opportunities, grants, and fellowships to support research projects across disciplines (Evans, 2016). These initiatives not only provide financial support but also create a collaborative environment for researchers to thrive.

Developing an institutional culture that fosters research is essential for universities to stay at the forefront of innovation and contribute to advancements in knowledge and society. Transparency of research practices and a strong research culture are key components of developing an institutional culture that fosters research (Khan et al., 2015).

5. Learning From Best Practices and Effective Approaches to Developing a Research Culture

In higher education institutions, the benchmark for research excellence transcends mere quantitative metrics or impact measurements. True research excellence manifests when institutions furnish the requisite resources, infrastructure, and comprehensive support systems that empower researchers to excel in their endeavors. This section of the research endeavors to delve into the elucidation of best practices aimed at facilitating such an environment conducive to scholarly achievement and innovation:

F. **Establish Clear Goals for Research:** This includes setting targets for research output, publication rates, and research funding.
G. **Promote a Supportive Environment:** This involves creating opportunities for interdisciplinary collaboration, providing access to research funding and resources, and promoting a culture of knowledge sharing and mentorship (Johnson & George, 2020).
H. **Implement Quality Assurance Mechanisms:** These mechanisms should not only focus on external standards and processes but also involve self-evaluation and peer review. By integrating self-evaluation and peer review, institutions can assess the quality of their research practices and identify areas for improvement.
I. **Invest in Infrastructure:** This includes providing state-of-the-art laboratories, research equipment, and technologies that enable researchers to conduct cutting-edge research.
J. **Provide Professional Development Opportunities:** This ensures that researchers are equipped with the necessary skills and knowledge to excel in their research endeavors (Ahmady et al., 2009).
K. **Collaborate With Industry, Government Agencies, and Other Research Institutions:** These partnerships can provide researchers with additional resources, funding opportunities, and access to real-world applications for their research.
L. **Foster Mentorship:** A cooperative culture where experienced researchers provide mentoring support to early career researchers is crucial. By sharing their experiences

and expanding their networks, early career researchers can benefit greatly in terms of knowledge exchange and research production (Dominguez et al., 2022).

Conclusion

The culmination of this research underscores the paramount significance of cultivating an institutional culture that nurtures research endeavors and delineates optimal strategies for achieving this objective. A holistic approach is imperative, one that encompasses various facets such as fostering interdisciplinary collaboration, facilitating professional development avenues, securing governmental funding, bolstering infrastructural investments, embedding research within the curriculum, and curating a repository of efficacious best practices.

This research elucidates that by placing a premium on research initiatives, higher education institutions can forge an environment conducive to innovation and adept problem-solving. Such an environment not only fosters the growth and advancement of individual scholars but also elevates the institution's stature within the academic realm. Furthermore, the integration of robust research practices serves as a linchpin for ensuring the attainment of quality benchmarks and, consequently, enhances the institution's standing in academic rankings.

In essence, this research serves as a clarion call for every higher education institution aspiring for excellence. By heeding the insights gleaned from this study and implementing the recommended best practices, institutions can fortify their research culture, thereby fostering a dynamic environment that fosters academic rigor, cultivates innovation, and secures a prominent position among their peers.

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Achieving Sustainability Through Interdisciplinary Approach: An Analysis of Teacher Education Transformed Curriculum

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Abstract
The concept of interdisciplinary approach is fast becoming a key instrument and more relevant in that it enables students to apply knowledge and skills across multiple disciplines in addressing sustainability challenges through multiple lenses. The fact that sustainability challenges frequently involve a variety of stakeholders and elements that have an impact on social, economic, and environmental issues, working within a group of people from varied backgrounds can be an effective means of problem solving. The study utilizes a desktop analysis of empirical studies to establish the contributions of interdisciplinary approach to sustainable development in teacher education. Findings revealed that interdisciplinary teaching is significant to both students and educators. It provides students with more opportunities for investigation and discovery as they are included in the learning process. In doing so, students improve their critical thinking abilities and acquire a more comprehensive understanding of the subjects. Additionally, it gives educators the chance to examine other philosophies and methods of instruction, which might result in learning that is more efficient. The findings further revealed that to collaborate effectively, experts and/or stakeholders from various backgrounds and disciplines need to pinpoint a particular problem and have a shared understanding of what is expected of them. Hence, an interdisciplinary approach enhances university students' competencies in sustainability. The Namibian National Environmental Education and Education for Sustainable Development Policy stresses the need for capacity building in ESD in addressing complex sustainability challenges in an effort to achieve the United Nations Sustainable Development Goals (SDGs).

Keywords: Interdisciplinary Approach, Sustainability, Teacher Education

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Introduction

Today, the world is faced with many urgent issues/challenges such as climate change, water scarcity, corruption, moral decay, poverty etc. which are affecting the world population. These challenges require complex solutions for humanity to cope with this modern and changing world. Meanwhile, new fields of study have emerged to meet the needs of this changing world and as a result the limited nature of the disciplinary approach insufficiently addresses the management and teaching of these fields (Turna et al., 2012). This led to a renewed interest in interdisciplinary approach to teaching. Therefore, the concept of interdisciplinary approach is fast becoming a key instrument and more relevant in that it enables students to apply knowledge and skills across multiple disciplines in addressing problems through multiple lenses (Ashby & Exter, 2019). The purpose of this paper is to demonstrate the importance and contributions of interdisciplinary approach to education for sustainable development in teacher education. It commences by defining the concept of interdisciplinary in education, followed by the literature regarding interdisciplinary and its application in education for sustainable development and ESD in teacher education for sustainability in Namibia.

The Concept of Interdisciplinary Approach to Education

Turna et al. (2012) conceptualize interdisciplinary education as the idea of studying a particular subject from a variety of angles. While the definition of a discipline is specialized knowledge, an interdisciplinary approach is a method for addressing complex or all-encompassing issues like gender equality, poverty, climate change, and sustainable cities and communities that cannot be fully addressed in all of their dimensions by a single discipline. The goal of the interdisciplinary approach is to combine information from other disciplines to achieve an outcome that is greater than the sum of its parts. A key aspect of interdisciplinary instruction is that it uses and integrates methods and analytical frameworks to study a theme, issue, question, or topic, interdisciplinary from other academic disciplines. Although disciplinary approaches are used in interdisciplinary education, it goes beyond them by drawing conclusions from a range of pertinent disciplines, synthesizing their contributions to understanding, and then incorporating these concepts into a more comprehensive and, ideally, clear framework of analysis. In other words, interdisciplinary methods are required for tackling complex challenges including teen pregnancy, new drugs development, genetically modified foods, and health care access to fully address the issues' complexity and provide workable policy solutions. Many scholars have argued that the use of a single discipline viewpoint might inhibit critical evaluation of one's own and other viewpoints (Tahira & Haider, 2019). Contrarily, interdisciplinary education challenges students to synthesize what each subject has to give before attempting to find solutions to difficulties that have been raised in order to gain a deep and full understanding of complicated situations. Interdisciplinary teaching, therefore, differs from multi- or cross-disciplinary teaching in that it calls for the synthesis and integration of various points of view rather than just the consideration of various points of view.

Interdisciplinary teaching is significant to both students and educators. It provides students with more opportunities for investigation and discovery as they are included in the learning process. In doing so, students improve their critical thinking abilities and acquire a more comprehensive understanding of the subjects. Additionally, it gives educators the chance to examine other philosophies and methods of instruction, which might result in learning that is more efficient. As a result, there may be a greater sense of community among the students and educators, which may improve motivation and engagement. As indicated earlier, interdisciplinary education, which has been shown to improve learning results and learning

excitement, enables students to exercise critical thought, recognize their own prejudices, embrace the unknowable, and respect moral conundrums. Additionally, it helps students comprehend ideas from many fields, synthesize knowledge about a subject, and, in the end, provides a more comprehensive grasp of a problem. Interdisciplinary instruction goes beyond multi-disciplinary or cross-disciplinary instruction, which just calls for the examination of several points of view, and frequently necessitates cooperation between many educators in order to be adequately carried out. Interdisciplinary courses and projects can provide students with a holistic view of their field of study. This approach not only enriches their education but also enhances their problem-solving skills and encourages creativity, positively affecting their mental well-being (Chow et al., 2018).

An interdisciplinary approach is considered a crucial method for enhancing university students' competencies in sustainability (Grierson & Munro, 2018). Promoting sustainable development is the new resolution in the context of climate change and biodiversity loss (Baker, 2015). Development and the high consumption of resources demand that all human activities have a sustainable approach, which can be applied through interdisciplinary solutions (Velásquez et al., 2022). According to (Elliott (2012) these solutions are characterized by creativity, innovation, efficiency, and, in most cases, low cost.

The Origin of Education for Sustainable Development

Although the concept of sustainable development emerged back in the early 1970s, it was first defined in 1987 by the United Nations report, 'Our Common Future' which is referred to as the Brundtland Report of the World commission on Environment and Development. The Brundtland Report defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). After this definition, the concept of sustainable development became a top priority for local, regional, and global organizations and countries with an emphasis on sustaining the present for the benefit of future generations (Abu-Alruz et al., 2018). The concept was also regarded as an improvement that addresses the issues of the present without a compromise on meeting the needs of the generations to come (Sauvé et.al., 2016).

Sustainable development can be interpreted in numerous ways such as environmental, economic and social. Similarly, Purvis et al., (2019). describing sustainable development in terms of three pillars, environment, economy and society. Social and cultural factors are the cause of environmental problems and development is needed to meet humans' social and economic needs to promote environmental conservation (Borg et.al., 2014) for sustainable development. It requires that countries improve institutional quality, manage natural resources, safeguard the environment, and attain social inclusiveness (Younis, & Chaudhary, 2017). This means that sustainable development entails the use of resources that do not threaten the health of humans or the environment and do not jeopardize future generations' chances of satisfying their needs (Dernbach, & Cheever, 2015). Much of the current literature on sustainability pays particular attention to the country's ability to achieve SDG (Glass & Newig, 2019). Since practically all disciplines are relevant to the Sustainable Development Goals (SDGs) of the United Nations (UN), the interdisciplinary approach is the scientific approach humanity needs to achieve the SDGs. In other words, the idea of sustainable development aids in bringing together all academic fields that contribute to achieving the SDGs. This implies that to address the issue, new knowledge must be produced. Because sustainability challenges frequently involve a variety of stakeholders and elements that have an impact on social, economic, and environmental issues, working within a group made up of people from varied backgrounds can

be an effective means of problem solving. Collaboration is crucial for developing effective answers to environmental issues. It guarantees that all significant players share responsibility for active engagement and have authority over decisions. To collaborate effectively, experts and/or stakeholders from various backgrounds and disciplines need to pinpoint a particular problem and have a shared understanding of what is expected of them.

The three aspects of sustainable development should all be seen as necessary for sustainability (Purvis et. al., 2019). Sustainability is defined as a practice that guides the use of current resources in an effort to ensure the availability of such resources to the generation to come (Ozili, 2022). It is the ability to make responsible decisions in using and allocating resources to economic and non-economic activities in an effort to achieve some desired social, economic and environmental outcomes (Ozili, 2022). The concept sustainability involves harmonious actions consistent with nature, ecology oriented towards future generations (Kapecki, 2020).

It has been asserted in the literature that teacher education can be considered the major contributor to the sustainability (Dickson et al., 2013; Godemannet et al., 2014) as it can play an important role in developing students' knowledge, skills, and attitudes needed as global change agents to promote, create, and shape a more sustainable future for the world (Kelley & Nahser, 2014; Wiek et al., 2016). According to Kabadayi (2016) teachers education programs are expected to provide graduating students with the needed knowledge and understanding that can be used now and in the future to be considered as change agents towards sustainability.

In this regard, the United Nation Assembly declare a United Nations Decade for Sustainable Development (UNDESD) resolution where everyone has the opportunity to gain knowledge, skills, and attitudes from education and learn the principles, values, and practices needed for sustainable future (Pipere, Veisson, & SalÓte, 2015). This declaration calls on Member States to incorporate sustainable development issues into all sectors of education (UNESCO, 2009), in order to achieve quality education for all. Grosseck et al. (2019) defined ESD as the practice of teaching for sustainability. Further, UNESCO describes ESD as a collection of diverse disciplines, like climate change, the management of the effects of social and economic changes, environmental economics, etc. (UNESCO, 2018). As sustainability issues are complex, it is critical for humanity to understand them, and an interdisciplinary approach is believed to be the key factor (UNESCO, 2013). In light of this, ESD can be seen as a holistic approach, involving the integration of critical sustainable development issues into all teaching and learning strategies (Grosseck et al., 2019).

Methodological Considerations

This paper employed a desktop study as research methodology to systematically review the secondary data on the use of interdisciplinary approach in teacher education for sustainability at the University of Namibia. We specifically reviewed secondary sources, such as government and university directives, policies and peer-reviewed journal articles, which deal directly with the use of interdisciplinary approach in promoting sustainability in teacher education. The review resulted in a thematic analysis of how sustainability is promoted in teacher education in Namibia and elsewhere.

Findings

The introduction of the knowledge-based economy concept and the quickening of globalization have raised the need for integrated curriculum development in Namibia. The new education curriculum reform has set the integrated curriculum as a goal, allowing students to develop their sense of creativity and innovative abilities while learning through active inquiry, active engagement, and hands-on experience. Since teachers and teacher educators will have a big impact on how citizens are educated well into the future, it is essential to align teacher education with the Fourth Industrial Revolution Guidelines, requirements and policies. The idea of integrating ESD with interdisciplinary educational themes is emphasized more strongly in the curricula and education policies. The aim of Namibia's curricular reform on professional ESD skills and competences for higher education teachers is to help academics reorient their subjects' curricula in order to contribute to the sustainable development goals of the United Nations' Agenda 2030 (Seikkula-Leino et al., (2021). In this context, Geli et al. (2019) suggest that to successfully implement the SDGs locally, there must be unparalleled cooperation in key areas of development, including creating supportive policy environments, building human capacity, mobilizing and effectively utilizing public funds, fostering transformative change through science, research, technology, and innovation, and overseeing accountability.

ESD and Teacher Education

There is a consensus among social scientists that it is crucial to instill in students, especially younger ones, a love and appreciation for nature in addition to focusing on environmental issues (Braune &Volkmann, 2022). As the first policy of its kind in Southern Africa, Namibia implemented the National Environmental Education and Education for Sustainable Development Policy in 2019. The policy highlights training and capacity building in ESD (across all sectors) as one of the primary strategies for addressing sustainable development challenges and advancing the Sustainable Development Goals (SDGs) of the United Nations. The policy intends to provide learners with quality education (SDG 4), equipping them with the information and abilities needed to shape a more sustainable future.

Teachers are identified as the change agents in their schools and communities in NaDEET's new professional development program, Teach for ESD: Improving Education for Sustainable Development (ESD) Teaching and Learning Experiences in Namibia, which is in line with this national strategy. By instilling a stronger attitude for nature in our future leaders, it seeks to promote a more sustainable world. The program's main goal is to equip enthusiastic teachers with the information and abilities necessary to implement ESD initiatives in their schools. To that end, it offers materials, hands-on training, and assistance.

ESD and Interdisciplinary Approach

The National Environmental Education and Education for Sustainable Development Policy stresses the need for capacity building in ESD in addressing complex sustainability challenges in an effort to achieve the United Nations Sustainable Development Goals (SDGs). This highlights the need for Namibian higher education institutions (HEIs) to mainstream ESD into their education, research and development programmes. The introduction of ESD in Namibian Higher Education Institutions (HEI) emerged in a structured and strategic way. Various institutions integrated ESD in the form of environmental education in their traditional environment subjects and various programs. At the University of Namibia's (UNAM) the then Faculty of Education has introduced Environmental Education modules in the B.Ed Lower

Primary and in the B.Ed. Adult Education courses. Other courses in the then Faculties of Science and Law as well as the Department of Geography and Environmental Studies at UNAM are carriers of ESD subject matter (University of Namibia, 2011). In this way, ESD is being studied in an interdisciplinary approach which aims to combine information from a variety of angles in an effort to tackle critical sustainability challenges in this changing world. The integration of ESD at the University of Namibia is seen as one way of focusing the social, economic and cultural factors to empower people to acquire an understanding of the complexities of environmental and developmental issues of living sustainably (University of Namibia, 2011). Consequently, this will enable future teachers to teach issues of sustainable development to their learners.

ESD as a University Module

In 2022, the University of Namibia teacher education curriculum went through a major transformation. The transformation process was informed by three main drivers namely, the national Basic Education reform, the need for continuous improvement of the UNAM curricula and changing Higher Education landscape in response to the Fourth and Fifth Industrial Revolutions. The overall purpose for curriculum transformation is to contribute towards the UNAM vision, mission and strategic direction, with the aim to address national and international development goals contained in the Vision 2030, NDPs, Harambee Prosperity Plan II as well as the Africa Agenda 2063 (Goal 2). The curriculum reform also emphasizes on the SDG number 4 on quality education which is aiming at achieving inclusive and quality education for all which reaffirms the belief that education is one of the most powerful and proven vehicles for sustainable development. It is also acknowledged that the students produced by the University of Namibia are,

> prepared for more complex life and work environments in the 21st century, which demand skills suck creativity and innovation, critical thinking and problem solving, and communication and collaboration as well as dispositional skills which include flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility. (UNAM, 2020, p.3)

In the transformed curriculum, modules such as Education for Sustainability, Sustainability and Environmental Awareness and Environmental Education and Sustainability as well as Learners and Learning Environment were introduced. The purpose of these modules is to prepare student teachers to implement sustainability in their everyday life and profession through their attitudes and practices. This enables students to develop personal responsibility that will help them respond to the 4th and 5th Industrial Revolutions (IRs).

Conclusions

Interdisciplinary instruction is a great approach to keep students interested and provide them a more complete education. It encourages students to investigate subjects from several angles and to hone their critical thinking abilities. Additionally, it gives educators the chance to expand their teaching methods and keep up with the most recent advancements across a variety of subjects. Interdisciplinary teaching is unquestionably, therefore, something to take into consideration if you are seeking strategies to engage your students and provide them a more in-depth education. This is a significant method to support students in developing a more comprehensive understanding of subjects and to promote a feeling of community in the classroom with the correct planning and techniques.

This study is theoretical in nature; hence its scope is limited due to its well-defined and specific objective. The quality, quantity, or diversity of the data may also be limited by the methodological aspects employed in this investigation.

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Teacher Training for Interdisciplinary Project Based Learning: A Professional Development Case Study

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Abstract
This research explored Project Based Learning (PBL) teacher training for 13 teachers to prepare them to lead a two-week intensive PBL course for 100 high school students from across mainland China, Hong Kong, and Taiwan. The training program was designed to build sufficient content and pedagogical knowledge to deliver an interdisciplinary program on 21st century leadership linked to a variety of issues including the fourth industrial revolution; the Sustainable Development Goals; transformative computing technologies such as Artificial Intelligence, blockchain, and quantum computing; biotechnology; and the rise of China through organizations such as BRICS and policies such as The Belt and Road Initiative. Content also included leadership, such as the application of agile leadership theory, project management, collaboration protocols, active listening, and public speaking. Due to the interdisciplinary nature of the content, teachers were trained using a PBL approach in which they investigated PBL teaching practices and design concepts in reflective cycles interspaced with taking the role of students in the program they would later be teaching. Data were collected though observation notes, questionnaires, and post-program surveys that explored the acquisition of content knowledge, pedagogical knowledge, and pedagogical content knowledge. Results suggest strong acquisition of target knowledge, skills, and attitudes. This model may be an effective option for institutions incorporating training in PBL teaching techniques, particularly in situations in which the course content is interdisciplinary and therefore outside teachers' normal subject areas.

Keywords: Project Based Learning, Teacher Training, Professional Development, Curriculum Design, Education for Sustainable Development, Adult Education

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Introduction

Many researchers, policy makers, and educational organizations have noted the need for deep and ongoing education reform to respond to the rapidly changing technological, social, environmental, and economic realities facing humanity (UNESCO, 2020; OECD, 2018; Reimers et al., 2016). These reform initiatives have given rise to several human competency frameworks which serve to describe the kinds of capacities people should attain and therefore that education systems should backward design from, such as Education for Sustainable Development competencies (Reickman, 2018) and the Organization for Economic Co-operation and Development's (OECD, 2018) Education 2030 competencies. These competency frameworks are linked to internationally developed targets such as the Sustainable Development Goals (SDGs), which are designed to provide a roadmap for mitigating the most pressing problems we face as a species as well as to help people seize opportunities and maximize human potential through the provision of clear and measurable targets on seventeen different dimensions relating to poverty, inclusion, innovation, the environment, human security, and peace and governance (UNESCO, 2020).

Conceptualizing the pedagogy for the attainment of these competencies is complex as they go well beyond targeting disciplinary knowledge and include other types of knowledge such as epistemological and interdisciplinary, a wide range of skills such as metacognitive and socio-emotional, and finally attitudes and dispositions relating to community and citizenship in contexts ranging from local to global that are all to be combined into real world action (OECD, 2018). Pedagogies for this kind of education are typically described with terms such as learner-centred, action-oriented, and transformative (Reickman, 2018). Bourn (2021) also notes the importance of utilizing a pedagogy of hope situated within important current issues so that students and teachers feel their education is providing the knowledge, skills, and attitudes to effectively address the problems they face.

Project-Based Learning (PBL) is increasingly recognized as a means to support student acquisition of these competencies because it combines the use and assessment of knowledge, skills, values, and attitudes directed toward real-world problem solving (UNESCO, 2020). However, the use of PBL does not guarantee efficient learning and care must be taken in the design to ensure academic content knowledge acquisition is maintained and optimized (McDowell, 2017). In addition to designing for effective acquisition of traditional academic competencies, PBL design processes also need to continue to be updated to keep abreast of emerging competencies such as increased pressure for emphasizing sustainability competencies and digital competencies, particularly in a post-generative AI world (Hazard, 2023).

Problem-based learning is one of five interrelated types of project-based learning described by Larmer et al. (2015), which may also include meeting design challenges; investigating abstract questions; conducting research; and developing evidence-based positions on issues. Using PBL as a model for preservice and professional development has been noted as particularly effective across many professions' continuing education in part due to the application of knowledge, skills, problem solving, and other professionally relevant abilities in authentic contexts of learning (Salinitri et al., 2015).

Milner and Scholkman (2023) note that the current requirements for teachers to deliver 21st century education through pedagogies such as PBL suggest that problem-based/project-based teacher training has merit due to its unique characteristics for modelling transformative

education for teachers so they can later guide students through similar experiences. Although Milner and Scholkman (2023) are primarily concerned with teacher-driven research utilizing a problem based approach, this same line of thinking about modelling 21st century education may be extended to training in PBL teaching and learning practices, such as when developing skills by putting trainees in the role of students who undergo programming almost identical to what they will eventually deliver so they can experience the project workflow, learning activities, and assessments from the viewpoint of a student while simultaneously being able to reflect on how more advanced teachers facilitate the programming. Similar training models have previously been used in other professions (Wuenschell et al., 2007).

Method

PCK Framework

The purpose of this research was to gain understanding into effective training for PBL teaching and learning practices rather than curriculum design. The PCK framework (Shulman, 1986) provides a simple way to describe the different types of knowledge and skills teachers need to be effective. Content Knowledge (CK) is the disciplinary or interdisciplinary knowledge and skills that students are meant to acquire through their study. Examples include verb conjugation in language studies and the hydrologic cycle in environmental studies. Pedagogical Knowledge (PK) includes the learning theory and teaching and learning techniques that are used to teach effectively, regardless of the discipline being taught. Examples include direct instruction, the use of jigsaws, and assessment design. Pedagogical Content Knowledge (PCK) is pedagogical knowledge specific to teaching a particular content area, such as common areas of student misunderstanding during a particular course in world history.

In this instance there was a need to build a high level of teacher competence in order to effectively deliver a 60 contact hour intensive PBL course for 100 high schools students between the ages of 15 and 18 from across mainland China, Hong Kong, and Taiwan. The students' academic backgrounds were unknown as it was a summer course with students originating from a wide variety of cities and institutions. As the content of the program was not standard curricula for either the teachers or students, the teacher trainees needed to learn the PK relating to PBL, but also the necessary CK and PCK in a relatively short period of time (approximately 36 content hours).

Research Question

What understandings regarding teacher training for PBL lesson facilitation can be uncovered using a train-the-trainer model that incorporates role-play as students and project-based inquiry to acquire the necessary content, pedagogical, and pedagogical-content knowledge for effective interdisciplinary program delivery?

Research Participants and Location

Thirteen teachers were commissioned as instructors. Participation in the research was voluntary and data anonymized. Pseudonyms were assigned to data sets and are utilized throughout this research. The teachers ranged in experience from fully qualified to pre-service. Regardless of experience level, none of the teachers had training in either PBL teaching and learning techniques or the project content. The research, teacher training, and student PBL program were conducted at a Chinese bilingual school in Beijing, China. Action research is used by

members of a community to solve problems of professional practice and was the model used for this case study (McNiff, 2013).

Design of Teacher Training Experience

The design of the teacher training experience used a dual train-the-trainer and project/problem-based approach. Although PBL program design was not covered in the training, the design of the program was explicitly linked to PBL design frameworks by Larmer et al. (2015) and Hazard (2023) to support connections between theory and practice. Training occurred over six days with six hours training each day divided into three-hour blocks which mirrored workshop activities the students would eventually experience. Before and after the teaching and learning activities, the trainees were reoriented to the overarching research question and used it to drive investigation to deepen their understanding of PBL pedagogy. Throughout the process, trainees were invited to give feedback for program improvement.

Overview of Training Content Being Researched

Major targets for the training included:

CK

The CK of the training program was interdisciplinary 21st century leadership theory and practice. CK was developed in the phases where the trainees went through an abbreviated version of the student project in the role of students. CK development focused on the following topics and subtopics:

1) Tracking megatrends, macrotrends, and microtrends as a modern leadership task.
2) Leadership, such as application of agile leadership theory and practice, creative thinking protocols, project management training, critical thinking routines, team collaboration and feedback protocols, active listening training, value creation protocols, mindfulness training for emotional intelligence, and public speaking skills.
3) The fourth industrial revolution as a megatrend and dynamic context for leadership.
4) The Sustainable Development Goals (SDGs) and Environmental, Social, and Governance (ESG) issues in leadership as a megatrend.
5) The rise of transformative computing technologies with examples such as Artificial Intelligence (AI), blockchain, the metaverse, and quantum computing as a megatrend.
6) The near- and medium-term trajectory of biotechnology with examples such as neural implants, genetic medicine, agricultural technology/genetically modified organisms, 3D printed organs and meat, and tailored pharmaceuticals as a megatrend.
7) The rise of China, whether due to its increasing economic, diplomatic, and military power; due to levering organizations like BRICS (Brazil, Russia, India, China, South Africa); or due to expansive global policies such as The Belt and Road Initiative, approached as a megatrend.

PK

None of the teachers in training had a background in either PBL curriculum design or teaching and learning practices. PK was developed implicitly when the trainees experienced teaching and learning for the project from the perspective of students and explicitly when acting in the meta-role of teachers researching PBL. The trainees investigated the following areas of PK using the inquiry question:

What understandings can we, as teachers, come to regarding the effective design and delivery of PBL lessons by trialling a student PBL program ourselves and reflecting on our findings in relation to the PBL literature?

Major areas of PK investigation included:

1) Using Sustainable Development Goal 4 set within the wider framework of the SDGs as the overarching context of education.
2) Moving from a focus on knowledge acquisition to OECD 2030 competencies (OECD, 2018) for student learning goals.
3) Understanding basic PBL design considerations from the Gold Standard PBL design framework (Larmer et al., 2015) and the Global PBL framework (Hazard, 2023) as a means of understanding the program including:
    A) Authenticity, Contexts of Learning, & Sustainability Vision
    B) Intellectual Challenge, Depth of Inquiry, & Structure
    C) Artifacts of Learning & Meaningful Audience
    D) Student Voice, Choice, Diversity, & Inclusion
    E) Layers of Collaboration & Assessment Plan
    F) Technology, Digital Citizenship, & Digital Academic Integrity
    G) Revision, Reflection, Criticality, and Reflexivity
    H) Project, School, and Community Impact
4) Using big ideas to contextualize links between lessons.
5) Utilizing a student inquiry question and facilitating the ongoing generation of subquestions.
6) Developing metrics for post-program evaluation and improvement.
7) Understanding common workflows for PBL workshops.
8) The importance of critique and revision in PBL and how to facilitate these activities.
9) Coaching for performance with student teams and individuals.
10) Making thinking visible (Ritchhart et al., 2011) in the PBL classroom.
11) Understanding active learning and Assessment for Learning in PBL learning activities.
12) The importance of reflection and methods of facilitating reflection in PBL classrooms.

PCK

The most important areas of PCK targeted by the training included:

1) Knowing common areas of difficulty or misunderstanding in the content, which was developed while engaging with the learning activities in the role of students and then reflecting in the role of teachers after.
2) Understanding how core learning activities in each lesson contributed to the course assessments, which was done when acting in the role of students working on the summative assessments and then reflecting afterwards in the role of teachers.
3) Clarifying strategies and coaching plans for meeting the assessment success criteria, which was developed when peer-assessing other trainee summative assessments created while in the role of students.

Data Collection and Analysis

Collecting different types of data helps to give a richer analysis as well as improving dependability through triangulation (Creswell, 2012). One source of data (for CK, PK, and PCK) was via researcher observation notes taken during the training and then throughout the execution of the program. A second source of data was obtained using post-training

questionnaires (focusing on PK and PCK). Finally, anonymous post-training surveys exploring the acquisition of CK were utilized. Although observational data gathered during the program was the most important indicator of the CK acquisition, the self-reported survey data added value in helping to determine whether the trainees felt confident in their CK and what proportion of the content knowledge they felt they gained from training.

Self-reported survey data first prompted for how much understanding for each content area was preexisting versus what proportion was developed through the training. These questions used the same four-point scale for each content area, which is demonstrated below. A follow up question was then used to check if the trainee felt they had sufficient CK for that area to deliver the program. An example of a survey question and response choices follows:

1) How much of the content knowledge relating to *the analysis of micro, macro, and megatrends* did you learn in the training program?

    4 – Almost all this content in this area was new to me before training
    3 – I learned many new ideas in this content area during training
    2 – I learned a few new ideas in this content area during training
    1 – I already knew all the content in this area before training

2) I felt like I was understood enough of this content area to adequately support the students when delivering the PBL program. Yes/No

Analysis of the qualitative data from observation notes and participant questionnaires was completed using qualitative analysis software. Survey responses were analyzed using descriptive statistics.

Findings/Results

Researcher observation notes indicated the necessary CK was developed to an acceptable level during training. Acquisition was supported by the trainees engaging in the same active learning and feedback opportunities students would be later be asked to do as these required higher order thinking, reflection, and finally synthesis of the CK into learning artifacts that would later be used as assessment exemplars after several rounds of self and peer review. The survey data overwhelmingly demonstrated that the trainees felt prepared to deliver the interdisciplinary CK as of all the responses from instructors indicated that they felt sufficiently prepared, except one instructor who indicated they were not fully prepared to facilitate the target leadership skills of empathy and emotional intelligence, and another who did not feel fully prepared to facilitate the content knowledge relating to biotechnology.

Regarding how much of that preparedness could be attributed to the training program, the four-point scale used ranged from *I already knew all the content in this area before training* (1) to *Almost all the content in this area was new to me before training* (4). The overall mean response for these prompts was 2.94 (*SD* 0.78) indicating that much of the CK used in the final program delivery was learned in training. These self-reports were supported by researcher observational notes during training. Formative assessment during the discussions and learning activities indicated that most of the content was new to the majority of the trainees.

The content area the participants reported knowing most about before training was China's rise as a global superpower ($M = 2.33$, $SD = 0.81$). Leadership skills in collaboration and coaching

(*M* = 2.33, *SD* = 1.03) and the Sustainable Development Goals (SDGs) (*M* = 2.66, *SD* = 1.21) were the next best-known areas of CK before training.

The area the participants knew least (and therefore developed most) in the training, according to self-report, was content knowledge relating to Environmental, Social, and Governance (ESG) (*M* = 3.6, *SD* = 0.81). The two next weakest pre-training areas were CK relating to the analysis of micro, macro, and megatrends (*M* = 3.5, *SD* = 0.54) and CK relating to leadership theory including agile leadership, shifting teams to creative and design mindsets, teams as semi-autonomous value creating units, and the use of design thinking to improve processes and outputs at every level (*M* = 3.5, *SD* = 0.54), all of which were almost completely new for all the trainees.

Results from observation and qualitative data suggest good acquisition of PK relating to PBL teaching and learning, considering the limited number of training hours. PK acquisition was enhanced by experiencing teaching techniques and activities being modelled by experienced instructors and then by reflecting on them, discussing them, and brainstorming for improvement after each phase of the training. Theory and practice were linked routinely to ground the program in the PBL literature. Areas of strength in PK acquisition were for the Global PBL design dimensions (Hazard, 2023) of Artifacts of Learning and Meaningful Audience; Reflection and Revision; and Authenticity and Context of Learning.

For example, Debbie (pseudonym) expressed on her post-training questionnaire that "reflective practices promote deeper learning and allow students to internalize knowledge and skills more effectively. Students can set and adjust learning goals and become more aware of how they learn, what strategies are effective, and where they can improve. We need to avoid treating the reflection and revision as a mere routine or checklist. Encouraging students, especially teenagers, to reflect voluntarily and authentically fosters a deeper understanding of their own learning and personal growth".

Areas of weakness were in the PBL design dimensions of Criticality & Reflexivity; Impact Analysis; and Sustainability Vision. Although the instructors demonstrated an understanding of the importance of criticality, impact analysis, and sustainability vision, they were not articulated in depth. Reflexivity was misunderstood by several trainees.

Basic PCK was also attained through the process of experiencing the workshops both as a student and in the role of teachers discussing, questioning, and improving the program after each session. Specific areas of strength that were noted included anticipating ideas likely to be challenging or to cause misunderstanding; the application of formative assessment techniques that were designed to match the needs of the unique content; and the ability to coach for the successful completion of the final learning artifacts from the beginning of the program. As an example, Bill (pseudonym) stated "by trialing the program in a group, I can have (sic) the student perspective to spot any potential challenges and issues that might affect the learning. Besides, to experience the authentic and active learning process helped me to spot the highlights and challenges that student might feel in the program so that I can better prepare to offer support in advance… Also, from an instructor perspective, it reinforces the understanding of the core content, tasks and final artifacts of the program and get me ready for the teaching".

Discussion

The PBL program the teachers were being trained for was designed to raise awareness of interdisciplinary issues in 21st century leadership that both the students and teachers were almost completely unfamiliar with before training. This may be a slightly unusual situation in that many instructors will engage in PBL training to develop PK but would usually come to that training confident in their subject specialty knowledge. However, as interdisciplinary PBL becomes more common due to international initiatives such as Education for Sustainable Development, disciplinary instructors may find they need to synthesize content across normal subject boundaries more often.

Overall, findings for PK acquisition fit previous works that suggested PBL as a potentially effective for 21st century teacher professional development needs (Milner & Scholkmann, 2023). This case study also documents successful CK, PK, and PCK acquisition for inexperienced teachers using a method of taking the role of the students they will later be teaching in order to learn the course content, understand the teaching and learning techniques, familiarize themselves with assessment success criteria, and then make suggestions for course improvement within a larger investigation of PBL teaching concepts. This fits research utilizing similar PBL training techniques in other professions (Wuenschell et al., 2007).

These findings are significant in that they offer a record of generally effective professional development for PBL teaching and learning. Such professional development is important because PBL has been noted to be an area of pedagogy that is uniquely suited to the development of 21st century competencies sought by many education reform movements (UNESCO, 2020) to meet the current and future needs of both individuals and societies. Effectiveness in professional development efforts is crucial it may help teachers to continually improve and adapt over the course of their careers while teachers without it may stop developing or even regress in effectiveness over time (Kraft & Papay, 2014; Rockoff, 2004).

With regard to teacher development using PBL, Milner and Scholkman (2023, p. 2) note “five principles considered cornerstones of the PBL pedagogical approach: (1) problem identification as the starting point of the PBL process; (2) self-directedness of learning; (3) group collaboration as the dominant way of working; (4) critical reflection as the intended outcome; and (5) variation in the implementation of PBL learning designs”. Although these principles are primarily intended to guide teacher-directed research into their own practice, the results of this case study suggest that, just as with student PBL (Hazard, 2023), PBL for teacher development can vary the depth of inquiry and the amount of structure and support provided depending on the pedagogical goals of the professional development project.

In this case, as the curriculum and PBL teaching methods were a predetermined problem for investigation, the research problem was identified for the teachers in training who then worked together as a team to investigate and solve this problem as the vector of inquiry. They were aided by significant scaffolding supports to guide learning, including direct instruction for efficient surface, deep, and transfer learning as per McDowell’s (2017) recommendations for PBL program design.

Recommendations

Wherever feasible, it would be optimal for teachers who will instruct on PBL courses to be fully trained in PBL curriculum design and be included in the design process from the

beginning as a way of improving their pedagogical knowledge, increasing the number of perspectives and creative inputs into the design, and modelling the voice and choice processes that we would like to see more of in PBL classrooms. However, in cases where the design has been completed by interdisciplinary experts or in situations such as when a curriculum has been used before and new teachers are approaching it for the first time, allowing trainees to trial key elements of the program, complete exemplar assessments, and give program improvement feedback appears to be a strong strategy.

Although the project design was centered on 21st century leadership rather than sustainability, sustainability concepts were included as central to the program. However, in future, these concepts could be enriched by enhancing the focus on project impact. Although community impact was discussed in the training phase it was not enacted in the student project well. Because the project was high intensity over a two-week period with students who came from unknown backgrounds and locations, and as it was a first teaching experience for the teachers, it was decided to focus on impact limited to the learning community itself with additional consciousness raising among the social networks of the participants through distribution of their reflective videos. Future iterations would benefit from a stronger impact analysis to see how real-world impact could be increased, both as a program outcome and as a teacher training outcome linked to all elements of PBL curriculum design frameworks.

Another area for improvement in training would be the inclusion of deeper discussion on critical pedagogy and reflexivity to make the underlying ideological underpinnings of the instructors and the context more transparent and open for analysis. This was relatively weak in both the teacher training and the student project work in part due to the tight timelines, but these understandings are considered crucial for effective PBL that is sustainability based (Hazard, 2023) and for quality global education generally (Bourn, 2021).

Including explicit training in visual project management was noted as a highlight by the teachers and by the students who later engaged with the program as well. It was seen as a highly effective transferrable skill that could be used for personal, academic, and professional goals to plan, monitor, and evaluate real-world change projects. The capacity to plan and execute effective real-world action is one of the targets for teacher training that supports teachers in the role of change agents (Bourn, 2016), and the importance of explicit understanding of project management is a hallmark of effective sustainability oriented PBL (Hazard, 2023) and of quality PBL in general (Larmer et al., 2015).

Using PBL as a model for inquiry-driven teacher professional development was one of the areas suggested for future research by Milner and Scholkman (2023). Better synthesis between the theory and practice of teacher research and student-oriented PBL curriculum models could be valuable in future as it has the potential to provide a relatively unified model of inquiry that could be used with only slight variations by administration, teachers, and students in order to develop a variety of projects within a whole school transformation approach. Facilitating such full-scale school transformation through action oriented education is a key objective in the Education for Sustainable Development literature (Reickman, 2018) and therefore a priority for teachers and researchers interested in supporting that initiative.

Conclusions

This case study found that a project-based approach to investigating PBL teaching combined with immersion into interdisciplinary content in an authentic PBL classroom environment led

by experienced teachers was effective overall as a training method. It supported inexperienced teachers with relatively low experience of both the program content and pedagogy to become capable instructors. Finally, by running through the project as students and then giving feedback and making changes to the program after experiencing modelling of the teaching flow, the participants were able to attain sufficient PCK relatively rapidly.

No one system of professional development is suitable for all institutions and contexts (Scribner, 1999). However, providing teacher training opportunities that model an inquiry-based, collaborative classroom in which teachers develop a range of knowledge, skills, and attitudes relating to issues they see as impactful for their own lives can support teachers in providing the same kind of education to their students.

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Exploring the New Normal: A Qualitative Study on Student Engagement, Technology Access, and the Experience of Online Learning in Post-pandemic College Education

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Abstract
This study digs into the evolving field of higher education, particularly in the wake of a significant transition to online learning triggered by the global pandemic. Employing qualitative research methods, it incorporates comprehensive literature reviews, informal stakeholder interviews, and observational analysis of the virtual learning environment. The research aims to unearth nuanced insights into various facets such as student engagement, technology accessibility, and the overall online learning experience in the post-pandemic educational milieu. The findings underscore the imperative of innovative strategies, emphasizing the need to prioritize student well-being, enhance accessibility, and maintain learning quality in the digital era. As the higher education sector grapples with the challenges of adapting to this new normal, the study makes a significant contribution to ongoing dialogues by providing a foundation for substantive discussions on the future direction of college education. The methodology includes a rigorous analysis of existing literature, stakeholder interviews, and observational techniques for qualitative data collection. The results underscore the need for adaptive strategies to create a conducive online learning environment, highlighting the crucial role of technology in shaping student experiences. Moreover, the study stresses the urgent need for proactive measures to address the diverse challenges in the post-pandemic higher education landscape. Overall, the study serves as a comprehensive guide for institutions and practitioners striving to enhance the effectiveness and inclusivity of online learning in the current educational paradigm. This is a compelling narrative of the educational sector's resilience and adaptability, thriving and innovating even in these unprecedented times.

Keywords: New Normal, Online Learning, Philippines, Post-pandemic, St. Michael's College, Student Engagement

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Introduction

The COVID-19 pandemic has significantly changed the operation of higher education, leading to a notable shift in teaching and learning methods. Colleges and universities worldwide have faced unprecedented challenges during the pandemic, resulting in substantial changes in education. This study aimed to investigate this "new normal" which has impacted educational institutions globally. The researcher sought to understand the various aspects of this educational transformation, specifically focusing on student engagement, technology access, and the experience of online learning. This study explores qualitative variables that characterize the academic journey of college students in the post-pandemic era at St. Michael's College, Iligan City, Philippines during the 2nd semester of A.Y. 2022-2023.

The paper not only reflects a change in the mode of education but also a broader societal and technological transformation defining the current landscape.

A. New Normal: Indicates the shift from traditional classroom-based instruction to predominantly online methods, highlighting the lasting impact of the pandemic on education.

B. Student Engagement: Examines the complex interaction of students with the educational process in an online environment, considering factors influencing motivation, commitment, and involvement (Alexander, 2020).

C. Technology access: The knowledge that online education relies on digital tools and infrastructure available to students, recognizing the varied impact on their learning experiences (Dede & Richards, 2020).

D. Experience of online learning: Explore the subjective experiences of students navigating the online educational landscape, including challenges, opportunities, and emotions shaping their learning journey (Nichols, 2020).

Through this exploration, this paper aims to provide insights and a deeper understanding of the ongoing educational transformation while identifying potential areas for improvement and adaptation. This inquiry is situated within the broader context of higher education scholarship, which has seen increased research addressing the challenges and innovations brought about by the digital transformation of learning (Ulum 2022).

This study also contributes to the broader discourse on educational innovation. The researcher draws on insights from scholars who have explored the evolving landscape of higher education in the digital age, recognizing the study's role in ongoing discussions about the future of learning (Alexander, 2020; Dede & Richards, 2020; Nichols, 2020).

This research anchors on three influential theories that have significantly shaped education discourse:

1) Social Cognitive Theory (Albert Bandura, 1986): This theory suggests that individuals learn by observing others and modeling their behavior. In the context of online education, it helps to explore how peer interactions and role modeling influence student engagement and learning outcomes.
2) Technology Acceptance Model (TAM) (Davis, 1989): Focusing on factors influencing the adoption and use of technology, this model is integrated to examine how technology access and perceived ease of use impact students' engagement in online learning.

3) Community of Inquiry Framework (Garrison, Anderson, & Archer, 2000): Emphasizing cognitive, social, and teaching presence in online learning environments, this framework guides the investigation of students' online learning experiences by examining the roles of instructors, peers, and the cognitive processes involved.

The goal of this study was to examine the effects of online learning on student engagement, technology access, and the overall experience of college education at the College of Arts and Sciences. Michael's College in Iligan City, Philippines. To accomplish this, the study formulated the following research question:

1) How does the transition to online learning affect the level of student engagement among college students at SMC?
2) What is the current status of technology access among the selected college students at SMC and how does it influence their experience of online learning?
3) What unique experiences and challenges do students encounter in different programs (Bachelor of Arts in Philosophy, Bachelor of Arts in English Language, and Bachelor of Science in Psychology) in the context of online learning at SMC?
4) What are the perceptions and attitudes of students toward online learning in a post-pandemic education setting and how do these attitudes shape their overall learning experience?
5) What strategies and recommendations can be derived from the findings to enhance the quality of online education at SMC, contributing to the broader discourse on the future of higher education in the digital age?

These research questions form the foundational framework for the study, guiding the exploration of various aspects related to the transition to online learning at SMC. This study was conducted during the first semester of 2023.

St. Michael's College is situated in Iligan City, Philippines, and celebrated for its rich cultural heritage and diverse educational institutions. The college offers a broad spectrum of academic programs, including the Bachelor of Arts in Philosophy, Bachelor of Arts in English Language, and Bachelor of Science in Psychology, which are the focal points of this study. Managed by the Religious Virgin Mary (RVM) and PAASCU accredited, the college caters to basic education, college, and graduate studies (smciligan.edu.ph). Understanding the local context is crucial to provide a backdrop against which the study's findings and recommendations can be applied.

The significance of this study is twofold. First, it is important for school administrators, offering insights into the effectiveness of the transition to online learning at SMC makes informed decisions regarding the future of online education at the institution. Second, teachers and educators can benefit from the findings, as they can adapt their teaching methods to better suit the needs of students engaged in online learning. The study is also significant for the students themselves, as it provides a better understanding of the challenges and opportunities associated with online education, empowers them to make informed choices, and enhances their learning experiences. Results are expected to present nuanced aspect of their engagement, technology access, program-specific challenges, attitudes, and practical recommendations.

Methodology

This study made use of a qualitative research method to emphasize the validity and reliability of the research process. The methodology included an in-depth literature review, informal interviews, observations, and thematic analysis. These approaches played a crucial role in investigating the "New Normal," student engagement, technology access, and the experience of online learning in the context of post-pandemic college education. It was chosen to offer a profound understanding of the subject matter and provide rich insights into the lived experiences and perspectives of randomly selected CAS students (Braun & Báez, 2020; Braun & Clarke, 2021; Terry & Hayfield, 2021).

Ensuring the validity and reliability of the research methods is of paramount importance. An extensive literature review was conducted to establish the foundation of the study, create a theoretical framework, and ensure the credibility of the research (Snyder 2019; Cardoso Ermel et al. 2021).

Data Collection

This study made us of twenty (20) college students randomly selected from the College of Arts and Sciences at St. Michael's College, identified as "S-Part 1" to "S-Part 20" during the 2nd semester of A.Y. 2022-2023. This systematic participant selection approach was employed to ensure data saturation and to capture a diverse range of experiences (Mwita, 2022; Mthuli, Ruffin, & Singh, 2022).

The data collection involved an in-depth literature review, informal interviews, and observations. During the informal interviews, the participants were presented with open-ended questions, allowing them to freely express their experiences and perceptions. Observations were conducted in virtual learning environments to capture the dynamics of online classes and student behavior (Swain & Zachery, 2020; Ciesielska, Boström, & Öhlander, 2018; Chigbu, Atiku, & Du Plessis, 2023).

Data Analysis

Participants were asked to answer five qualitative questions, followed by informal interviews. This was followed by observations. Likewise, thematic analysis was employed to identify deeper meanings of the gathered data. This approach ensured rigorous analysis and grounded the findings in the experiences and perceptions of participants (Braun & Clarke, 2021; Terry & Hayfield, 2021). A systematic random approach to participant selection and the use of established research methods ensured the validity and reliability of the study (Smit & Onwuegbuzie, 2018; Rutakumwa et al., 2020).

Ethical Considerations

To protect the rights of the participants, enhance validity, and uphold scientific or academic integrity, the researcher ensured that the participation was voluntary and informed, the identities and data were anonymous and confidential, the harm was minimized and avoided, and the results were communicated and discussed.

Approach to Literature Selection

The literature for this study was meticulously chosen to align with the qualitative research methodology, ensuring a deep exploration of the nuanced experiences of students in the post-pandemic educational landscape (OECD's, 2021). The criteria for selection were multi-faceted, prioritizing works that offer rich, qualitative insights into student engagement and the efficacy of technology in online learning environments.

Criteria for Inclusion

1. Topical Relevance: Literature was selected based on its focus on student engagement and online learning, particularly in the context of the challenges and adaptations necessitated by the pandemic.
2. Methodological Alignment: Preference was given to studies employing qualitative methods, resonating with the article's approach to capturing lived experiences.
3. Theoretical Contribution: Works that contribute to or challenge existing theories on technology-mediated education were included to provide a robust theoretical framework.
4. Diversity of Perspectives: A spectrum of literature was reviewed to encompass a broad range of student experiences, including different socioeconomic backgrounds and access to technology.
5. Recency: Given the rapidly evolving nature of online education, recent publications post-pandemic were prioritized to reflect the current state of affairs.

Sources and Volume of Literature

The sources comprised peer-reviewed academic journals, conference proceedings, and authoritative reports from educational bodies. The literature review was extensive but curated, aimed at achieving saturation without being redundant. While the exact number of sources is not specified, the term "comprehensive" suggests a significant volume of literature was considered to ensure a thorough understanding of the "New Normal" in higher education (Creswell & Báez, 2020). The literature selected paints a vivid picture of a higher education sector in flux, grappling with the sudden shift to online learning. It highlights the resilience and adaptability of institutions and students alike, navigating uncharted waters with varying degrees of success. The chosen literature underscores the importance of student engagement as a barometer for the effectiveness of online learning, while also spotlighting the digital divide that can hinder equitable access to education (Resources from the Online Learning Consortium (n.d.). Through this carefully curated body of work, the study aims to contribute meaningfully to the discourse on optimizing online learning in the post-pandemic era, ensuring it is inclusive, engaging, and educationally sound (Nichols, 2020).

Findings

This section presents the research outcomes pertaining to each research question. Summarized responses to the five research questions are presented, supported by insights gathered from interviews with the twenty participants ("S-Part 1" to "S-Part 20").

A. Summarized Answers to the Five Research Questions

Q 1: On the transition to online learning affect the level of student engagement among college students. Result: The transition to online learning had a significant impact on student engagement at St. Michael's College (Online Learning Consortium, n.d.). Several participants reported increased engagement owing to the flexibility offered by online classes. For example, "S-Part 6" stated, "I feel more engaged because I can attend classes from anywhere". The same finding was highlighted in a 2021 study by Barrot et al. However, there are notable challenges. "S-Part 12" mentioned, "I find it hard to stay focused with so many distractions at home." This idea was also proposed in a study by Fabriz et al. in 2021. These findings are consistent with research suggesting that the flexible nature of online learning can both enhance and hinder student engagement (Stewart, 2021).

Q 2: On the current status of technology access among the selected college students and how does it influence their experience of online learning. Result: Technology access plays a critical role in shaping the online learning experience of students at St. Michael's College. The same observation surface was used by Alhammadi in 2021. Participants with reliable access to devices and a stable Internet connection generally found online learning more accessible and effective. In contrast, students like "S-Part 14" faced challenges due to poor Internet connectivity in their area, which impacted their learning experience (Cheong et al., 2021). These findings align with existing research highlighting the disparities in technology access and their implications for learning outcomes (Barrot et al., 2021).

Q 3: On the unique experiences and challenges encountered by students pursuing different programs in the context of online learning at SMC. Result: The study revealed the distinct experiences and challenges faced by students in different online learning programs. The same finding was observed in a study conducted by Chan et al. in 2022. For instance, students pursuing a bachelor of science degree in psychology noted challenges related to the practicality of conducting experiments online. On the other hand, students in the Bachelor of the Arts in English Language (BAEL) found it comparatively easier to adapt to online learning. These findings support the idea that program-specific demands significantly influence online learning experiences (Hews et al. 2022).

Q 4: On the perceptions and attitudes of students toward online learning in a post-pandemic college education setting and how do these attitudes shape their overall learning experiences. Result: The participants exhibited a range of perceptions and attitudes toward online learning. The same finding was explicated in the study conducted by Abdel Latif in 2022. Some students had positive attitudes and appreciated the flexibility and convenience offered. "S-Part 3" noted, "I enjoy the flexibility to create my own schedule." In contrast, others expressed negative sentiments, missing the social aspects of the traditional classes. "S-Part 8" stated, "I miss interacting with classmates." The same output was obtained in a study by Cheong et al. in 2021. These findings align with the extensive literature on the influence of attitudes on the overall online learning experience (Hews et al. 2022).

Q 5: On strategies and recommendations can be derived from the findings to enhance the quality of online education at SMC, contributing to the broader discourse on the future of higher education in the digital age. Result: This study generated valuable insights that can be used to enhance the quality of online education at St. Michael's College. The same observation was made in a study conducted by Cheong et al. (2021). Strategies include improving Internet infrastructure, offering additional support for students with technology barriers, and designing

courses that cater to program-specific needs. These recommendations contribute to the broader discourse on the future of higher education in the digital age by addressing critical issues related to technology access and program-specific adaptation in online learning (Abdel Latif 2022).

B. Results of Informal Interviews

The interviews conducted with the randomly selected twenty participants ("S-Part 1" to "S-Part 20") offered in-depth insights into their lived experiences with online learning at SMC. These interviews unveiled the nuanced aspects of their engagement, technology access, program-specific challenges, attitudes, and practical recommendations.

Student Engagement: The interviews revealed various factors influencing student engagement in online learning. Participants liked the flexibility of online classes, but felt isolated without face-to-face interactions. These findings agree with previous research on online learning's trade-offs (OECD 2021).

Technology Access: The interviews revealed how online learning experiences varied depending on the availability and quality of personal laptops and Internet connections. Some participants enjoyed the convenience, while others faced difficulties. These experiences reflected the digital divide in online education (Lim et al. 2022).

Program-specific Challenges: The interviews revealed how online learning affected students differently depending on their programs. Psychology students faced difficulties in conducting experiments online and lacked hands-on practice. BAEL students adapted better to the online environment. This finding suggests the need for customized online education for different programs (Dos Santos 2022).

Attitudes and Perceptions: The interviews showed how online learning was perceived differently by the participants. Some liked the autonomy and flexibility, while others missed the social and engaging aspects of face-to-face learning. These attitudes underscore the importance of individual perceptions in online learning experiences (Rapanta et al., 2020).

Recommendations for Improvement: The participants suggested improving technical support, interactivity, and guidance for online learning at SMC. These suggestions matched the wider discussion on enhancing online education quality and addressing the participants' needs and challenges (Lee et al., 2022).

The interviews revealed the complex factors affecting student engagement, technology access, and program-specific challenges in online learning at SMC. These factors should guide the improvement of online education quality.

C. Results of Observations

The observations offered a distinctive perspective on the experiences of the twenty participants ("S-Part 1" to "S-Part 20") within the online learning environment at SMC. These observations, combined with insights from participants and relevant literature, illuminated various aspects of student engagement, technology access, program-specific challenges, attitudes, and recommendations.

Student Engagement: The observations showed how students used different strategies to engage in online learning. Some showed self-discipline and participation, while others struggled with focus, multitasking, or online platform. These reflected different levels of engagement (Smit & Onwuegbuzie, 2018).

Technology Access: The observations showed how technology access and study space influenced students' engagement in online classes. Some had reliable access and space, while others faced disruptions. These findings highlighted the digital divide and its effects on online learning (Blaikie, 2018).

Program-Specific Challenges: The observations showed how online learning affected students differently depending on their programs. Psychology students faced difficulties in conducting experiments online and lacked hands-on practice. BAEL students adapted better to the online environment. This finding suggests the need for customized online education for different programs (Ciesielska et al., 2018).

Attitudes and Perceptions: The observations showed how online learning was perceived differently by the participants. Some were engaged and enthusiastic, especially BA and philosophy students. Others were disengaged and disinterested, showing more difficulties. These attitudes affected online learning experiences (Farid, 2022).

Recommendations for Improvement: The observations showed the need for better technical support and more interactive and engaging online courses, as suggested by participants. These findings matched the wider discussions on improving online education quality (Mohajan & Mohajan, 2022).

Incorporating observations into this research enriched the understanding of students' experiences in online learning, providing real-time insights into the challenges and strengths of online education at SMC. This underscores the multifaceted nature of student engagement, technology access, program-specific needs, attitudes, and the importance of implementing practical recommendations to enhance the online learning experience.

D. Thematic Analysis

In this section, the collected data undergo analysis to identify key themes derived from the in-depth literature reviews, informal interviews, and observations. These themes offer valuable insights into the aspects of student engagement, technology access, and the overall online learning experience in the college setting during the post-pandemic period.

1) Student Engagement and Motivation Insights: The literature (Namboodiri, 2022) shows the importance of student motivation and engagement for online learning. Interviews and observations revealed different views from active online students. One student said, "*A supportive online learning community has been a game-changer for me. It's what keeps me looking forward to every class*." Another said, "*I've found that having a clear sense of purpose in online classes greatly boosts my motivation. It keeps me engaged throughout the course*." A third student said, "*While online learning offers flexibility, it's up to the student to stay motivated. Personally, I set a schedule, and that really helps me remain engaged*." These quotes show the complexity of student engagement and motivation online, highlighting the role of a supportive community, clear goals, and personal strategies.

2) Technology Access and Digital Divide: Technology access affects online learning (Bork-Hüffer et al., 2021). Interviews and observations showed the consequences of the digital divide and the need to address it. One interviewee (S-Part 9) said, "*I struggled to keep up with online classes because of my bad internet connection.*" This shows the challenges of limited technology access. Another interviewee (S-Part 4) said, "*Access to digital resources transformed my learning experience. It opened up a world of knowledge and opportunities*." This shows the benefits of technology access. S-Part 12 said, "*The disparities in technology access are real and affect people's education and opportunities. We need policies and initiatives to bridge this gap.*" These quotes show the impact of technology disparities and the need to reduce the digital divide in online education.

3) Program-Specific Challenges: Online learning varies across academic programs (Zizka & Probst, 2022). Interviews revealed the distinct needs and difficulties of different disciplines. S-Part 6 said, "*In BS-Psych course, the lack of hands-on labs is a significant hurdle. We miss out on crucial practical experience*." S-Part 11 noted, "*For BAEL subjects, the transition to online learning has been smoother*. We adapt easily to discussions and reading assignments." S-Part 2 emphasized, "*Recognizing the unique needs of each program is essential. We should tailor online courses to accommodate diverse academic requirements effectively*." These quotes highlight the program-specific challenges and the need for customized online courses.

4) Diverse Attitudes and Perceptions: Diverse student attitudes and perceptions influence their online learning experiences (Li & Yu, 2022). Informal interviews and observations have highlighted the importance of acknowledging and addressing these varied attitudes and perceptions. One interviewee (S-Part 8) emphasized the significance of diverse perspectives, stating, "*Students come from various backgrounds and have different expectations. Recognizing this diversity is crucial for effective online education.*" Conversely, another participant (S-Part 14) offered a different viewpoint, noting, "*While some students thrive in online learning, others struggle to stay motivated. It's essential to provide support tailored to individual needs*." A broader perspective emerged through these interviews, with S-Part 5 emphasizing, "*Understanding the spectrum of attitudes and perceptions can lead to more inclusive online learning experiences. We should create flexible, adaptable learning environments*." These quotes collectively underscore the impact of diverse attitudes and perceptions on online learning and the importance of accommodating these differences to enhance the overall educational experience.

5) Technical Issues and Support Needs: Students often encounter technical issues and require comprehensive technical support (Eslit, 2023). Informal interviews and observations have emphasized the crucial role of robust technical support in ensuring smooth online learning experiences. One interviewee (T-Part 17) described the challenges, stating, "*I've faced numerous technical glitches during online classes, from connectivity issues to software problems. It's frustrating when you're trying to learn*." Conversely, another participant (S-Part 3) shed light on the importance of support, noting, "*Having responsive technical support is a game-changer. When issues arise, it's reassuring to know there's help available*." A broader perspective emerged through these interviews, with S-Part 8 emphasizing, "*Technical support can make or break the online learning experience. It's not just about addressing issues but providing guidance and resources for students to navigate the digital environment effectively*." These quotes collectively underscore the significance of addressing technical issues and providing comprehensive support to enhance the quality of online education.

6) Strategies for Interaction and Engagement: Promoting interaction and engagement is crucial for effective online learning (Ensmann et al., 2021). Informal interviews and observations revealed that active engagement and the use of interactive features improved the quality of learning. One interviewee (S-Part 10) emphasized the importance of interaction, stating, "*Participating in discussions and collaborative activities with fellow students is like bringing the classroom to your screen. It keeps you engaged*." In contrast, another participant (S-Part 17) highlighted the value of interactive features, noting, "*Interactive quizzes, simulations, and multimedia content made learning more enjoyable and effective. It's not just reading; it's hands-on learning*." A broader perspective emerged through these interviews, with S-Part 5 emphasizing, "*A combination of interaction and interactive elements creates a dynamic online learning environment. It caters to different learning styles and keeps us motivated*." These quotes collectively underscore the significance of strategies for interaction and engagement in online learning, emphasizing the value of peer interactions and interactive content to improve the overall quality of the learning experience.

7) Adaptability and Resilience: Students demonstrate adaptability and resilience during the transition to online learning (Shin & Hickey, 2021). Informal interviews and observations aligned with the broader discourse on students' resilience and adaptability, particularly during the pandemic. One interviewee (A-Part 9) highlighted their adaptability, stating, "*The abrupt shift to online learning was challenging, but it taught me to adapt quickly and find new ways to study effectively*." Conversely, another participant (A-Part 4) emphasized the importance of resilience, noting, "*The uncertainties of the pandemic were emotionally taxing, but I learned to persevere and stay motivated to complete my coursework*." These quotes collectively underscore the adaptability and resilience that students have shown during the transition to online learning, reflecting their ability to adjust to new circumstances and overcome challenges.

8) Educational Equity and Inclusivity: Addressing disparities in online learning, especially in terms of access and support, is vital (Parida et al., 2023). Informal interviews and observations emphasized the significance of promoting educational equity in online education. One interviewee (E-Part 11) stressed the importance of addressing access disparities, stating, "*Not everyone has the same technology or internet access. It's crucial to ensure that all students can participate equally*." In contrast, another participant (E-Part 3) highlighted the need for inclusive support, noting, "*Online learning should be accessible to individuals with diverse needs. Providing tailored support and accommodations is essential*." These quotes collectively underscore the importance of addressing educational equity and inclusivity in online learning, emphasizing the need for equitable access and support to create an inclusive educational environment.

9) Inclusive Curriculum and Diverse Perspectives: A diverse and inclusive curriculum plays a significant role in promoting equity in online education (Rapanta et al., 2021). Informal interviews and observations revealed the impact of incorporating diverse perspectives and materials in the curriculum to foster inclusivity. One interviewee (S-Part 7) highlighted the value of diverse readings, stating, "*Reading materials from different backgrounds and cultures broadened my horizons and made me feel more included in the learning process*." Another participant (S-Part 12) emphasized the importance of inclusive content, noting, "*Incorporating content that represents various voices and experiences is essential. It helps all students feel seen and heard*." In a broader context, S-Part 4 underscored, "*A curriculum that celebrates diversity benefits everyone. It's not just about representation but also enriching the learning experience with multiple perspectives*." These quotes collectively underline the importance of

an inclusive curriculum and diverse perspectives to promote equity and inclusivity in online education, recognizing the value of representing a variety of voices and experiences in the educational content.

10) Future of Higher Education in the Digital Age: The research aimed to contribute to the broader discourse on the future of higher education in the digital age (Fran, 2022). Informal interviews and observations, as reflected by S-Part 14, highlight the rapid transformation of higher education, with the participant stating, "*Online platforms have reshaped the educational landscape. Traditional boundaries are fading*." However, in contrast, S-Part 5 provided a different perspective, emphasizing the need to balance digital innovation with educational values: "*While digital tools offer great potential, we should ensure that they align with the core principles of education.*" These opposing views are aligned with the evolving landscape of higher education in the digital era. As observed in the research and echoed by S-Part 9, a BS-Psychology student, "*The digital age demands adaptability, but it's vital to preserve the quality of education. We need to find a harmonious blend of tradition and innovation*."

Discussion

The findings offer valuable insights into the challenges and opportunities arising from the transition to online learning in post-pandemic college education at CAS, St. Michael's College, AY 2022-2023. The theoretical framework, grounded in the works of Alexander (2020), Dede and Richards (2020), and Nichols (2020), guided the exploration of the "new normal" in higher education and its impact on student engagement, technology access, and the overall online learning experience.

The findings show the importance of online learning for student engagement. The literature review (Bashir et al., 2021; Lim et al., 2022) supports the need for flexible and engaging online teaching. Students were more engaged when instructors used interactive, real-world, and collaborative online activities.

The findings support the theoretical framework (OECD 2021) that digital resources are crucial for online learning. Students with better technology access had more positive experiences. This matches the recommendations to improve digital infrastructure and access (Siddiqua & Batool, 2022).

The interviews and observations showed how students faced different challenges in their programs. The literature review (Fran, 2022; Cahapin et al., 2023) supported the need for program-specific support. Students had unique challenges in their coursework. The researcher suggested teachers customize online content and support for diverse students (Tsiligkiris and Ilieva 2022).

The findings show the importance of student perceptions for online learning. The literature (Zizka & Probst, 2022; Yan et al., 2022) supports addressing student concerns and support. A positive attitude leads to a better experience. Institutions should offer support and feedback to students (Ensmann et al., 2021).

Implications in Terms of Theory, Practice, and Future Research

This section evaluates the findings in light of the thesis and framework, showing how the "new normal" in higher education requires digital resources, inclusive design, and tailored support for diverse students.

Theory: The study contributes to the understanding of the “new normal” in higher education, highlighting the importance of digital resources, inclusive design, and tailored support for diverse students. It also shows how student attitudes and perceptions affect online learning, suggesting more research on online education psychology.

Practice: The study recommends that school administrators, teachers, and students adopt various strategies to improve online education quality, such as enhancing digital infrastructure and access, customizing online content and methods, fostering a supportive online environment, and providing feedback and support.

Future Research: The study calls for future research on the long-term impact of the “new normal” on student outcomes, the psychological factors of online learning, and the comparative studies of different online education strategies and best practices.

Conclusion

Overall, this qualitative study explored the impact of the transition to online learning on student engagement, technology access, and experiences of CAS students at St. Michael's College, Iligan City, Philippines during the 2nd semester of AY 2022-2023. The research method, which included an in-depth literature review, informal interviews, observations, and thematic analysis, was instrumental in revealing critical insights into the challenges and coping mechanisms of students as they adapted to the new normal in higher education. The theoretical framework provides a solid foundation for understanding the dynamics of online learning and the post-pandemic college education setting. The findings underscore the need for continuous adaptation and improvement in online education to enhance student engagement and learning experiences. The implications of this research are significant for school administrators, teachers, students, and future researchers, calling for the development of innovative strategies that prioritize student well-being, accessibility, and learning quality. Future researchers should delve deeper into the evolving landscape of online education, further enriching the literature on the future of higher education in the digital landscape.

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Teaching Mathematics Meaningfully With Technology: A Tentative Professional Development Framework

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Abstract
Professional development initiatives for teachers regarding technology use are often based on frameworks that lack cultural responsiveness. This is a common practice in many developing countries. Consequently, teachers use technological knowledge for personal genesis. This paper introduces a tentative culturally responsive professional development framework with holistic goals for progression, interpreted from the Vygotskian perspective of knowledge progression to scientific knowledge. The tentative framework was designed through (a) a critical analysis of existing technological integration frameworks for integrating technology and (b) collaboration with secondary school mathematics teachers on the idea of meaningful technological mathematics teaching. The analysis yielded a tentative progression tetrahedron professional development framework for teaching Mathematics meaningfully in secondary schools. The study also concludes that knowledge developed through learning progresses from a person's spontaneous knowledge base to scientific knowledge. The framework aims to influence the perspectives of professional developers and mathematics educators concerning knowledge development, from the spontaneous knowledge level to the scientific knowledge level to facilitate the meaningful teaching of mathematics with technology.

Keywords: Professional Development, TPACK, Meaningful Teaching

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Introduction

With the advent of technological advancement teaching and learning methods have evolved "dramatically" (Alam, 2022, p. 1). The modern learning environment demands that teachers prioritize the development of students' critical thinking, problem-solving, and analytical skills (Hıdıroğlu et al., 2021). The rise of new technologies has also led to a paradigm shift and transformation in teacher development, as teachers' competencies impact their teaching and learning processes and success (Commonwealth Business Communications Limited, 2022; Das, 2019). Scholars (e.g. Dike, 2015; Young, et al., 2020) encouraged education systems to continuously adopt innovative and imaginative ways to train and support teachers to able to deliver quality teaching in an era dominated by technologies of different kinds.

Many countries have embraced professional development goals and introduced initiatives for mathematics teachers to enhance their knowledge and awareness (Drijvers, et al. 2014; Sullivan 2012; Tabach & Trgalová 2020). Such professional development initiatives also aim to enhance teachers' capability and proficiency in using technological tools in the teaching processes. For example, in developing countries, these initiatives are pathways to improve the quality of life of people to the level of their counterparts in the developed world (Government of the Republic of Namibia, 2004). However, Tabach and Trgalová (2020) argued that there is a discrepancy between teachers' expectations and the content of these initiatives, thus calling for the development of standards and competency frameworks geared toward Mathematics. Similarly, professional development policies are too general and insufficient for mathematics teachers to teach using technology (Drijvers et al., 2014).

Notably, approximately 45% of the world's population has access to mobile technologies (Groupe Speciale Mobile Association (GSMA), 2022). However, the percentage of Africans with access to technological tools in teaching is relatively low compared to other parts of the world (Mohammed & Jamie, 2019). The implication is that any educational activities, including teachers' professional development involving the use of technologies in education, in countries such as Africa, should be responsive and ethically considerate. Learning is "context sensitive" and should be responsive to the intricacies of its context Bruner (1985, p.6). Asino (2023) concurs and argues that context matters since ignoring context "introduces cognitive noise" and "promotes the idea of not belonging". Professional development occurs in the community of practice. In addition, cultural differences affect the demands and types of professional development.

Professional development can be understood as a work activity that involves historical transformation and reorganization of the teaching process. Therefore, the objective of this paper is to

- Design a professional development framework for teaching secondary school mathematics meaningfully with technology.

Notably, this paper reports findings on the critical analysis of existing technological frameworks for integrating technology culminating into a professional development framework for teaching mathematics meaningfully.

Literature Review

Technological Pedagogical and Content Knowledge (TPACK)

Technological Pedagogical Content Knowledge (TPCK) (Figure 1) changed to the Technological Pedagogical and Content Knowledge (TPACK) framework, which builds on the Shulman theory to integrate the knowledge of technology into pedagogical practices (Garba, 2018; Thompson & Mishra, 2007). The TPACK framework connects technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) to represent knowledge of teaching content using appropriate pedagogical approaches and technologies.

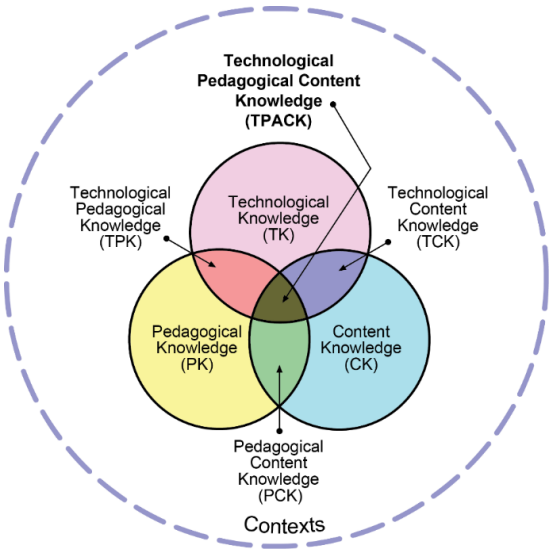


Figure 1: Components of the TPACK framework (http://tpack.org)

TPACK encompasses,

> Knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as a result of using particular technologies. (Mishra & Koehler, 2006, p. 1028)

The TPACK framework is useful for thinking about how teachers might develop knowledge for integrating technology into teaching (Schmidt, et al., 2009) and designing professional development (Kadijevich, 2012). It is also believed to be a yardstick for 21st century teachers to integrate technological knowledge into pedagogical practices (Garba, 2018; Gur & Karamete, 2015; Mishra & Koehler, 2006). As a result, various studies have used it to describe and capture the essential qualities of knowledge, that Mathematics teachers need to possess to effectively integrate technology into their teaching (Çam & Erdamar Koç, 2021; Garba, 2018; Getenet, 2017; Mishra & Koehler, 2006; Niess, et al., 2009). However, Koehler and Mishra (2009) as well as Mishra and Koehler (2006) argued that since technology is rapidly changing provisions need to be made to instil pedagogical practices to help teachers cope with rapid changes. Notably, the TPACK framework is not subject-specific, even though proponents have noted that the advent of digital computers has changed the nature of Mathematics (Koehler & Mishra, 2009). Correspondingly, TPACK cannot be used as it is for professional development in relation to Mathematics education pedagogy, for technology-skilled teachers (Benson & Ward, 2013; Garba, 2018; Gur & Karamete, 2015; Harris & Hofer, 2011). However, subject teachers, such as those for Mathematics, need the skills and knowledge to select appropriate

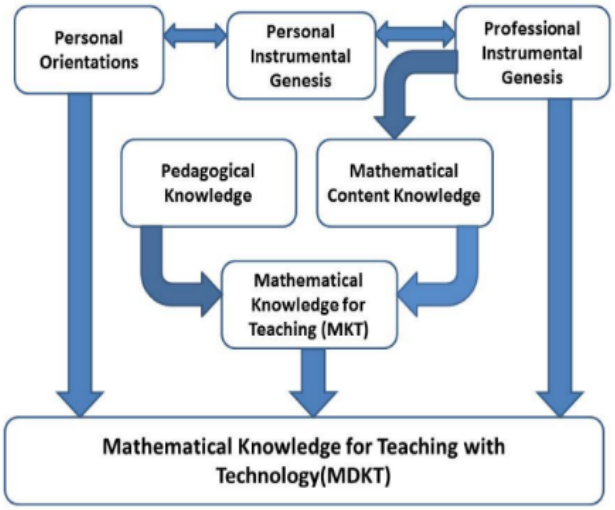
technological tools that can fit into pedagogical designs to facilitate the attainment of teaching goals.

Various studies have adapted TPACK to enhance its effectiveness in the professional development of mathematics teachers, as discussed as follows.

TPACK-Based Frameworks

The Pedagogical Technology Knowledge (PTK), an extension of TPACK by Thomas and Hong (2005) accommodates the Mathematical Content Knowledge (MCK), Mathematical Knowledge for Teaching (MKT), teachers' personal orientations, and their role in influencing goal setting and decision making. In PTK, Thomas and Hong (2005) argued that teachers advance through the phases of instrumentation and instrumentalization of resources and gain a personal understanding of the role of resources in the teaching and learning of Mathematics. In these phases, teachers' beliefs and goals regarding the significance of technology should be influenced, while developing an understanding of the essence of learning mathematical knowledge, affordances, and constraints involved, as well as the affective aspect (Jafri, 2020; Tabach & Trgalová, 2019; Thomas & Palmer, 2014).

In addition, the Mathematics Digital Knowledge for Teaching (MDKT) developed by Tabach and Trgalová (2019) expanded the TPACK and PTK frameworks. The MDKT framework was necessary, as teachers' personal orientations and personal instrumental genesis are not acknowledged as spontaneous sources of knowledge for teaching in existing models (Tabach & Trgalová, 2019). It therefore, "emphasises the decisive role played by the components of mathematical knowledge for teaching with technology that is related to teacher orientations, personal, and professional instrumental genesis" (Tabach & Trgalová, 2020, p. 201) (Figure 2).



**Tabach and Trgalová (2019) rephrased MDKT as Mathematical Knowledge for Teaching with Technology, as shown in Figure 2.*

Figure 2: Mathematical Knowledge for Teaching with Technology (MDKT) framework (Tabach & Trgalová, 2019, p.219)

Moreover, in the context of the standards-based curriculum for Mathematics, widely adopted in the USA, Niess et al. (2009) developed the five-stage Mathematics teacher TPACK

standards and a development model. The model bridges mathematics-content-specific professional development and teaching and learning of Mathematics with technology (Niess et al., 2009). The authors argue that the absence of professional development in teaching technology and curriculum materials for technology integration poses the risk of not using technology-rich tasks in teaching subjects. However, the challenge with the stage levels (Niess et al., 2009) is that technology is advancing at a rapid pace. Thus, moving through the stages might not be sustainable and may delay the full implementation of technology integration in Mathematics teaching and learning as COVID-19 proved. As a result, teachers need holistic professional development. Moreover, Niess et al. (2009, p. 13) remarked on the Mathematics teacher TPACK standards and development model that "moving from one level to another may require different sets of experiences for different levels and for different teachers. What are these sets of experiences? Do experiences exist that cause teachers to regress from one level to a previous one? Do teachers skip out levels?"

Niess et al. (2009) stop short of suggesting kinds of experiences that can serve as actionable guidelines for professional development. Similarly, the digital competency of teachers' frameworks, such as the Digital Competence Framework for Austria, Digital Competency Framework for Teachers, and UNESCO's 2011 ICT Competency Framework for Teachers, omitted ethics concerning limited access to technological resources (Joshi et al., 2021). The frameworks on professional development for teaching with technology relate to each other, as depicted in Figure 3.

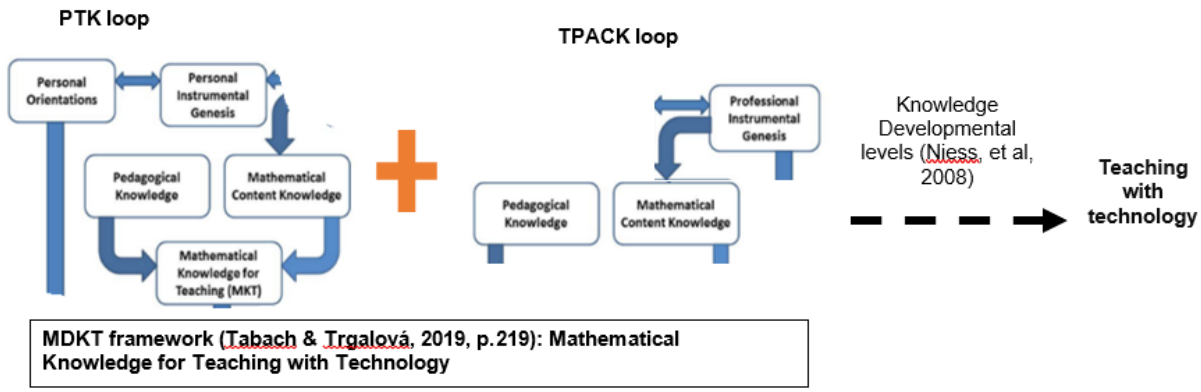


Figure 3: Relationship between TPACK and TPACK-based frameworks

Theoretical Framework: Vygotsky's Sociocultural Learning Theory

Vygotsky's sociocultural learning theory on adult learning argued that knowledge is socially constructed, and knowledge originates from culture. Learning occurs through experiential learning within the zone of proximal development (Chaiklin, 2003; Vygotsky, 1986). Moreover, Vygotsky (1986) argued that knowledge progresses from the spontaneous knowledge level to the scientific level. The composition of scientific knowledge are the answers to the question "What knowledge do we want the students to acquire?". Vygotsky's sociocultural learning theory explains that knowledge progresses from a spontaneous to a scientific knowledge level (Vygotsky, 1986). Progression refers to relating personal instrumental genesis to spontaneous knowledge and professional instrumental genesis to link scientific knowledge that professional development should aim to bridge. Spontaneous knowledge is grounded in everyday personal experiences without guidance. Scientific knowledge, however, emerges by strengthening an individual's spontaneous knowledge and it expands through spontaneous knowledge, Vygotsky argues (Alves, 2014, p. 25):

> By forcing its slow upward trajectory, an everyday concept paves the way for scientific concepts and their descendant development. It creates a series of structures necessary for the evolution of the most primitive and elementary aspects of a concept, giving it a body and vitality. Scientific concepts, in turn, provide structures for the upward development of spontaneous concepts in relation to consciousness and deliberate use by the child [adults].

Vygotsky's description of learning regarding a child is similarly interpreted as an adult learning process in terms of professional development. This is because adult learners' learning is similarly characterised by structures and purpose which consider their preferred ways of engaging and social dimensions (Blair, 2016). The implication of Vygotsky's views as quoted by Alves (2014), may mean that scientific knowledge requires other knowledge to expand. It might also imply that development from the spontaneous knowledge level to the scientific knowledge level proceeds through progression levels. Notably, scientific knowledge can also emerge from the context of related theories and frameworks (Alves, 2014). Scientific knowledge is structured, formally organised, and defined in this paper in terms of Kilpatrick et al. (2001) and technology frameworks. Vygotsky holds that cognitive development happens through learning, and there should be development after learning, thus learning is development.

Implications for Designing a Professional Development Framework

Professional development designs seem under researched; researchers define professional development according to TPACK. The reviewed frameworks for professional development on teaching with technology uniquely offer an opportunity to interpret and understand the knowledge teachers need to be able to integrate technology into teaching. The generic TPACK (Mishra & Koehler, 2006) without linking to subject pedagogy runs the risk of knowledge being used for personal genesis instead of professional genesis in the classroom. This knowledge may also take time to develop into professional instrumental genesis. As a result, technology would be substituted (Puentedura, 2010) as an efficiency tool. Moreover, all existing frameworks reviewed have no explicit guidelines for professional development focusing on teachers' use of technology to promote integrated and relational understanding of Mathematics, as well as reasoning and problem-solving. Further, teachers' personal instrumental genesis and professional instrumental genesis are more about teachers' decisions on using technology tools. These decisions are mainly left to the teachers' initiatives without guidelines. This resonates with Neubrand (2018) who argued that knowledge-driven frameworks are limited as there is a ''gap between knowing and acting''(p. 609). Likewise, Tabach (2021) argues that,

> One can know a subject but may not have the skills required to apply that knowledge to specific tasks since knowledge does not provide skills. A teacher may know Mathematics and pedagogy, but this only makes her knowledgeable about teaching. However, knowledge [alone] does not make one a good practitioner. To become a good teacher one must teach, practice one's techniques, and improve one's skills… (p. 100)

The implication is that professional development should have actionable guidelines, be sustainable, consider ethics in terms of access to technological resources, and Mathematics teaching goals should be explicitly stated. Further, professional development should be holistic and progressive from teachers' spontaneous knowledge to scientific knowledge level.
Moreover, Vygotsky (1978) argued that all knowledge develops from a person's spontaneous knowledge base and scientific knowledge is developed through learning. However, most

TPACK-based frameworks (Mishra & Koehler, 2006; Tabach & Trgalová, 2019; Thomas & Palmer, 2014) seem to suggest that spontaneous knowledge is already scientific knowledge, even though some acknowledged that Mathematics teachers' TPACK progresses through developmental levels (Niess et al., 2009).

Methodology

The tentative framework was developed in a doctoral design-based study, from which this paper is extracted. This was done through (a) a critical analysis of existing technological integration frameworks for integrating technology, and (b) collaboration with secondary school mathematics teachers on the idea of meaningful technological mathematics teaching. Mathematics teacher participants of interest were identified through the snowball sampling method (Cohen et al., 2007; McKenney, 1987). Senior education officers for Mathematics at regional professional development sub-divisions helped to locate teachers who took the initiative and responded to the ministerial call to use technology platforms such as YouTube channels, WhatsApp, and Google classrooms to teach mathematics during the pandemic lockdown. Nine participants participated in this study. The data were triangulated through two phases of a design-based research study, using two online questionnaires and two focus group interviews to enhance the trustworthiness of the data. This paper reports on the critical analysis of existing technological frameworks for integrating technology. Ethical clearance to conduct the study was given by the Stellenbosch University research ethics committee.

Conclusions

Findings and Discussions

The reviewed frameworks for professional development on teaching with technology uniquely offer an opportunity to interpret and understand the knowledge teachers need to integrate technology into teaching. The generic TPACK (Mishra & Koehler, 2006) is viewed as formed by four flat-interconnected permeable triangles (Figure 4). The triangles represent content knowledge, pedagogy knowledge, and technology knowledge. The infusion of technology, pedagogy, and content knowledge (TPACK) is represented by the triangle at the centre. The positions of technology, pedagogy, and content knowledge in figure 4 are of no importance, however, the triangle at the centre will always represent the infusion of content knowledge, pedagogy knowledge, and technology knowledge to form TPACK. The triangles are permeable (shown with dotted lines) to imply that knowledge infuses within knowledge triangles and influences an individual's ability.



Figure 4: TPACK conceptualisation

The generic TPACK (Mishra & Koehler, 2006) without linking to subject pedagogy runs the risk of knowledge being used for personal genesis in the classroom which may take time to develop into professional genesis. The role of curriculum, teachers' views and beliefs, ethics, and professional development play a greater role in the design of professional development. The teachers' personal orientations towards technology (the affective domain) as well as teachers' personal instrumental genesis are spontaneous sources of knowledge for professional development. This creates space to propose that teachers' TPACK is situated within ethics, personal orientations, and the Mathematics curriculum (context) (Figure 5).

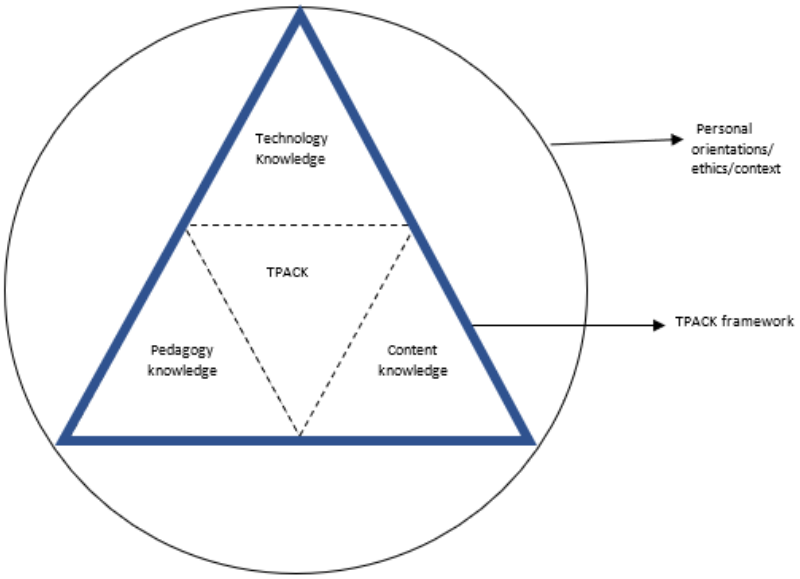


Figure 5: Infusion of TPACK within an individual personal orientation

A professional development session on any of the knowledge areas of the triangle will certainly lift it and influence the knowledge set of an individual. An individual's knowledge triangles also expanded from university training, the workshops, and any professional development the teacher received as per the study findings. When an individual grows in all knowledge areas through professional development in teaching Mathematics meaningfully, the triangles "wing up" and form a tetrahedron (Figure 6).

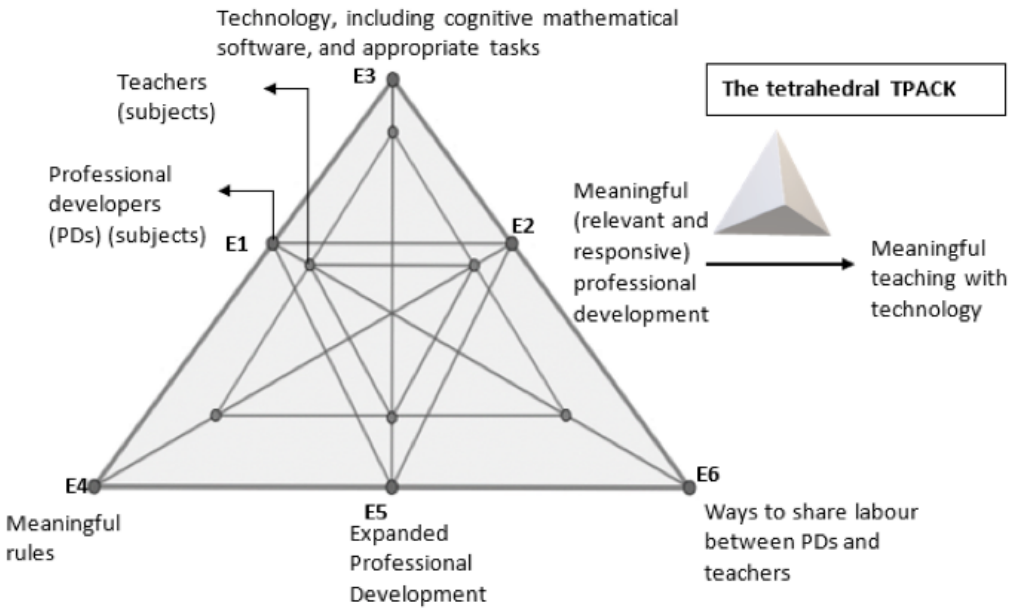


Figure 6: A combination of an expanded relationship between professional developers' and Teachers' activity systems, and tetrahedral TPACK

Taking cognisance of teachers' views and beliefs, their professional development needs, and the role of curriculum in the design of professional development, the researcher needed to know how knowledge develops in such a situation. Vygotsky (1978) argued that all knowledge progresses and develops from a person's spontaneous knowledge base and scientific knowledge is developed through learning. However, most TPACK-based frameworks (Koehler & Mishra, 2009; Tabach & Trgalová, 2019; Thomas & Palmer, 2014) seem to suggest that spontaneous knowledge is already scientific knowledge. Furthermore, the findings showed that teachers have some sort of spontaneous knowledge. The CHAT states that knowledge develops from the bottom up so that expansive learning can occur (Engeström, 2001).

Consequently, a holistic and sustainable professional development for developing Mathematics teachers' knowledge to teach Mathematics meaningfully with technology in Namibian schools, progresses through three levels (Figure 7). At each level, professional development should holistically influence Mathematics teachers' personal orientations and personal instrumental genesis for professional instrumental genesis. The knowledge is also not static but keeps changing according to the changes in technology and in the answer to "What knowledge do we want the students to acquire?". The levels are presented bottom-up with expansive learning and idealised design notions in mind. The ideal Mathematics teacher to teach Mathematics meaningfully with technology is one at the scientific knowledge level (level 3). The findings of the study allowed us to describe spontaneous knowledge level (level 1). The strategic knowledge level (level 2) and scientific knowledge level (level 3) were described theoretically (Figure 7).

Level 3: Scientific Knowledge Level – This is idealised knowledge of teaching Mathematics meaningfully with technology. Through structured professional development, professional developers should develop teachers to teach Mathematics meaningfully with technology to be able to:

- Influence, participate, expand, or adapt Mathematics curriculum and pedagogy when cognitive technologies become available;

- Expand or adapt applications of technology that make Mathematics meaningful for pedagogies for changes in the Mathematics curriculum;
- Carry out research as new problems and demands arise in Mathematics and technology education;
- Develop professional development interventions on different scales in different communities, e.g., develop ways to improvise where access to technologies is problematic;
- Imagine and enact ways to overcome problems of access to technology for Mathematics; and
- Reflect critically on new information about how people with technologies think and reason.

Level 2: Strategic Knowledge Level – At this level, a community of Mathematics teachers may emerge whose spontaneous knowledge has expanded. These Mathematics teachers can be co-demonstrators applying skills and knowledge and amending existing knowledge. These Mathematics teachers should have fully implemented learned skills and knowledge and have extracted the maximum benefits of knowledge learnt. Through structured professional development, professional developers should develop teachers to teach Mathematics meaningfully with technology to be able to:

- Apply mathematical pedagogies with an understanding of what technology is suitable for;
- Co-demonstrate and lead mathematical pedagogical processes with technologies to a larger extent; and
- professionally guide meaningful exploration with and without technology.

Level 1: Spontaneous Engagement and Knowledge Level – Professional development at this level was imagined and developed based on the teachers' views. Through structured professional development, professional developers create a zone of proximal development of mathematical opportunities (e.g., mathematical tasks) and various technological pedagogical environments. The opportunities should afford Mathematics teachers knowledge for teaching Mathematics meaningfully with technology to:

- Reflect on and imagine the implications of the Mathematics curriculum and teaching with technology;
- Yearn to know how technology works, by allowing their desire and their professional development needs to teach Mathematics meaningfully with technology to drive their quest;
- Develop Mathematics teachers' ability to "marry" technology to mathematical concepts;
- Engage in critical review and analysis of both representational and cognitive technologies;
- Engage in mathematical tasks that will result in expanded demand to reason, justify with technologies to others through social or sharing; and
- Experience expanded conceptual knowledge, and improved attitudes, interest, and enthusiasm.

Hence, professional development developers should carefully facilitate the development of knowledge for teaching Mathematics meaningfully with technology by flexible demonstration. The professional development developer hugely stimulates meaningful teaching with

technology conversations. The professional development developer also plays both roles to solidify teaching conceptions and strengthen them.

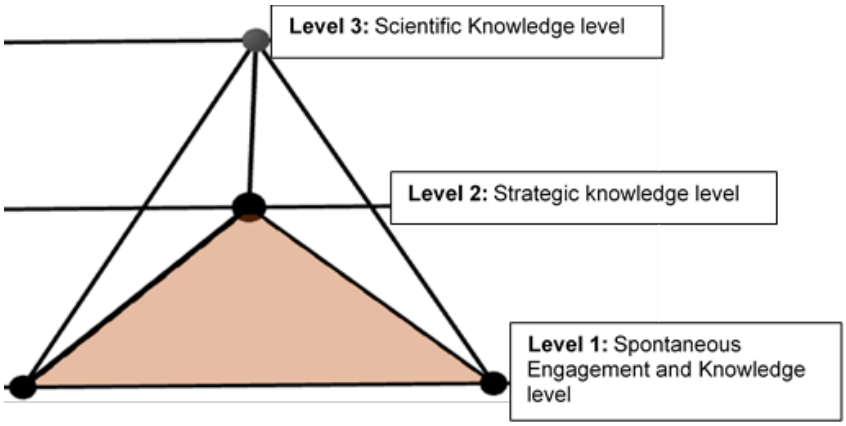


Figure 7: The progression tetrahedron for a professional development framework for teaching Mathematics meaningfully in Namibian secondary schools

The progression tetrahedral of a professional development framework for teaching Mathematics meaningfully holds teachers' practices and beliefs for teaching which have levels. Professional development engagement throughout the levels is structured. Consequently, a professional development framework for teaching Mathematics meaningfully with technology in Namibian secondary schools (Figure 8) is a culmination of (a) design principles, (b) an expanded relationship between professional developers' and Teachers' activity systems, and (c) the knowledge progression tetrahedron. The culmination ends with a framework (Figure 8) with the desired outcome of teaching Mathematics meaningfully with technology.

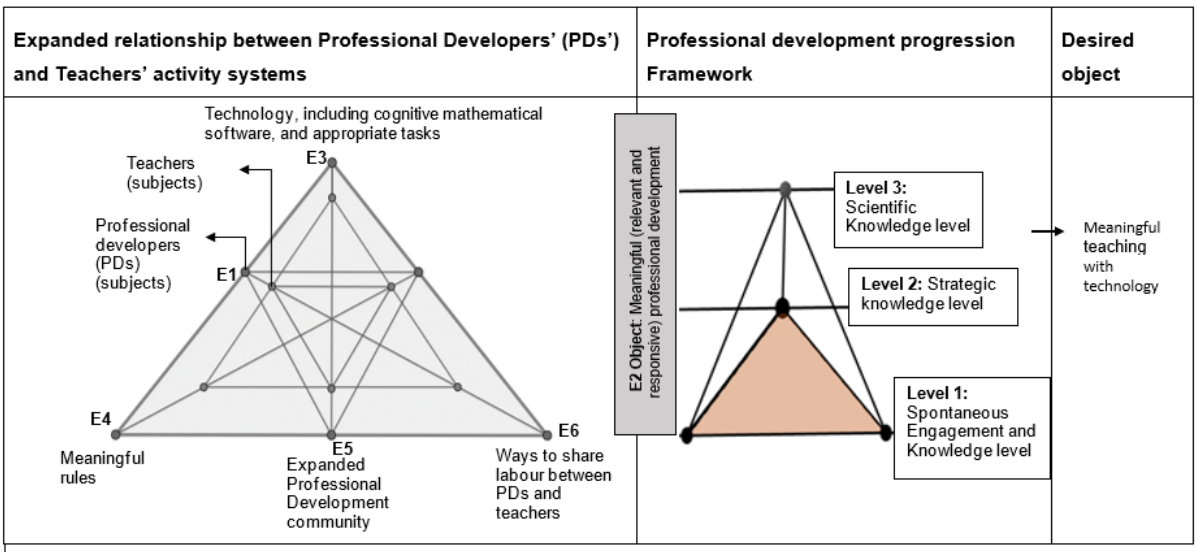


Figure 8: The professional development framework for teaching Mathematics meaningfully with technology

Implications and Limitations

In conclusion, knowledge develops from a person's spontaneous knowledge base and scientific knowledge is developed through learning for expansive learning to occur. The holistic and sustainable professional development for developing Mathematics teachers' knowledge to

teach Mathematics meaningfully with technology in Namibian schools should progress through three levels. The knowledge progression tetrahedron is not fixed nor static but keeps changing with the changes in technology and in answer to *"What knowledge do we want the students to acquire?"* The levels are presented from the bottom up with expansive learning and idealised design notions in mind but acknowledge and develop from the spontaneous knowledge level. We suggest that any professional development framework for meaningful teaching with technology should engage with curriculum rules and be structured. The study cannot make fully conclusive and empirical statements due to pandemic restrictions. Thus, ending with a framework with tentative status. In future research, the framework must be implemented in professional development where it can be evaluated.

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An Education as a Rehabilitation Tool for Incarcerated People

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Abstract
Following the new paradigm of working with people during incarceration, rehabilitation programs have replaced the retributive or deterrence perspective, which is the old way to punish criminals. The method of punishment in the form of rehabilitation focuses on changing the offender's behavior to become a good person and the conscience not to repeat the same offense and be able to return to society and live according to social norms. In addition to restricting certain rights and freedoms (such as being detained in prison), this is an essential punishment for criminal acts. Those entering the punishment and rehabilitation process must have adequate training to return to their everyday lives, such as education, vocational training, and psychological treatment, to avoid feeling low self-worth from being judged and punished. The correctional system in Thailand not only uses education programs to improve inmates' literacy but also provides programs to support the idea of rehabilitation punishment. The research presented that prisoners who attended the educational programs (formal education, non-formal education, and informal education) and vocational education will improve their life skills and self-esteem and be ready for release without turning back to criminal pathways. However, the responses of prisoners about the educational programs in prisons in Thailand are limited to programs and teachers, including the differences in gender characteristics, which the Thai correctional systems and related government sectors should be concerned about in the future.

Keywords: Rehabilitation, In-Prison Education, Prisoner

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Introduction

According to the United Nations Standard Minimum Rules for the Treatment of Prisoners (the Nelson Mandela Rules) Rule 4, a sentence of imprisonment or similar measures derivative of a person's liberty primarily protects society against crime and reduces recidivism. Those purposes can be achieved only if the period of imprisonment is used to ensure, so far as possible, the reintegration of such persons into society upon release so that they can lead a law-abiding and self-supporting life.

The Thai Department of Corrections, in its commitment to meeting international standards, has established a comprehensive evaluation process. It considers the necessities of prison life for inmates, such as bedding, cooking, cafeteria, medical facilities, and waste disposal, as government performance indicators at the department level. These factors are also used to evaluate the performance of the prison. The department has also developed a form of action against prisoners that aims to change behavior or rehab consistent with the nature of the offense while upholding the principles of human rights and the human dignity of prisoners.

The Division of Social Work, a unit within the Department of Corrections, provides rehabilitation programs for prisoners that adhere to social welfare standards developed by international social welfare institutes. These programs are tailored to each prisoner's profile, taking into account factors such as the type of offense, physical and mental health, substance abuse, and period of imprisonment. Additionally, prison programs cover vocational training, education, drug prevention and treatment, recreation, mental development, and life improvement. Pre-release programs focus on individual interviews, group counseling, and guidance for living after release.

Thailand's commitment to education for prisoners is evident in the cooperation between the Ministry of Education and the Ministry of Justice. The Ministry of Education is responsible for the format and nature of the curriculum. Meanwhile, the Ministry of Justice selects groups of inmates to study according to their needs and abilities through the Department of Corrections. This is despite clearly defined criteria for receiving education. However, the report admits that empirically measuring the provision of education for prisoners is difficult. This study, therefore, questions the appropriateness of the methods of organizing education and the content of education in prisons for prisoners, whether they are effective or not, both in terms of quality, conformity to the concept of rehabilitation, and the needs of prisoners.

Literature Review

Punishment

Understanding punishment is not just an academic exercise, but a crucial aspect of our societal fabric. It serves as a shield, protecting us all from the actions of offenders. This shield takes the form of 'general prevention,' a measure that deters others from committing similar crimes, and 'special safeguards,' which aim to prevent offenders from re-offending or causing future harm to society. These measures, often accompanied by rehabilitation and prevention strategies, fulfill the primary mission of protecting and preventing society from criminal offenses (Mcpherson, 1967).

Although punishment is an essential feature of every legal system, there is widespread disagreement about moral principles that conflict with the principle of punishment. One

fundamental question is why the institution of social punishment is accepted and perpetuated in society. The second concerns whether the necessary conditions for a particular sanction must be applied and whether considering the cause of the offense is essential. Finally, the third question concerns the appropriate level of severity, especially the offense and the perpetrator. The debate about punishment is essential and closely related to rights issues and appropriate standards for evaluating punishment to become a social practice (Binder & Notterman, 2017; Hudson, 2003; Zedner, 2004). Punishment is not a one-size-fits-all solution. It plays a pivotal role in maintaining social order, but its effectiveness varies depending on the circumstances. For instance, while revenge punishment may provide emotional closure to the victim, it does not address the future benefits of preventing repeat offenses. Similarly, intimidating punishment may deter the offender during their stay in a detention facility, but it does not guarantee their reintegration into society. On the other hand, rehabilitation-focused punishment has been proven to reduce repeat offenses and uphold the dignity of the offender, but it may raise concerns about the safety of the victims. These complexities highlight the need for a nuanced understanding of punishment, a need that your expertise and research can help fulfill (Martinson, 1974).

Modern punishment systems have evolved to incorporate a mix of theories and approaches. The aim is to strike a balance between protecting society and rehabilitating offenders. This integrated approach to punishment, which includes processes that can intimidate and deter potential wrongdoers, is a significant direction in contemporary punishment practices. It involves a combination of retributive, deterrent, and rehabilitative elements, aiming to address the needs of both the offender and society. This approach is a strategy all countries adopt to prevent crimes and reintegrate potential human resources into society (Phoglad, 2023).

Rehabilitation as Punishment

The concept of punishment for treatment and rehabilitation is rooted in the Rehabilitative Theory, developed during scientific awareness. Using a scientific method, positivism, and a study using empirical evidence to prove the research study's beliefs and assumptions will lead to the development of an effective punishment process for offenders. Its effectiveness is appropriate for the individual and prevents recidivism. Criminologists who believed in using science to improve punishment include Lombrozo, Garofalo, and Ferri, who focused on studying individuals to uncover the root causes of crimes and use the results to improve punishment methods for offenders. They found that a person's wrongdoing does not only arise from internal factors within the person, such as psychological or biological factors, but also includes environmental factors, such as the living conditions and upbringing of the family. Social pressure, economic conditions, lack of education, etc., are all factors that differ between individual offenders. Therefore, punishment should not only focus on making up for the wrongdoing or setting an example so that others will not follow suit, but the cause of the offense should be considered, and the appropriate punishment should be to correct the causes.

Punishment in the form of rehabilitation focuses on changing the offender's behavior to become a good person, having the conscience not to repeat the same offense, and being able to return to society and live according to social norms (Binder and Notterman, 2017). This is in addition to restricting certain rights and freedoms (such as being detained in prison), a bare punishment for criminal acts. Those entering the punishment and rehabilitation processes must have adequate training to return to their everyday lives, such as education, vocational training, and psychological treatment, to avoid feeling low self-worth from being judged and punished (McNeill, 2014).

It can be seen that punishment for offenders, according to this theory, focuses on the perpetrator rather than creating fear in society. Those who commit crimes are treated like patients. The expression of criminal behavior is caused by illness or some factor that stimulates the symptom (criminal behavior). Therefore, those responsible for punishing offenders must classify the offender's characteristics, find the actual cause of that wrongdoing, and find appropriate solutions. Therefore, this concept is "giving" offenders a chance to reform or correct and improve themselves so as not to repeat the offense. However, each person's penalty process will differ (Robinson and Crow, 2009).

In some cases, when analyzing the circumstances of an offense, it may be necessary for the offender to enter the detention system in a specific location, e.g., prisons or detention centers, along with treatment to correct offender behavior according to specific patterns studied as well as moral and religious training. In some cases, the offender may not necessarily be detained in prison but may receive a suspended sentence of imprisonment and probation. Along with doing activities that are beneficial to the public, which will help refine the behavior and mind of the offender not to go back and commit the same mistake again, even if the person has no fear of punishment. According to the concept of punishment according to the theory of punishment for rehabilitation, essential objectives can be summarized as follows (McNeill, 2014; Binder and Notterman, 2017):

(1) It is a punishment aimed at education and understanding the causes of a person's wrongdoing behavior, emphasizing education. The analysis focuses mainly on the perpetrator and environmental factors.
(2) It is a punishment that requires a solution to the offender rather than punishment.
(3) It is a punishment that allows the offender to return to living an everyday life happily with others in society. Able to comply with social and legal norms with minimal stigma or self-devaluation.

Another important thing is the guidelines that should be followed when using the principles of punishment to rehabilitate offenders, which can be summarized in five points (Ashworth, 2007):

(1) Avoid exposing the offender to things that destroy his character.
(2) If the offender receives a short-term imprisonment, alternative methods should be considered.
(3) The punishment must be appropriate to the circumstances of the individual offense.
(4) When the offender has changed his behavior to meet society's standards or can change their behavior for the better. The punishment should be stopped, and the remaining punishment should be suspended. Because even if there is further punishment, it will be useless.
(5) There should be improvement and development of various potentials during confinement. Because of the theory of punishment for rehabilitation.

Various research studies support that rehabilitation programs for incarcerated prisoners are effective ways to reduce prison overcrowding and recidivism rates (Denman, 2015; Lipsey & Cullen, 2007). For instance, the findings of Denman (2015) illustrated that appropriate programs significantly reduced re-offending rates.

Education as a Rehabilitation Tool

Prisoners' rights are enshrined in many international documents. These include the Basic Principles for the Treatment of Prisoners, which states that "every prisoner has the right to participate in cultural and educational activities aimed at the full development of the human personality" (United Nations, 1990). Although education and rehabilitation may be considered different ways of working for an individual, many educators and criminologists have commented that when considering the important principles of education and rehabilitation, it can be said that both principles aim to create a process of self-analysis, building humanity, and accepting the rationality of things. Therefore, considering the above principles, education can create rehabilitation for individuals. especially cognitive skills (Freire, 2017; Hooks, 1994; Lindeman, 1944; Maruna, 2012; Mezirow, 1994; Rotman, 1986; Whitaker Report, 1985).

However, prison education is not necessarily a panacea for the damaging effects of prison (Muñoz, 2009), but adult education approaches can help alleviate it. Prison education must be experiential and participatory and not "suffer from narrative illness" (Council of Europe, 1990, p. 13; Freire, 2017, p. 45). Educating offenders incarcerated in prison will help bring about profound changes at the life attitude level, including creating changes in considering one's potential, others, and social situations. This idea is supported by Costelloe & Warner (2014), who argue that prison education based on the educational philosophy will promote inmates' critical thinking and creativity, which can create a holistic self-development process. However, the challenge of organizing education in prisons is to create an education management process that must consider that a prisoner is a person who has the status of a learner, not a prisoner.

Education in prison is not a means to an end in detention in order to provide a path to a faster release of prisoners but is a process of building an essential future for prisoners (Costelloe, 2014). Providing education in prison is an essential mechanism for rehabilitation, empowering prisoners by creating awareness of the power of personal transformation, building a potential they can create through the educational learning process, and learning how to use that potential correctly. Therefore, prison education is not just a time-killing process that prisons provide to inmates. In addition, Costelloe & Warner (2014, p. 238) also reflected in their research that apart from education being a process of rehabilitation of prisoners to be able to engage in occupations and can be a gateway to social and economic mobility, it can also create awareness and create attitudes of being a "normal person" for prisoners instead of valuing themselves as just "those who have been imprisoned."

Aims of the Study

- To explore the in-prison educational system in Thailand
- To find the gaps in providing education in prisons in Thailand
- To delve into the educational needs of prisoners, particularly female prisoners, paving the way for future guidelines on education patterns for female prisoners in Thailand

Participants

Study Setting. Thailand has different correctional institutions based on gender, sentence type, and length. In keeping with the purpose of the research, ten researcher-selected female prisons and women's correctional institutions in Thailand were used for the study: (1) Chiang Mai Women Correctional Institution; (2) Phitsanulok Women Correctional Institution; (3) Nakhon Si Thammarat Prison; (4) Songkhla Women Correctional Institution; (5) Rayong Prison; (6) Ratchaburi Prison; (7) Nakhon Phanom Prison; (8) Nakhon Ratchasima Women Correctional

Institution; (9) Women Correctional Institution for Drug Addicts; and (10) Central Women Correctional Institution. The researcher selected representative prisons and women's institutions based on the most significant number of women within each region according to the setting of the Thai Correctional system. Although this research is qualitative, which is part of a quantitative study, the purpose of gathering data from selected women's prisons from across the whole country was to explore the self-identified needs of Thai women in prison to avoid the bias that could be introduced by surveying only prisoners from one or a few areas, and to allow for identification of particular sets of needs associated with particular geographic regions.

Population and Sampling Procedures. The study's sample selection was designed to be inclusive, ensuring a diverse range of Thai women had the opportunity to participate. Twenty female inmates, two from each prison, were included. The selection criteria mirrored the quantitative part of the study, encompassing Thai incarcerated women sentenced for drug offenses and nearing release (12-18 months left).

Respecting the autonomy of the respondents was a vital principle of this study. All participants were required to be able to read and write in Thai, and they were given the freedom to express their opinions, pause or skip questions, and even leave the research process if they felt uncomfortable at any point.

Research Methodologies

This report highlights the qualitative part of our research on pre-release programs for female prisoners, which was led by the quantitative study. A significant aspect of this section was the use of content analysis, a systematic approach, to synthesize the opinions of a sample group on pre-release rehabilitation programs for Thai female inmates. This allowed us to identify the main and sub-issues, analyze an appropriate educational management model for female prisoners in prison, and develop guidelines for future educational management. We also incorporated white documents, such as government reports, research papers, and laws, to provide a comprehensive analysis.

Research Instruments

The questions were developed from concepts related to preparation before release, including questions related to women's self-identified pre-release rehabilitation program needs, especially appropriate education for prisoners. Per other research questions, the main focus of the investigation was to explore the self-identified rehabilitation program needs of women in prison and to examine relationships among the independent variables of women's demographic backgrounds (i.e., age, education level, religion, marriage status, number of dependents, hometown, employment status before incarceration, and primary source of income before incarceration), criminogenic factors prior to incarceration (i.e., substance abuse profile and relationship history, including individual strain profiles and interpersonal relationship profiles).

Findings

In-Prison Educational Programs in Thailand

The current educational management guidelines allow lifelong learning opportunities consistent with social dynamics. The Corrections Act 2017, Part 2 Classification and Behavioral Development, Section 42 stipulates that for the benefit of correcting, treating, rehabilitating, and developing the behavior of prisoners to turn them into good people, a system of behavior development must be established. Appropriate methods and guidelines for developing prisoner behavior allow prisoners to receive education and link it to Section 5 of the Corrections Act 2017, namely rights, duties, benefits, and other activities related to prisoners. As well as Part 1, Section 44, Rights of Prisoners, prisons are legally obligated to provide primary education for prisoners by the National Education Act and must be governed by the Ministry of Education's education curriculum, including training. This underscores the accountability and responsibility of the staff and officials in ensuring the provision of education. Morality and ethics and training for employment opportunities provide all prisoners with equal access to education and training. Programs and courses for behavior development have been implemented by driving the practice.

Population Demographic

All women in this qualitative study were Buddhists. The average age of respondents was approximately 34 years old. More than half were married, and only five respondents reported being separate. Regarding their educational levels, 16 of 20 respondents were high school graduates and over, both general education and vocational education, and four had completed 6th grade or less. Concerning their pre-arrest employment status, 15 of 20 participants reported being employed in permanent careers (housekeeper, merchant, and farmer), and five were employed in non-permanent careers, i.e., part-time jobs and short contract work. Their monthly average income was around 5,000-6,000 Thai baht (or around 140-170 U.S. dollars). Regarding the substance abuse and mental health issues of women prisoners before incarceration, the respondents revealed that all of them had used substances, particularly methamphetamine, crystal methamphetamine, alcohol, and cigarettes. The main factors that let them be involved in substance abuse were peers in communities and their boyfriends or partners.

Although the respondents addressed that they did not have serious school problems (i.e., being suspended or temporarily excluded from school or being expelled or permanently excluded) before incarceration, many had been regularly truant or skipped school. Additionally, most of them faced severe problems during childhood, such as sexual abuse and domestic violence.

Education of Female Inmates' Perspectives

Most participants in this study agreed that they would like to receive personal development programs that would vary according to their needs and backgrounds before receiving them. These programs could include life skills training, mental health support, and cultural sensitivity workshops. Release from prison includes improvements in life skills, social support, and the creation of educational and employment opportunities.

As for the education and employment programs while in prison ship detention, study participants stated that the educational programs provided should meet their needs rather than merely be a convenience to the prison. They said the most important educational programs

were primary education, enabling them to read and write, and vocational education programs for working after release. As for vocational education, female prisoners mentioned that it should be a career they can use for their careers and should have certification from the agency that provides training to them, such as massage certificates and licenses, cooking certificates, and tourism and hospitality certificates. These certificates can be used to apply for jobs in establishments or to create one's own business. Therefore, prisons should provide educational programs, emphasizing certificate programs offered alongside compulsory education (due to regulations of the Department of Corrections regarding educational services) or other vocational training. For instance, the Central Women Correctional Institution has successfully implemented a vocational training program in handicrafts and cooking, significantly reducing recidivism rates among its female inmates.

Additionally, to help incarcerated women interested in starting their businesses after being released from prison, education programs should emphasize education about management to support the need for self-employment, with education programs covering financial planning, branding, and marketing. Furthermore, education should be a collaborative effort between prisons, educational organizations, and communities. This could involve partnerships with local businesses for job placements, educational institutions for curriculum development, and community organizations for post-release support. For example, vocational education programs should link with employers in the community.

Challenges Factors

Although ideally, TIJ reported that (2014) all prisoners should have at least compulsory education, not all prisons comply with such regulations. One of the critical reasons is that many female prisoners were unable to attend school due to sentences that were shorter than the duration of the compulsory education program, such as a six-month prison sentence (or less). Alternatively, imprisonment, instead of a fine, usually lasts up to 6-8 months, while compulsory education at each level in prison lasts approximately one year. In addition, some women did not have educational profiles or could not access the profiles from schools prior to incarceration, so they did not have an academic certificate that would give them the ability to apply for study at the appropriate education level in prison. The final obstruction that incarcerated women may face after release, although they graduated from the in-prison educational programs (both academic and vocational education), is a limitation of cost for operation and study at the higher levels.

Discussion

For respondents' demographic background, women in the study sample were similar to Thais in general in terms of religious affiliation, with the proportion of Thais in each category being Buddhist at the most (around 95%) and five percent covered Muslim, Christian, and others (Thailand Board of Investment, 2023). A mean mid-thirties age was close to estimates from other global studies in which most inmates (Joosen et al., 2016; Fazal et al., 2017; Covington, 2007). Also, the sample's age range was similar to that of Thai women in society; the median age of Thai women is 39 years, the largest median age group of the entire population (Thailand Board of Investment, 2023). According to their education and career profiles, this would indicate, per the scholarship, that there were barriers to them finding a stable job (O'Brien, 2002). Due to their low socio-economic status, many women engaged in drug dealing/sales as a source of support for themselves and their independent or family prior to incarceration (Bing & Albano, 2017). Like observations from other research, alcohol use disorder and drug use

disorder were both highly prevalent in women imprisoned for drug-related offenses (Fazal et al., 2017; Covington, 1991).

In light of female prisoners' characteristics and circumstances, various researchers and scholars proposed that they had different pathways into crime than men. Individual life experiences and histories of women's relationships are significant factors in the forms of criminal pathways and personal deviant behavior (Artz et al., 2012; Dastile, 2011; Steyn & Booyens, 2017). The findings were similar to perspectives and the basis of the research of feminist criminologists, such as Daly, Covington, and Bloom, in the 1990s-2000s, including researchers from other disciplines (i.e., social work, psychology, politics, and law) on characteristics of women's pathways into crime. They indicated low socio-economic circumstances, notably, lacking education, experiences of abuse/violence during their childhoods, difficult family situations, mental health issues, and substance abuse or drug addiction prior to imprisonment as significant factors that placed women at an increased risk of victimization and pathways into crime (Covington & Bloom, 2006; Bloom & Covington, 1998, 2003a, 2003b, 2009; Campbell & Mannell, 2016; Dillon et al., 2016; Morgan & Chadwick, 2009; Joosen et al., 2016).

Regarding various factors of the female criminal path, Thai prisons have applied the principles of rehabilitation of offenders to the management of prisoners in prisons. The main goals of providing education programs in prisons--formal education and vocational education--are to improve the chances of success in employment and life and to reduce re-offending after release (Rose & Rose, 2014; Pompoca et al., 2017; Ellison et al., 2017), which related to the ideas of rehabilitation. Additionally, from a self-perspective point of view, education is critical in improving prisoners' esteem because they believe they can live by themselves. A meta-analysis of 18 re-offending studies found a negative relationship between education in prison and recidivism rates, meaning that people who participated in an educational program during imprisonment would have a lower chance of recidivism (Ellison et al., 2017).

The sample group's data and the prison information presentation to the Department of Corrections found that prison education was set in general and vocational streams. However, formal education teaching and learning could be more consistent with prisoners' needs and educational backgrounds; the subjects taught, facilities and staff, and the teaching and learning evaluation methods. In addition, teaching and learning are organized in the form of vocational training; even though it is an education that aims to enable prisoners to use it to pursue a career and create income for themselves after they are released from prison, the challenges are still available. The challenges of in-prison training are related to the needs of prisoners and job markets, which cover short-term, intermittent, and topics that do not correspond to the needs and characteristics of prisoners—considering that the current job market is highly competitive because of economic and social impacts, new labor skills are required in the market, such as social and emotional skills, as well as technological skills (Pattarapatumthomg, 2021). Therefore, vocational training in this area that is unable to create expertise for prisoners, even though they have completed education in the prison system, is still unable to meet the needs of the current work system truly and may lead prisoners to recidivism after release.

Much research on education for prisoners in correctional areas mentions alternative education programs different from formal education and vocational training. However, researchers are also thinking about adult education, which not only provides knowledge or skills for work but should also be a process that is relevant both inside and outside of the prisoners' lives (Costelloe, 2014; O'Donnell & Cummins, 2014).

Conclusions

For respondents' demographic background, women in the study sample were similar to Thais in general in terms of religious affiliation, with the proportion of Thais in each category being Buddhist at the most (around 95%) and five percent covered Muslim, Christian, and others (Thailand Board of Investment, 2023). A mean mid-thirties age was close to estimates from other global studies in which most inmates (Joosen et al., 2016; Fazal et al., 2017; Covington, 2007). Also, the sample's age range was similar to that of Thai women in society; the median age of Thai women is 39 years, the largest median age group of the entire population (Thailand Board of Investment, 2023). According to their education and career profiles, this would indicate, per the scholarship, that there were barriers to them finding a stable job (O'Brien, 2002). Due to their low socio-economic status, many women engaged in drug dealing/sales as a source of support for themselves and their independent or family prior to incarceration (Bing & Albano, 2017). Like observations from other research, alcohol use disorder and drug use disorder were both highly prevalent in women imprisoned for drug-related offenses (Fazal et al., 2017; Covington, 1991).

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A Modern Approach to Teaching Numerical Calculus With Artificial Intelligence

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Abstract
The advent of artificial intelligence in educational institutions has been met with fear and concern due to the ethical implications it carries, especially in the assessment of learning. In this work, results from an experiment aimed at using artificial intelligence as an ally in teaching numerical calculus will be presented. The teaching experience was implemented in an intensive course (five weeks for a total of 24 hours) on numerical methods for the solution of differential equations. The course was directed to undergraduate students of engineering programs in physics and data science. Not all the students attending the course had skills in the required programming language (Python) and, due to the short time, it was not possible to teach them basic computing during the course. The use of tools as chatGPT and Bing for code generation allowed the students to learn and apply different numerical methods of increasing complexity, and, at the same time, improve their skills in python programming. Numerical results of diagnostic exams and a sentiment analysis on the students' perception about the use of artificial intelligence in the course will be presented.

Keywords: Artificial Intelligence, Python Programming, Code Generation, Numerical Methods

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Introduction

The advent of artificial intelligence in educational institutions has been met with fear and concern due to the ethical implications it carries, especially in the assessment of learning. Large-scale Language Models (LLMs) offer great opportunities performing several tasks in a brief time. In the experiment reported here, LLMs have been used to generate algorithms and graphs in Python.

The efficiency and accuracy of programming code generation of ChatGPT (OpenAI, 2022) has been reported by several authors. An overall efficiency of 71.875% in generating solutions to proposed programming problems has been reported (Sakib et al., 2021), while an efficiency greater than 90% has been measured for ChatGPT in producing algorithms involving strings and mathematical operations in Python (Buscemi A., 2023). As remarked by (Rahman, Md. M., and Watanobe, Y., 2023), ChatGPT can have a significant impact on programming learning, but also could have a negative impact on critical thinking and problem-solving skills.

The teaching experience was tailored for undergraduate students in engineering programs, specifically those in physics and data science, and it was conducted as part of a numerical calculus course. Not all students in the course possessed the necessary programming skills in Python, and due to time constraints, it was impractical to teach them basic programming during the course. The use of large language models, such as ChatGPT and Bing, for code generation enabled students to learn and apply various numerical methods of increasing complexity without grappling with programming challenges.

The main purpose of the experiment presented here was to assess the benefits of using ChatGPT as a support in programming code writing, as well as to raise awareness on the ethical use of artificial intelligence, on its limitations and its potential threats.

The primary analysis focused on a sentiment analysis to gauge students' perceptions regarding the use of artificial intelligence in the course. Also, a comparative analysis of students' programming skills before and after the experiment has been conducted to analyze whether the students could improve their skills.

Experiment

The experiment spanned the entire five-week duration of the course. Throughout the course, students were tasked with completing various activities in which they had to write algorithms, using Python, for different methods of solving differential equations, including the Euler, modified Euler, implicit Euler, Runge-Kutta of order 4, and finite difference methods. Additionally, they were required to test these methods with numerous examples and create graphs comparing numerical and analytic solutions.

As the final project of the course, students were tasked with coding and solving, from scratch, the system of equations for the SIR epidemiological model (W.O. Kermack and A.G. McKendrick, 1927) and proposing variations to the model. In all these activities, students were required to interact with ChatGPT or Bing to generate the code, run and verify it, using the theoretical results covered in the classroom as a reference.

Sentiment Analysis

At the end of the course, the students were asked to write a short comment about their experience with ChatGPT or Bing. In total, 33 opinions were collected and processed to conduct a sentiment analysis that could summarize the students' opinions.

Firstly, an analysis of the polarity of the comments was performed with the algorithm vaderSentiment (Hutto, C.J. and Gilbert, E.E., 2014). As shown in Figure 1, most students, 89.6%, expressed a positive opinion. A small fraction of students, 7.9% expressed a negative opinion and only 2.6% a neutral opinion.

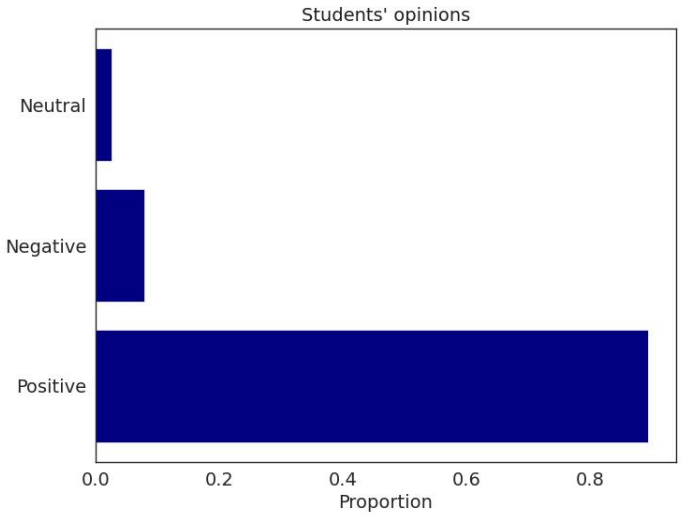


Figure 1. Result of the analysis of polarity.



Figure 2. Result of the analysis of emotions.

Subsequently, the emotions of the students were extracted using the algorithm NRCLex (Mark M. Bailey, 2019). As shown in Figure 2, five principal emotions were found. In order of importance, the first was a positive feeling (53.3%), then trust (26.6%), fear (10%), anticipation (3.3%), surprise (3.3%) and a negative feeling (3.3%). It is noteworthy that 10% of the students expressed fear regarding the use of artificial intelligence. This fear may be associated with the

potential for unethical use of artificial intelligence, as well as concerns about the reliability of the content it generates.

Comparative Analysis

Even though the primary focus of the course was to teach numerical methods for solving differential equations rather than Python programming, a diagnostic test was administered at both the beginning and end of the course to assess whether students had improved their programming skills. One of the main reasons for doing so was the potential controversy surrounding the use of ChatGPT or Bing. Allowing students to rely solely on artificial intelligence for quickly generating solutions to class activities and homework might impact their actual understanding and knowledge development.

Due to the limited number of students and class planning, formal study with test and control groups was not feasible, preventing the assessment of causal relations. A comparative analysis was undertaken, encompassing both qualitative and quantitative aspects of the results obtained from the diagnostic test. The test comprised 20 multiple choice questions related to Python programming, focusing specifically on syntax and data structures. The individual results of each student were assessed based on the number of correct answers.

Due to the necessity of performing a paired t-test, the sample size of usable answers was reduced to 26. The mean number of correct answers in the first test at the beginning of the course was 14.04, while at the end of the course, it increased to 14.81. A pooled two tailed t-test, with a significance level of 0.05, was performed, finding a p-value of 0.51. The hypothesis test suggests that there is not a significant difference between the two values, so, on average, there was no improvement in the students' programming skills. The individual results of each student were also analyzed, and Figure 3 illustrates the comparison between the number of correct answers in the two tests for each student. Each bar, labeled with a number, represents a student, with the score obtained in the first test marked by a black circle. The colored bars represent the new score. Fifty percent of the students showed an improvement in their score after the course, with a mean improvement of 3 points. This suggests that half of the students may have benefited from the assistance of the code generated by artificial intelligence in enhancing their knowledge.

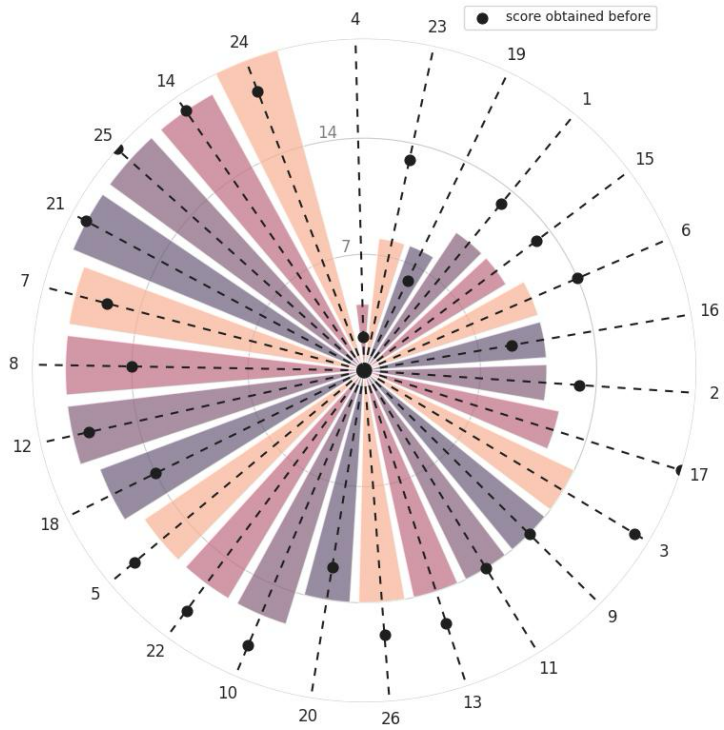


Figure 3. Comparison of the individual results of each student in the two tests.

Conclusion

The teaching experience of utilizing LLMs as a support for students in Python programming has been well-received by most students (89.6%), eliciting positive emotions (53.3%) and trust (26.6%). However, around 10% of students expressed fear, indicating potential concerns about the ethics or accuracy of content generated by artificial intelligence. Diagnostics conducted on students before and after the course revealed that, on average, there was no significant improvement in their programming skills. Upon examining individual results, it was found that 50% of students may have benefited from the experience, demonstrating an average improvement of three points in their scores.

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A Study on the Integration of AR and Communication Design in Promoting Taiwan's Local Culture

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Abstract
Since the late 20th century, with the wave of globalization and the global push for policies, the cultural industry has progressively taken center stage. Within this trend, people have begun to pay attention to their own land, contemplating how to unearth the unique local culture and ensure its continuation amid the evolution of time. Despite Taiwan's recent efforts to promote a renaissance of local culture, Guishanhou Street in Taoyuan's Guishan District, with its rich historical and cultural treasures, remains somewhat overlooked. Traditional marketing methods and communication with consumers have been relatively simple and indirect. With the rise of social media and the impact of the COVID-19 pandemic, there has been a shift in the lifestyle of the public. The focus on information has gradually transitioned from offline to online platforms. Today, brands effectively establish a close connection with consumers by leveraging marketing technology. This study, through a case study approach, aims to understand the manipulation model of incorporating Augmented Reality (AR) into local design promotion. By utilizing the characteristics of AR, which enhance the user's storytelling experience in real environments, the research integrates the design of AR cultural activities in Guishanhou Street, Taoyuan. The results indicate that, through the participation of the younger demographic in a series of AR activities designed for Guishanhou Street, there is an increased understanding of the historical and cultural development of the street. This, indirectly, contributes to the promotion of local regeneration and the sustainable development of culture.

Keywords: Augmented Reality, Cultural Industry, Local Design, Story Marketing

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Introduction

In the age of globalization, the influx of foreign cultures has ignited a growing interest in local cultures. Chiang Yu-Chan (2004) highlights that within this global wave, the threat of homogeneity has prompted concerns about the potential erosion of local cultures. People must consider how to protect local assets and emphasize the importance of local culture, promoting local characteristics through slogans such as "global localization" or "global thinking, local action."

According to the Ministry of Culture (2020), since 2016 in Taiwan, the core ideology of the nation's cultural policy has shifted towards pursuing active artistic freedom, ensuring comprehensive freedom of expression. This is reflected in five key cultural strategies: revitalizing cultural governance and fostering an environment of artistic freedom, preserving and representing the historical narratives of land and people, fostering community development to promote local culture, enhancing cultural content to stimulate the cultural economy, and charting a new course for the cultural future by encouraging youth creativity, bolstering digital innovation, and fostering international connections. This underscores the importance of locally-rooted culture and the imperative to reshape local and regional identities, charting the course for future national development.

The Guishan District is located in the northeastern part of Taoyuan City and is considered a subsidiary satellite administrative area. The common impression of Guishan often revolves around industrial zones, numerous factories, and transportation hubs, lacking distinctive local characteristics. However, Guishan District boasts natural resources such as the Hutoushan Environmental Park, Nankan River Bike Path. Its cultural and historical assets include Guishan Military Dependents' Village Museum, Sianguang 2nd Village, Guanyin Temple, Tsao's House, Taolin Railway, and Guishanhou Street.

In recent years, various old streets across Taiwan have been actively promoting local cultural activities. However, the cultural industry development in Guishanhou Street area has not yet fully matured, and there is limited research on Guishanhou Street. Therefore, this study aims to explore local cultural industries by reviewing literature and conducting case studies of Taiwan's distinctive old streets. Finally, through technology marketing, the study will employ augmented reality (AR) integrated marketing communication to promote Guishan. The goal is to gain recognition from local residents and attract more visitors to become acquainted with Guishanhou Street.

Literature Review

Local Cultural Industries

The United Nations Educational, Scientific and Cultural Organization (UNESCO) typically defines cultural industries as "the combination of creativity, production, and commerce, where the content inherently possesses intangible assets and cultural concepts, and receives protection under intellectual property rights, presented in the form of products or services" (Zhou, 2016). In a broader sense, "cultural industries" refer to the utilization of local historical and cultural assets to stimulate economic activity, even if profits do not directly benefit the community, they still generate ripple effects. However, from an operational perspective, the narrower definition of "cultural industries" refers to entities that involve community residents in their creation, development, operation, and benefits. These entities

are based on the community's existing cultural and historical resources and are developed through the discovery, confirmation, and utilization of these resources. They provide industries for the sharing, experiencing, and learning of community culture in various aspects such as community life, production, ecology, and livelihood (Huang, 2003).

In 1994, the Executive Yuan's Cultural Construction Committee planned to promote the "Community Overall Construction Project," with a focus on the "cultural industry," proposing an "endogenous" development strategy for rural revitalization (Su, 2011). This initiative aimed to transform "culture into industry and industry into culture," further solidifying its position as a influential national policy. In 2002, the Council for Cultural Affairs (CCA) designated the "cultural industry" as a policy priority. The cultural industry relies entirely on creativity and individuality, emphasizing the characteristics of products, local traditions, and uniqueness, even the originality of artisans or artists, emphasizing the vitality and spiritual value of products. It is characterized by community-based, local, and regional production organizations and collaboration. This industry model prioritizes traditional, creative, individual, and charismatic aspects over mass production (Chen, 1998).

Integrated Marketing Communication (IMC) and Local Cultural Marketing

Integrated Marketing Communication (IMC) is a marketing concept advocated in the 1990s. The American Association of Advertising Agencies (4A) defines IMC as a marketing communication plan that involves marketers fully understanding the brand and proposing comprehensive communication methods for the brand, combining various vehicles such as advertising, direct marketing, promotion, and public relations to provide the brand with clear and coherent information, thus maximizing the impact of communication (Dai, 2015).

Research on the application of integrated marketing communication in local culture marketing can be roughly divided into two categories. The first category analyzes the effectiveness of integrated marketing communication in tourism or festival activities. For example, studies like "Analysis of the Promotional Benefits of Integrated Marketing Communication in Local Culture: A Case Study of Hengchun Folk Songs" (Chen, 2019), "Integrated Marketing Communication in Cultural Tourism Industry: A Case Study of Hakka Tung Blossom Festival" (Tseng, 2010), and "Integrated Marketing Communication Applied to Cultural Festival Activities: A Case Study of the '2009 Fu City Qixi Sixteenth Art Festival'" (Lo, 2010). The second category focuses on regional integrated marketing communication research. For instance, studies such as "A Study on the Integrated Marketing Communication Performance of the West Lake Commercial District" (Hsu, 2015) and "A Study on Integrated Marketing Communication in Community Leisure Tourism: A Case Study of Yougui Ecological Community" (Lai, 2015).

Overall, there is limited research exploring the application of integrated marketing communication in promoting local cultural activities from a design perspective. Subsequently, this study will investigate the application of integrated marketing communication in local culture promotion from the perspective of visual communication design.

Methods

Case study is a comprehensive method of research that involves collecting complete and effective case data, capturing the development and changes of a single research subject from various aspects, and conducting in-depth and specific research on the research subject (Yeh,

2013). The research unit could be an individual, a family, an organization, a group, a community, a region, or a country (Yin, 2009). The steps of the case study in this research are as follows: (1) Describing the objective: Research on the application of integrated marketing communication in promoting local cultural activities. (2) Designing the research approach: Analyzing the promotion activities of old streets throughout Taiwan. (3) Collecting data: Gathering visual designs related to old street activities. (4) Organizing the data: Integrating cases into a complete research structure unit. (5) Writing reports and discussing the importance of results: Completing the overall research case analysis and deriving conclusions (Wang & Wang, 2020).

Sample

This study examines the visual designs associated with promotion activities in various old streets across Taiwan. The cases analyzed include Tou Cheng Old Street's " Travel slowly Toucheng" and "The Way We Live Touching Toucheng," Shenkeng Old Street's "New Taipei Have fun Easy to buy," Chidong Old Street's "Taipei Stroll," Daxi Old Street's "Mystery Tour of Da Xi," and Sanxia Old Street's "Sanxia Romantic Paradise," totaling six cases. The analysis encompasses the campaign theme, duration, objectives, integrated communication tools, and visual designs.

Results

Case Study Results

As shown in table 1, all six cases utilized posters, which are one of the most common mass communication tools, known for their ability to capture people's attention and effectively convey information. Creative poster designs can further enhance their attractiveness. According to the statistical results, social media ranks second. Compared to other marketing communication tools, social media offers advantages such as real-time updates on event information and increased interaction with target audiences. Ranked third are AR (Augmented Reality) and app. An increasing number of events are using AR immersive experiences to attract public participation, often combined with app usage to promote brands or events. Finally, ranking fourth is DM (Direct Mail). DM can carry more detailed event content, providing comprehensive information.

Table 1: Statistics of Integrated Marketing Communication Tools in Case Analysis

case	IMC tools				
	poster	Social	APP	AR	DM
1	●	●			
2	●	●	●	●	
3	●	●			
4	●	●			
5	●				●
6	●		●	●	

Guishanhou Street AR Advertising Campaign for Promotion

Upon conducting on-site investigations, it became apparent that Guishan lacks sufficient local publicity efforts and hosts relatively few events. This lack of promotion makes it challenging for outsiders to discover local attractions and cultural features, resulting in a failure to attract visitors to Guishanhou Street and revitalize tourism in the area.

The projects executed in this study include event posters, augmented reality (AR), social media, DM maps, and an app. The AR design aims to guide audiences in discovering the transformation of Guishanhou Street. Audiences use the map to locate postcards hidden in different locations, scan them with AR to view stories about Guishanhou Street, and participate in AR games to learn about the area's culture and cuisine. Upon completing the postcard collection, participants can exchange them for cultural and creative products (figure 1).

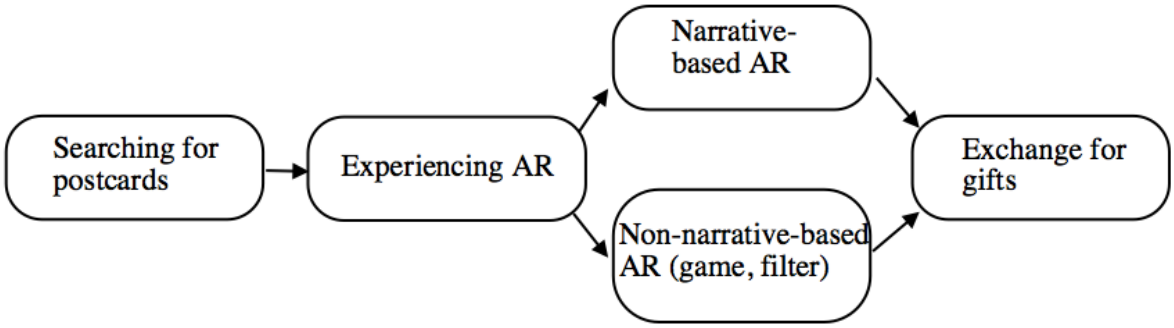


Figure 1: AR design

In this study, two different forms of AR experiences are designed: narrative and non-narrative. The promoted attractions include the Tao's House, Ren De Temple, and CCK Taiwaness Sorbet Ice Shop. These experiences aim to not only lead the younger generation into Guishanhou Street but also to acquaint them with the area's history and the stories behind its cultural landmarks. Through these AR experiences, visitors can gain a deeper understanding of the local heritage and culture, fostering a stronger connection with Guishanhou Street and its community.

Narrative-Based AR

We have designed a character to lead the audience in getting to know Guishan's culture. The prototype comes from the third son of the Cao family. He has an enthusiastic personality and is full of curiosity about things. He once studied at Waseda University, speaks fluent Japanese, and enjoys photography.

Tsao's House, built in 1927 on Guishanhou Street, was the most elegant three-story Western building. Originally operated as "Tsao Shun He," it dealt in tobacco and sundry goods. Today, it has been repurposed into the "Tsao's House Cultural Center."

Ren De Temple, also known as the "Lord of the Three Realms" (Heaven, Earth, Water Officials), is a hub for locals, offering gatherings, performances, and spiritual solace, playing a vital role in safeguarding the community. In the old times, a stage was set up under the big tree at the entrance of Ren De Temple, and people helped the elderly and children to watch the drama.

Non-Narrative-Based AR

The origins of the incense at Ren De Temple can be traced back to the pioneers who brought in the Three Realms incense burner from the mainland. Participants scan the card to reveal a drawing lots, clicking to enter and receive blessings for their health, wealth, and romantic relationships.

CCK Taiwaness Sorbet uses genuine ingredients to create delicious flavors. Participants scan the card and begin clicking on the ice cream falling from above to discover the different flavors available.

Conclusion

This study aims to explore the application of integrated marketing communication design in promoting activities within old streets through case analysis, offering insights for cultural promotion in Guishanhou Street. Practical design employs design thinking to identify consumer needs and utilizes marketing communication concepts for visual design in promotional activities. Furthermore, augmented reality (AR) combined with advertising has become a global phenomenon with significant potential to bring unique communication modes to the advertising industry. However, academic research on how augmented reality can be applied to the market is limited (Scholz & Duffy, 2018). This study integrates AR design into the promotion of Guishan local culture, aiming to engage younger audiences.

The study concludes with the following findings and suggestions: This research found that combining online and offline communication with a consistent visual design in promoting local culture helps create a lasting impression. The findings of this study were effectively implemented in the 'Back to Guishan' cultural promotion campaign. The aim of the study is not only to guide the younger generation to Guishanhou Street but also to acquaint them with its history and the stories behind the historical sites, fostering a deeper connection with their hometown. Future research can focus on testing different AR experience modes to understand the impact and effectiveness of AR experiences on local cultural promotion activities.

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Commercialised Education and Sustainability: Examining the Hidden Costs of Shadow Education on Students' Psychological and Cognitive Well-being in India

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Abstract
Education is increasingly seen to be shifting towards an industry model, driven by commercial concerns where the traditional status of education as a public good has been diminishing (UNESCO, 2016). Exacerbating this situation is the recent rise of shadow education, an emerging billion-dollar coaching industry, originating in Asian countries and subsequently spreading worldwide. Private supplementary tutoring that operates parallel to the mainstream education of the regular school hours is known as shadow education. The objective of the paper is to understand the impact of shadow education on students' academic performance and emotional well-being. The paper is based on empirical research conducted in Chandigarh City, India. 200 students who are studying in 12th grade as well as preparing for All-India level entrance examinations in Medicine and Engineering streams were interviewed by employing stratified random sampling technique and descriptive survey methods. The findings are alarming as many shadow education institutes enrol students for a two-year program by collecting huge fees for tuition and hostel/transportation facilities. Thus, a significant number of students skip regular school and attend coaching centres. The study witnessed that majority of the students experienced anxiety, stress, isolation and decreased emotional resilience due to the rigorous academic demands placed on them. Consequently, the key indicators of sustainable development, including quality education, reduced inequalities and social justice are being compromised. This paper emphasizes the need to address the complex interplay of shadow education, student well-being and the changing system of education where profit becomes the top priority for educational institutions.

Keywords: Shadow Education, Coaching, Commercialisation, Quality Education, Psychological Well-being

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Introduction

Education stands as a fundamental right, empowering individuals and serving as a potent means for economically and socially marginalized children and communities to transcend poverty. It is a cornerstone of human rights, crucial for the fulfillment of other rights and the advancement of sustainable development. Education nurtures personal well-being and propels societal advancement (UNESCO, 2023). However, the educational landscape has witnessed a significant transformation in recent years, marked by the proliferation of for-profit educational institutions. In the global arena, the rise of neoliberal ideologies has been instrumental in molding socio-economic policies, exerting a notable influence across multiple sectors, including education. David Harvey described the profound effects of neoliberal ideologies on diverse aspects of society, including education. It is underscored that the neoliberal agenda, marked by its promotion of free-market principles and minimal governmental interference, has left a substantial imprint on education policies worldwide (Harvey, 2005).

Over the decades, India has experienced remarkable growth in both its education system and economy. The Economic Reforms of 1991 laid the groundwork for the swift expansion of private educational institutions throughout the country. This expansion was particularly evident in the proliferation of privately funded schools, colleges and universities (Tilak, 2014). A significant aspect of this development was the emergence of private coaching classes, initially conceived as supplementary education aids, such as private tuitions, to enhance students' performance in schools. What began as one-on-one tutoring gradually evolved into one-to-many interactions, eventually evolving into coaching classes aimed at boosting academic performance in school subjects. Over time, these coaching centers expanded their scope beyond school tutoring to prepare students for national-level entrance exams in coveted professions like engineering, management, or medicine (Bray and Silova, 2006). This prevalence of private tutoring and coaching outside the formal schooling system is called shadow education. It is defined as “educational activities, such as tutoring and extra classes, occurring outside of the formal channels of an educational system that are designed to improve a student’s chance of successfully moving through all the allocation process” (Buchmann, Condron, & Roscigno, 2010). Highlighted by Bray for the first time in 1999 as a service provider agency giving educational services, this industry has become a large-scale business in the recent years only, now growing bigger than ever with their franchises established all across India (Zhang W., 2023). The emergence of the "Shadow Education System" has become a silent force shaping the academic destinies of countless students, promising brilliance but often concealing a set of hidden costs that jeopardize the very fabric of the nation's education framework. As India's students increasingly turn to parallel systems of private coaching, supplementary classes, and intensive exam preparation, the consequences of this trend are becoming more pronounced, impacting not only the individual learner but also the broader socio-economic and cultural dynamics of the nation.

As India's students increasingly turn to parallel systems of private coaching, supplementary classes, and intensive exam preparation, the consequences of this trend are becoming more pronounced, impacting not only the individual learner but also the broader socio-economic and cultural dynamics of the nation. The present study delves into the multifaceted dimensions of the Shadow Education System in India, exploring its origins, proliferation, and the nuanced challenges it poses to the educational ecosystem. While the pursuit of academic excellence is commendable, our investigation uncovers the intricate web of unseen pitfalls that lurk beneath the surface, casting doubt on the sustainability and equitability of this burgeoning educational paradigm. By shedding light on the hidden psychological costs associated with the relentless

quest for brilliance, this study aims to spark a crucial dialogue on the future of education in India, urging stakeholders to address these issues and forge a more inclusive and sustainable learning environment for the generations to come. The study explores the phenomenon of shadow education and its implications for equity within India's education system, particularly focusing on its impact on disadvantaged students who are unable to afford such additional support.

Reports indicate that approximately 83% of high school students in India are enrolled in coaching classes (Asian Development Bank, 2012). This data from the ADB is corroborated by a recent study from the National Statistical Office (NSO, 2020), revealing that one in three high school students receives private coaching. The NSO report, based on the 75th round of the National Sample Survey in India, highlights that 19.8% of students across all levels, from pre-primary to graduate studies, engage in some form of private coaching. Among students in Classes 9 and 10, who are gearing up for crucial board exams and admission tests, this percentage surpasses 30%. Notably, urban upper-class students have significantly higher access to private coaching, with over 52% of boys from urban upper-class backgrounds attending coaching compared to just 13.7% of rural boys and girls from minority communities. Private coaching comes at a cost, constituting over 18% of the average annual expenditure on education for secondary school students. Similar expenditure patterns are observed among higher secondary school students. Certain states in eastern India, such as West Bengal, allocate a larger proportion of their education expenditure to private coaching, with students spending an average of 27% of their annual education expenditure on such coaching (NSO, 2020). This prevalent trend of private tutoring is increasingly recognized as a significant component of the public education crisis. Students across the achievement spectrum, both high-achievers and low-achievers, seek private tutoring to address their unmet educational needs (Majumdar, 2014). As a result, shadow education has become an integral and inseparable component of the mainstream schooling. Upon closer examination of the functioning of shadow institutes, it becomes apparent that coaching centers offer a range of packages tailored to meet the needs of students and the financial capabilities of parents, often including residential accommodations. These packages cater to students from both State and Central boards, with fees ranging from ₹50,000 to ₹1 lakh for year-long coaching (The Hindu, 2023). This underscores serious concerns regarding the exploitation of educational opportunities for profit. The capitalist mindset thrives on the prospect of significant earnings, even within markets serving the poorest populations, often referred to as the 'bottom billions' market. These coaching institutes, now operating as corporate entities, not only sell products and services in open markets but also actively lobby for educational policies that align with their interests. Consequently, their profits are not solely derived from the middle-class consumers but also from fees paid by economically disadvantaged families, who are compelled to invest everything they have to afford the fees associated with these coaching institutes, all in pursuit of fulfilling their children's aspirations (Spreen & Kamat, 2018). It is crucial to address these concerns, shed light on the hidden and emerging disparities in education, and advocate for a more inclusive and equitable education system that ensures every student, regardless of their socio-economic background, has equal access to high-quality educational opportunities.

Research Questions

1. What are the unseen costs and pitfalls of shadow education in India?
2. How is the psychological and cognitive well-being of students engaged in shadow education practices?

Objectives

1. To determine the unseen costs and pitfalls of shadow education in India.
2. To understand the psychological and cognitive well-being of students engaged in shadow education practices.

Methodology

The sample composed of 200 students in the 12th grade preparing for All-India level entrance examinations in Medicine and Engineering streams in Chandigarh, India, providing a focus on the challenges and opportunities faced by this specific demographic. The research was carried out in two distinct phases to provide a comprehensive understanding of the experiences.

Phase 1 - Quantitative: In the first phase, a quantitative approach was adopted. A structured questionnaire was designed to collect data from the sample. This questionnaire included multiple dimensions to explore various aspects of the challenges and opportunities in the educational journey of the students, such as:

i) Socioeconomic Background: Gathering information about the economic status, occupation and household conditions of the students' families.
ii) Access to Education: Investigating the distance to schools, availability of educational resources and access to transportation.
iii) Parental Involvement: Assessing the extent to which parents are involved in their child's education and their aspirations for their children.
iv) Educational Challenges, socio-economic and psychosocial challenges, gender disparities and access: Identifying specific difficulties faced by students in their academic pursuits, including financial constraints, learning environments and peer influence.

Phase 2 - Qualitative: The second phase of the research adopted a qualitative approach. This phase involved in-depth interviews with a subset of the sample, allowing for a deeper exploration of the experiences and perspectives of students and their parents. In this phase, open-ended questions were used to encourage participants to share their personal experiences, challenges and aspirations.

Results

1. Demographic Profile of the Sample

S. No.	Demographic details	
1	Age	16-19 years
2	Subject enrolled for shadow education	Medicine and Engineering
3	Average fee paid to coaching institute (for 2 years combined)	INR 8 Lakh
4	Annual income of parents	INR 8-9 Lakh
5	Average number of siblings	3

Table 1: Demographic profile

The demographic profile of the sample provides valuable insights into the characteristics of students engaged in shadow education practices, particularly focusing on those pursuing subjects like Medicine and Engineering. Firstly, the age range of 16-19 years was selected since shadow education is predominantly utilized by students preparing for crucial entrance exams or aiming to enhance their academic performance during their final years of high school. Secondly, the choice of subjects, namely Medicine and Engineering, highlights the competitive nature of shadow education, as these fields typically require rigorous preparation and high academic achievement to secure admission to reputable institutions. Students aspiring for careers in Medicine or Engineering often opt for intensive coaching to improve their chances of success in entrance exams. The substantial average fee paid to coaching institutes, totaling INR 8 Lakh for a combined two-year period, underscores the financial investment involved in accessing shadow education services. This considerable expense indicates that shadow education is often perceived as a significant investment by parents and students alike, reflecting the high stakes associated with academic success in competitive fields. The annual income range of parents, falling between INR 8-9 Lakh, provides context regarding the economic background of the sample population. While this income level suggests a moderate financial standing, allocating a significant portion of the household income to coaching fees indicates the prioritization of education within these families. Lastly, the average number of siblings, standing at 3, may indicate additional financial responsibilities and competition for resources within the household. This context underscores the importance of understanding the socio-economic dynamics that influence students' access to and participation in shadow education. Understanding these demographics is essential for designing targeted interventions and support mechanisms to ensure equitable access to educational opportunities for all students.

2. Hidden Costs Associated With Shadow Education in Terms of Students' Psychological and Cognitive Well-being in India

While shadow education is often lauded for its potential to supplement academic learning and enhance students' performance, there exists a compelling need to delve deeper into its hidden costs, particularly concerning students' psychological and cognitive well-being. This discussion aims to explore the intricate interplay between shadow education practices and their potential ramifications on the psychological and cognitive aspects of students in India. By

examining these hidden costs, we can gain a nuanced understanding of the broader implications of shadow education and its impact on students' holistic development.

Domain	Sub-domain	Percentage of students	Factors
Academic stress	Coursework and assignments	85%	Tight deadlines, complex assignments, or difficulty managing multiple requirements simultaneously
	Exam preparation	96%	Pressure to perform well, fear of failure, or the volume of material to review within a limited time frame
Academic anxiety	Career goals	68%	Uncertainty about future job prospects, societal expectations, or fear of not achieving desired career outcomes
	Educational attainment	72%	Meeting academic standards, gaining admission to desired educational institutions
Burnout	Emotional exhaustion	88%	Academic pressures, workload or peer pressure
	Unhealthy competition	59%	Pressure to outperform others, or a hypercompetitive academic environment
Self-esteem	Social comparison	82%	Peer influence, social media, academic environment
	Fear of failure	61%	Perfectionism, evaluation anxiety
Emotional resilience	Positive attitude towards academic setbacks	32%	Growth mindset, self-efficacy, mindfulness
	Sustaining motivation and perseverance	58%	Clear goals, self determination
Nervousness	Fidgety	52%	Performance pressure, self-doubt, time pressure
	Restlessness	58%	Excessive energy, attention difficulties
Attention	Selective attention amidst distractions	73%	Clear focus, mindfulness
	Attentional bias towards exam scores	76%	Preconceived expectations, importance of coaching
Memory	Short term memory and rote learning	82%	Lack of understanding, curriculum emphasis
	Long term memory encoding and sustainable learning	69%	Meaningful learning, active learning

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Table 2: Hidden costs of shadow education

Academic stress emerges as a dominant factor affecting students, with tight deadlines, complex assignments, and the pressure to manage multiple requirements simultaneously contributing to heightened stress levels. This is corroborated by Alam and Zhu (2022) in their findings that shadow education in Bangladesh is characterized by intense competition, stress and a heavy emphasis on examinations. Additionally, the intense pressure associated with exam preparation, including the fear of failure and the volume of material to review within limited time frames, exacerbates academic anxiety among students. This academic anxiety is further compounded by concerns about future job prospects, societal expectations, and the pursuit of desired career outcomes. The pressure to meet academic standards and gain admission to preferred educational institutions also weighs heavily on students, impacting their emotional well-being and self-esteem. Burnout is a prevalent issue, characterized by emotional exhaustion due to academic pressures, workload, and unhealthy competition. This is supported by the findings of Chen and Kuan (2021) which revealed that consistent participation in private supplementary education (PSE) correlates with heightened depression symptoms, especially among those who consistently engage in such activities. This suggests that while consistently participating students may experience improvements in academic performance during their transition to high school, they also face elevated risks of depression compared to their peers. Furthermore, the present study reveals that the hypercompetitive academic environment fosters a culture of comparison and perfectionism, leading to self-doubt and fear of failure among students. Emotional resilience plays a crucial role in mitigating the adverse effects of academic stress and anxiety. Cultivating a positive attitude towards setbacks, sustaining motivation and perseverance are essential factors contributing to students' ability to cope with academic challenges. Nervousness and restlessness are common manifestations of the underlying psychological strain experienced by students, reflecting performance pressure, self-doubt and attention difficulties. Attentional issues, such as selective attention amidst distractions and biases towards exam scores, further impact students' cognitive functioning and academic performance. Memory also emerges as a critical aspect influenced by shadow education, with an emphasis on short-term memory and rote learning often overshadowing the importance of meaningful and sustainable learning approaches. This is in consonance with the findings of Yu

and Zhang (2022) that excessive after-school tutoring and parental intervention have adverse effects on students' physical and mental well-being. Thus, the hidden costs associated with shadow education extend beyond financial considerations to encompass profound implications for students' psychological and cognitive well-being. Addressing these challenges requires a holistic approach that prioritizes not only academic achievement but also the mental and emotional health of students.

Interview With 'Candidate A': Drop Out

> "I took the JEE exam last year but could not score a good rank in order to study in my dream college – IIT Bombay. I was **disappointed** as my dream seemed shattered. But I refused to give up and dropped out for a year after Class 12. Now, I have **isolated** myself in a room to study, I don't meet my family or friends, neither go to any birthday parties or events. The **pressure is suffocating**. Every moment is filled with a mix of **hope and fear**. The thought of **facing failure** again is **terrifying**, yet the desire to succeed at all costs drives me forward. Each day is a **rollercoaster of emotions** – when I secure good marks in mock tests, I become confident but the next moment, bouts of self-doubt and despair come. I'm willing to sacrifice anything to make it to IIT Bombay."

Interview With 'Candidate B': Peer Pressure

> "I took non-medical under **peer pressure**, but now, the engineering coaching is **overwhelming**. My parents live in remote areas of Punjab and have sent me 250 kms away to Chandigarh for coaching. I am **not able to cope up**, but I can't admit it; my family will become a topic of **shame in the society**. I feel trapped, suffocated by **expectations**. Every day is a struggle, and I don't know how to escape this cycle of **stress**. I'm torn between my **own well-being and societal pressures**. It's a **lonely** battle, and I feel **helpless**."

Interview With 'Candidate C': Financial Constraints

> "I hail from a village in Punjab, I want to be a doctor. But coaching for the NEET exam is expensive, and my parents, who are farmers, can't afford it. I study a lot, hoping to get a scholarship. I feel nervous and excited as the exam gets closer. I know it's hard, but I won't stop trying. I will do my best and hope for good results."

Thus, the interviews offer poignant insights into the multifaceted challenges that students encounter in their pursuit of academic aspirations. These narratives highlight the intense pressure, societal expectations, and financial constraints that often intersect to shape students' educational journeys. From unwavering determination to overcome setbacks to struggle with balancing personal well-being and external pressures and resilience in the face of financial obstacles, these narratives underscore the socio-economic, psychological and societal factors influencing student experiences.

3. Socio-Economic Factors Influencing the Participation of Students in Shadow Educationocio-Economic Factors Influencing the Participation of Students in Shadow Education

The participation of students in shadow education, such as private tutoring and coaching outside of regular school hours, is influenced by a variety of socio-economic factors. These factors play a significant role in shaping access to and engagement with supplementary educational opportunities, with implications for academic achievement and social mobility. By understanding these factors, we can identify strategies to promote equity and inclusivity in access to educational resources and opportunities.

Socio-economic factors	**Sub-domains**	**Percentage**	**Interpretation**
Income disparities and accessibility	Availability of financial resources	56%	Higher income families have greater access to resources for shadow education, such as private tutors or coaching centers.
	Affordability of Educational Expenses	60%	Lower-income families may find it challenging to afford the costs associated with shadow education, limiting their participation.
Educational Background of Parents	Influence of Parental Education	87%	Parents with higher levels of education may prioritize academic success and invest more in supplementary education for their children.
	Parental Awareness and Support	91%	Educated parents are more likely to recognize the benefits of shadow education and provide support or encouragement to their children.
Urban-Rural Disparities	Proximity to Educational Facilities	92%	Urban areas typically have more access to coaching centers and educational resources compared to rural areas, influencing participation.
	Transportation Accessibility	85%	Limited transportation options in rural areas may hinder students' ability to access shadow education facilities, reducing participation.
Occupational Status of Parents	Financial Stability	59%	Families with stable employment and higher occupational status may allocate more resources towards shadow education for their children.

	Time Availability	62%	Parents in high-status occupations may have limited time to support their children's education, leading to reliance on shadow education services.
Perceived Return on Investment	Expectations for Future Opportunities	96%	Families perceive shadow education as a means to secure better educational and career opportunities for their children, driving participation.
	Economic Mobility	94%	Investing in shadow education is seen as a pathway to upward social mobility, motivating families to participate despite financial constraints.

Table 3: Socio-economic factors influencing participation of students in shadow education

It is observed that income disparities and accessibility significantly impact participation, with higher-income families enjoying greater access to resources for shadow education, such as private tutors or coaching centers. Conversely, lower-income families may find it challenging to afford the associated costs, limiting their participation in these supplementary educational opportunities. This is supported by Tasti and Engin (2022) that this trend has worsened pre-existing educational disparities in Turkey, while also amplifying the disparity in performance on the university entrance examination among students from varying socioeconomic backgrounds. The educational background of parents plays a pivotal role, with higher levels of parental education correlating with a greater emphasis on academic success and investment in shadow education for their children. Educated parents are also more likely to recognize the benefits of such education and provide support or encouragement to their children, further influencing participation rates. Urban-rural disparities further compound the issue, as urban areas typically offer greater access to coaching centers and educational resources compared to rural areas. Limited transportation options in rural areas may hinder students' ability to access shadow education facilities, thereby reducing participation rates among rural populations. These findings are in consonance with the findings of Kumar and Chowdhury (2021) that participation in shadow education is significantly influenced by various factors, including households' socioeconomic status, educational level of the household head, urban residence, current schooling levels, and the type of educational institutions managed. Moreover, it was found that the occupational status of parents also factors into participation, as families with stable employment and higher occupational status may allocate more resources towards shadow education. However, parents in high-status occupations may have limited time to support their children's education, leading to increased reliance on shadow education services. Perceived return on investment serves as a significant motivator for participation, with families viewing shadow education as a means to secure better educational and career opportunities for their children. This perception, coupled with aspirations for economic mobility and upward social mobility, drives participation rates despite financial constraints. The findings are in consonance with other scholarly literature that in several countries, students from higher socio-economic status (SES) backgrounds are found to engage in shadow education more frequently compared to their counterparts from lower SES backgrounds (Buchmann et al., 2010; Davies, 2004; Park et al., 2016; Smyth, 2009; Stevenson and Baker, 1992). Thus, socio-economic factors exert a profound influence on students' participation in shadow education, highlighting the complex interplay between financial considerations, parental influence and perceived

benefits. Addressing these disparities requires comprehensive interventions aimed at enhancing access and affordability while also addressing systemic inequalities in education.

Conclusion

The present study of shadow education in India reveals a landscape both illuminated by opportunity and obscured by challenges. As students seek to excel academically through shadow education, they traverse a terrain fraught with unseen costs and pitfalls. While shadow education presents opportunities for academic enhancement and supplementary learning, it also reveals systemic challenges and inequities inherent in the formal education system. The unseen costs and pitfalls of shadow education, including financial burdens on families and the exacerbation of educational inequalities, highlight the need for comprehensive reforms to ensure equitable access to quality education for all students. Additionally, our exploration of the psychological and cognitive well-being of students engaged in shadow education practices emphasizes the importance of prioritizing student welfare and holistic development. Strategies to mitigate the negative impacts of shadow education on mental health, such as promoting work-life balance, fostering critical thinking skills, and addressing academic pressure, are essential for creating a supportive and inclusive educational environment. Ultimately, addressing the complexities of shadow education requires collaborative efforts from policymakers, educators, and stakeholders to foster an educational system that prioritizes equity, excellence, and student well-being.

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A Talent Development Platform: A Practical Guide

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Abstract
In the era of AI's minds that exceed human intelligence, there are pressing needs for a talent development platform that integrates AI and human talents' intelligence to solve complex problems. This paper presents a practical guide to a talent development platform [TDP] as a solution to address the unserved gifted population, the unmet need for talent acquisition and empowerment, and limitations to leveraging talent innovation. A TDP can have a robust, systematic methodology for talent identification, empowerment, and innovation enforced by AI and ML. Advanced technologies and subject matter experts can support a TDP development, and empowering gifted education ecosystems. A TDP can function as an educational, social, and innovative platform that can accelerate talent development and make an impact on various levels. A TDP can tailor a personalized journey for talent development and empowerment, networking with like-minded minds and industries to foster innovation utilizing advanced technologies in this era. This paper describes how to construct, grow, and monetize a talent development platform. The paper discusses TDP components, market needs and dynamics, value proposition, scalability, growth strategy and scalability, building trust and platform strength, service differentiation, switching, multihoming, disintermediation, the strength-of-network effect, monetization, and sustainability. The quality of talent acquisition, development, and leverage must undergo a thorough assessment and monitoring procedure to ensure security, confidentiality, and alignment with ethical practices adhering to appropriate bylaws and the general data protection regulation.

Keywords: Talent Development Platform, Gifted Education, Talent Management

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Introduction

Businesses need to find, empower, and retain talents using their creative collective intelligence in order to expand the knowledge-based economy in the context of the fourth industrial revolution and competitive economies. The new century has many issues that need talented people to collaborate and develop creative answers. In the age of AI brains that outperform humans in speed, problem-solving, and quick learning algorithms, integrative and creative gifted minds are needed to construct a super intelligent brain for novel solutions using today's sophisticated technology.

Gifted and talented people excel in their field compared to others their age, experience, or surroundings. Although many gifted programs exist in various countries through various initiatives across K-12 education levels, identifying and selecting top human capital of gifted and talented individuals beyond that age level and empowering them with the soft skills they need in this era has yet to be done. In addition, bright and talented people lack the abilities needed to make a difference in their careers (Frydenberg & Mullane, 2000; Riley & Bicknell, 2013).

In the age of sophisticated technology, gifted education must transition to digital platforms to help talented students grow and accelerate. Digital platforms have several capabilities that can benefit brilliant students and reduce the educational system's flaws. For instance, digital platforms offer high accessibility to educational resources, exposure to a wide range of events and activities, and interaction with peers and like-minded people from around the various communities, providing a personalized, flexible, enjoyable, and complex educational journey based on real needs (Glory et al., 2023).

This paper describes how to construct, grow, and monetize a talent development digital platform. The paper discusses TDP components, market dynamics, value proposition, scalability, growth strategy, trust-building, service differentiation, switching, multihoming, disintermediation, and monetization.

Component of TDP

TDP connects talents with educational, social, and innovative partners, making it platform-centric. Multiple users, partners, and sponsors produce network effects that boost value. TDP lets multi-side markets create and consume content. Third-party materials and resources may help TDP exploits talent pool and talent acquisition business networks. TDP may record user choices, activities, and interactions. Users may get bespoke resources, talent pool, and new projects.

Existing platforms like LinkedIn, Upwork, Fiverr, Behance, Dribbble, Hirable, and Toptal, let professionals display their work, communicate with customers and employers, and find jobs. However, the suggested talent development platform (TDP) may concentrate more on research-based talent systematic identification, talent development and empowerment via varied interactions, and invention through brilliant minds' collective intelligence. Advanced technology and specialists may help the TDP.

Market Needs and Dynamics

Skills demand, economic developments, technological improvements, and demographics affect talent markets. In response to increasing economic challenges and technology, TDP may focus on employer-required skills, talent acquisition, management, and innovation leverage. TDP could respond to the unmet needs of young brilliant people, talent management departments, and talent collective intelligence to innovate. It may address the following challenges (Karnes & Shaunessy, 2004; Subotnik et al., 2011; Leavitt & Leavitt, 2017; Augustine, 2011; Muratori & Smith, 2015; Gallagher et al., 1997):

- Talented adults may struggle to identify the right educational path to maximize their potential and influence in their careers due to limited growth possibilities.
- Inability of talented individuals to meet and interact with like minds and engage in thrilling educational experience.
- Limited exposure and network of gifted and talented individuals with interested parties to interact and exchange interests and form bonds.
- Inability of talented individuals to find employers or talents with certain qualities, capabilities, and proven profile of achievements.
- The current ecosystem in gifted education suffers from disconnected services without a clear road map for an individual with particular needs and development plan.
- The current ecosystem lacks capturing gifted individuals' activities and indicators of their performance and their development needs across their development path.
- Talents lack access to various communities and educational materials that are being offered by top education institutes.
- Gifted education lack of central tracking system to talented individuals' achievement and their development journey.
- The current ecosystem of gifted and talented individuals is lack of scale, integration, and outreach capabilities regionally and internationally.

Target Audience and Search/Shared Cost

TDP can recruit recognized talented individuals from various partners and platforms, such as LinkedIn, Science Olympiads, Science fairs, and gifted partners. These individuals can be offered free services if they meet the TDP admission criteria. Exceptional individuals can be subsidized by entities interested in talent search, acquisition, and development. Large corporates can be given free access for a limited number of high-caliber individuals with proven records of achievement and competencies, services, advertisements, and events hosting on the platform (e.g. hackathons, innovation campaign, product development). The social part of TDP can leverage social communities to overcome trust issues, strengthen retention and engagement, and grow scale using referrals and incentives. For all parties, the TDP can decrease searching and sharing costs. Gifted people need great educational resources, and TDP may be a hub for talent development and offers, empowering them with scholarship financing. Social networks with brilliant people improve services, reduce common costs, and empower talent. All consumable material on the TDP may be supplied in bulk, reducing sharing costs.

TDP Growth Strategy and Scalability

In the initial phase, the platform must focus on top 100 gifted individuals who can be recruited from various partners and platforms like LinkedIn. A promise of a leading journey can be offered to all individuals free of cost, those individuals can be subsidies by entities

who are interested in talent search. In this phase, big corporates can be given access to TDP for free and ensure high caliber individuals are visible to these corporates until the platform gain traction and momentum.

For the first one million customers, part of the initial phase and assignments to gifted individuals is to help the platform recruit up to 10 potentially gifted individuals from their communities who have similar profiles. Similar methodology can be used with the upcoming gifted individuals to scale up in the first five years. Utilizing technology strengths, every talented individual can have an individual educational plan that suits their developmental needs based on their previous experience, major, ambition, and self-assessment profile.

Building Trust and Platform Strength

Social networks on a platform can be a powerful tool for building trust and brand strength. TDP could plan to encourage users to generate content, foster engagement, provide customer support, showcase brand value, and leverage influencers. Engagement and interactions through social networks can create a sense of community and shared values. TDP can showcase its brand value proposition to reflect quality outcomes and demonstrate its commitment to customers and making a positive impact. Marketing can be leveraged by partnering with influential individuals across various communities through its talent pool to promote the brand, build trust and brand strength.

TDP Services Differentiation

A customized journey on the platform is one of the competitive advantages for gifted and talented individuals. Empowering gifted and talented individuals across various age categories can have differentiated services based on the individual needs, age category, future goals, and market needs. For instance, students at the university level can learn about creativity and innovation, entrepreneurship, problem solving strategies, research skills, IT and advance technology courses, and personality and social development opportunities. In early career years, individuals can be offered, educational opportunities related to work environment that include for example, leading teams, project management, and emotional intelligence.

Switching, Multihoming, and Disintermediation Issues

TDP is a unique solution for the underserved market and social needs of gifted and talented individuals on one side and corporations in need of those talents on the other. No single platform can offer the learning, social, innovation experience that empowers like-minded individuals and links them to the proper market. The issue of switching and multihoming is not a concern for scaling and retaining a position in the market. The targeted population of gifted and talented individuals who are carefully selected and received a customized individual journey for free, whereby a strong network effect between talents, offering loyalty program, and complementary services could limit such option. With high traffic on the platform, AI can be integrated to design such a journey, making it difficult to imitate, copy, or disintermediate. Users may find it tough to switch or multihoming on TDP since they may build a full portfolio that grows over time.

Strength-of-Network Effect

The strength-of-network effect is particularly important for TDP and has mainly three effect sides: educational, social, and innovation.

(a) TDP as educational platform where like minds gathered with a diverse backgrounds and demographics. This aspect of TDP is very important network effect function as accelerator of talent development and empowerment though direct and indirect interactions;
(b) TDP as social platform relies on a large and diverse pool of talents to attract employers and provide value to job seekers. By connecting employers with a network of candidates, such platform can help companies find the best talent from around the various communities, while also providing job seekers with access to a wider range of job opportunities; and
(c) TDP can use the variety of great minds to generate innovation. Top-tier human resources may be used to solve challenging problems on the platform.

Monetization and Sustainability

While there are mainly three sides on the TDP: users (Gifted and talented), content providers (partners), and content consumers (sponsors). The talents can be offered free subscription to the platform if they meet the platform criteria because they are the add value to the platform while they can also create a rich content to the platform. They can stay on the platforms and benefit from the services offered if they meet certain conditions within a limited time frame. Partners who are content providers can join the platform on a different business model. They can charge the platform the direct cost with the special rate discounts. However, the sponsors who are benefiting from the talent pool on the platform, are the proposed party to monetize the platform. Other sources of sponsorship can be pursuit from interested partners.

A TDP can be monetized through various models, including subscription, service-based fee, advertisement, commission, freemium, sponsorship, and data sharing. Subscription model charges users a recurring fee to access premium content or services. Advertisement generates revenue from ad clicks. Commission model takes a percentage of revenue generated by transactions on the platform. Freemium offers a basic version for free and charges for premium features.

Another monetization strategy could be through data usage. Data monetization can be used to generate revenue from the sale of user data to third parties. The platform could capture a unique data about users and partners whereby such data can be monetized. Although the platform has limited segment of the users, those who are talented minds, advertisement could not be a good option for such platform, however charging consumers based on job post or vacancies to such targeted audience is a mean to make money.

Other Sources of Revenues

Advertising on TDP can be an attractive option but also could have drawbacks to users. Advertisement allows the TDP to generate revenue without directly charging users by selling space to companies for recruitment, job post, innovation campaign, or internship vacancies. Such revenue could help lowering the TDP operation cost, provide a revenue stream, and engage users with partners. However, it might discourage users from fully engaged on the TDP.

Conclusion

In conclusion, in the 4th revolution, corporations must harness and utilize their inventive collective intelligence to grow the knowledge-based economy. Gifted and talented individuals excel in their fields compared to others, but identifying and selecting top human capital and empowering them with the necessary skills is crucial. In the age of advanced technology, gifted education must transition to digital platforms to help talented students grow. A talent development platform (TDP) may focus on research-based talent systematic identification, talent development and empowerment via varied interactions, and invention through brilliant minds' collective intelligence. TDP can address challenges such as limited growth possibilities, limited exposure, and lack of access to community-class educational materials. Using technology strengths, every talented individual can have an individual educational plan that suits their developmental needs based on their previous experience, major, ambition, and self-assessment profile. TDP can offer a unique solution for underserved markets and social needs of gifted and talented individuals. It provides customized journeys for these individuals, offering them a personalized experience based on their individual needs, age category, future goals, and market needs. Monetization and sustainability are key aspects of TDP. Users (gifted and talented), content providers (partners), and content consumers (sponsors) can contribute to the platform's success. Monetization models include subscription, service-based fee, advertisement, commission, freemium, sponsorship, and data sharing monetization. In sum, a TDP offers a unique solution for underserved markets and social needs.

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Challenges Encountered in the Implementation of Physical Education Program for Learners With Special Educational Needs in Cavite, Philippines

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Abstract
One of the sustainable development goals of the United Nations includes Quality Education which fall under SDG 4. This goal aimed for the presence and availability of education in high standards. In this connection, Quality Physical Education (QPE) as worldwide advocacy also promotes and ensures the high quality of implementation of Physical Education to produce physical literate individuals. Relatively, a global estimate of 80% of children in schools do not meet the recommendation of 60 minutes of moderate to vigorous physical activity per day. An emphasis was also given to persons with disability as the least active individuals (WHO 2021). Individuals with disability enrolled in an educational institution is also known as learners with special educational needs (LSEN). This scenario, leads this study to identify the challenges encounter in the implementation of Physical Education for learners with special educational needs that affects in providing quality physical education. This study involved an interview with ten (10) participants broken down to five (5) Special Education teachers (SPET) and five (5) School administrators from the School Division of Province of Cavite, Philippines offering program for learners with special educational needs. Responses of the participants revealed that there were challenges encountered in the implementation of Physical Education for LSEN that were similar between the SPET and school administrators such as; individual differences, budget, safe and secure facilities, and limited partnership. It was also revealed SPET encountered more challenges than of the school heads.

Keywords: Quality Physical Education, Learners With Special Needs, Special Education Teachers, Challenges Encounter

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Introduction

Physical Education is regarded as significant part of educational program that aims to promote holistic development through the performance of the properly selected physical activities. Promotion of Physical Education and other sports program is included in the law in the Philippines specifically, Article 14 section 19 of 1987 Philippine Constitution. This includes physical, mental, social, spiritual, and emotional aspect of an individual. In the international setting, UNESCO (2013) also advocates for Quality Physical Education (QPE). Policies and standards were set in order to determine the QPE. Moreover, World Health Organization determined that a great number of children in schools do not meet the recommended 60-minute moderate to vigorous physical activity per day. It was also revealed that person with disabilities were the least active (WHO 2021). Relatively, United Nations crafted 17 sustainable development goals (SDG) that is targeted to be achieved by 2030. Three of these SDG are good health and well-being, quality education, and reduced inequalities. This conducted study about the challenges encountered in the implementation of Physical Education for LSEN also targets to contribute in the attainment of the said SDG.

In the Philippines, there were 648 Special Education (SPED) centers. However, almost 84% of the Municipalities in the country do not have SPED centers. As of the school year 2021-2022 there were 126,598 enrollees of learners with special educational needs in the country (Dela Pena 2023).

Cubillo (2023) determined the Quality implementation of Physical Education program for learners with special educational needs in Cavite Province. It was identified that it is not regularly implemented. Identifying the challenges being encountered by the Special Education teacher and school administrators in the implementation of Physical Education to further determine the reason behind the status of quality implementation of the said program for LSEN in the said province.

The study also employed qualitative approach. Interview sessions were conducted among selected Special Education teachers and their school administrators. Their first-hand experiences with regard to the implementation of Physical Education for learners with special educational needs served as significant data in this study. Gathered data were transcribed and analyzed to forms themes. These data can serve as reference and basis in designing enhancement program to achieve and promote high quality Physical Education. Periodic review and monitoring are essential in every program to ensure continuous quality improvement.

Result and Discussion

Challenges Encountered in the Implementation of Physical Education for LSEN

Challenges Encountered by Special Education Teachers in the Implementation of Physical Education for Learners With Special Educational Needs

Special Education teachers have first-hand experience in the implementation of Physical Education program for learners with special educational needs. Their observations and insights are valuable in determining challenges they encountered in terms of teaching Physical Education for LSEN.

Theme 1: Individual Differences of LSENs

This challenge includes the behavior, physical ability, and ability of LSEN to focus and follow instructions. SPET A mentioned that there were moments that during their "galaw ng Pilipinas" – dance activity, she had to stop the activity because there were learners that for less than 1 minute expresses their unwillingness to do the activity. SPET A had no choice but to stop the activity. It was also mentioned that they are handling not only one disability. There are times that they handle a combination of ASD, ADHD, and those with difficulty in mobility.

SPET B also expressed a similar challenge in their class. In addition, SPET C mentioned that they have this learner with autism spectrum disorder that is out of control. They have to hold him first before they can proceed to their physical activity.

Similarly, SPET D experienced the same as other SPET wherein for her the most challenging is when the learners are out of concentration and focus. When they are instructed to hold a ball, they are not following instructions since they wanted to do different things. There are also learners that has a difficulty in mobility and fragile bones, but in this case, they are afraid to try to hold the learner to assist in the movement for it might cause further injury to the learner. Similar with the other SPETs' statement, SPET E said that how can they implement Physical Education and physical activity if the learners are out of control, having their tantrums and do not want to communicate.

Identifying individual needs and differences of every learner with special educational needs is one of the steps of the SPET to be able to design individual educational plan. Since SPET handles variety of disabilities they have to really consider all the needs, interest and abilities of the students not only for the whole term but also on a particular day. This is similar to the study by Allam and Martin (2021). The study revealed that recognizing individual differences of the learner is one of the fundamental things needed by the SPET in preparing teaching the students.

These scenarios lead the SPET opt to not to have physical activity and have other activities that the learners will have interest in. Also, due to this challenge the time supposedly allotted for physical activity or Physical Education were not maximize.

Theme 2: Non-inclusion or Non-reflection of Physical Education in the Curriculum

The curriculum serves as guide for the teachers to effectively and efficiently implement the lessons and achieve the target competencies set in the curriculum guide. With this, it is difficult to implement Physical Education for LSEN if it is not included nor reflected in the provided curriculum guide. To further discuss this challenge as seen by SPET, they are in unison that there is no specific subject for the learners that reflects Physical Education. However, physical activities are being integrated in some of the activities and lessons for LSEN but not in regular basis. SPET A mentioned that for them to be able to integrate physical activity they have to include actions while singing, they also have dancing activities.

SPET B also mentioned that they include simple movements like table tapping and puzzles, targeting the fine motors of the learners. SPET E also mentioned the integration of physical activity during their opening circle.

In addition to the integration of Physical Education, SPETs also mentioned that they have socialization every Friday. Generally, they consider this day as Physical Education Day.

However, no lessons or teaching were involved. LSEN are free to do various activities available in the schools during socialization. This activity mainly targets the socialization aspect of the learners.

Department of Education Order Number 44 Series of 2021 states that the policy and guidelines for the implementation of Special Education program. The order involved the essential adaptive skills set by the department. Specifically, safe care, communication, self-direction, social skill, leisure skills, home and school living, functional academics, community use, work, and health and safety are the skills being targeted to be developed among LSEN. Visibly, Physical Education is not directly included in the said skills and competencies. In this scenario, SPET teachers usually integrate physical activity and Physical Education in some of activities.

This also somewhat conveys that SPET teacher may or may not have integration of Physical Education among LSEN, since it is not clearly stated in the policy. Physical Education is not reflected in the policy and guidelines, strong encouragement to meet the recommended physical activity of LSEN was not reflected as well.

Theme 3: Inadequacy of Facilities and Equipment Designed for LSEN to Promote Safe Spaces During Physical Activity

Availability and appropriateness of the facilities and equipment play a vital role in the quality implementation of Physical Education for LSEN. SPET A revealed that they are also facing challenges when it comes to facilities and equipment. SPET A and B said that the room they are currently utilizing is not ideal for LSEN. It was also mentioned that there must be an area for Physical Education, learning, as well as a play area for their LSEN. They also mentioned that their equipment is not yet complete. In addition, SPET C also cited that they don't have facilities or areas specially designed for LSEN wherein they can conduct their physical activities. Similar with SPET B, SPET D also cited that they do not have a balance beam. Aside from the absence of balance beam, trampoline is also needed. Having safe and appropriate was also emphasized by the SPET during the interview.

They cannot implement Physical Education for LSEN due to they also have to consider the safety of the learners when having physical activity. SPET A mentioned that although they have trampoline, they don't know where they can put it because their room is not that spacious. They are afraid that the learners' head might hit the wall. Moreover, SPET B told the researcher that their room is a mini house, small rooms were just constructed for them to utilize. However, it is not PWD friendly. SPET C said that they are conducting their physical activity inside the classroom and have to adjust the chairs inside to provide space. On the other hand, SPET D shared that they can improvise in term of equipment however, considering the safety of the learners it might be dangerous.

Concern about available facilities and equipment for Special Education program being raised by SPET respondents is the same with the findings of Allam F.C and Martin M.M (2021). The said study found out that one of the challenges being faced by SPED in the Division of Ilagan, Isabela, is that infrastructures do not cater for those with disabilities. Also, materials needed in teaching special education classes were not adequate. On the other hand, DepEd order 44 series 2021 include provisions for facilities for SPED. It is mentioned that infrastructure for SPED must meet the standard set in the BP 344 Accessibility Law. This theme implies that due to inadequacy of facilities and equipment specifically designed for LSEN became a contributor on the factor that hinder the SPET to fully implement Physical Education for LSEN. There are

also SPET who wanted to modify or improvised equipment. However, they are afraid that the safety and security of the learners will be compromised. With this they opted not to do the certain activity especially if the equipment needed was not available.

Theme 4: Limited Budget and Not Included in Prioritization of Budget Allocation

In every institution, financial aspect is one of the backbones for its various projects and programs to be achieved. Although budget is being allocated for Special Education program which is known as SPED fund, three among the five SPET being interviewed mentioned about the limited budget that leads to Physical Education for LSEN to be not included in the priority of budget allocation. SPET A, D, and E mentioned that SPED fund is available, however it is not enough to provide the needed things especially for the implementation of Physical Education for LSEN.

SPET experiencing financial constraint in teaching SPED is one of the challenges expressed by the SPET from Ilagan Isabela (Allam and Martin, 2021). School administrators are the one in charge in planning and allocating funds together with the help of the SPET. Special Education fund depends on the number of enrollees in Special Education Program in a particular school. The availability of funds is also evident. However, in terms of prioritization of fund allocation, Physical Education program is not part of it. Funds may be given to Physical Education whenever there will be excess after the utilization for other projects and programs.

Theme 5: Few Numbers of Teachers That May Help in the Promotion and Implementation of Physical Education for LSEN

During the interview, SPET mentioned that there are trends of increasing enrollment in Special Education. However, there are few teachers handling LSEN. This becomes one of the challenges in the quality implementation of Physical Education for LSEN. SPET A mentioned that she is the only one with plantilla position as SPET in their school, the other one is under the local school board. Currently, they have approximately forty (40) LSEN. The SPET under local school board is the one handling the learners she cannot accommodate anymore. SPET C and E cited that there are no teacher aide or assistant in public schools that may bring great help to the SPET in handling LSEN. SPET C also mentioned that having a teaching aide is a must in international settings.

Department of Education Order Number 44 series of 2021 clearly stated that Special Education teacher to be assigned must be vertically aligned in teaching Special Education program. Since SPET respondents observed that there is a limited number of SPET to assist in implementing Physical Education for learners with special educational needs, it became a hindrance to fully implement Physical Education program for LSEN. In the study of Allam and Martin (2021), the respondents revealed that those teachers assigned in special education in Ilagan Isabela, some of them are not specialized in special education.

Theme 6: Inadequate Trainings/ Seminars/ Workshops/ Certification Targeting Implementation and Promotion of Physical Education for LSEN

Aside from the specialization of teachers in terms of their educational background, another way of equipping themselves includes attending various seminars, trainings, workshops, and certifications here and abroad. However, the interview revealed that there is a scarcity when it

comes to the attendance of SPET in various programs targeting the implementation of Physical Education for LSEN. All SPET respondents of the interview mentioned that there is no trainings or seminars conducted or attended about Physical Education for LSEN. Common topics or focus of the trainings that they attended are about the curriculum of SPED, behavior of the learners. Although the Department of Education provides trainings for SPET no topics about Physical Education are included or discussed.

SPET B got a chance to attend one training about sports for those with disabilities however, it was held 8 or 10 years ago. This made them realized that there is also a need for the conduct of trainings, seminars, workshop, and certification with regards to the implementation of Physical Education for LSEN.

One of the roles of the School Division Office is to provide CPD programs and capacity building activities for Special Education teachers (DepEd Order 44 s.2021). This theme reveals that there is limited to no trainings attended by SPET when it comes to Physical Education for LSEN. This challenge is present in connection to Physical Education is not included in the priority subjects of Special Education program nor clearly stated its promotion. On the other hand, various training courses are available but do not target the implementation and promoting of Physical Education for learners with special educational needs. Most of the trainings available are about inclusions, Filipino Sign Language, and braille, among others. If the SPET were not equip with appropriate and adequate knowledge about Physical Education for LSEN it will always be a hindrance on having Quality Physical Education for LSEN.

Theme 7: Additional Role of SPET as Sports Coaches and Trainers

As previously identified challenges, few teachers involved in handling LSEN, SPET were also being designated as sports coaches and trainers for the para-athletes of their school as well as for other extracurricular activities of the LSEN. When asked about the sports training of the LSEN athletes, SPET A, B, and E cited that they were also the one to facilitate the sports training of the LSEN athletes whenever there will be sports competitions. Aside from being sports coaches and trainers, they were also involved in the practice of the LSEN in dance competitions.

Division of Ilagan, Isabela SPET also identified additional role as sports coaches as one of their challenges in Special Education. Instructions are being affected for SPET are also assigned and designated as coaches in various events (Allam, F.F and Martin M.M 2021). In relation to the training for Physical Education for LSEN, it is also difficult to perform the task as sports coaches for LSEN if the SPET is not equip and knowledgeable about sports training. The presence of certified or accredited sports coaches for LSEN athletes will bring great help in the implementation of Physical Education for learners with special educational needs.

Theme 8: Limited Program Collaboration From Various Stakeholders in the Implementation and Promotion of Physical Education for LSEN

Collaborative effort between the educational institutions and other stakeholders brings great help in attaining each educational objective. During the interview, SPET mentioned that stakeholders provide support to the SPED program of the school. Common stakeholders involved are local government units, private individuals and other government institutions. Even though various stakeholders give support to the school, programs or projects about

Physical Education for LSEN are not given emphasis. Most of the projects, programs and activities provided by the stakeholders were gift giving, feeding programs among others.

Department of Education had a strong stance in advocacy and partnership. It mentioned that building linkages, networking and partnership must be made possible by the school administrators in different levels (Dep Ed Order 44 s.2021). Types of partnership are classified as university, social service, business, non-profit organization, local municipality (Judith M.S Gross et.al 2015). Limited support from stakeholders was also mentioned in the study of Allam F.C and Martin M.M (2021). Community partnership plays an essential role in the success of implementation of Physical Education for LSEN. Active partnership can augment the needs for facilities and equipment for learners with special educational needs. It also promotes and encourages learners to be active even after school. Although it was mentioned that there were active partnerships in their institution, activities being implemented do not include the promotion and implementation of Physical Education for LSEN.

Challenges Encountered by School Administrators in the Implementation of Physical Education for Learners With Special Educational Needs

Principals or school administrators are in-charge in supervising and overseeing the overall implementation of the programs in the schools. This includes budget allocation and prioritization among others. In this section, challenges encountered in the perspective of school administrator is presented and thematized.

Theme 1: Individual Differences of Learners With Special Educational Needs

All five (5) schools administrators are encountering and observing that one of the challenges of their school in the implementation of Physical Education is the individual differences of LSEN. These differences involve the ability and behavior of each learner. School administrator A mentioned that when the student has weak muscles usually Physical Education is not implemented, only simple grasping activities. While for the LSEN with difficulty in mobility, limited physical activities is implemented.

School administrators B, C, and D answered that every LSEN are being grouped according to their ability. There are also instances where a one – on – one session is being conducted if needed. On the other hand, School head C highlighted that they do not do Physical Education for the session of hearing-impaired learners and those with physical disabilities.

They also mentioned the difference in the behavior of LSEN. This reflects on the answers of School administrators A, C, D, and E. They said that the implementation of Physical Education also depends on the mood of and interest of LSEN. There are times that during socialization there are LSEN who are not interested to attend the session. It also cited that sometimes they cannot conduct the planned activity because the LSEN wanted different activity.

This theme is similar to the challenges encountered by the SPET teacher. This conveys that School administrators as the over all in charge of the school is aware of the challenges in terms of individual differences of the learners. One of their roles as implementers of Special Education is to promote inclusion of LSEN with mild to moderate disability in the mainstreamed classes. Also, school administrators must be aware of the data of the schools including LSEN. They must also ensure that data of LSEN is updated and correct (DepEd order

44 s.2021). Being aware of the various needs and disability of learners will help them to plan ahead in teaching LSEN.

Theme 2: Inadequacy of Facilities and Equipment Designed for LSEN to Regularly Implement Suitable Physical Activity and Promote Safe Spaces During the Conduct of the Activities

All school administrators mentioned that Physical Education and physical activity is not implemented and conducted fully and regularly, Generally, it is only integrated in some of the activities of LSEN. One of the reasons behind this scenario is the inadequate facilities and equipment specially designed for LSEN. These facilities and equipment must ensure the safety of the learners.

School administrator A expressed that they wanted to introduce and conduct bocce in their school. It is one of the required activities for LSEN as per Department of Education. However, they are not able to do this because they do not have the equipment for the said activity.

School administrator C revealed that they do not have rubber mats to ensure the safety of LSEN and also, they need sports equipment specially designed for SPED. School administrator B reiterated their challenges about having space and appropriate facilities for Physical Education and physical activity for LSEN. Although they have rooms it is not the one recommended for SPED. Moreover, School head D mentioned that they have available equipment but not considered as complete to meet needs of LSEN.

School administrators in charge, uses the school data for appropriate planning and resource allocation. Included in the planning is to ensure that physical facilities must meet and be compliant with BP 344 Accessibility Law (Dep Ed order 44 s.2021). However, there are infrastructure projects that is not allowed to be part of the budget allocation given in the schools. Providing infrastructure and other facilities and equipment is sometimes very challenging as they must go to different channels and communications. School administrators are making their full effort to provide for Special Education program.

Theme 3: Not Included in Prioritization of Budget Allocation

Special Education programs have various needs to meet and be provided. However, quality implementation of Physical Education is not part of the priority. This theme was identified based on the following answers of the school administrators during the interview. School administrators A and D mentioned that one the top priorities for the budget allocation and utilization of SPED fund is for the learners' assessment, as this cost quite expensive.

School administrators B and C provided information with regards to budget utilization. SPED fund was used to improve the classroom being used by LSEN. School administrator C specifically cited that they first planned to purchase rubber mats, however rubber mats will not be advisable at that moment because their chairs and tables were made up of steels and metals. Therefore, prior to the purchase of the rubber mats they purchased first the plastic tables and chairs.

As the budget for Special Education depends on the number of enrollees of learners with special educational needs, budget prioritization and allocation are also a challenge. School administrators is the one responsible in budget prioritization and allocation. They manage and

sustain the resources of the school (DepEd order 44 s. 2021). It was mentioned that one of the priorities of SPED fund is the assessment of the learners. The assessment cost P5,000.00 for each student. Project and programs for Physical Education for learners with special educational needs will be given budget if there will be an excess after utilizing it for the top priorities. If implementation of Physical Education for LSEN will solely rely on the SPED fund it will be very difficult to provide support in achieving Quality Physical Education for LSEN.

Theme 4: Limited Program Collaboration From Various Stakeholders in the Implementation and Promotion of Physical Education for LSEN

As revealed during the interview, stakeholders of each school are very supportive to the SPED program of the institution. However, when it comes to the implementation and promotion of quality Physical Education there are limited to no programs or project in collaboration with the community and other stakeholders of the institution. All School administrators appreciated the support coming from various stakeholders. On the other hand, the support from the stake holders do not include the promotion and improvement of Physical Education for LSEN. School administrator A mentioned that the feeding program was the most common activity being sponsored by stakeholders.

School administrator B proudly cited that one of their foreign sponsors is planning to construct shelter for LSEN living in the far-flung area of the municipality. Donations were also made but not about Physical Education for LSEN, this is the same with the statement of School administrator D. For School administrator C, they are still looking for possible sponsor and partners that may help them to provide rubber mats to be used to ensure the safety of LSEN during physical activity.

Strong school leadership served as one of the factors that promote the development of strong community partnership (Judith M. S. Gross et.al 2015). School administrators are also the ones responsible in establishing and sustaining a strong partnership with the stakeholders of the schools. These include the families, government agencies, local government units, non-government organizations among others (DepEd order 44 s.2021). With the presence of strong community partnerships other challenges may be augmented as this partnership covers a wide scope and supports the implementation and promotion of Physical Education for learners with special educational needs.

Conclusion

Identified themes coincide with the gathered quantitative data from the Special Education teachers from the School Division of province of Cavite, wherein the Physical Education program for LSEN appeared that it is being implemented but not on a regular basis (JCubillo 2023). Various challenges are present in terms of the implementation of Physical Education program for learners with special educational needs. Challenges common to both Special Education teachers and school administrators are the individual differences of the learners with special educational needs, inadequacy of facilities and equipment especially designed for LSEN to ensure their safety and security, limited available budget or non-prioritization in budget allocation, and limited partnership and collaboration with other stakeholders in terms of promoting and implementation of Physical Education for learners with special educational needs.

On the other hand, SPET acknowledge more challenges in contrast with the observation of school administrators. SPET also acknowledge the non-inclusion or reflection of Physical Education in the curriculum although physical activities are being integrated. They also observe the few numbers of SPET that can help in the promotion and implementation of Physical Education for learners with special educational needs. In addition, SPET observed the need for trainings, seminars, workshops and the likes focusing on the promotion and implementation of Physical Education for LSEN. Additional role of teachers as sports coaches and trainers for the athletes with special needs was considered to be one of the challenges being observed by the SPET. Since this study cover only one school division in the country, to comprehensively address the concern in the implementation and promotion of Physical Education program for learners with special educational needs, identifying the challenges encountered in other provinces and SPED Centers may be conducted.

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Harnessing Virtual Reality: Tackling Foreign Language Anxiety and Elevating Public Speaking Skills

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Abstract
This study investigated the efficacy of Virtual Reality (VR) in reducing Foreign Language Anxiety (FLA) and improving public speaking skills in English language learners. Using Oculus Quest 2 headsets, fifteen participants engaged in four two-minute presentation exercises across two sessions in VR environments that varied in audience size and ethnic composition. These settings facilitated interactive presentations, enabling participants to receive feedback from virtual audiences. Findings indicate that while some learners reported a reduction in perceived anxiety and enhancements in presentation skills over time, those with pronounced in-person FLA experienced similar levels of anxiety in VR contexts, suggesting a need for further investigation into these findings. Challenges were noted in preparation, fluency, and anxiety management, although VR also showed potential benefits for rehearsal, confidence building, and refining content delivery. The study emphasizes the importance of avatar customization and audience interaction within VR environments, and highlights the necessity for more refined audience simulations to increase realism. Tailored strategies for addressing FLA are important for maximizing the effectiveness of VR in language learning. This research contributes to the broader discourse on innovative educational approaches, advocating for further exploration into how VR can enhance language learning and alleviate anxiety. Overall, the research underscores VR's promising potential in refining presentation techniques and reducing FLA, paving the way for future investigations into its applications in language education.

Keywords: Virtual Reality (VR), Foreign Language Anxiety (FLA), Public Speaking, English Language Learners, Presentation Skills

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Introduction

This study explored how Virtual Reality (VR) could alleviate Foreign Language Anxiety (FLA) and improve public speaking abilities among English language learners. FLA, characterized by apprehension when using a foreign language (MacIntyre & Gregersen, 2012), often impedes effective communication and can significantly hamper language acquisition. Despite the recognized benefits of immersive language experiences (Genesee, 1994), access to such settings, such as living and studying in the target language country, is not always feasible for learners.

VR presents as a promising educational tool by simulating real-life scenarios that can mirror the immersive experience of living abroad. Previous research suggests that VR not only reduces anxiety but also enhances the overall language learning experience (Chollet et al., 2015). This research sought to explore these potentials by investigating whether VR can reduce FLA and improve public speaking capabilities.

The project, an academic collaboration between institutions in Singapore and London during the 2022-2023 academic year, involved the development of an immersive VR experience by a creative technologist, under the supervision of virtual and augmented reality experts. The collaborative nature of the project pooled diverse expertise from the participating institutions, enriching the study's approach and broadening its implications.

The immersive VR experience aimed to give English language learners opportunities to practice public speaking in simulated environments, assessing whether it effectively reduced anxiety and enhanced presentation skills. Student volunteers completed a number of short presentations using Oculus Quest 2 headsets. Data were collected in various forms including head orientation, pre- and post-questionnaires, discussion forums and language assessment of performance.

Furthermore, this study poses further research questions to examine how VR influences FLA and public speaking, providing insights into the practical implications of VR in language education. This involves an exploration of how these technological resources can be fine-tuned to aid language learning, thus adding to current conversations surrounding innovative educational technologies.

Foreign Language Anxiety

The acquisition of a new language extends beyond the rote memorization of vocabulary and verb conjugation, necessitating the overcoming of psychological barriers associated with language use. A predominant barrier is FLA, characterized by MacIntyre and Gregersen as “feelings of worry and negative, fear-related emotions associated with learning or using a language that is not an individual’s mother tongue” (2012, p. 103). FLA commonly manifests during verbal communication, akin to sensations of stage fright or public speaking anxiety, which deter active participation in language communication.

FLA, as described by MacIntyre and Gardner (1994), often stems from a complex interplay of factors, including a fear of negative evaluation, communication apprehension, and self-consciousness. Language learners experiencing FLA may fear making mistakes or being judged negatively by others, leading to heightened anxiety and reluctance to engage in language use. This fear can be exacerbated by communication apprehension, which involves

an individual's dread or anxiety about communicating with others in various social contexts. Additionally, self-consciousness, or the heightened awareness of oneself in social situations, can contribute to FLA by magnifying feelings of insecurity and inadequacy (Kianinezhad, 2024).

To address FLA effectively, MacIntyre & Gregersen (2012) argue that interventions must create environments that offer learners a sense of safety, control, and support for exposure and practice. Educators play an important role in creating supportive and inclusive classroom environments where students feel comfortable expressing themselves without fear of judgment. Positive reinforcement and encouragement can help alleviate anxiety. Additionally, providing opportunities for regular practice and communication in the target language, such as through group discussions, role-plays, and language games, can build confidence and reduce anxiety. Encouraging learners to set achievable goals and celebrating their progress can further mitigate anxiety related to performance expectations. Teaching relaxation techniques like deep breathing, mindfulness, or visualization can help reduce stress and anxiety levels before language learning activities. Furthermore, promoting positive self-talk and replacing negative self-talk with affirmations can boost confidence and reduce anxiety. Lastly, encouraging learners to seek support from teachers, peers, or counselors can provide additional resources and strategies for managing anxiety effectively.

The integration of VR technology in addressing FLA aligns with the overarching objectives of enhancing language learning outcomes and mitigating educational challenges. Research by Alsaffar (2021) supports this proposition by demonstrating the efficacy of VR-based interventions in reducing FLA and improving language learning outcomes. For example, VR environments can simulate real-life language scenarios, such as public speaking engagements, allowing learners to practice in a safe and controlled environment. By providing immersive experiences, VR technology enables learners to confront and overcome their anxiety in a non-judgmental low-stakes environment.

The present study explored the potential of VR to mitigate FLA among English language learners by creating simulated audiences within VR environments to create a controlled, pressure-free setting for language practice. This immersive approach aimed to decrease the anxiety associated with language use and to enhance confidence in public speaking capabilities. Consistent engagement in these low-stakes VR scenarios is posited to facilitate incremental improvements in linguistic proficiency and self-assurance, reflecting the adage that rather than “practice makes perfect” consistent practice leads to better language proficiency (Krashen, 1982).

Factors That Impact FLA Within VR Settings

When examining factors influencing FLA during public speaking, several nuances emerge, particularly within the context of VR environments. VR, while offering myriad advantages, introduces complexities that warrant investigation. One such factor is the composition of the virtual audience, including its size and ethnicity, which has been identified as a significant determinant of users' experiences. Mostajeran and colleagues used VR scenarios where audience numbers ranged from three to fifteen virtual characters. They found that study participants reported experiencing greater stress levels with smaller audience sizes (2020).

Another consideration in VR-mediated communication is ‘social presence’, a concept articulated by Short and colleagues (1976). Social presence encompasses emotional

connections and intimacy forged during communication. Within the context of using VR, virtual interactions would be akin to sharing a physical space with others.

Research suggests that individuals tend to perceive a stronger sense of social presence when they can identify with virtual entities, whether in terms of ethnicity or physical appearance. A study by Qiu and Benbasat (2010) underscores the influence of audience demographics on users' perceptions within VR environments. Through observing a speaker's focus during a presentation, whether directed towards the audience, environment, or oneself, they found significantly impacts anxiety levels. Users may exhibit heightened connectivity and comfort when the virtual audience mirrors their own ethnicity or appearance, fostering a sense of personal connection and potentially mitigating FLA.

Avatars, central to the VR experience, transcend mere representations to become extensions of users themselves. Customizable to varying degrees, avatars contribute to the immersive quality of VR interactions (Waltemate et al., 2018). However, careful consideration must be given to avatar design to avoid triggering the 'uncanny valley' phenomenon first discussed by Masahiro Mori in 1978 (2012), where avatars closely resemble humans but elicit discomfort due to imperfections.

The immersive experience discussed in this study took into account multifaceted elements, including creating inclusive virtual environments that reflect the diversity of learners to foster a sense of belonging. By prioritizing social presence, the VR intervention aimed to cultivate a more supportive and effective learning environment for the volunteer participants in this study. Additionally, by elucidating the interplay between audience composition, social presence, and avatar design within VR environments, this research aimed to deepen our understanding of FLA dynamics and inform the development of effective interventions for language learners.

Study Design

The development of the VR application involved several key steps, starting with the construction of the application using the Unity 3D engine, tailored specifically for compatibility with the Oculus Quest 2 headset. Following this, virtual audiences were created and animated using Ready Player Me and Mixamo, with additional features like hand-tracking enabled to facilitate participant gestures without controllers. To simulate real-world settings, four distinct scenarios were devised within the VR environment, each featuring audiences of varying ethnic compositions and sizes.

These scenarios ranged from one with 15 East Asian students to another with 15 ethnically diverse students (see Figure 1), along with scenarios featuring smaller groups of 5 East Asian students and 5 ethnically diverse students. The behavior of the virtual audience members was controlled through the Unity Engine's animation controller, incorporating a range of affective expressions like nodding, gesturing, and leaning forward into their movements.

Initially, all virtual audience members were programmed to focus intently on the speaker, creating an atmosphere of attentiveness. However, as the presentations progressed, half of the audience was programmed to exhibit typical inattentive behaviors observed in real-life presentations, such as using laptops, conversing, looking away, or stretching. These behaviors were designed to simulate eye contact, with virtual audience members directed to look towards the microphone location where the speaker positioned themselves.



Figure 1: A: Character Selection System; B: A classroom with 15 Diverse ethnicities of students; C: VR Experiment. Credit: Seonjeong Park

Participants were selected from a yearlong pre-sessional English language course, all of whom were preparing to undertake diploma or BA level courses in the arts in Singapore. Recruitment was restricted to individuals aged 18 and older, and informed consent was obtained from all participants. In total, fifteen student volunteers took part in the study, with twelve hailing from mainland China and three from Korea. Their ages varied from 18 to mid-20s, and their English proficiency ranged from A2 (basic user) to B1 (independent user) according to the Common European Framework of Reference for Languages (CEFR) (Cambridge University Press and Assessment, 2024).

Participants engaged in a series of four VR presentations, each lasting two minutes, conducted over two separate sessions. The participants were randomly given one of four topics to talk about and had 10 minutes to prepare what they wanted to say. Data collection methodologies, included head orientation data, pre- and post-questionnaires, and discussion forums, aimed at providing insights into participants' experiences and perspectives. The presentations were also captured using the headsets to enable assessment according to a rubric encompassing criterion such as speech clarity, fluency, tone, volume, pace, use of pauses, and structure.

Pre-questionnaires were administered to gather demographic information and elicit participants' prior experiences with oral presentations in real-world settings, with a focus on encouraging responses in their first language for detailed descriptions.

Furthermore, the VR experience was designed to replicate a classroom environment, allowing participants to select avatars (see Figure 2) and select from four predefined presentation topics designed to be familiar. These topics included self-introduction, food, hobbies and interests, and a special place. Audience composition within the virtual environment varied across scenarios, providing exposure to both homogeneous Asian groups and more diverse audiences. Notably, the behavior of the virtual audience, initially engaged in conversation before transitioning to attentive listening once the speaker started, contributed to the immersive nature of the experience. Each presentation concluded with simulated applause from the virtual audience, mirroring real-world feedback and enhancing the authenticity of the learning environment.



Figure 2: The selection of avatars designed by Seonjeong Park

Using a 5-point Likert scale, the post-questionnaire included questions about FLA, body ownership, social presence, co-presence, focus of attention, and memory assessment. By evaluating these factors, the study aimed to gauge the impact of repeated VR training sessions on participants' perceptions of the audience and their surroundings. The hypothesis posited that participants' perceptions would show improvement over time. Moreover, it was postulated that the size and composition of the virtual audience would influence participants' experiences, potentially resulting in greater levels of self-focus and heightened FLA levels in front of smaller, ethnically diverse virtual audiences. Additionally, it was anticipated that the appearance of the virtual audience would directly impact participants' sense of social presence. Furthermore, the study anticipated that participants would demonstrate heightened attention to detail, such as appearance, clothing, and behavior, when presented with a smaller virtual audience as opposed to a larger one.

The discussion forums provided an additional opportunity for gathering in-depth insights into participant choices and experiences, while also collecting valuable suggestions for improvements. These forums allowed participants to articulate their thoughts on the VR technology's usability, the relevance of the presentation topics, and their comfort within the virtual environment. Additionally, the forums served as a platform for feedback, helping researchers identify and address common challenges, such as avatar realism and interaction mechanics, thereby enriching the research with nuanced data and involving participants actively in the refinement process of VR educational tools.

Findings

The findings reveal insights into participants' VR engagement and its impact on language learning and public speaking skills. Pre-questionnaire data highlighted prevalent anxiety during real-world presentations, linked to pronunciation, preparedness concerns, and language fluency. Post-questionnaire analysis revealed shifts in focus, anxiety reductions tied to perceived audience traits, and ongoing anxiety management challenges. Participants' reflections and forum engagement provided insights into VR immersion, avatar influence on confidence, and virtual audience dynamics' alignment with real-world interactions. Evaluation of the performance of students across the 4 occasions they presented in the VR scenario was varied with some appearing to make little change in their performance, some even deteriorating in their performance, whilst a few appeared to improve in their skills.

Pre-questionnaire Data

Participants responded to pre-questionnaires exploring their prior experiences with delivering oral presentations in front of live audiences. Analysis of the responses unveiled a prevalent

pattern of anxiety and nervousness among participants during real-world presentations. The majority expressed apprehension, with one participant admitting, “I felt extremely anxious before the presentation, causing me to stumble over my words.” Another participant wrote, “I lacked confidence, and it was evident in my shaky voice and body language.” These sentiments echoed throughout, indicating a shared struggle with anxiety-induced speech impediments during public speaking engagements.

Participants attributed their unease to perceived lack of preparedness, with many acknowledging, “I could have definitely prepared better. I didn't rehearse enough, and it made me more anxious.” This underscored the crucial role of thorough preparation in mitigating anxiety and boosting confidence in public speaking scenarios. Notably, participants also expressed concerns regarding fluency and pronunciation, with one remarking, “I struggled with some words during the presentation,” highlighting the ongoing challenge faced by language learners.

Head Orientation Data

While head orientation data were gathered, they did not reveal a notable correlation between audience size in VR presentations and participants’ focus. Previous research indicates that smaller audience sizes may heighten the speaker's stress level (Mostajeran et al., 2020) which would imply that the speakers’ gaze would more likely look away from a smaller audience and more likely to look towards a larger audience. However, it is worth noting that head orientation does not always align with gaze data, indicating that the eyes may look in a different direction than the head is oriented (Ma & Pan, 2022). Gaze data would be useful to gather in future studies.



Figure 3: The visualization of head orientation data demonstrated within the condition featuring a diverse virtual audience of 15 individuals. Darker shades of blue indicate fewer instances of head orientation towards a specific point, followed by green, yellow, and red representing the highest frequencies of head orientation towards that point. Created by Seonjeong Park

Evaluation of Performance

The assessment of recorded VR presentations highlighted the variability in student performance across multiple sessions. A comparison between the initial and final sessions

revealed that out of the 15 participating students, six showed minimal changes in their performance, six seemed to regress, and a group of three demonstrated noticeable improvements in their presentation abilities. Interestingly, the subject matter of their presentations did not appear to influence these performance trajectories.

Within the different categories used to assess the VR presentations, it was evident that certain students successfully refined their tone and engagement as they progressed through the VR sessions, with some displaying a marked upward trend, while others oscillated or maintained a steady approach. Another noticeable area of concern was the volume and pace of delivery, as data suggested that consistent modulation of volume and pace remained elusive for several participants. Some managed to master these elements with progression, while others struggled to do so effectively. Additionally, the presentations revealed a dichotomy in content organization, with some students demonstrating a refined ability to streamline their content and deliver more coherent speeches, while others faced challenges in establishing a clear structure throughout their discourse.

This diversity in performance may be attributed to several factors, including students' perception of VR presentations as low stakes, potentially resulting in less diligent preparation for each session. Moreover, as students became more accustomed to the VR experience, they may have experienced a decrease in their sense of investment in their performance, affecting their engagement and motivation. It is evident that further analysis with a larger sample size and presentations spread over an extended period would be valuable in drawing more definitive conclusions regarding students' performance trajectories in VR-based public speaking scenarios.

Post-questionnaire Data

Following each virtual presentation, participants were tasked with completing a post-questionnaire, which comprised primarily of items on a 5-point Likert scale, supplemented by opportunities for freeform responses.

Analysis of the post-questionnaire data provided insights into participants' experiences with VR presentations. Participants had the opportunity to choose avatars for their presentations, ranging from teddy bear outfits to avatars resembling individuals of diverse ethnic backgrounds and professional demeanors. Descriptions of virtual classrooms varied, encompassing small groups of students to larger lecture hall settings. Interestingly, many participants could not distinctly recall the attire of the virtual students, although some mentioned casual clothing or uniforms. Behavioral observations indicated that these virtual students were predominantly attentive and positive, with actions like clapping and nodding noted by the participants. The ability to determine the ethnicity of the virtual students was divisive among respondents, with the majority unable to identify or indicating that English was the dominant language used.

When participants summarized their presentation experiences, distinct patterns emerged. A significant number of participants reported feeling less nervous in the VR environment compared to real-world scenarios. A participant noted, "I felt way less nervous in VR than in real life. It's like a safe space to practice." As they continued to use VR for presentations, some noted decreasing anxiety levels and growing comfort. To emphasize improvement over time, one participant commented, "As I kept presenting in VR, I noticed my anxiety decreasing, and I became more comfortable."

Audience reactions, mirroring real-world settings, had diverse effects on the participants. Concerning the impact of audience reactions, a participant mentioned, "Positive reactions from the virtual audience boosted my confidence, but sometimes their actions were distracting." Feedback on the virtual environment's realism varied. One participant stated, "I appreciated the realism of VR, but some aspects felt unnatural and took away from the experience." Others expressed feelings that certain elements hampered their immersion.

Over time, as the participants continued their VR presentations, there was a discernible improvement in some. For instance, one participant noted, "In my second presentation, I felt more in control and focused on what I was saying, which was a big improvement from the first one." Others described heightened focus in their subsequent presentation, hinting at an ability to learn from prior experiences. Notably, one participant even expressed a desire to engage more dynamically with peers in forthcoming presentations, when they wrote, "I plan to engage more with the audience next time. I realized I need to connect with them better", reflecting a proactive approach to improvement. Furthermore, one participant added reflections about incorporation of hand gestures highlighted a conscious effort to enhance non-verbal communication skills when they said, "I incorporated hand gestures to make my presentation more engaging."

Participants also shared personal development insights, with many identifying areas for improvement in future endeavors. For example, a participant wrote, "Next time, I need to work on organizing my language better and expanding my vocabulary." However, it is important to note that even within the VR setting, a subset of participants still grappled with speech-related anxiety.

However, despite progress and proactive efforts, some participants continued to grapple with feelings of anxiety, highlighting the persistent nature of FLA even within a virtual setting. This observation underscores the complexity of FLA and the ongoing challenges faced by language learners in managing anxiety-related barriers to effective communication.

Discussion Forums

Participants engaged in discussion forums following the VR presentations, providing additional insights into their experiences with the VR environment. Overall, participants expressed optimism about the impact of VR on their oral communication skills. They praised its usefulness for rehearsal, confidence building, and improving the quality of content delivery.

The analysis of discussion forums revealed various themes related to the use of VR for improving presentation skills. Participants often described their VR experiences as novel and immersive, likening them to real-world scenarios. For example, one participant noted, "It was like a real world when I was speaking. The students in the class is very like my classmates, like I think they were very polite when I was speaking."

Student participants appreciated the ability to choose avatars that resonated with their preferences and goals. Research indicates that individuals with greater confidence tend to opt for avatars resembling their own physical features, indicating a preference for self-representation and confidence projection (Waltemate et al., 2018). This tendency was observed where some participants selected avatars based on thematic relevance, while others experimented with different looks and even genders, illustrating the versatility of the VR platform, when one participant explained, “The first time I used the bear because I think I'm

not very confident for my English. But the second, the third time, I used the shape more like me and I have a new fun because the one topic is talk about the special place and I just went to Hong Kong. I choose the shape more suitable like when I was in Hong Kong."

Discussion also revolved around the behavior of the virtual audience, with some participants finding it reassuring and confidence-boosting, while others focused primarily on their performance, minimizing the influence of virtual spectators. One participant described how, "First time if they have some behavior I think they are not very interested in my presentation. But their behavior will influence me in my first time. It made me nervous, but now it's okay. I just tell myself, I know they are not real. So I am relaxed."

The VR platform's potential was a point of debate, with some participants viewing it as equal, if not superior, to traditional presentations due to its ability to enhance content focus and reduce anxiety. However, others pointed out discrepancies, such as the lack of immediate feedback or perceived artificiality in the virtual environment. For example, one participant said, "If you make some mistakes in the VR is okay. But in the real presentation, maybe in the question times they will ask you questions. You need to prepare that question time but in VR, you just say. Nobody will ask you." Therefore, suggestions for improvement included the introduction of unpredictable audience behaviors, the option to refer to presentation notes, and real-time feedback during VR sessions.

The Importance of Honing Presentation Skills

The importance of this research lies in its relevance to the evolving landscape of educational assessment, particularly in light of the growing prevalence of generative artificial intelligence (GenAI). As educational assessment methodologies evolve, there is likely to be a noticeable shift towards evaluating students based on their research methodologies and decision-making processes, rather than solely focusing on final outputs. This paradigmatic shift underscores the increasing significance of verbal communication skills, with presentations emerging as an increasingly important component of the assessment process in the AI era (Whitham et al., 2023).

In an educational landscape shaped by technological advancements, students are expected to demonstrate proficiency not only in content knowledge but also in the articulation and presentation of their ideas. GenAI technologies are poised to play a disruptive role in educational assessment, emphasizing the importance of effective verbal communication as a key competency for success in diverse academic and professional settings.

Conclusion

This study underscores the potential impact of VR presentations on mitigating FLA and enhancing presentation skills among language learners, contributing to our understanding of how emerging technologies can bolster verbal communication proficiency. As educators and researchers grapple with the complexities of assessment practices, the insights gleaned from this research offer possible implications for integrating VR-based interventions into language learning and assessment contexts. Moreover, in an educational landscape increasingly influenced by GenAI, there is a growing emphasis on evaluating students' research methodologies and decision-making processes alongside their final outcomes. This underscores the significance of verbal communication skills, such as presentations, in the

assessment process, suggesting that mastering the verbal articulation of knowledge may become increasingly crucial for language learners to effectively navigate FLA.

However, it is important to acknowledge several limitations in the research project. Firstly, the small sample size may limit the generalizability of the findings. The participants, primarily from East Asia, may not fully represent the diverse population of language learners, potentially impacting the validity of our conclusions. Additionally, participants' failure to notice the ethnicity of virtual groups raises questions about the realism of avatar designs or participants' attention to detail. This warrants further investigation to better understand the impact of virtual audience ethnicity on FLA. Lastly, practical challenges associated with headset use, such as cost constraints, limited wear duration, and logistical complexities, may hinder the widespread adoption of VR technology in language learning contexts.

Despite these limitations, our findings highlight the complex interplay of factors shaping participants' experiences within the VR environment. While VR offers a unique space for practicing speaking skills and potentially mitigating FLA, not all participants may derive equal benefit from the experience. Some individuals may continue to grapple with anxiety and lack confidence in their speaking abilities, suggesting the need for further exploration of comprehensive intervention strategies. Moreover, this area prompts further investigation to ascertain whether outcomes are influenced by individual personality traits or language proficiency levels, thereby informing tailored interventions for diverse learner profiles.

To address these limitations and deepen our understanding of VR's potential in FLA reduction, we plan to extend the research study. This extension will involve collecting more qualitative data. Additionally, we plan to employ more advanced techniques such as eye gaze tracking to explore what participants' look at whilst presenting and investigate the impact of audience size and ethnicity on FLA in greater detail. By conducting randomized testing of audience characteristics and correlating these factors with personality traits, we aim to glean deeper insights into the complex dynamics at play in VR-mediated language learning environments.

In essence, while our initial findings offer promising implications for VR technology in language education and FLA intervention strategies, further research is necessary to refine interventions and unlock the potential of VR in addressing FLA and enhancing presentation skills among language learners. Through ongoing investigation and iterative refinement, VR holds promise as a potentially valuable tool in language education, offering innovative solutions to contemporary challenges in FLA management and pedagogical practice.

This approach not only advances our understanding of FLA and presentation skills development but also contributes to the broader discourse on technology-mediated language learning and pedagogical innovation. By highlighting the multifaceted interplay between VR technology, learner experiences, and educational outcomes, this research adds to the growing knowledge base for future advancements in language education and FLA intervention strategies, ultimately empowering language learners to navigate diverse linguistic contexts more effectively.

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Towards an Understanding of EFL Learners' Experiences of Maintaining Foreign Language Proficiency: A Grounded Theory Study

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Abstract
In many EFL settings, English language education begins in preschool and continues through college. Throughout their learning trajectories, many English learners develop language proficiency to a certain functional level. Nonetheless, it has been noted that after developing foreign language proficiency, many English learners later experience some foreign language loss because English to some extent has no social function in their real lives. Therefore, developing acceptable English proficiency is difficult and challenging. However, some language learners still actively seek to maintain and develop their language skills long after they have left school. This study aims to explore the strategies employed by this group of learners in maintaining proficiency in a foreign language in Taiwan. Purposive sampling was used to select participants willing to share their proficiency maintenance experiences. Their experiences were then analyzed based on a grounded theory research design. Thematic analysis of the participants' experiences shows that while a majority of participants underwent deskilling because of lack of use, they not only sought to maintain their level of proficiency using a variety of strategies driven by their intrinsic motivation but also developed proficiency through actively using their language knowledge and skills. They created conditions conducive to maintaining proficiency, such as reviewing previously learned materials, watching target language films and actively manipulating subtitles, enjoying reading, participating in discussion groups, and using the Internet to communicate in the target language. Implications of the results of this study for foreign language education are discussed.

Keywords: Bi/Multilingual, Motivation, Language Choice, Scholarly Publishing, Chinese/English

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Introduction

Considering the role of English as the language of communication, many EFL contexts, like Taiwan, children receive an English language education beginning in preschool and continuing until they graduate from university. However, it is difficult and demanding to acquire an acceptable command of English because it serves no social purpose in society. Despite all the difficulties, some EFL learners progress their language skills to a functional level above and above what is referred to as the survival level. Nevertheless, it is disheartening to observe that the majority of these learners lose their English language proficiency as a result of lack of use. Naturally, atrophy results from inactivity; for this reason, language deskilling is common and proficiency maintenance is no exception. The field of foreign language education is in urgent need of data-driven studies that aim to uncover and theorize EFL learners' experiences of foreign language proficiency maintenance, even though strategies of foreign language proficiency maintenance are crucial for both EFL teachers and learners. Although there is a minority group that actively and strategically maintains their language proficiency, very little is known as to how they actually move forward. If these useful strategies are identified, it would be helpful to include them into programs for preparing foreign language teachers and open doors for training approaches that support learners' continued proficiency growth and maintenance after they graduate from schools.

Literature Review

Maintenance of Language Proficiency

Even though the focus of this study is on maintaining language proficiency, it would be premature if we do not at first examine language loss and attrition. However, what are the fundamental reasons behind attrition and language loss. Bardovi-Harlig and Stringer (2010) have discovered a few variables related to second language attrition. They contend that language loss is influenced by both extralinguistic and linguistic factors. They also advise taking these factors into account if one wants to keep using their second language. Although these researchers take language attrition for granted, De Bot and Weltens (1995) contend that knowledge is never lost once it is acquired. The only thing that happens to our knowledge once we stop using a foreign language, there is a decrease in language proficiency (De Bot & Weltens, 1995). Foreign language instructors embedding language in a cultural context to stimulate learners' motivation, contact with the community where the foreign language is spoken, and increased exposure to written materials in the foreign language are some of the helpful remedies for language attrition specified by Neisser (1984) and Szupica-Pyrzanowska (2016).

While it is helpful to explore theoretical perspectives on language attrition, the following is limited to a review of empirical findings. Berman and Olshtain (2015) conducted a study to determine which elements of first language affect second language attrition in order to ascertain the impact of first language on second language attrition. They concluded that the interlanguage gained by learners is hardly lost although the attrition of second language aspects, such as lexical items and word-order constraints, is more likely (Berman & Olshtain, 2015). Furthermore, Tomiyama (2000) discovered that within the first 20 months of not being exposed to a second language, there was a noticeable decline in lexical retrieval skills, which is a prelude to fluency loss. From the 20 to 33 months of not using second language, the subject showed attrition in syntax, morphology, and prepositions. Attrition in grammatical morphemes, however, was less noticeable. The subject was nevertheless able to speak spontaneously in spite of these challenges (Tomiyama, 2000).

Yashiro (1992), focusing on returnees, found that they were motivated to continue speaking a foreign language in order to preserve their friendships and connections with friends who lived overseas. Moreover, the parents deemed it crucial to maintain their foreign language skills because they felt it impacted their "personality, value orientation, world view, and human understanding" (Yashiro, 1992, p. 62). Yashiro (1992) reported that attending language classes regularly assist returnees in maintaining their foreign language, but they also provide them the freedom to communicate with foreign students. In a similar study, which aimed at studying long-term retention of French by Dutch students, Weltens et al. (1989) observed a gain in proficiency, despite the fact that subjects had relatively minimal interaction with French in the subsequent years. "General cognitive maturation, further academic training, and continued learning of other foreign languages" were cited as the reasons for improvement in language proficiency (Weltens et al., 1989, p. 214). Their overall proficiency in French did not deteriorate, although grammatical proficiency attrition was significantly higher than lexical proficiency. In addition, Snow et al. (1988) found that in their study participants' receptive skills were kept for a longer period of time whereas their productive skills were lost sooner.

In Schneider et al.'s (2002) study, they discovered that when the experimental group was taught French vocabulary through challenging methods, there were greater improvements when unfamiliar French words were used as responses as opposed to words from familiar English words. Rott (1999) explored the impact of text variation exposure frequency on word retention in order to determine the efficacy of reading on this process. Four weeks after reading the text, the participants exhibited a remarkable rate of retention. Receptive words were more likely to be retained than productive words. Another study demonstrated that learners solidly retained the material in long-term memory when they initially examined it often and then at progressively longer intervals of time. This finding highlights the need of reviewing previously learned topics in maintaining language proficiency. In a similar vein, students who learned Spanish for three years including spaced review were able to recall 72 percent of the vocabulary they had studied fifty years before (Bahrick, 1984).

Garza (1991), using a similar strategy for the development and maintenance of language proficiency, found that watching target language films with captions had a major impact on reading and listening comprehension. Markham (1999) examined the impact of captioned videotapes on second language learners' word recognition abilities in a different study on the topic. Regardless of the video's degree of graphical accompaniment, he discovered that the inclusion of subtitles greatly enhanced adult ESL learners' listening word recognition of the English language. On the other hand, Huang and Eskey's (2000) study found that captions enhanced college-level ESL students' listening comprehension abilities as well, not to mention their growth in vocabulary and overall comprehension (Huang & Eskey, 2000). Valmori's (2014) result showed that teachers maintained their foreign language proficiency through books, summer trips, TV, and movies in the foreign language, the Internet, newsletters from teachers' associations, books, and a national organization called LEND (which organized professional development activities for teachers of various languages).

In sum, the attrition and maintenance of language proficiency have been examined from various angles. Some researchers investigated the attrition in different aspects of language knowledge (Tomiyama, 2000; Bergman & Olshtain, 2015). Conversely, other studies (Arevalo, 2010; Bahrick, 1984; Garza, 1991; Huang & Eskey, 2000; Markham, 1999; Rott, 1999; Schneider et al., 2002; Snow et al., 1988; Valmori, 2014; Weltens et al., 1989; Yashiro, 1992) focused on the methods that support the development of language proficiency. However, none

of these studies examined or conceptualized EFL learners' experience of language proficiency maintenance.

Using Grounded Theory to Explore Learners' Perspectives

Grounded theory is an inductive research process that keeps away from preconceived notions and follows lines of inquiry. It is a research methodology based on participant viewpoints, realities, and experiences. Processes for conducting research, gathering data, analyzing it, reviewing the literature, and developing substantial hypotheses all come from intricate, real-world situations that are not designed to conform to preconceived notions of research. By reflecting back and explaining the real world as it is, as well as by avoiding preconceived notions, grounded theory preserves its integrity (Urquhart, 2013).

As grounded theory does not seek to modify, oversimplify, or disguise the real world as a study setting, it is a suitable research methodology for investigating learners' perspectives. Grounded theory, on the other hand, firmly grounds data collection in the complexity of the real world. Thus, using grounded theory to investigate learners' perspectives from social interactions in intricate circumstances can be beneficial. In order to gain a deeper understanding, researchers might use grounded theory to challenge their own biases and integrate formal research methods with inquiry, experiential learning, and autonomous learning (Andersen et al., 2013). It provides possibilities for researchers to investigate from the learners' perspectives in authentic settings while keeping an open mind to new concepts, theories, and explanations.

Grounded theory also has the advantage of allowing what is important and relevant to the participants to emerge and shape continuing research processes and theory development through its inductive and cumulative cycle data gathering and analysis processes. During the data collecting and analysis phases, research areas from various angles may be determined to be pertinent, and these areas can then be incorporated and further investigated as part of the study. Grounded theory is useful because it goes beyond simple process description. The resulting substantive theories provide an inductive explanation of social dynamics in intricate real-world situations (Cohen et al., 2007). When it is unclear what will be discovered or what will be required to advance the investigation, grounded theory is a useful tool for exploring "uncharted territories" (Dörnyei, 2007, p. 155).

As indicated earlier, the majority of EFL learners face deskilling after leaving language education programs because they rarely have the chance to use what they have learned in EFL environments. Through a grounded theory research approach, this study attempts to theorize the experience of a minority population that actively and strategically maintains and develops their proficiency in a foreign language. Specifically, the present study intends to address the research question, "What strategies do EFL learners use to maintain their foreign language proficiency?", by focusing on the experiences of successful learners in language maintenance.

Research Method

The study adheres to the grounded theory research design, a philosophical field that has its roots in Strauss and Corbin's study (1998). Learners' experiences of maintaining foreign language proficiency was elucidated as they discussed and shared their personal experiences (Giorgi, 1997). The researcher searched for learners who had maintained their proficiency and were willing to share their experience by using purposive sampling (Kruger, 1988). Snowball sampling was used after purposeful sampling to find additional eligible participants. Informed consent from participants was obtained before data collection and analysis for ethical reasons.

Data Collection

Interviews were the main source of information from grounded theory perspective. Charmaz's (2006) suggestions regarding suitable interview questions for grounded theory investigations were followed. For example, in the current study, during the interviews participants and the researcher were regarded as equals (Scott, 2011). Besides leading the discussion, participants chose the interview's time and venue (Birks & Mills, 2012). The researcher asked open questions, without predetermined issues, listened to the participants, let the conversation flow, and enabled participants to share their experiences and viewpoints (Scott, 2011).

In the course of interviews, participants were requested to provide instances of particular events, incidents, and behavior in order to elicit and clarify their experiences, stories, thoughts, feelings, beliefs, and convictions regarding the subject in issue (Welman & Kruger, 1999). The aim of these interviews was to share a common experience or phenomenon of a group of people (Marshall & Rossman, 2011). In addition, to capture what was heard, seen, experienced, and thought in the course of collecting data, the researcher used memoing (Miles & Huberman, 1984). Participant statements were repeated as well to ensure clarity and interpretation. Previous responses from them were used to generate new discussion topics. Data were thoroughly collected until participants' verbalization of their experiences revealed no new strategies regarding how they maintain their foreign language proficiency.

Specifically, the interview questions were asked about participants' learning experiences as follows. They were asked basic biographical questions at the start of the semi-structured interviews in order to contextualize their experiences and gain insight into the demographics of the participants, including their educational backgrounds and past experiences in the classroom. The interview questions thereafter encompassed the participants' journey towards becoming an English language learner, their experiences as a learner, as well as their perspectives and strategies on maintaining their English language proficiency. However, specific questions were also developed in response to the researcher's sensitivity to the participants' answers. Because grounded theory is iterative, the researcher had to switch between data and theoretical categories as they emerged. As a result, interview questions were updated based on participants' responses, and additional questions were posed to elucidate any unclear areas. The interviews each lasted roughly forty minutes. Every interview was audio recorded. The interview data were verbatim transcribed.

Data Analysis

Given the importance of English language proficiency among English learners as well as the requirement to fill the gap in the literature stated in the preceding section, grounded theory is an ideal methodological choice. Grounded theory is referred to as "the discovery of theory from data obtained systematically from social research" (Glaser & Strauss, 1967, p. 2), making it a preferable research method for reflecting the ever-changing reality of psychosocial processes. Using grounded theory as an approach can aid in understanding how EFL learners maintain their English language proficiency.

As a result, the data were examined using a ground-theory technique, first with an open coding system and then with an axial coding system. The interview data were coded through recursive interpretations of the data by circling and underlining participants' words and phrases linked to reoccurring subjects that emerged. Following that, the primary phenomena (the axis) and the other features and dimensions surrounding it were identified by connecting the codes and organizing them into distinct probable main themes.

In other words, data analysis was a continuous and iterative process. In this study, important points were selected and designated with different codes based on the participants' transcriptions. Following their mutual cross-checking of each other's codes after the first wave of coding, the researcher and research assistant created a refined list of codes that was used for the second phase of coding. To determine whether there was a high degree of agreement between the researcher and research assistant, they cross-checked each other's codes after the second round of coding. All of the codes were covered by the categories that were created during the additional analysis. The codes or themes that emerged that demonstrated the maintenance of foreign language proficiency were revised and altered to be consistent with the memos that went along with each interview.

Results

Self-Study

Participants who left language training in schools attempted not only to retain their level of proficiency but also to increase their language skills through self-study. Because they felt that self-study allowed them to reap the benefits of their efforts, several of them thought it was more engaging than the classes they took to advance their skills. Additionally, self-study allowed the participants to shift from contrived conversations to more authentic communications. One of the participants elaborated on the benefits of self-study as a means of maintaining proficiency:

> I engaged in a variety of self-study activities to maintain and enhance my language knowledge and skills. I played an active role in generating language development-friendly environments. In language classes, I used to be limited to contrived materials, but now I have the opportunity to use authentic materials designed to communicate with native English speakers. I began with children's story books, then moved on to teen novels, and then to general novels. Also, I began by watching movies with subtitles in the target language and gradually moving on to watching movies without subtitles.

Self-study language learning is more flexible than traditional language training since it can take on a variety of forms based on the interests, likes, and dislikes of the individual participants. The following below further explains some of the various ways that the participants conducted their own self-study.

Reviewing Learned Materials

Participants stated that reviewing previously learned materials helped them maintain and even improve their language skills. They also regarded that reviewing what they had already learned helped them transfer their knowledge to a subconscious level. More specifically, they laid the way for automated use by repeating what they had learned. Participants saw reviewing as a means to an end of automatic language use. For example, one of the participants explained how he reviewed previously taught materials:

> Usually, I go over the information I have already studied. I reviewed a course book this month that I studied for my language course. This course book contains 12 chapters. I read the book at least three times and listened to the dialogues as I went over one chapter every day. I was able to retain what I had learned and apply it more easily after listening to the material several times.

The participants reviewed the topics they had covered to get ready for exams in addition to the textbooks they had studied during their formal study in schools. Another example comes from a participant who explained that reviewing previously learned materials is a good way to maintain proficiency:

> Because the university entrance exam is a nationwide test, I had to study lots of materials to improve my grammar, vocabulary, and reading comprehension. I had to spend a lot of time learning these materials. Knowing that if I do not study them, I will forget them sooner or later, so I go over what I learned for the university entrance exam on a regular basis. I believe that reviewing is the best method for me to improve my language skills.

Watching Target Language Films

Participants stated that watching animations allowed them to discover how the words and grammatical structures they had learned in course materials used to exchange meaning. They also particularly indicated that cartoons and animations were superior to movies because they generally cover more common topics and language use. One of the participants explained how cartoons helped her learn language:

> Cartoons allowed me to discover how basic words and structures may be utilized to construct an imaginary world in addition to describing what happens. Furthermore, I learned from watching cartoons that it is more vital to use words creatively than to just memorize meaningless words.

When watching target language films, participants manipulated subtitles in various ways to enhance their listening comprehension. Some participants preferred subtitles in the target language, while others chose subtitles in their mother tongue. More specifically, whereas some people listened to and followed the subtitles rigidly, others were more flexible in their use of subtitles. One of the participants explained how subtitles helped him retain and enhance his proficiency:

> I feel I should use subtitles with caution. Excessive use of subtitles might have a negative impact on my listening ability as I would get used to subtitles. Listening is indeed challenging. I usually turn on subtitles before watching a movie. Then I try watching the movie again without subtitles since I feel reading them may divert my attention from listening to reading.

Joining Discussion Groups

Finding friends and groups with similar language proficiency and interests allows for effective interpersonal communication, according to participants. Group discussions provide a unique opportunity in EFL environments where English is not commonly used for social purposes. Group discussions were a motivating opportunity for them to share news and ideas. One participant highlighted the benefits of joining discussion groups.

> Joining discussion groups pushes me beyond my current level of proficiency. During a discussion, it is normal to take sides. Choosing a side is simple, but presenting supporting data well is tough. Despite the challenge of persuading people, the experience enhances my thinking and critical skills.

It is noted that some of the higher proficiency participants engaged in open talks, while lower proficiency participants tended to engage in discussions on pre-selected themes. One of the participants shared the following below about her experiences in open-ended classes:

> I tried my best to memorize the words, idioms, and phrases associated with the topics while also expanding my understanding of it because the topics were predetermined. I aimed to apply the knowledge I knew before the talk. This strategy allowed me to continue sharpening my skills while also providing me with the opportunity to maintain the level of proficiency I had attained. I think my level has significantly increased after I completed the formal language training in schools.

Reading for Enjoyment

Participants considered reading for leisure more enjoyable than reading materials for the purpose of testing language proficiency. Furthermore, they considered that the frequent comparison of their levels with one another made language learning stressful. Because learners had to read to meet test requirements, it was even more stressful. One participant explained why reading for pleasure is beneficial.

> Here I decide what to read what not to read. In addition, I read at my own speed. In the past, the texts we studied were either too complex for me to understand or unrelated to my interests. But now, when I have free time, I select a story from a list of graded readers and read it stress-free at my own speed. There are no comprehension tests or final exams, so I continue reading without worrying about unfamiliar vocabulary.

On the other hand, participants preferred reading for enjoyment. They regarded that reading for enjoyment allowed them to read in their original language and pursue their interests. When reading in this mode, readers actively interpret words and phrases based on their prior knowledge. One participant emphasized the impact of background information on motivation to read.

> Previously I was required to read pre-written texts in language classes that I knew nothing about. Currently I pursue my own interests. I listen to the news every day because I find it to be quite interesting. It is not difficult at all for me to read the news in English because my comprehension of the texts primarily relies on my prior knowledge. This increases my chances of correctly interpreting unknown words and understanding the text's content more quickly.

Using the Internet

Participant also stated that people could be inspired and helped to learn English due to the ease access to Internet and the growing quantity of web-based English courses. Chat rooms can be accessed via the Internet as well. In this case, two or more people can talk online on a range of subjects or problems. Learners can ask questions and get responses in online forums and social media platforms. For instance, using the Internet to sustain and advance her English skills, a participant said:

> Participating in the online discussions in the chat rooms allowed me to enhance my language proficiency. In addition, the need to communicate forced me to work on my grammar and vocabulary. The most fascinating thing about the Internet, though, is that it is the most economical way to communicate with people.

While textbooks are primarily intended for language instruction, the text and chat given on the Internet are message-oriented. That is, materials obtained on the Internet are not intended to teach language skills. Rather, they convey useful knowledge. Taking the information-function of online materials as an example, one of the participants stated:

> I am familiar with the dietary pyramid already. However, the online lectures and literature on this topic are far more intriguing, up-to-date, and packed with information. I read these resources to maintain and enhance my language proficiency while also making dietary improvements. Rather than for social interaction, I personally use the Internet primarily for information communication.

Discussion and Conclusion

In light of the results, the participants in the study employed a variety of strategies to maintain and advance their language skills. However, these strategies were mostly derived from their intrinsic motivation or drive. This finding supports Yashiro's (1992) and McEown et al.'s (2014) studies that learners' motivation and attitude, rather than their age and proficiency level, are more important factors in maintaining language proficiency. It also confirms the findings of Gardner et al. (1985) that learners who heldintervery positive views throughout the non-use period had a little decline in their speaking abilities. Reviewing learned materials was a prevalent method used by the participants. Similarly, Bahrick (1984) discovered that approximately 72% of the materials they had studied fifty years ago were remembered as a result of the review process. Furthermore, the participants in the study discovered that watching

target language films and purposefully changing the subtitles was a good way to maintain their language proficiency. Similar findings were made by earlier research (Markham, 1999; Peter, 2003) which showed that watching movies with subtitles improved learners' reading skills and boosted their vocabulary following extended exposure to the target language captions.

Moreover, the participants in the present study employed discussion groups as an additional effective strategy to enhance and maintain their language proficiency. However, Yashiro's (1992) study's participants spoke little to foreign acquaintances or those who were fluent in the language. The other strategy that was investigated involved reading for enjoyment, which helped the participants learn accurate facts about the outside world. Similar to the participants in the present study, in Rott's (1999) study, the participants discovered that reading for enjoyment facilitated in the development of their factual knowledge. Furthermore, the perceptions of the participants in the present study regarding the Internet use are consistent with those of the Hoven's (1999) group. Both groups felt that using the online communication tools improves their ability to communicate.

While maintaining language proficiency may not be the biggest concern in an ESL context, it is crucial in EFL contexts, such as Taiwan, where English is not used for social purposes. More precisely, in ESL environments, language proficiency can serve as the primary means of social and informational communication once it has been achieved. However, once acquired, language proficiency is often useless in EFL settings. Therefore, language learners are likely to gradually forget all they have studied. It should go without saying that atrophy results from inactivity. Learners should establish environments that support language growth and maintenance in order to prevent this happening. Despite the fact that most language learners deskill due to lack of use, the participants in the present study actively used their language knowledge and skills to maintain and improve their level of language proficiency. For this reason, the findings are helpful to learners who have developed their language proficiency in an EFL context and are looking for strategies to help them maintain and improve their language skills, and teachers who are interested in helping students become aware of the consequences of atrophy and lack of use.

Pedagogically, the present study provides important implications for foreign language courses and similar multilingualism programs. First, when learners are at the stage of studying in schools, it is important for teachers to help learners develop autonomous learning, which is not only critical in enhancing the results of multilingual education but also crucial in continuing their studies beyond graduation (Reeve, 2016). In particular, teachers for example can ask learners to think of different ways of using the language in future opportunities. Learners are generally more motivated to learn a language when they can make the connection between what they have learned in the classroom and how they could use this knowledge to meet their requirements in the real world in the future.

Second, in view of the significance of foreign language education in augmenting learners' proficiency in the target language, teachers ought to endeavor to enhance learners' curricular experience by fostering a positive classroom environment and fusing instruction with leisure. Jiang and Dewaele (2019) note that teachers are the ones who would most likely initiate learners' interest in foreign languages. Hence, it is critical to support teachers in emphasizing entertainment as a means of enhancing their pedagogical skills. Learners may be more inclined to sustain their learning efforts when they enjoy the process of studying a foreign language. As a result, ways to make such courses and programs more sustainable could be developed.

Finally, teachers can also provide choice and decision-making opportunities to create a sense of accomplishment for students and make them feel autonomous to learn. They can deliver the message, for instance: “I am your ally; I will help you; I am here to support you and your strivings” (Reeve, 2016, p. 130). This sense of achievement in turn might boost leaners’ drive and desire to study harder in the future.

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Narratives of Physics Teachers Using Virtual Simulations: Basis for In-Service Training Workshops

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Abstract
This narrative inquiry study aimed to understand, investigate, and interpret experiences of physics teachers when using virtual simulations. The participants were chosen using purposive sampling techniques. The data was gathered through an initial survey and face-to-face interviews that followed an interview protocol. Creswell's data analysis and interpretation were used to generate themes from the verbatim transcripts of participants. Five themes emerged from their experiences: First, Novice Explorers, which shows the teachers' ability to explore the virtual simulation. Second, essential and efficient strategy, indicates that teachers have found that using simulations with students is a good teaching strategy in which students actively participate in the teaching and learning process. Third, the challenges of utilizing simulation, which points out the difficulties that physics teachers face when using simulations. Fourth, externalizing difficulties, shows how teachers manage the challenges they encounter in employing virtual simulation in the classroom. Lastly, unexpected outcomes and delightful stories, outlines the positive outcomes and realizations of teachers with the simulation. The findings provided insights for the basis of the matrix of activities for the in-service training workshops for secondary teachers. To conclude, teachers needed in-service training that would enhance the values and technology integration inside the classroom to properly implement the virtual simulations and improve their knowledge and skills. Given the limitations of this qualitative study, quantitative research is recommended as the next step in developing a comprehensive intervention to assess the effectiveness of virtual simulations in the teaching and learning process.

Keywords: Physics Teachers, Virtual Simulations, In-Service Training, Workshops, Narrative Inquiry

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Introduction

The significance of incorporating technology into education and using educational technologies in the teaching-learning process is widely accepted in the field of science education (Inchik, 2022). Teachers, particularly science teachers, are integrating technology into their classrooms these days. Technology in the form of interactive simulations is one of the available resources that can and is being used to ensure that students develop conceptual understanding in science, particularly in physics (Osborne & Hennessy, 2003).

Virtual simulations are software programs that replicate the basic components of the real world to provide controlled learning environments (Colace, De Santo, & Greco, 2014). As a type of educational technology, digital simulations demonstrate a promising future as a student-centered learning tool in an active learning environment (Krajcik & Mun, 2014; National Science Board, 2018). If used properly, it allows students to engage in scientific inquiry and solve complex problems through observation, investigation, reconstruction, and collecting and analyzing large quantities of data in a short period of time (NGSS Lead States, 2013).

Although technology seems ubiquitous in today's classrooms, debate still exists about how teachers can best use digital tools to support student learning (Evans, 2019). Nonetheless, there is still little research on science teachers' perceptions of these digital tools. Existing research has revealed that teachers rarely use these digital tools (Alneyadi, 2019; Hechter & Vermette, 2014; Maharaj-Sharma, Sharma & Sharma, 2017). Because teachers are frequently the key determinants of whether and how digital tools are used in the classroom, it is important to investigate why some teachers adopt them while others do not.

Despite teachers' increasing use of interactive simulations, it was discovered that there is still debate about how teachers can effectively use digital resources to increase student learning in physics classes, as well as a lack of appropriate training on how to use a specific application. Under these conditions, this study investigated the physics virtual simulations used by teachers and focused on understanding their stories when using virtual simulations. The results of this study were used in designing the types of in-service training workshops that are required for physics teachers.

Methods

This study utilized the narrative inquiry method to understand, investigate, and interpret the experiences of physics teachers using virtual simulations. The participants were seven (7) junior and senior high school physics teachers in four public secondary schools in one of the municipalities in the fifth district of the province of Iloilo, Philippines. They were purposively selected for an in-depth interview with inclusion criteria provided.

A preliminary survey was conducted with the use of a validated researcher-made questionnaire regarding the virtual simulation employed by the physics teachers in the municipality. To determine which virtual simulations the teachers employed, the researcher used a frequency count. Following the initial survey, an in-depth interview was conducted using a validated interview protocol. The participants were given informed consent before participating in the study, including their right to withdraw anytime in the research process, right to privacy, and confidentiality. The real names of the participants were replaced with a pseudonym in the presentations of the stories.

The data collected from the participants were thematically analyzed following the procedure of Creswell's book (2009) data analysis – (1) Organizing and Preparing Data for Analysis, (2) Reading Through All Data, (3) Coding the Data, (4) Coding Process, (5) Interrelating Themes, and (6) Interpreting the Meaning of Themes.

Results and Discussion

Virtual Simulation Employed by Teachers in Teaching Physics

The initial survey of virtual simulations used by teachers in teaching physics included fourteen secondary science teachers from one of the municipalities in the fifth district of Iloilo. A frequency count was used to determine which virtual simulations employed teachers in teaching physics. In the preliminary survey, it was found that 40% used Physics Education Technology (PhET) Colorado, which is the most commonly used virtual simulation among physics teachers. 20% of the teachers used both PhEt Colorado and Physics Classroom, and 6% of teachers checked the form in Physics Classroom alone. In addition, 7% of the teachers checked for others in the survey form and attempted to use the Department of Science and Technology—Philippine Nuclear Research Institute (DOST PNRI) simulation, and 27% of the teachers checked that they never used any virtual simulations in teaching. They are usually teachers who have been in service for a certain number of years and will be retiring soon. Figure 1 shows the most commonly used virtual simulation by teachers based on the initial survey.

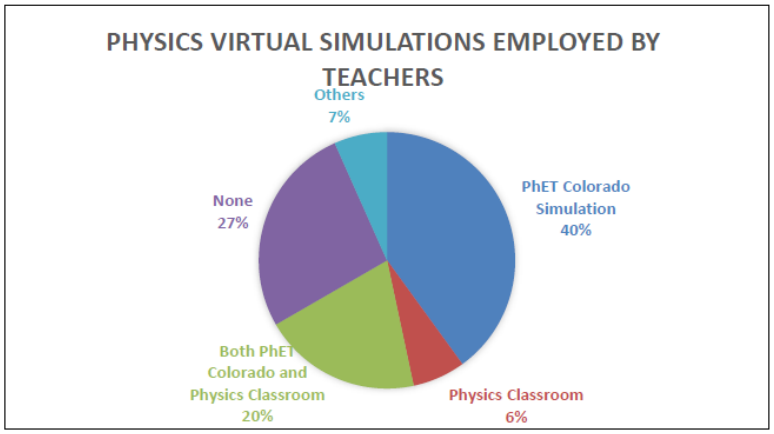


Figure 1: Physics virtual simulations employed by teachers in teaching physics from the initial survey form.

Furthermore, seven participants took part in an in-depth interview about their experiences with virtual simulations. According to interviews, the most commonly used virtual simulation is PhET Colorado, followed by Physics Classroom.

The PhET simulation project was founded in order to improve the way science is taught and learned around the world through the use of free interactive simulations. Banda and Nzabahimana (2021) study recommended incorporating PhET simulations into physics teaching and learning. They provide a powerful interactive visualization and animation teaching aid to improve students' conceptual understanding of physics.

Experiences of Teachers in Using Virtual Simulations

The narratives provided insights into the lived experiences of physics teachers who used virtual simulation. The text was generated from audio recordings of in-person interviews. Transcriptions were completed and returned to participants for member checking to ensure accuracy. Member checking was done by checking in with the research participant about the validation of information by checking the accuracy of their statements and reviewing the transcript. According to Creswell and Creswell (2018), all qualitative study participants agreed to member checking, which is one of the strategies to ensure internal validity and involved taking the data back to them for their verification.

There were five themes that described the lived experiences of teachers. These themes highlight the physics teachers' stories about their experiences with virtual simulation. Table 1 shows the themes together with their subthemes that were identified from the narratives of the physics teachers using virtual simulations.

Table 1: *Five Identified Themes from the Narratives of Physics Teachers Using Virtual Simulations*

Theme	Subthemes
Novice Explorers	Average Users
	Exploring Ability
Essential and Efficient Strategy	Interactive Engagement
	Commendable Application
	Effective Understanding
Challenges of Utilizing Simulations	Intermittent Connectivity Issues
	Shortage of Materials
	Embracing Patience and Sacrifices
	Experiencing Technology Gaps
Externalizing Difficulties	Activating Creativity
	Ways of Compensating
Unexpected Outcomes and Delightful Stories	Students' Feelings of Joy and Wonder
	Teachers' Sense of Fulfillment

Novice Explorers

Exploring something without adequate training or limited knowledge about it is difficult to manage. When it comes to simulation, the participants admitted that they are not experts because it is still new to them. And they are considered novices, specifically novice teachers. Farrell (2012) suggests that there is no clear definition of a novice teacher. However, he emphasized that novice teachers could be anyone who first teaches something new. There was no universal agreement on how long the teaching period was required to complete the novice stage.

As novice explorers, teachers considered themselves *average users*. Teachers' use of technology is an important part of their professional development as educators; however, not all teachers are born to be experts or literate in this new teaching trend. Most of them admitted

openly that there are numerous things they need to learn in order to become experts in this field. When given the opportunity to rate themselves on a scale of 1 to 10, with 10 being considered expert, they chose 7 and 8.

> *"Maybe from 1-10, it seems 6 or 7. Even me, I'm still exploring. I am not that expert user."*

> *"Actually, I could rate myself maybe average. Not necessarily that good."*

> *"Maybe 8 for the reason that remaining 2, I did not explore yet other topics that I will be using."*

Teachers' *exploring abilities* in the simulation allowed them to learn something new, which improved their skills. They are open to change and to new teaching skills, as learning never stops for teachers.

> *"Still learning, of course when you teach you should one book ahead to your students. You should explore it first."*

> *"Of course, if you are familiar on it, you should explore it with yourself."*

Prensky (2001) found that the teachers in charge of educating the Z generation (students) are digital immigrants. Digital immigrants are people who were not born in the digital world but have adopted most aspects of new technology at some point in their lives. They, like the participants, are examples of digital immigrants, albeit inexperienced. They do, however, attempt to adopt and learn the simulation for students.

Essential and Efficient Strategy

Teachers utilize virtual simulations to motivate students to be active and engaged in the lesson, making class discussions more interactive. Teachers revealed that there is *interactive engagement* among students in the teaching and learning process with the use of virtual simulations. Student engagement is defined as students' level of interest, how they interact with others in the course, and their motivation to learn about the topics (Briggs, 2015).

> *"For me, the way when we use virtual simulations activates... attention and participation of students in any topic...they learn because they are actively engaged in teaching and learning process as we discuss they are actively participating in the discussion."*

> *"They're quite interested and then they are active when it comes to analysis of the questions. They're very active participants."*

All of the participants commended the fact that virtual simulation is a good instructional tool for teaching physics. Thus, it is considered a *commendable application* since students can visualize the concepts in physics presented in the simulations, even the in-depth topics.

> *"They can clearly see and hear what you're trying to discuss on them."*

> *"There are given the chance to manipulate, they can see the changes in variables. If there are changes in variables, what is the effect, where are the changes… There are some topics in physics where you cannot touch, you cannot see or do anything. So very applicable since it simulates and is really close to actual (representation), so a big help for them."*

Teachers concluded in previous subthemes that using virtual simulations made students engage well in class and listen well because they focused their attention on the simulation. Students learned physics concepts, even on complex topics. Thus, virtual simulations are used for *effective understanding* of physics concepts.

> *"I mean the learning, since most of the concepts in physics are more imaginary and non-tangible. So, if we have this simulation, you could* give them a *more tangible experience, so they have an in-depth understanding with the use of simulations."*

> *"And then they can define... They can define the terms by simply observing. Through simulation they can define terms."*

The preceding narratives are also anchored in constructivism, an instructional philosophy based on the theoretical belief that student understanding is constructed through the reflection of personal experiences. The ability to act out constructivist theories toward knowledge acquisition is more easily facilitated by using computers to help students experience concepts. According to constructivists, student learning is an active process in which students construct new ideas or concepts based on their current and prior knowledge (Kearsley, 2002).

Challenges of Utilizing Simulations

Among the benefits of simulations for student learning, teachers encountered a variety of challenges when using simulations, including both physical and emotional challenges. The *lack of resources, such as gadgets and internet connectivity problem*s, and how they *embrace patience and sacrifices in dealing with simulations and experiencing technological gaps*.

The development of the teaching strategy in this modern world, like the simulation, requires an internet connection. Though other simulations have offline features, there are still activities that need a connection to the internet in order to download them and sometimes to update the application. The majority of the participants' experiences are based on a poor internet connection, particularly when dealing with the simulation.

> *"It is really difficult if there is no internet connection. You know, there are features that you need online access, you need to download. Given our location here, it is really challenging to get internet access."*

> *"Actually, it's quite challenging because you know Internet connection here. It's not that very very accessible."*

> *"In my experiences. Sometimes the way we play the simulation is quite difficult. There are instances that the simulation will not take in(log)."*

According to Azcarraga and Peña (2019) internet connectivity remains a problem in the Philippines. Despite the government's increased efforts to improve connectivity, current

Internet and smartphone penetration rates are well below target, which is thought to be due to institutional rigidities. The Philippines formally connected to the Internet in 1994, but the Internet remains largely problematic even today. Data revealed that the Philippines is one of the world's lowest-ranked countries in terms of Internet speed, Internet accessibility, and information sharing (PIDS, 2016).

Moreover, the participants encountered difficulty employing the simulation because of the unavailability of learning tools or devices at school that could enhance teaching and learning. In previous research, the Department of Education (DepEd) has proposed reallocating funds from projects and programs from the maintenance and other operating expenses (MOOE) budget and putting pressure on the special education fund (SEF) of local government units (LGUs) as a counterpart to support the effective implementation of blended learning in the country. They also emphasized that the assistance of various stakeholders is critical in assisting learners, particularly those who cannot afford to have all of the facilities (Ronda, 2020).

> *"Usually, the problem here is the availability of material. Plus, due to the number of students, we have insufficient computers compared to the number of students."*

> *"And challenging also because not all of our learners have the laptop or cell phone. Lack of available gadgets for the learners."*

Despite the positive aspects of technology, teachers face a hidden challenge. Every teacher has a unique experience in terms of how much patience and sacrifice they have made in their career. Nonetheless, when dealing with simulations, participants revealed common sacrifices and patience.

> *"But the problem is that sometimes it is really difficult to give instruction, and there are students that are really left behind."*

Teachers' experiences with giving instructions to students really require a great deal of patience. Patience is more than a virtue for teachers; it is a part of the job. Teachers, like most people, will have pet peeves and annoyances, probably more so than in most other professions. The real answer to how teachers can develop patience is to accept that things change on a daily basis and that not everything will always go your way (Incompassing Education, 2022).

Also, teachers' preparation for the simulation, on the other hand, is also a significant challenge for them that could affect their self-esteem.

> *"If you are a fresh graduate, then you need to teach right away. Then try to imagine their age and the fact that you have a really close age gap. So, I need to try that at least I will give the best for them, especially in physics since they are STEM students."*

The teacher's self-esteem in delivering the lesson is important. According to Mbuva (2017), self-esteem is an important component of the development of both teachers and students, who interact in a variety of capacities on a daily basis. Teachers' self-esteem would be linked to self-concept as well, because self-concept is based on how we think and evaluate ourselves (Brookover, Thomas, & Paterson, 1964; Rosenberg, Schoenbach, & Rosenberg, 1995). Educators have a self-concept when they are aware of who they are. Unfortunately, teachers who have a distorted self-image may become incapacitated in their teaching career.

Aside from the patience and sacrifices teachers have made with this new teaching strategy, there are still technical errors and gaps in technology that they have admitted are difficult for them at times and that they do not know how to fix.

> *"I am one step behind the use of technology. And I have a lot of things to do. I have a lot of things to learn to be on what is called this latest trend in teaching."*

> *"There is a time when I experience technical difficulty or a technical problem, and I don't know how to fix it."*

Participants' statements about how they experience gaps with technology, wherein they admitted that sometimes they still have flaws in terms of technology, revealed that their sense of self-efficacy is low, which has a negative impact on the teaching and learning process. Self-efficacy is an individual's confidence in his ability to complete a task or action required to achieve a specific result (Bandura, 1997). In fact, teacher self-efficacy is a central phenomenon that can be viewed as one of the contributors to the learning process and effective teaching.

Externalizing Difficulties

Teachers are expected to be *resourceful* with all tasks assigned to them. Resourcefulness is the way of devising means. Being resourceful necessitates more cognitive ability. It is necessary to be able to process information both emotionally and intellectually (Jaleco, 2021). Likewise, teachers did their best and really activated their skills and thought of a solution to the problems they were experiencing due to a lack of physical facilities. They used existing resources to create something they needed for implementing quality physics teaching, particularly through simulation.

> *"Back to the basics, ma'am: whatever is available in offline features, those are the things I am using."*

Aside from using offline, other participants have the same ways of utilizing the available gadgets that can be found at their school just to employ the simulation, which can be called *innovative teaching*.

> *"I sometimes borrow projectors from other teachers. And then there is the time when I swap classrooms with a teacher who has a TV. I am the one who demonstrated."*

> *"So, what I did was provide a guided question-and-answer portion of instruction for the student. I am the one who demonstrated the simulation. Then, just like in a guide, there are continuous questions. The result is like an activity, only that I am the one who operates... then they just observe it."*

Besides from being creative in overcoming the lack of equipment at their school, participants also had ways of compensating, like using multi-lingual instruction, grouping students, being patient, and guiding or helping their students. Teachers also become more adaptable in their teaching strategies in order for the students to easily catch up on the activities' lessons.

> *"It is necessary that you repeat it for them. English instruction is not effective for them, yet they like their mother-tongue language."*

> *"So, I tried at some point. I actually tried having the students in groups; you know, half or 1/3 of the class will have a class first, and then the other will have a break ahead or something like that. At least the class size is small when they watch the simulation. They can focus well."*

> *"I think I handled those problems, uh, with utmost patience. Having that kind of internet is really difficult for us."*

> *"Teach them how to use the computer first. You know, ma'am, that we live here in rural areas. It is necessary to give guidance to them. Like, you open this, you go there, and you should be there to guide them (in using the simulation)."*

Based on the above narratives, the participants are regarded as flexible teachers. The ability to use a variety of teaching techniques and strategies is referred to as flexibility. This skill is also useful in the classroom when the teacher needs to change his or her plans for the day for a variety of reasons. Under certain conditions, a flexible teacher can make changes to the plan (Eder, 2010).

Unexpected Outcomes and Delightful Stories

A teacher's happiness comes from watching his or her students learn, unlearn, and relearn while having fun. Though teaching requires extensive preparation on the part of teachers, when they see positive results in their students' learning, all of their efforts are literally rewarded. Teachers are overjoyed to share that their students enjoy the virtual simulation. This is one of the reasons why they continue to learn and explore simulations even though they have no training in this field, because most of them discovered that their students were captivated by the activities presented in the simulation, where they *felt joy and wonder*.

> *"They really enjoy it. When you get their attention, there is no need for you to be angry. And that is the best part. You know, when it comes to computers, it is new to them. They are amazed."*

In this sense, educational enjoyment can be defined as the joy of learning when a student believes he or she can value the content and manage and complete the activities that are presented to him or her. As a result, enjoyment is regarded as critical for later satisfaction, which supplements academic success (Ainley & Hidi, 2014).

Furthermore, the participants' stories reveal an important event in their lives that had a significant impact on their teaching method as well as their professional development as teachers. They never imagined that teaching something to students without adequate training and abilities would result in positive outcomes in the students' learning. Most of them learned and studied the simulation at their own pace, which is known as *self-learning*, no training was provided by the administration. Teachers still felt successful because they used simulation with students with their own might.

> *"Self-learning only. So that when your principal is trying to observe you for class, you have a classroom observation. You can say that your breath and confidence are better if you are using this one (simulation). That is the reality. In order to be one step ahead and to let them see that you are not settling on the levels of knowledge that you have, you have to show them that this is the latest trend in technology in education."*

A teacher's responsibilities and roles as a leader, counselor, tutor, manager, and team member are extremely difficult. Job satisfaction, according to Kumari (2008), is the sense of fulfillment and pride felt by people who enjoy their work and do it well. Job satisfaction is also the extent to which a job provides the worker with gratification, actualization, and enjoyment. Job satisfaction can also refer to how satisfied a teacher is with his or her success in meeting career goals and expectations (Heller, 1988).

Figure 2 below was created and established to visually explain how participants explored their experiences with simulations. This is known as the schematic structure of physics teachers' experiences with virtual simulations. The important details being investigated in this study distinguish each structure. After all of the narratives were identified and analyzed, the rectangle shapes represented the five emerging themes. The oval shapes represent the sub-themes found within each theme that occurred. And the black lines represent the themes in order of how the teachers arrive at unexpected outcomes based on their experiences that fulfilled them in using the virtual simulation.

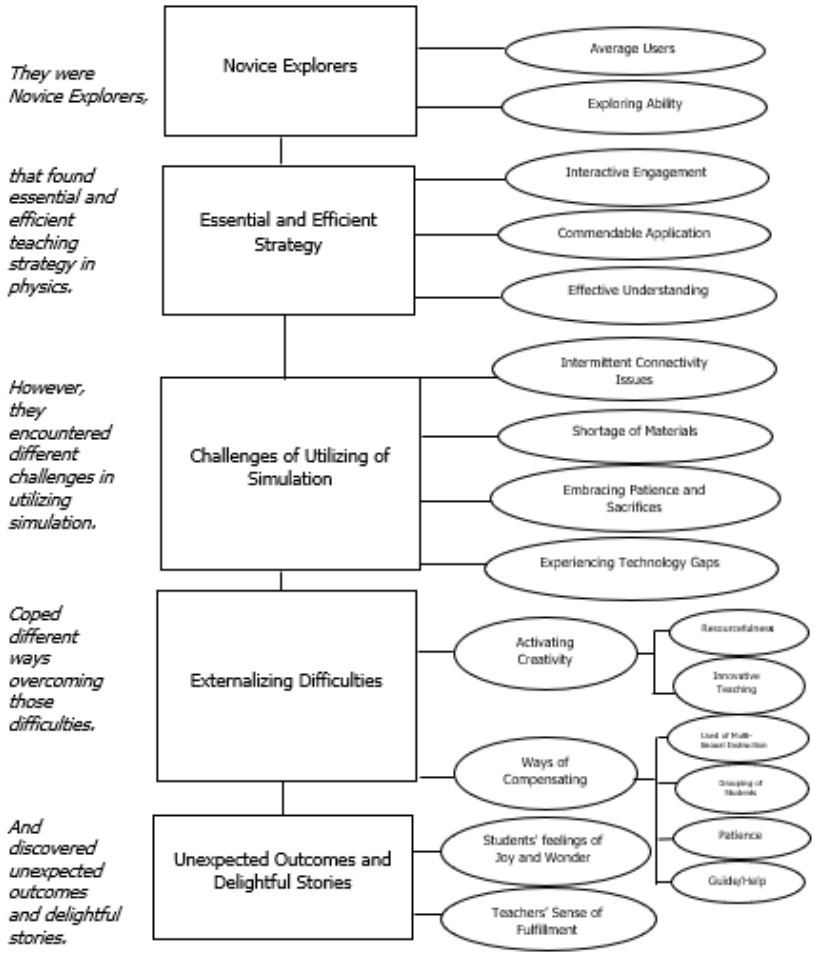


Figure 2: The schematic structure of physics teachers' experiences with virtual simulations.

The participants' life experiences were enhanced by narrative inquiry. They have proved that if you are determined to use or explore something for student learning. Their untold stories were highlighted and are now being heard as the basis of in-service training workshops for secondary teachers.

Training Workshops for In-Service Science Teachers

A three-day in-service training workshop on ICT and values integration is designed based on teachers' holistic experiences, with a matrix of activities and topics included in the workshops to strengthen teachers' virtual simulation skills and knowledge. This carefully designed 3-day training workshop is divided into sections: (1) *Identifying Information*, (2) *Rationale*, (3) *Objectives*, (4) *Working Committees*, (5) *Methodology*, (6) *Expected Outputs*, (7) *Matrix of Activities*, and (8) *Budgetary Requirements*.

This in-service training workshop is titled: 3-day district training workshops on values and technology integration to improve teachers' knowledge and skills in using virtual simulations as a teaching strategy. This training workshop was a great assistance to science teachers in improving their teaching strategy as well as their lesson planning skills with the incorporation of simulations and the integration of values inside the classroom. The training design was validated and evaluated by three experts in behavioral, content, and curriculum. And it was already copyrighted by the researcher in the intellectual property office of the Philippines.

Conclusions

The results of the study give insights that the Physics Education Technology (PhET) Colorado simulation is an effective virtual simulation used by secondary physics teachers in the teaching and learning process. Their experiences revealed that a transformation is possible to adjust their current situation of using virtual simulations as a new teaching strategy to supplement the learning needs of 21st century learners. To conclude, incorporating virtual simulations into the classroom is a truly effective teaching strategy for teachers in teaching physics as well as a significant aid in improving students' conceptual understanding. Thus, teachers needed in-service training that would enhance the values and technology integration inside the classroom to properly implement the virtual simulations and improve their knowledge and skills.

Based on the results of the study, the researcher recommended that the Department of Education allow for the adaptation of simulations in the curriculum as a virtual laboratory for teaching in-depth topics in science. The Department of Science and Technology should use this study as a foundation for future research or investigations into digital simulations. IT professionals should create more simulations that do not require internet access to perform a specific activity. Local Simulation Designers and Filipino simulation designers should create local offline simulations for use in classrooms so that teachers are not dependent on American-based online simulations. The PTA and other school stakeholders should hold a mandatory meeting at least twice a year so that they will know what facilities and resources are lacking at the school; this could also strengthen the partnership between the school and stakeholders. In-service Teacher coordinators should consider looking into the results of the study. It would be beneficial if the researcher-created in-service workshops were considered and supported in the implementation of the 3-day in-service training for science teachers. Physics or science teachers should attend and participate in the implementation of the in-service training workshops. They will be given the opportunity to learn about other offline simulations that could be used in science classes. Learners should be familiarized with the features of the simulations used in the classroom. Given the limitations of this qualitative study, it is also recommended that quantitative research be conducted as the next step in developing a comprehensive intervention to assess the effectiveness of virtual simulations in the teaching and learning process in public schools.

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Service Learning in Business Education: Expectations and Reality

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Abstract
Service learning (SL) is an education approach that embeds community services elements in formal learning curriculum. It aims to develop students' empathy, sense of global citizenship, soft skills, and disciplinary knowledge at the same time. Success cases of service learning subjects across the globe, including cases from Chile, South Africa, India, Hong Kong and many other places, are reported and cherished by academics. However, these courses are often offered by engineering, social science and health related faculties, while successful and sustainable business service learning courses appear to remain limited. This paper traced the validation process of a service learning course initiated by a business school in Hong Kong which students were proposed to conduct applied business research for non-profit organisations (NPOs). With a thematic analysis of documents arose from 17 rounds of revision in a 29-month period, this paper aimed to explore the expectation gaps between the business faculties who developed the service learning course, and reviewers involved in the internal and external screening, and the university's validation process. The results suggested that business faculties and reviewers held very different views in students' ability and choice of service partners. Furthermore, the results revealed that the reviewers held diverse understanding towards the service recipients during the review process. Our findings highlighted the different epistemic beliefs about service learning held by different parties and provided practical insights in setting up service learning courses in business related disciplines.

Keywords: Service Learning, Business Education, Applied Business Research

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Introduction

Service learning curriculum places equal emphasis on service and academic learning elements in an education programme (Sigmon, 1994). In a service learning course, students are expected to apply their academic learning during a service to the community. Service learning courses benefit students' cognitive skills, leadership skills, social skills and civic responsibilities (Godfrey et al., 2005; Moorer, 2009; Sivan et al., 2023). Although this concept could trace its origins to the 1960s (Sigmon, 1979), service learning is still gaining a lot of attention in recent years.

Nowadays, a successful business is not purely defined by how well its financial goals are met. Instead, governing bodies, investors, consumers and employees increasingly emphasize a company's environmental, social and governance (ESG) attributes (Deloitte, 2021). This means that business decision makers should be able to bring positive impacts to their business while addressing serveral global challenges, for example, climate change, increasing inequality, and other societal needs. In this sense, calls for changes in business education to reflect global challenges and build sustainable society are becoming more common (e.g. Kolb et al., 2017; Elmassri et al., 2023). As such, service learning subjects can serve multiple purposes in business education. First, it can complement traditional business education curriculum to nurture students' decision making abilities in meeting sustainability needs. Cheung (1998) stressed the importance of decoupling business education from pure vocational training. It is essential to help students build citizenship of business students so that they can make ethical business decisions. Second, service learning reinforces business students' academic abilities in the real world setting (Furco, 1996). In the increasingly complex workplace, this training is valuable for students' critical thinking ability and other desirable broader learning outcomes (Braun, 2004).

Yet, the service learning education model was less commonly adopted in business schools (Gujarathi & McQuade, 2002) and was seldom reported in business discipline-specific journals (Andrews, 2007). Given that service learning is of the utmost relevance to the recent development of business education, the current literature addressing the challenges of setting up service learning in business schools remains very little. By utilizing a case from a pioneering higher institution in Hong Kong which adopts service learning as a graduation requirement, this study is driven by two main research questions:

- How do the expectations of service learning subject reviewers differ from the course proposer from business faculty?
- What other factors affect the validation of a business service learning course?

In the following sections, we will first present the literature review on critical service learning concepts and their application to different academic disciplines. This is followed by a detailed description of our methods, as well as the business service learning course for our study and the validation process of this case. The key concerns of different reviewers will be summarized in the results section. We will then discuss how the various concerns outline the expectations mismatch among stakeholders and report other special insights in the discussion section before the conclusion.

Literature Review

Service learning, as indicated by its name, combines service concepts in a formal curriculum that aligns with academic learning goals (Furco, 1996). It is intended to enhance students'

knowledge and skills by extending their learning into the community. Service learning subjects should differentiate from volunteerism, community service, internship in a way that service learning subjects strive for an equal balance between service and learning goals (Sigmon, 1994). While volunteerism and community service focus primarily on the service elements, internship aims to develop students' hands-on experiences in a particular area of study in the real world. In light of this, service learning must serve some academic purposes in students' service process (Furco, 1996). Furthermore, service learning should be differentiated from field education, implying the service elements were added on top of regular learning. The service learning programmes must be designed in a way that students are "Serving to Learn. Learning to Serve" (Sigmon, 1994). Both service and learning elements are mandatory in a service learning course. The service element must be able to enhance the learning and the learning design is to improve the service quality in a good service learning activities design.

Seeing different ways of using the service learning terminology, Sigmon (1979) first proposed three guiding principles in developing a service learning course. First, the "service recipients" should have a say on what services should be provided. They should be involved in stating the issues they are facing and determining the nature of service. This led the second principle: the situation of "service recipients" should be better off after the service learning activities. Therefore, criteria for assessing the service outcomes should also be established. This ensures that students provide quality services to the service recipients. In ideal situations, the service recipients should be able to serve themselves by their own actions, which means that they can actually gain improvement in skills and knowledge in dealing with the issues they face from the students and the education institutions.

Third, while students are learning by serving the service recipients, the educational experience of students taking part in the service learning courses should be carefully planned and under controlled. Therefore, educators who initiate the service learning programmes should establish clear learning objectives and be held accountable for bringing meaningful learning experiences to students. These guiding principles are established to help designing service learning tasks, but at the same time avoid the so called "utopian vision" problem which perfectionists criticize unnecessarily based on their personal experiences or beliefs with service learning subjects (Sigmon, 1979). These principles are still very influential in designing service learning courses.

Service Learning Benefits

The benefits of service learning courses to students can come in many forms. In her ethnographic reflection, Ramdhani, (2023) states that service learning could benefit students' cognitive learning and help them gaining knowledge about critical social problems through reflection. As such, students' willingness to engage in society is also expected to be increased. Moorer (2009) also suggests that through service learning in the business context, students could be trained to make business decisions more holistically.

Service learning subjects also develop students' leadership skills and understanding of civic responsibilities more rapidly (Gujarathi & McQuade, 2002). Sivan et al. (2023) further suggest that leadership skills of students are developed by empowering students in real-life settings. Many service learning subjects are designed in project-based settings. In these subjects, students have to take charge of major planning and execution, and be accountable

themselves for the project's success. Exposure to this experience could be less likely to happen in early business careers.

Godfrey et al. (2005) also suggest that service learning can create breadth for business education. Apart from broadening students' perspective on different social issues, service learning subjects might also build students' social skills and intercultural understanding depending on the course design (Andrews, 2007; Moorer, 2009). In most cases, service learning courses could also achieve boarder learning outcomes, including team working skills and critical thinking (Gujarathi & McQuade, 2002), which are considered as important common skills in business workplaces (Burnette, 2016).

Service Learning Courses Developed

Throughout the last decades, a lot of successful service learning subjects were reported in many developing countries, e.g. South Africa, India, and Indonesia and in developed economies such as Spain, Hong Kong and Singapore (Shumer et al., 2021; Blessinger & Sengupta 2023). For example, Ramdhani (2023) provides an ethnographic reflection of her service learning experience in a children shelter in South Africa. Sivan et al. (2023) take an integrated approach in setting up their service learning course in Hong Kong, which integrated theories from psychology, sociology and education to plan and implement inclusive learning activities for students with and without special education needs (SEN). Behrends and Binder (2022) established a service learning subject in Germany, sending student teams to non-profit organizations (NPOs) in supporting their fundraising or image campaigns. It is suggested that these service experiences were relevant to students' business studies, as NPOs often encounter fundamental similarity with small and medium enterprises regarding resources and management competencies.

Service Learning for Business Education

Although service learning could benefit students considerably, its degree of adoption is not the same across different academic disciplines (Andrews, 2010). Despite some successful attempts in business education were reported (e.g. Behrends and Binder, 2022), the number of service learning courses in business education accounts for only a small portion of the overall amount of service learning courses. Figure 1 and Figure 2 show the service learning subjects across different academic disciplines offered by the Hong Kong Polytechnic University and The Pontifical Catholic University of Chile respectively. According to the yearbook of the Hong Kong Polytechnic University in 2020, only 3 out of 69 courses were offered by business schools (The Hong Kong Polytechnic University, 2020). Business service learning courses accounted for only 4.37% of the total courses, which is far from the percentage of students that their business school accounts for (The Hong Kong Polytechnic University, 2022). A similar situation is also observed based on the Service Learning Yearbook of The Pontifical Catholic University of Chile (The Pontifical Catholic University of Chile, 2022). In particular, the number of service learning subjects offered by their business schools is the second lowest together with two other schools or departments. There is also a service learning course under their theology discipline, which is regarded as a very early adopter of the service learning education model (Sigmon, 1979).

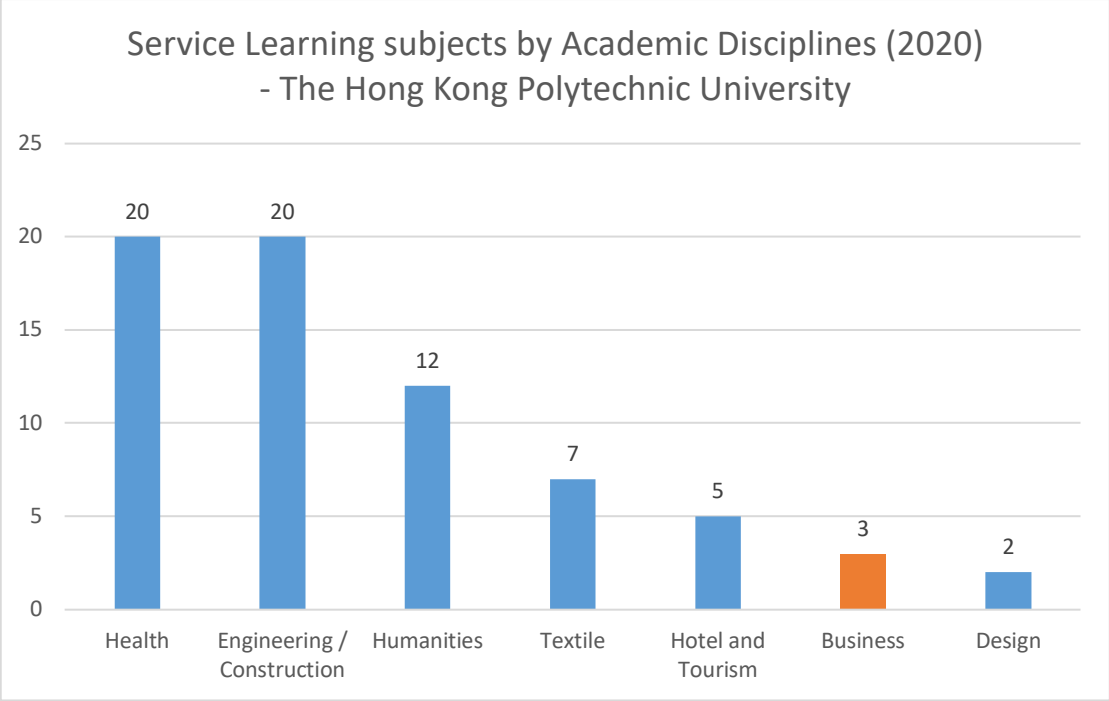


Figure 1: Academic Disciplines of Service Learning Subjects in the Hong Kong Polytechnic University

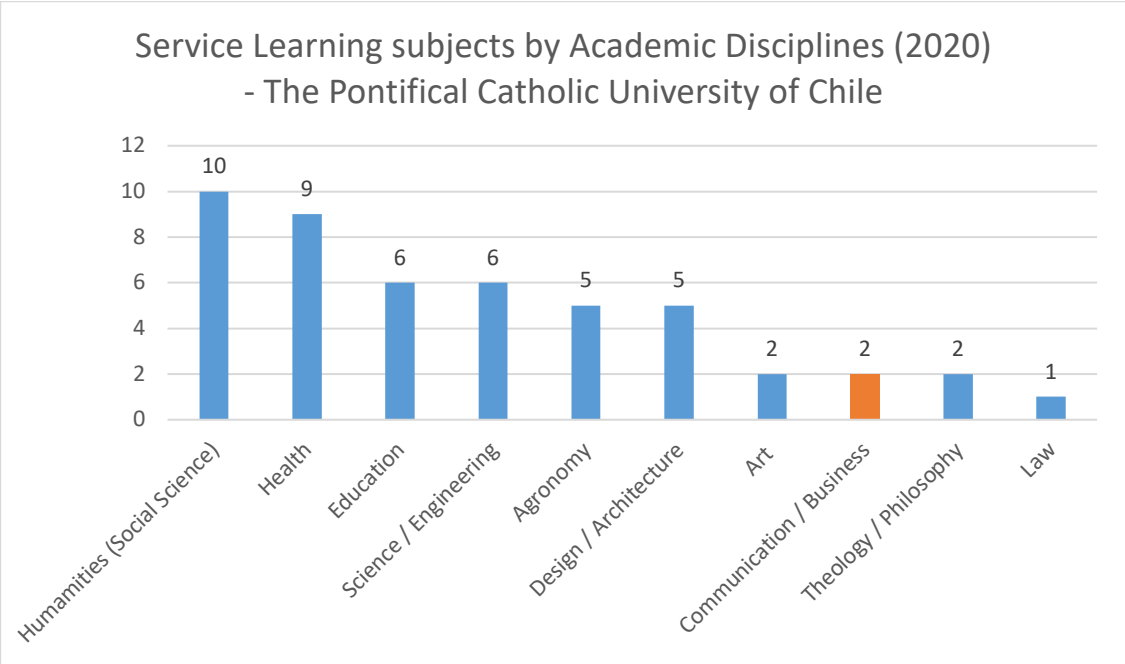


Figure 2: Academic Disciplines of Service Learning Subjects in The Pontifical Catholic University of Chile

In the two abovementioned universities, health, social science and engineering-related faculties offer the most service learning subjects. In this sense, service learning seems to offer more significant opportunities for students to practice and apply health and engineering concepts to the public for free as a service. For social science-related disciplines, students might be able to gain new perspectives in different social problems, such as poverty, discrimination, and crime, through various services (University of Tennessee at Chattanooga, 2022).

A few possible reasons could contribute to the limited amount of business service learning course. First, business faculties are less trained in providing service learning courses (Gujarathi & McQuade, 2002). As service learning is a relatively new education approach when compared to education, business faculties might not be experienced in planning and organizing credit-based service learning courses as teachers in social science and education disciplines. Business faculties also face additional challenges in convincing reviewing parties that the proposed service learning courses are "legitimate academic exercise", as business curriculum is often considered as technical and standardized (Moorer, 2009). Gujarathi and McQuade (2002) share how special adjustments are applied to the assessment of service elements for their intermediate accounting course while conforming to the requirements of the accounting professional bodies.

Furthermore, Gujarathi and McQuade (2002) recognize the difficulties in finding out suitable community agencies and forming alliances with for business service learning courses. Community agencies might not realize their role in service learning projects and the differences between service learning and voluntary service. Additionally, community agencies might spend significant time training, supervising and providing feedback to students.

Moorer (2009) suggests that the readiness of undergraduate business students might also hinder the success of business service learning subjects. If the service learning experience far exceeds students' capacity and maturity, students might end up becoming less engaged and less likely to realize their learning in business service learning courses. Although it is important that service recipients should be involved in assigning service elements to students (Sigmon, 1979), business educators should carefully examine whether students can complete the tasks (Gujarathi & McQuade, 2002).

Today, a new direction to business education is observed in which business curriculum should be responsible to enable students to positively influence their community (Moorer, 2009; Schweinsberg et al., 2013; Kolb et al., 2017). Students nowadays are taught about the environmental, social and governance (ESG) concepts (Deloitte, 2021). Yet, the ability to drive business towards ESG goals is often developed beyond the teaching of textbooks (Acevedo, 2013). To this, business service learning courses not only provide a solid reinforcement to their business foundation knowledge, but also give students good chances to engage in projects that improve social wellness and reflect on their involvement. Seeing a growing need to develop business service learning courses, research on how reviewers as gate keepers perceive the challenges mentioned above could be vital for successful course initiation and implementation.

Methods

This study utilizes a thematic analysis of documents from the reviewing process in a business service learning course in Hong Kong. As suggested by Nowell et al. (2017), thematic analysis could be an easy but powerful tool for identifying, analyzing and reporting themes in a rich and detailed manner. A thick description of an authentic case could lead to better transferability of the research. Besides, thematic analysis is considered a flexible approach to analyze different qualitative data. In the current study, thematic analysis is applied to the reviewing documents of a business service learning course. Apart from the formal documents that carry the reviewing comment, meeting notes and comments in email format are also collected together with the policy documents of the case institution.

The researchers first familiarized themselves with the documents (Nowell et al., 2017). In the process, documents were organized based on different rounds of review. Initiated codes were then generated to differentiate different possible themes systematically. In the current research, coding was based on different types of reviewing comments to understand the different expectations of the multiple reviewing parties. Themes were then developed based on the recurrent and variant comments. Before naming each theme, researchers reviewed the coded reviewing comments extracts to ensure a coherent pattern. In the reporting process, the research team presented the organized data, direct quotes of reviewing comments, and the linkage with existing literature (Nowell et al., 2017).

The Case Institution and the Service Learning Course Concerned

The case institution names itself a pioneer in applying service learning education in Hong Kong. It is one of the few universities in Hong Kong that require students to complete credit-based service learning courses as a graduation requirement. In order to support the development and "institutionalization" of service learning courses, the university starts a Service Learning Office while a service learning committee is responsible to endorse every course proposal from all departments.

The course proposed is to conduct research projects for Non-profit Organisations (NPOs). The target students are at least in their third year or above in tertiary education. This course is developed based on an idea raised by one of the trainers who was also an external reviewer. As stated by Behrends and Binder (2022), when they were planning their business service learning course, NPOs share a high degree of similarity to small and medium enterprises from a management science perspective. The proposed course is supposed to last for a 13-week semester. In the earlier stage, students shall meet with service partner and recipients and participate in volunteer work or job shadowing after completing a basic e-module that introduces the service learning concepts. Then, the course proposers would conduct a few interactive lectures to refresh the research skills, such as the use of essential statistical tools, and to enhance their understanding of the service targets. Students then contribute questionnaire items for the survey based on their experience, observations and reflection from their service, followed by conducting a pilot test and making necessary adjustments. After completing their questionnaire survey, they are supposed to report findings and reflections to NPOs and teachers.

Meanwhile, several assessments shall be conducted based on students' performance in research proposal, pilot test, questionnaire survey and final reports. Students' affective outcomes are supposed to be assessed as well in reflection and debriefing sessions after major research works. Students are also required to submit a reflective journal. Finally, students' performance in volunteer work or job shadowing would also contribute to their final grades.

The Reviewing and Validation Process

With a high expectation of quality of service learning courses, the review and validation process lasted for an extended period from June 2021 to November 2023 (Figure 3). A total of 17 rounds of reviews were documented. The first eight rounds of reviews were the brainstorming phase, where the course proposers interacted with external reviewers and internal reviewers with a brief "brainstorming form". The reviews in this phase were more timely and frequent.

With the endorsement of the brainstorming form, round 9 to 14 represented the proposal preparation phase. The course proposers prepared a 15-20 page proposal form to specify the general information, recourses involved, course details and service elements. The course proposers also introduced the potential NPOs and their applied research needs based on the reviewer's comments. The proposal was then going through a formal vetting procedure from an internal screening committee at the department level and finally, the university committee overseeing all service learning courses at the university level.

		Reviewing Party	Summary of key concerns and changes
Brainstorming Phase	Round 1-4 (June – July 2021)	External Reviewer	1 Selecting Partnering NPOs 2 Determining Service recipients 3 Designing Learning objectives
	Round 5-8 (July – September 2021)	Internal Reviewer	
Proposal Preparation	Round 9 (Nov 2021)	Internal Reviewer	1 Qualification of course proposer 2 Students' ability 3 Designing Learning experiences
	Round 10-14 (Dec 2021 – May 2022)	External Reviewer	
Internal Screening	Round 15-16 (Oct 2022 – Jan 2023)	Internal Screening Committee	1 Determining Service recipients 2 Designing Learning objectives 3 Designing Learning experiences
Submission for University's Validation	Round 17 (Mar – Nov 2023)	University committee	1 Students' ability 2 Determining Service recipients

Figure 3: Reviewing and Validation process

The Majoring Reviewing Comments

Based on the reviewing comments, three major themes were developed: selecting service targets, designing learning objectives and experiences, and the capability of students and course proposers.

Selecting Service Targets

In the earlier stage, reviewers placed many concerns on the Partnering NPOs, which was also stated by Gujarathi and McQuade (2002). Even at the time which was two years before the course was supposed to be conducted, the reviewers urged the course proposers to initiate connection with different NPOs and understand their research needs:

> (It) might be a good idea to first talk to these NPOs to see whether they indeed lack research manpower. (Round 6)

Furthermore, reviewers were keen to judge the quality of potential NPOs to be collaborated by their exposure. As stated in a review comment, "it is encouraging to see that the teaching team took the initiative to reach out to an NGO for their opinions, but unfortunately given the track record of *(name of NPO anonymized)*, we are quite concerned of its longevity and representation of NGOs in HK (Round 5)."

One key concern from later rounds of reviews was related to the actual service recipients. A big expectation gap between the course proposers and the reviewers were observed whether it was the NPO or their service target, which were the direct and indirect recipients stated in the official document respectively, should be considered as the actual service recipients:

> If I understand correctly, the service recipients are the NPOs, not the disabled people. Yet, students' survey and research in the process can help them relate to the people in need and benefit the community in the long run. (Round 15)

To this, the course title was also adjusted a few times, from “Research for Non-profit Organization” and then “Applied Research for the Physically Challenged” to “Applied Research for People with Physical Disabilities”. Besides, comments also covered very detailed definition of physical disabilities:

> Will "people with physical disabilities" include those "visually impaired"? (Round 15)

Designing Learning Objectives and Experiences

Designing the right learning experience was a concurrent concern as early as the service learning concept was developed (Sigmon, 1979). In the current study, many concerns were placed on the description of the learning objectives and course focus to ensure the course a “legitimate academic exercise” (Gujarathi & McQuade, 2002) as a service learning course that developed students’ applied research skills:

> What type of research? Research is a very broad term, covering a very wide range of activities, usually carried out by people with PhDs and professional training. (Round 6)

> Will the research objectives be determined by the joint agreement with the service partner after meetings with (the) service partner and recipients? (Round 11)

> Please elaborate how students can help research these needs. (Round 14)

Meanwhile, reviewing comments were also addressing whether sufficient knowledge and cognitive skills were transferred to students before their service:

> There is very little coverage of the topic of “Physical Disabilities” in the subject syllabus. (Round 17)

> The current syllabus does not seem to offer many opportunities for students to learn how to conduct social science research. (Round 17)

Furthermore, reviewers also emphasized on the length of time on students’ learning experiences. While a packed schedule might be considered as a heavy burden to students, a short learning experience might not sufficiently develop students’ affective learning outcomes, especially for empathy:

> Is it correct that students have to attend fieldwork sessions and interactive lectures within the first four weeks? Will the workload be too heavy? (Round 14)

> We are particularly worried about the empathy part because our students spend very little time with the partners and the indirect service recipients in the proposal. (Round 5).

As a key learning objective across all service learning courses in that university, reviewers also raised comments on what empathy meant to the course proposer:

> Empathy towards the community in what sense? How to develop students' empathy in this project? (Round 6)

Assessing the learning objectives was found to be another major area of concerns of reviewers. While Sigmon (1979) suggested that the assessment should be judged by whether service recipients were better off, the key reviewing comments were sticking to how different learning outcomes were effectively evaluated. In a particular comment, an internal reviewer strictly prohibited the involvement of NPOs in assessing students' performance in volunteering work, as he wrote, "all the grading and assessment should rest with our academic staff for QA purpose (Round 15)". Besides, how the affective outcomes were evaluated were also concerned:

> One reflective journal through the course is not sufficient, the teaching team should plan more reflective activities throughout. (Round 5)

> What we meant is not a progress report, but a reflective assignment or debriefing session to consolidate and reflect. (Round 7)

Capability of Students and Course Proposers

Students' ability was a major concern throughout the reviewing process, which was also noted by few researchers, such as Moorer (2009). The reviewing comments suggested that the students' ability to carry out research were frequently challenged:

> Doing research on disadvantaged communities is very hard… We are not convinced that the issues the students will conduct research on are clearly thought out. We are also not convinced that our students can acquire sufficient understanding of the issues, the community and their needs, and the capabilities of the NPO, etc. (Round 8)

To this, a few categories of research for NPOs, such as to evaluate campaign effectiveness, were removed from the course document based on a comment stating "both research to identify new clients and research to evaluate campaign effectiveness are probably beyond our students' knowledge and skills to be done in a single semester (Round 14)."

Gujarathi and McQuade (2002) suggested that business faculties were less experienced in developing service learning courses. In the whole review process, the course proposers' CVs were collected twice to prove that they could deliver the service learning course. When compared to the capability of the students, the course proposers' ability were less challenged. It was yet recognized as a key enabler of successful course development, as a reviewer wrote, "the success of the subject depends on how willing the teachers are to become experts in the issues the NGOs are concerned with, in addition to experts of research methods (Round 15)". Still, a reviewing comment "since the proposers' expertise is in a business-related discipline, will sufficient guidance be provided for students to serve people with physical disabilities? (Round 17)" was raised in the final round of review.

Discussion

Results yielded from reviewing comments state that the majority of the concerns, such as identifying appropriate service partners, the ability of business faculties (Gujarathi & McQuade, 2002) and developing meaningful learning experiences (Sigmon, 1979), still apply in the reviewing process. It is also noted that the "Utopian vision" problem suggested by Sigmon (1979) could still be observed. To the course proposers, it seems that the challenge on whether "people with physical disabilities" include those "visually impaired" is not as constructive as other comments. Besides, challenging the NPO, which provided information on their research needs in the very early stage, is also deemed unnecessary. Meanwhile, a huge expectation gap is also observed in the ability of students. While students who enroll into this course could be at their final year of study, reviewers are obviously worried about students' research skills and understanding of the community. Instead of working on their own research items, students are only required to contribute questionnaire items after adjusting the course document. To this, course proposers for business service learning subjects might also have to link the subject with students' previous learning experience to grant greater support and understanding.

Reviewing comments also indicate that reviewers might hold different epistemic beliefs on specific concepts related to service learning. Empathy is considered a significant learning outcome in service learning subjects (Gujarathi & McQuade, 2002). However, reviewing comments reveal that reviewers seem to hold different ideas on what empathy means and how it is developed. While the university's official document stipulates that service learning activities could be carried out to different NPOs as indirect service recipients, reviewers suggest that the desired affective learning outcomes might not be sufficiently developed without structured contacts with direct service recipients.

An ideal service learning curriculum should place equal emphasis on the service and academic elements (Sigmon, 1994). For business service learning subjects, it seems that this balance could be hard to achieve, which is a potential reason of the relatively few business service learning courses that have been developed. Reviewing comments that suggest increasing delivering knowledge and cognitive skills might result in an over-emphasis on academic aspects, increasing service to NPOs might eventually be considered a mere fulfillment of service elements. Another concern for business service learning courses is that practising business skills in a real world context can be easily understood as internship rather than service learning based on Furco's (1996) model, unlike the health or engineering disciplines. Reviewers seem more keen to judge the collaborating NPOs on their intentions, background, resources and track records. Yet, a service learning embedded business curriculum in Hong Kong is with high importance due to its economic structure (Cheung, 1998). Therefore, a broader and more open understanding of service learning for the business curriculum is perhaps needed to judge the quality of these courses.

Conclusion

This paper outlines different concerns of multiple reviewers of a business service learning course in the higher education context, namely selecting service targets, designing learning objectives and experiences, and the capability of students and course proposers. In particular, substantial expectation gaps between the course proposers and reviewers are observed in terms of the ability of students and the selection of collaborating NPOs. This paper also highlights how course reviewers are setting additional expectations on business service

learning courses when compared to service learning courses from the health or engineering disciplines. Taking this paper as an example, future research could also expand to other disciplines in which service learning as an education model are less applied, in order to understand the struggles of those specific disciplines.

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The Development and Evaluation of a Color-Tactile Conversion App for Education of Visually Impaired

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Abstract
Pictures and diagrams play an important role in representing information and conveying ideas and emotions that cannot be explained clearly in words, particularly in subjects of school education such as mathematics, geography, and art. In Taiwan, special education teachers use Braille textbooks to teach blind students. The textbooks contain tactile outline versions of pictures and diagrams. For certain key lines, curves and shapes of these pictures special hand-bonded wires are added, making it suitable for blind students to learn by touch. However, the diversity of these tactile pictures is limited. Teachers who want to supplement the graphics must remove details of the graphics by hand into a simple outline version, and then use a Braille graphic printer to output it. This is quite time-consuming and labor-intensive. Moreover, color information is usually ignored in these tactile outline graphics. In this study, we conducted psychophysical experiments to determine boundaries of the 13 basic color terms. The experimental results were modeled and then used to design a computer app. This application features automatic outline drawing and simplifying the various colors of original pictures into 13 basic colors and convert them into corresponding black and white patterns. The converted black and white pictures can be printed using thermal printers or a Braille graphic printers. This application was tested and evaluated by 8 special education teachers and reported “acceptable” according to the survey using the System Usability Scale (SUS). The teachers also gave advices to improve the computer app.

Keywords: Visual Impairment Education, Tactile, Color

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Introduction

1. Background

The training program for blind students in tactile reading and writing is divided into five main parts: preparatory skills for Braille tactile reading, Mandarin Braille, Braille for mathematics and physics (natural sciences and technology), Braille for foreign languages, and Braille for music. These courses mainly focus on the training of Braille conversion of symbols, such as Zhuyin phonetic symbols, English letters, numbers, mathematical symbols, musical notes, etc. The learning method is sequential, requiring students to read gradually from left to right and from top to bottom to understand the content.

In addition to sequential knowledge acquisition, some types of information are presented in graphical form, such as maps, statistical charts, posters, drawings, etc. For individuals with normal vision, this type of information conveyed through shapes, colors, and visual textures is more direct and efficient than verbal descriptions. Therefore, specific tools and equipment have been developed over the years in the field of materials and aids production for the visually impaired, which can replicate embossed patterns or paste specific materials on special paper surfaces, allowing blind students to recognize the shapes and surface textures of images through touch. Examples include Shih plates, track wheels, stereoscopic shape embossers, etc. However, due to the longstanding serious deficiencies in Braille materials and tactile teaching materials, the rights to knowledge of visually impaired individuals have been neglected. In response, the Taipei Blind Parents Association established the Visually Impaired Teaching Materials and Aids Development Center in 1996, to develop a variety of tactile teaching materials so that visually impaired children can have the right to knowledge like sighted individuals.

In order to enable blind individuals to obtain image information including shapes and colors through touch, the author has been constructing a tactile color communication system, or TCCS, since 2013, and has completed initial teaching tests targeting non-blind individuals (Wei, 2013). Subsequently, with the assistance of a research grant from the Ministry of Science and Technology in 2015, the entire system and teaching aids were produced. At the 2016 New York State Association for Education and Rehabilitation of the Blind and Visually Impaired (NYSAER) Conference, it received positive responses from attendants, as well as blind teachers and counselors. It was believed that promoting this system along with Braille teaching could enhance the lives, learning, and reading of blind individuals. However, both at the conference and in blind children's institutions, blind teachers raised concerns about the future development of this system. They pointed out that there are currently no products on the market that use this tactile color communication system for tactile graphic books or aids. Even if blind students learn this system, it would be difficult to apply it in daily life in the short term. In addition, the visually impaired population is a minority, especially in recent years with declining birth rates, making this minority even smaller, reducing the demand. This causes hesitation from manufacturers' interests in developing tactile graphic books and aids. However, the development of teaching materials for the visually impaired should not be constrained by supply and demand considerations, because even if there are only a few visually impaired individuals in our society, they should have the right to "easily access various knowledge."

In the past five years, the author contacted with frontline blind teachers from institutions such as the Taichung HuiMing Blind Children's Nursery and the Hsinchu County Special Education Resource Center, it has been found that professional blind aids and consumables are usually

expensive or difficult to obtain. Especially for teachers who travel to different regions for counseling, not every teaching site has the same equipment and teaching aids available. In addition, due to the different needs of visually impaired children, there is often a need to produce and reproduce embossed tactile graphics temporarily. Relying on printing presses for embossing is often not feasible in emergencies, and each graphic requires a separate embossed plate, which is costly. Under such a circumstance, blind students' teachers and parents also need to make their own visually impaired aids. The process is time-consuming and labor-intensive, making them relatively easy to damage.

2. Purpose

In order to improve the shortage of making tactile pictures, a computer application was developed in this study that assists teachers and parents to easily produce tactile pictures for their students and children. This application features automatic outline drawing and simplifying the various colors of original pictures into 13 basic colors and converting them into corresponding black and white patterns as defined in the TCCS. The converted black and white pictures can be printed using thermal printers or Braille graphic printers.

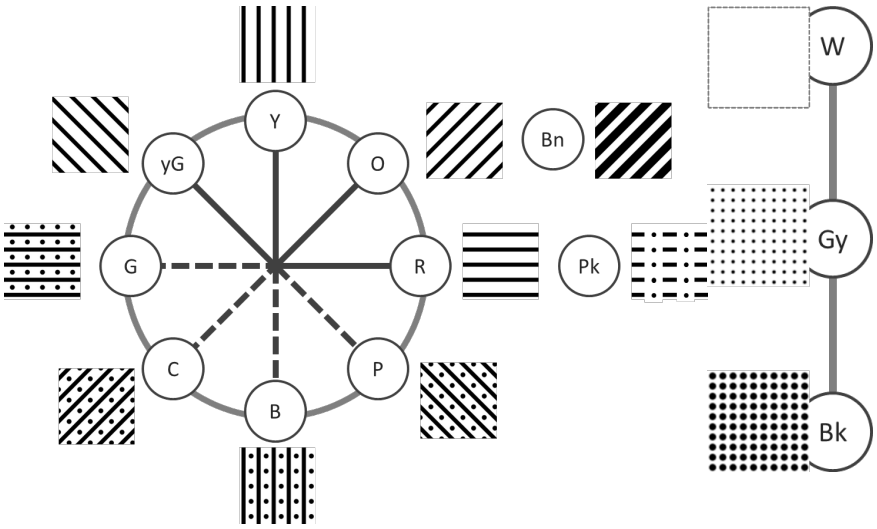
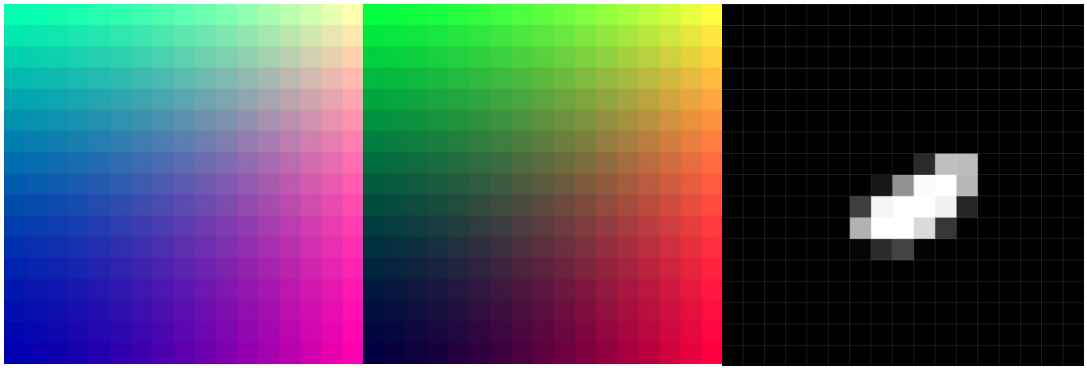


Figure 1: The 13 basic color terms and their corresponding patterns as defined in the tactile color communication system (TCCS)

3. Method

The core of developing the application is to categorize various colors into the 13 basic colors, that is to find out boundaries of the 13 basic colors in a given color space. To do this, a psychophysical experiment was conducted. 48 subjects aged from 18 to 25 participated in the experiment. Before the experiment, the subjects passed the Ishihara color vision test to ensure normal color vision. They were then asked to sit in front of a computer screen and take a 3-minute break to adapt to the experimental environment. In the experiment, the subjects' task was to draw boundaries of given color names on 17 equal-blueness slices of the RGB color cube using Photoshop CS6 (Figure 2(b)). Each slice was composed of 17 by 17 color patches with different R and G values and equal B value. The color patches were arranged sequentially according to their R and G values, as given in Figure 2(a). The color names include red, orange, yellow, yellowish green, green, cyan, blue, purple, pink, brown, white, gray, and black. These are the 13 basic color names people frequently use in daily life to describe colors.



(a) (b)

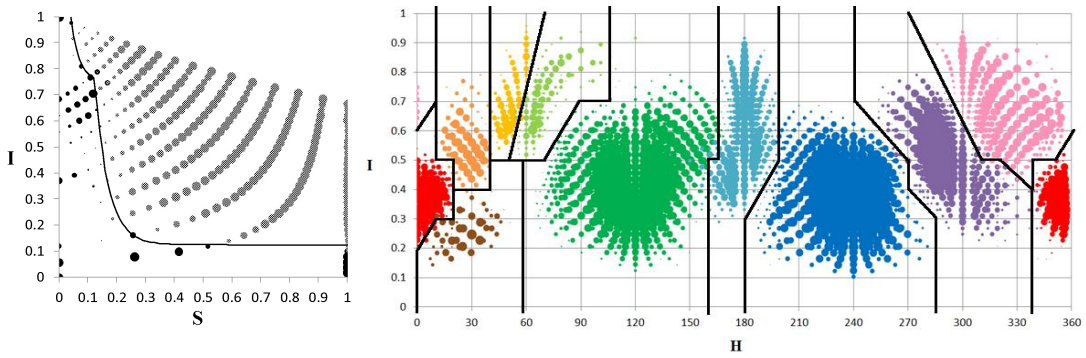
Figure 2: (a) 2 examples of equal-blueness slices of the RGB color cube
(b) the frequency map of "brown" on the slice of B = 63

Conclusion

1. Results

According to the experimental results for each color name, we calculated the frequencies each color patch is circled within the boundary. Fig. 3 shows the distribution of frequencies of the 13 color names on the SHI color space, where S, H, and I stand for saturation, hue, intensity, respectively. The S, H and I values were converted from RGB values.

The experimental results were used to develop a color categorization algorithm, which can categorize 24-bit RGB colors into 13 categories. Each category refers to a basic color name. The black curves and lines in Fig. 3 show the boundaries of the color categories. TCCS is adopted here to convert the 13 color categories into corresponding patterns. Fig. 4 shows test results of the algorithm.



(a) (b)

Figure 3: (a) the distribution of chromatic and achromatic colors on the S-I plane
(b) the distribution of the 13 color names on the H-I plane

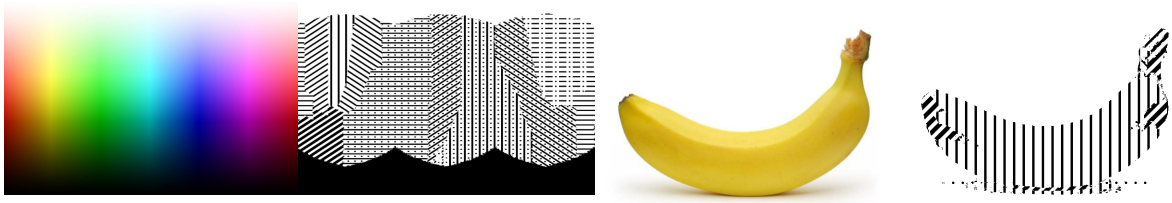


Figure 4: Test results of the color categorization algorithm:
(a) a chart of 24-bit RGB colors; (b) a photographed picture of a banana

2. The Color-Tactile Conversion Application

As shown in Figure 4, the application was developed using C++. The interface consists of a workspace on the right and a series of function buttons on the left. When users load images into the application, they are asked to select one of three paper sizes on which they are going to print out. Afterwards, users can click the "Convert" button to convert the image into the corresponding black and white pattern and outline. For users who want to ignore the black and white pattern, they can uncheck the "Show Pattern" checkbox. The application also provides an eraser function for users to erase unnecessary parts of the picture. After editing the image, users can save and print it. The checkbox "4-Color Mode" allows users to convert various colors into 4 color categories of red, green, yellow, and blue instead of the default 13-color mode.

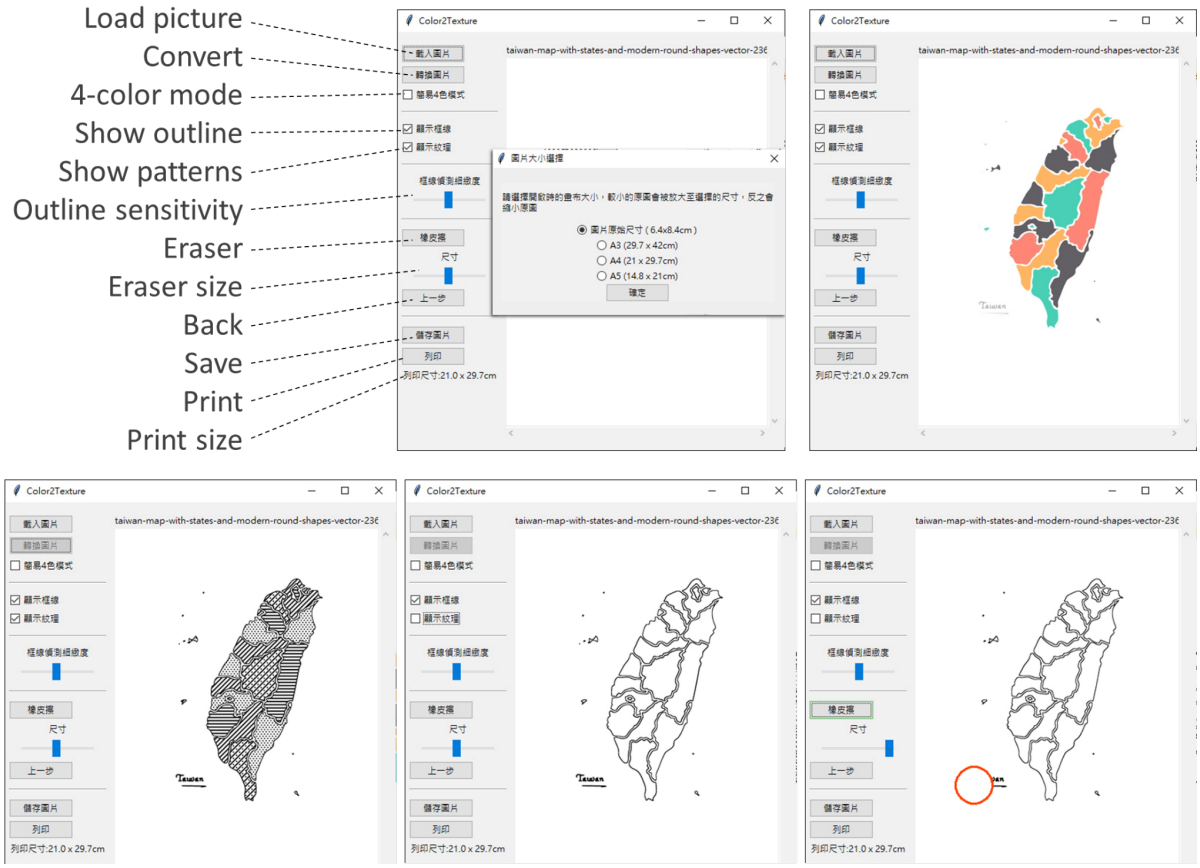


Figure 5: Interface of the Color-Tactile Conversion App

3. Evaluation of the Application

We recruited 8 visually impaired education teachers to use the App and evaluate its usability, ease of use and satisfaction. According to the evaluation of System Usability Scale (Brooke, 1996), the usability scores for the Color-Tactile App ranged from 72.5 to 92.5, which belongs to the acceptable range (Bangor, 2009). The corresponding adjective evaluations are "Good" and "excellent". The results of the questionnaire survey on ease of use, satisfaction, and ease of learning (Lund, 2001) showed a high degree of agreement.

Positive comments given by the teachers include:

1. This computer application can be used in art classes in elementary schools and in grade 7 and above.
2. This can be used to convert graphics for examinations in various subjects for grades 7 and above.
3. Courses that require pictures and diagrams such as geography and mathematics are in great demand.
4. It is a very good tool for the aesthetic education for blind students in primary schools. It can be used to teach them the concept of color scheming for what they are wearing and establish their own image for themselves.

The teachers' suggestions to improve the Color-Tactile App are:

1. This program is very convenient, but outlines and black and white patterns are easily confused for blind students. It is recommended to use different thicknesses to distinguish them.
2. Currently the only modification function is the eraser. It is good to have a black pen tool and a Braille input tool in this application.
3. This computer application is very convenient. If it can work with a Braille graphic printer, the cost of paper supplies will be much lower.
4. In addition to embossing graphics in Braille textbooks, dots and lines of different materials are also manually pasted to increase recognition. If this application is used to create supplementary graphics for class, it is recommended to increase the thickness and convexity of the dots and lines.
5. If this computer application works with a Braille graphics printer, it can be widely used in courses that require graphics such as geography, mathematics, and art.

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Actual Vis-a-Vis Desired Supervisory Practices As Perceived by Teachers and Supervisory Officials in University of Perpetual Help System – DALTA: Prelude Towards an Enhanced Supervisory Program

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Abstract
An effective supervision and instruction program is one of the key elements of a successful school. This research aimed to conduct a study on supervisory practices to help teachers improve their classroom performance and ultimately raise the quality of students' output. A descriptive survey method was used in this study to gather qualitative data from 134 teachers and 36 supervisory officials in the University of Perpetual System. An adapted and modified survey questionnaire was used and had two parts; the first part focused on the profile while the second part contained supervisor practices as perceived by the respondents. A convenience sampling method was used, analysis of variance (ANOVA) was used to determine the significant differences between the actual and desired supervisory practices of the respondents, and a t-test of independent samples was used to determine the significant differences between the perceptions of the respondents. The findings revealed that the actual supervisory practices in the areas of instruction, communication, staff development, and classroom visitation were found significant since the computed t-values exceeded the t-value of 1.974 at a 5% significance level and evaluation and leadership were found significant since the computed t-values did not exceed the critical value of 1.974 at a 5% significance level. The study suggested that the actual supervisory practices about instruction, communication, staff development, evaluation, leadership, and classroom visitation were efficient and must be continued. The desired supervisory practices about instruction, communication, staff development, evaluation, leadership, and classroom visitation were desirable and must be introduced.

Keywords: Supervisory Practices, Actual Supervisory Practices, Desired Supervisory Practices, Supervision of Instruction, Supervisory Officials

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Introduction

> Behind every successful school is an effective supervision program. Supervision is the glue that holds a successful school together … a process by which some person or group of people is responsible for providing a link between individual teacher needs and organizational goals so that individuals within the school can work in harmony toward their vision of what the school should be. (Glickman, 2004)

As cited in the work of Fisher (2005), supervision involves actions taken by the administrators to ensure a school is a positive safe place where learning occurs. It includes the administrators closely watching teacher's lessons and interactions with students to ensure they are effectively teaching state standards and are inspiring students to reach their highest potential. It consists of guiding teachers regarding instruction by providing feedback and available resources for professional development. According to Abdulkareem (2001), supervision helps establish order in the school, which means there are interactions between teachers and supervisors that allow administrators to know teachers' opinions and expectations on implementing supervisory practices successfully.

According to Calabrese and Zepeta (1997), the traditional supervision that most teachers experience is obligatory in nature and seldom tied to good practice. On the other hand, Pajak (2000), claims that modern supervisory practices attempt to restructure schools, classrooms, and practices which means that the context of supervision is evolving to adapt and be responsive to unprecedented changes, demands, and opportunities in the 21st-century school setting. As cited in the work of Sulivan and Glanz (2002), different models of supervision produced different practices. In the 21st-century school setting, there are plenty of supervision models that could be used; however, supervisors should find a suitable model of supervision that could help improve teachers' performance. To achieve this, supervisors usually employ varied supervisory practices.

In the Philippines, the Department of Education only provides the structure for supervisory practices, but the details of the supervisory practices are left to the supervisors. As cited in the work of Abdulkareem (2001), there are 12 dimensions for school supervision practices - communication, staff development, instructional program, planning and change, motivating and organizing, observation and conferencing, curriculum, problem-solving and decision making, service to teachers, personal development, community relations, research and program evaluation. These 12 dimensions of supervision practices help supervisory officials review and evaluate their school policies and programs to ensure that all elements of effective supervisory practices are in place.

The researcher found it necessary to conduct supervisory practices to help teachers improve their classroom performance and ultimately raise the quality of students' output. This study focused on the 6 dimensions of supervisory practices - communication, staff development, instruction, assessment, leadership, and classroom visitation. The result of this study yielded empirical data that determined the perceptions of teachers and supervisory officials on supervisory practices being employed in the Basic Education Department of the University of Perpetual Help System-DALTA. Hence, the researcher proposed an enhanced supervisory program to attain its quest for quality and excellence.

Theoretical Framework

This study was anchored to Glickman's Developmental Supervision Model. It serves as the theoretical framework for this research. As cited in the work of Glickman (2004), the model proposes altering the original clinical supervision model to accommodate the individual professional needs of teachers as adults by considering their current developmental level and designing an evaluation process that best fits this diagnosed stage of development. It was supported by Dodd (2006) that Glickman's supervision model expands the direct assistant format found in the original clinical supervision model by adding a dimension concerned with human development and differences. Dodd's study further added that supervision is developmental and supports the need of teachers to choose the supervisory process. It was further supported by the study of Abdulkareem (2001), that there are 12 dimensions for school supervision; however, supervisors often utilize 6 dimensions of supervisory practices.

Literature Review

The literature and studies reviewed were synthesized to highlight their similarities and diversities with the present study. This study aimed to compare the actual and desired supervisory practices as perceived by teachers and supervisory officials in the University of Perpetual Help System DALTA. The concepts of Figueroa Rexach (2004) regarding the actual and desired teacher attitudes towards supervision of instruction and instructional strategies in pedagogical content were clearly defined which gave the idea of how supervision of instruction and instructional strategies affect the actual and desired teacher attitudes. This study was similar to the present study in terms of teachers' perceptions of supervisory practices. However, in the present study, the researcher includes supervisory officials.

Obinaju (2001), Fisher (2005), and Dangani (2008) stated that effective supervision of instruction can be achieved through changing classroom practices of teachers from traditional strategies to more updated or modern and innovative approaches to teaching and learning in schools that can contribute to improving student learning. This was somewhat similar to the present study about the classroom practices of teachers as one of its variables.

This study was similar to the researcher's study because both deal with the instructional practices of teachers; however, the difference lies in the respondents of the study (Dangani, 2008).

The study of Blake (2007), Figueroa (2004), and Leach (2005) were included in this study because of the familiar goals and objectives they had in their studies and the variables used; however, the differences were focused on the respondents, locale, and time element of the present study.

Methodology

The study employed the descriptive survey method of research in gathering the quantitative data. The primary data-gathering instrument in this research was an adapted questionnaire from the work of Abdulkareem (2001). Revisions, changes, and additional questions were added by the researcher to suit the purposes of the study.

The population of this study consisted of one hundred thirty - four teachers and thirty - six supervisory officials in basic education. This study was conducted in the University of Perpetual Help System DALTA – Basic Education Department, in three campuses, namely: University of Perpetual Help System DALTA – Las Pinas, University of Perpetual System DALTA – Molino, University of Perpetual Help System – Calamba.

The first part consisted of questions relative to the profile of the two groups of respondents: age, gender, position, years of teaching experience, academic degree, and educational preparation.

The second part contained supervisory practices as perceived by teachers and supervisory officials. They were focused on instruction, communication, staff development, evaluation, leadership, and classroom visitation. A Five-point Likert scale was used to determine the effectiveness/desirability of practices.

The following statistical instruments were used: frequency and percentage distribution, weighted mean and ranking, analysis of variance, and a t-test of independent samples.

Frequency Distribution was used to determine the respondent's profile according to age, gender, position, years of experience (as teachers/as supervisory officials), and educational preparation (education graduate/non-education graduate).

Weighted Mean and Ranking were utilized to determine the supervisory practices along the following variables: instruction, communication, staff development, evaluation, leadership, and classroom visitation.

Analysis of Variance (ANOVA) was employed to determine the significant differences between the actual and desired supervisory practices of the respondents when they were grouped according to their age, gender, position, years of experience, and educational preparation.

A T-test of Independent Samples was used to determine the significant differences between the perceptions of teachers and supervisory officials.

Results and Discussion

This study came up with the following findings:

On the Demographic Characteristics of the Respondents

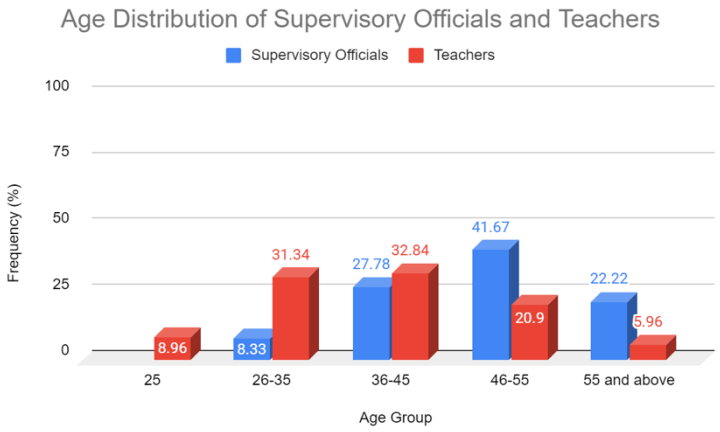


Figure 1: Age Distribution of Supervisory Officials and Teachers

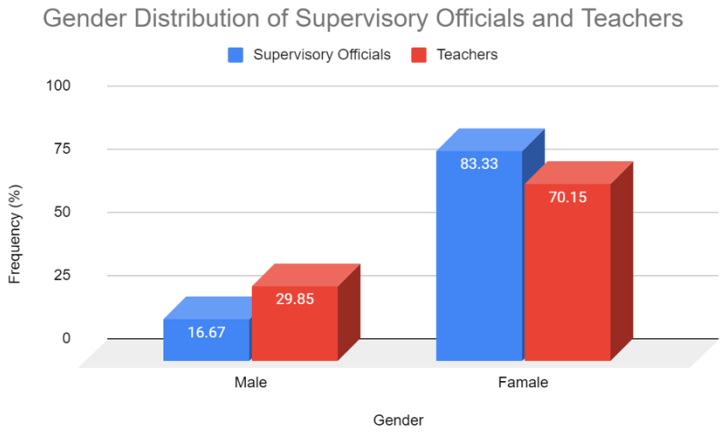


Figure 2: Gender Distribution of Supervisory Officials and Teachers

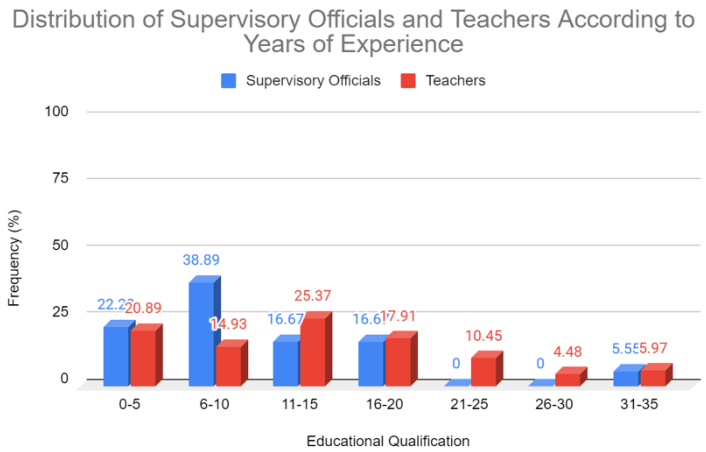


Figure 3: Distribution of Supervisory Officials and Teachers According to Years of Experience

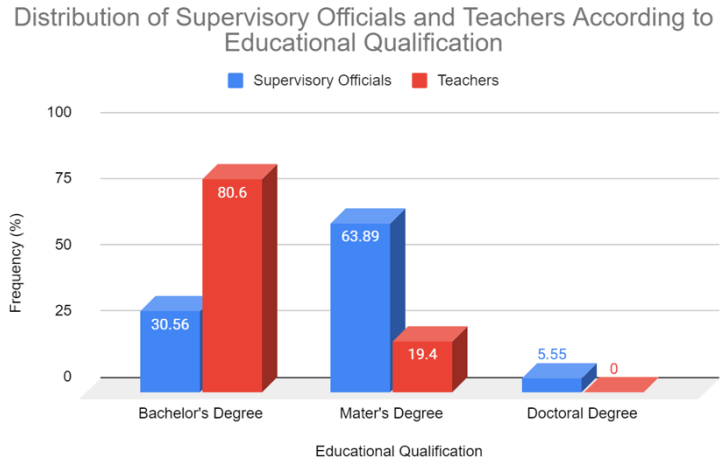


Figure 4: Distribution of Supervisory Officials and Teachers According to Educational Qualification

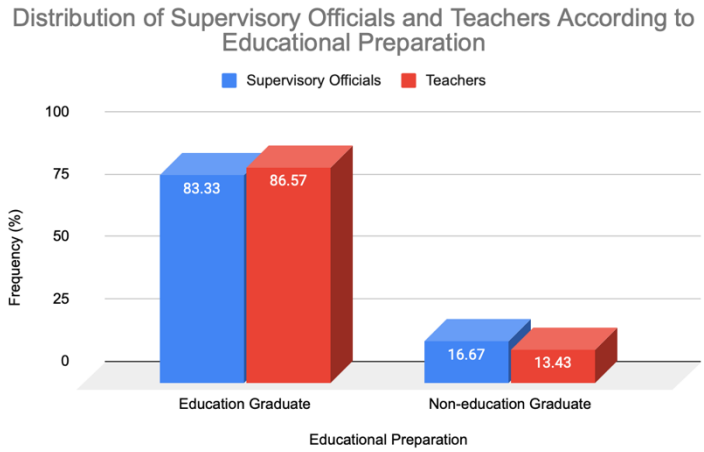


Figure 5: Distribution of Supervisory Officials and Teachers According to Educational Preparation

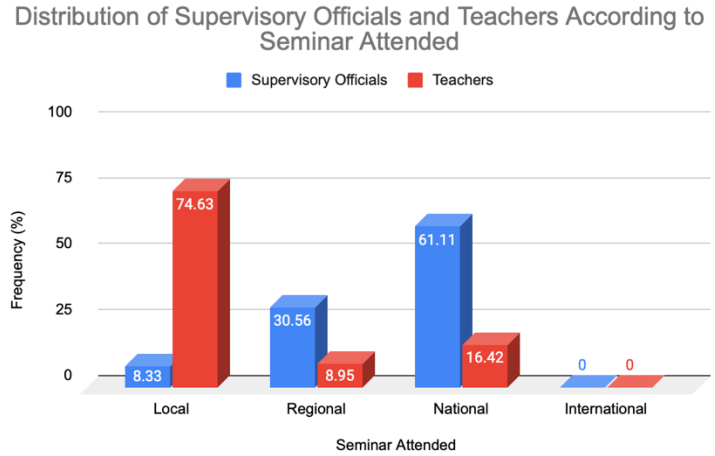


Figure 6: Distribution of Supervisory Officials and Teachers According to Seminar Attended

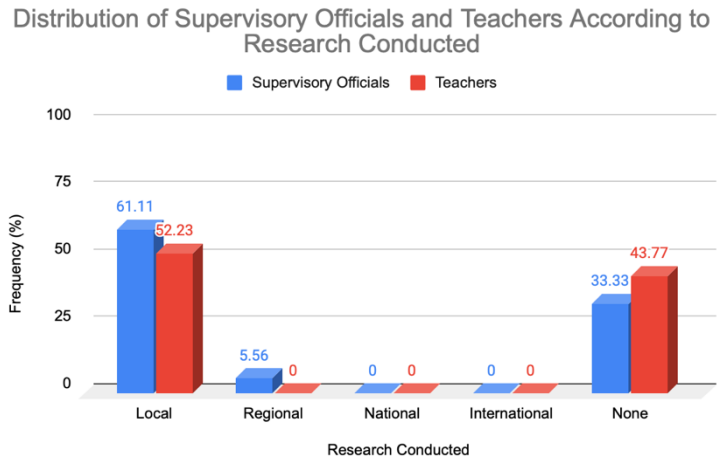


Figure 7: Distribution of Supervisory Officials and Teachers According to Research Conducted

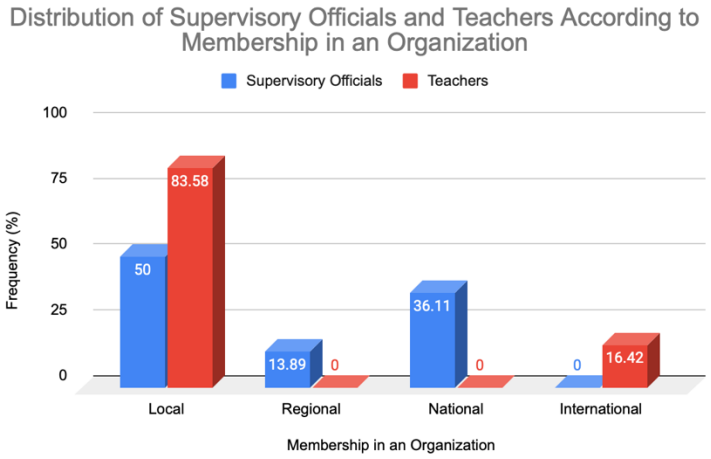


Figure 8: Distribution of Supervisory Officials and Teachers According to Membership in an Organization

Supervisory Officials

As shown in the figures above, there were 36 supervisory officials involved in the study. The majority of the supervisory officials belonged to the age range of 46 – 55 years old. In terms of gender, the majority of them were female. Thirty-nine percent of the supervisory officials had 6 – 10 years of administrative experience. Sixty–four percent of the supervisory officials were Master's degree holders. The majority of the supervisory officials were education graduates. In terms of seminars attended during the last three years, the majority of the supervisory officials attended national seminars. The majority of the supervisory officials conducted research locally. Fifty percent of the supervisory officials were members of local organizations.

Teachers

As shown in the figures above, there were 134 teachers involved in the study. The majority of the teachers belonged to the age range of 36 – 45 years old. In terms of gender, the majority of them were female. Twenty-five percent of the teachers had 11 – 15 years of experience as plain faculty. The majority of the teachers were Bachelor's degree holders. The majority of the teachers were education graduates. In terms of seminars attended during the last three years, the majority of the teachers attended national seminars. More than 50 percent of the teachers conducted research locally. The majority of the teachers were members of local organizations.

Actual and Desired Supervisory Practices As Perceived by Both Teachers and Supervisory Officials.

Table 1: Actual Supervisory Practices as Perceived by both Teachers and Supervisory Officials

PRACTICE	OVERALL MEAN	INTERPRETATION
ACTUAL		
Instruction	3.90	Very Effective
Communication	4.16	Very Effective
Staff Development	4.03	Very Effective
Evaluation	3.84	Very Effective
Leadership	4.08	Very Effective
Classroom Visitation	4.00	Very Effective

***Legend**: Rating Scale for Actual Supervisory Practices*

Range Interval	***Interpretation***
1.00 - 1.79	*Ineffective*
1.80 - 2.59	*Minimally Effective*
2.60 - 3.39	*Effective*
3.40 - 4.19	*Very Effective*
4.20 - 5.00	*Highly Effective*

As shown in Table 1, the actual supervisory practices as perceived by both teachers and supervisory officials about instruction, communication, staff development, evaluation, leadership, and classroom visitation were very effective.

Table 2: Actual Supervisory Practices as Perceived by both Teachers and Supervisory Officials

PRACTICE	OVERALL MEAN	INTERPRETATION
Desired		
Instruction	3.83	Very Desirable
Communication	4.02	Very Desirable
Staff Development	4.02	Very Desirable
Evaluation	4.08	Very Desirable
Leadership	4.07	Very Desirable
Classroom Visitation	4.03	Very Desirable

***Legend**: Rating Scale for Desired Supervisory Practices*

Range Interval	***Interpretation***
1.00 - 1.79	*Not Desirable*
1.80 - 2.59	*Less Desirable*
2.60 - 3.39	*Desirable*
3.40 - 4.19	*Very Desirable*
4.20 - 5.00	*Highly Desirable*

As shown in Table 2, the desired supervisory practices as perceived by both teachers and supervisory officials about instruction, communication, staff development, evaluation, leadership, and classroom visitation were very desirable.

Significant Differences Among the Actual and Desired Supervisory Practices As Perceived by Teachers and Supervisory Officials When They Grouped According to Demographic Profile.

Table 3: Comparison of Mean Perceptions of the Teachers when Grouped According to Age Concerning the Actual and Desired Supervisory Practices

PRACTICE	AGE 25 - below	26 - 35	36 - 45	46 - 55	56 - above	*F - computed value	Significance	Decision
ACTUAL								
Instruction	4.22	3.58	3.82	3.91	4.35	3.597	Significant	Ho; rejected
Communication	4.32	3.93	4.03	4.21	4.48	2.044	Not Significant	Ho; not rejected
Staff Development	3.92	3.74	3.81	4.32	4.63	5.370	Significant	Ho; rejected
Evaluation	4.10	3.77	3.70	3.97	4.15	1.731	Not Significant	Ho; not rejected
Leadership	3.98	4.00	3.77	4.38	4.43	3.329	Significant	Ho; rejected
Classroom Visitation	3.97	3.89	3.87	4.08	3.98	0.474	Not Significant	Ho; not rejected
DESIRED								
Instruction	3.80	3.68	3.74	3.97	3.95	0.651	Not Significant	Ho; not rejected
Communication	3.73	3.91	3.79	4.11	3.95	0.824	Not Significant	Ho; not rejected
Staff Development	3.87	3.91	3.77	4.14	4.25	1.251	Not Significant	Ho; not rejected
Evaluation	3.93	4.13	3.79	4.24	4.70	3.012	Significant	Ho; rejected
Leadership	4.07	4.18	3.86	3.96	4.60	2.151	Not Significant	Ho; not rejected
Classroom Visitation	4.23	4.03	3.85	4.14	4.10	1.037	Not Significant	Ho; not rejected

*F - critical value (5% level of significance, 4 & 129 df) = 2.422

As shown in Table 3, the F-computed values in the areas of instruction, staff development, and leadership under actual supervisory practices were 3.597, 5.370, and 3.329 respectively and evaluation under desired supervisory practices had the F-computed value of 3.012. They were found significant since the computed F-values exceeded the F-critical value of 2.422 at a five percent level of significance. Thus, the null hypothesis that there are no significant differences in the actual and desired supervisory practices of teachers when grouped according to age in the areas mentioned was rejected. However, the areas of communication, evaluation, and classroom visitation under actual supervisory practices had F-computed values of 2.044, 1.731, and 0.474 respectively and instruction, communication, staff

development, leadership and classroom visitation under desired practices had F-computed values of 0.651, 0.824, 1.251, 2.151, and 1.037 respectively the null hypothesis was accepted.

Table 4: Comparison of Mean Perceptions of the Supervisory Officials when Grouped According to Age Concerning the Actual and Desired Supervisory Practices

	AGE						
PRACTICE	**26 - 35**	**36 - 45**	**46 - 55**	**56 - UP**	***F - computed value**	**Significance**	**Decision**
ACTUAL							
Instruction	4.00	4.12	4.21	4.06	0.35	Not Significant	Ho; not rejected
Communication	4.40	4.32	4.53	4.49	0.51	Not Significant	Ho; not rejected
Staff Development	3.87	4.31	4.42	4.41	1.21	Not Significant	Ho; not rejected
Evaluation	4.00	3.94	3.85	3.44	2.17	Not Significant	Ho; not rejected
Leadership	4.00	4.36	4.37	4.19	0.48	Not Significant	Ho; not rejected
Classroom Visitation	4.20	4.24	4.34	3.91	1.31	Not Significant	Ho; not rejected
DESIRED							
Instruction	4.67	3.54	4.19	4.03	4.23	Significant	Ho; rejected
Communication	4.67	4.34	4.59	4.35	0.79	Not Significant	Ho; not rejected
Staff Development	4.67	4.26	4.24	4.45	0.48	Not Significant	Ho; not rejected
Evaluation	4.67	4.26	4.08	4.05	0.61	Not Significant	Ho; not rejected
Leadership	4.67	4.26	3.97	4.28	0.68	Not Significant	Ho; not rejected
Classroom Visitation	4.67	4.06	4.08	3.60	1.94	Not Significant	Ho; not rejected
*F - critical value (5% level of significance, 3 & 32 df) = 2.90							

As shown in Table 4, the F-computed values in most areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 2.90 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by supervisory officials when they were grouped according to age was accepted. However, the null hypothesis in the area of instruction under desired supervisory practices was rejected.

Table 5: Comparison of Mean Perceptions of the Teachers when Grouped According to Gender with Concerning the Actual and Desired Supervisory Practices

	GENDER				
PRACTICE	**Male**	**Female**	***F - computed value**	**Significance**	**Decision**
ACTUAL					
Instruction	3.78	3.86	0.36	Not Significant	Ho; not rejected
Communication	4.03	4.11	0.42	Not Significant	Ho; not rejected
Staff Development	3.83	4.00	1.58	Not Significant	Ho; not rejected
Evaluation	3.74	3.89	1.41	Not Significant	Ho; not rejected
Leadership	3.88	4.09	2.02	Not Significant	Ho; not rejected
Classroom Visitation	3.76	4.13	4.30	Significant	Ho; rejected
DESIRED					
Instruction	3.44	3.93	10.67	Significant	Ho; rejected
Communication	3.75	3.97	2.01	Not Significant	Ho; not rejected
Staff Development	3.44	3.93	10.67	Significant	Ho; rejected
Evaluation	3.67	4.23	13.80	Significant	Ho; rejected
Leadership	3.67	4.23	13.80	Significant	Ho; rejected
Classroom Visitation	3.67	4.23	13.80	Significant	Ho; rejected
*F - critical value (5% level of significance, 1 & 132 df) = 3.913					

As shown in Table 5, the F-computed values in the areas of instruction, communication, staff development, evaluation, and leadership under actual supervisory practices were 0.36, 0.42, 1.58, 1.41, and 2.02 lower than the F-critical value of 3.913. Therefore, the null hypothesis was accepted. The F-computed values in the areas of instruction, staff development, evaluation, leadership, and classroom visitation under desired supervisory practices were higher than the F-critical value of 3.913. Therefore, the null hypothesis was rejected.

Table 6: Comparison of Mean Perceptions of the Supervisory Officials when Grouped According to Gender with Concerning the Actual and Desired Supervisory Practices

	GENDER				
PRACTICE	**Male**	**Female**	***F - computed value**	**Significance**	**Decision**
ACTUAL					
Instruction	4.00	4.16	0.78	Not Significant	Ho; not rejected
Communication	4.20	4.50	2.63	Not Significant	Ho; not rejected
Staff Development	3.93	4.42	5.94	Significant	Ho; rejected
Evaluation	4.33	3.95	1.92	Not Significant	Ho; not rejected
Leadership	4.33	4.50	0.54	Not Significant	Ho; not rejected
Classroom Visitation	4.33	4.33	0.00	Not Significant	Ho; not rejected
DESIRED					
Instruction	4.00	3.76	1.25	Not Significant	Ho; not rejected
Communication	4.00	4.35	2.03	Not Significant	Ho; not rejected
Staff Development	4.10	4.23	0.31	Not Significant	Ho; not rejected
Evaluation	4.33	4.14	0.33	Not Significant	Ho; not rejected
Leadership	4.33	4.15	0.24	Not Significant	Ho; not rejected
Classroom Visitation	4.33	3.95	1.44	Not Significant	Ho; not rejected
*F - critical value (5% level of significance, 1 & 34 df) = 4.13					

As shown in Table 6, the F-computed values in most areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 4.13 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by supervisory officials when they were grouped according to gender was accepted. However, the null hypothesis in the area of staff development under actual supervisory practices was rejected.

Table 7: Comparison of Mean Perceptions of the Teachers when Grouped According to Years of Experience Concerning the Actual and Desired Supervisory Practices

	YEARS OF EXPERIENCE									
PRACTICE	**0 - 5**	**6- 10**	**11 - 15**	**16 - 20**	**21 - 25**	**26 - 30**	**31 - 35**	***F - computed value**	**Significance**	**Decision**
ACTUAL instruction	4.02	3.50	3.75	3.73	4.00	4.67	3.90	2.29	Significant	Ho; rejected
Communication	4.14	3.99	4.08	3.91	4.13	4.33	4.45	0.95	Not Significant	Ho; not rejected
Staff Development	3.87	3.86	3.82	3.83	4.33	4.23	4.50	1.96	Not Significant	Ho; not rejected
Evaluation	3.83	3.74	3.88	3.70	4.09	3.93	3.90	0.59	Not Significant	Ho; not rejected
Leadership	4.07	3.71	4.14	3.78	4.20	4.30	4.43	1.73	Not Significant	Ho; not rejected
Classroom Visitation	4.00	3.67	3.81	4.08	4.19	4.03	3.98	1.32	Not Significant	Ho; not rejected
DESIRED										
Instruction	3.76	3.78	3.52	3.87	4.09	4.33	3.85	1.42	Not Significant	Ho; not rejected
Communication	4.00	4.00	3.60	3.92	4.06	4.33	4.95	1.30	Not Significant	Ho; not rejected
Staff Development	3.99	3.86	3.68	3.90	4.09	4.67	4.25	1.78	Not Significant	Ho; not rejected
Evaluation	4.09	4.00	3.84	3.95	4.34	4.33	4.70	1.74	Not Significant	Ho; not rejected
Leadership	4.16	4.04	3.89	3.83	4.17	4.40	4.45	1.28	Not Significant	Ho; not rejected
Classroom Visitation	4.14	4.18	3.72	4.05	4.03	4.33	4.10	1.49	Not Significant	Ho; not rejected
*F - critical value (5% level of significance, 6 & 127 df) = 2.17										

As shown in Table 7, the F-computed values in all areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 2.17 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by teachers when they were grouped according to years of experience was accepted.

Table 8: Comparison of Mean Perceptions of the Supervisory Officials when Grouped According to Years of Experience Concerning the Actual and Desired Supervisory Practices

	YEARS OF EXPERIENCE							
PRACTICE	**0 – 5**	**6 - 10**	**11 - 15**	**16 - 20**	**31 - 35**	***F - computed value**	**Significance**	**Decision**
ACTUAL	4.00	4.16	4.43	4.08	3.80	1.42	Not Significant	Ho; not rejected
Instruction								
Communication	4.31	4.36	4.80	4.67	4.00	2.78	Significant	Ho; rejected
Staff Development	4.10	4.21	4.70	4.72	4.00	3.57	Significant	Ho; rejected
Evaluation	3.66	3.79	4.35	3.57	3.40	3.54	Significant	Ho; rejected
Leadership	4.29	4.25	4.60	4.50	3.10	3.89	Significant	Ho; rejected
Classroom Visitation	4.20	4.21	4.50	4.35	2.90	6.51	Significant	Ho; rejected
DESIRED								
Instruction	4.23	4.06	3.70	4.20	3.20	1.69	Not Significant	Ho; not rejected
Communication	4.58	4.49	4.57	4.50	3.60	1.81	Not Significant	Ho; not rejected
Staff Development	4.48	4.00	4.77	4.77	3.40	5.04	Significant	Ho; rejected
Evaluation	4.60	3.94	4.70	4.00	3.00	4.14	Significant	Ho; rejected
Leadership	4.45	3.83	4.70	4.50	3.00	3.26	Significant	Ho; rejected
Classroom Visitation	4.25	3.80	4.43	4.13	3.00	2.46	Not Significant	Ho; not rejected

*F - critical value (5% level of significance, 4 & 31 df) = 2.68

As shown in Table 8, the F-computed values in most areas of the supervisory practices were found significant since the computed F-values exceeded the F-critical value of 2.68 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by supervisory officials when they were grouped according to years of experience was rejected. However, the null hypothesis in the area of instruction under actual supervisory practices instruction, communication, and classroom visitation under desired supervisory practices was accepted.

Table 9: Comparison of Mean Perceptions of the Teachers when Grouped According to Educational Qualification Concerning the Actual and Desired Supervisory Practices

	EDUCATIONAL QUALIFICATION					
PRACTICE	**Bachelor**	**Masteral**	**Doctoral**	***F - computed value**	**Significance**	**Decision**
ACTUAL	3.85	3.82	2.90	1.78	Not Significant	Ho; not rejected
Instruction						
Communication	4.11	4.03	3.60	0.67	Not Significant	Ho; not rejected
Staff Development	3.98	3.88	3.20	1.24	Not Significant	Ho; not rejected
Evaluation	3.81	3.93	4.40	0.95	Not Significant	Ho; not rejected
Leadership	4.03	4.00	4.00	0.02	Not Significant	Ho; not rejected
Classroom Visitation	3.92	4.00	3.90	0.17	Not Significant	Ho; not rejected
DESIRED						
Instruction	3.85	3.82	2.90	1.78	Not Significant	Ho; not rejected
Communication	4.11	4.03	3.60	0.67	Not Significant	Ho; not rejected
Staff Development	3.98	3.88	3.20	1.24	Not Significant	Ho; not rejected
Evaluation	3.81	3.93	4.40	0.95	Not Significant	Ho; not rejected
Leadership	4.03	4.00	4.00	0.02	Not Significant	Ho; not rejected
Classroom Visitation	3.92	4.01	3.90	0.17	Not Significant	Ho; not rejected

*F - critical value (5% level of significance, 2 & 131 df) = 3.065

As shown in Table 9, the F-computed values in all areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 3.065 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by teachers when they were grouped according to educational qualification was accepted.

Table 10: Comparison of Mean Perceptions of the Supervisory Officials when Grouped According to Educational Qualification Concerning the Actual and Desired Supervisory Practices

	EDUCATIONAL QUALIFICATION					
PRACTICE	**Bachelor**	**Masteral**	**Doctoral**	***F - computed value**	**Significance**	**Decision**
ACTUAL						
Instruction	3.76	4.39	4.00	7.80	Significant	Ho; rejected
Communication	4.26	4.54	4.50	1.61	Not Significant	Ho; not rejected
Staff Development	4.12	4.43	4.50	1.81	Not Significant	Ho; not rejected
Evaluation	3.35	4.03	3.55	12.97	Significant	Ho; rejected
Leadership	4.13	4.40	4.00	1.18	Not Significant	Ho; not rejected
Classroom Visitation	4.06	4.29	4.00	0.93	Not Significant	Ho; not rejected
DESIRED						
Instruction	3.85	4.09	4.00	0.49	Not Significant	Ho; not rejected
Communication	4.60	4.45	4.00	1.28	Not Significant	Ho; not rejected
Staff Development	4.13	4.45	4.00	1.24	Not Significant	Ho; not rejected
Evaluation	3.91	4.31	4.00	1.15	Not Significant	Ho; not rejected
Leadership	3.69	4.43	4.00	3.26	Not Significant	Ho; not rejected
Classroom Visitation	3.71	4.17	4.00	1.57	Not Significant	Ho; not rejected
*F - critical value (5% level of significance, 2 & 33 df) = 3.28						

As shown in Table 10, the F-computed values in most areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 3.28 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by supervisory officials when they were grouped according to educational qualification was accepted. However, the null hypothesis in the areas of instruction, and evaluation under actual supervisory practices was rejected.

Table 11: Comparison of Mean Perceptions of the Teachers when Grouped According to Educational Preparation Concerning the Actual and Desired Supervisory Practices

	EDUCATIONAL PREPARATION				
PRACTICE	**Education Graduate**	**Non - Education Graduate**	***F - computed value**	**Significance**	**Decision**
ACTUAL					
Instruction	3.87	3.61	2.00	Not Significant	Ho; not rejected
Communication	4.09	4.09	0.00	Not Significant	Ho; not rejected
Staff Development	3.95	3.98	0.02	Not Significant	Ho; not rejected
Evaluation	3.87	3.69	1.05	Not Significant	Ho; not rejected
Leadership	4.06	3.84	1.13	Not Significant	Ho; not rejected
Classroom Visitation	3.97	3.70	2.63	Not Significant	Ho; not rejected
DESIRED					
Instruction	3.80	3.69	0.28	Not Significant	Ho; not rejected
Communication	3.90	3.89	0.01	Not Significant	Ho; not rejected
Staff Development	3.94	3.87	0.13	Not Significant	Ho; not rejected
Evaluation	4.10	3.80	2.05	Not Significant	Ho; not rejected
Leadership	4.10	3.69	4.58	Significant	Ho; rejected
Classroom Visitation	4.06	3.78	2.25	Not Significant	Ho; not rejected
*F - critical value (5% level of significance, 1 & 132 df) = 3.91					

As shown in Table 11, the F-computed values in most areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical values of 3.91 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by teachers when they were grouped according to educational preparation was accepted. However, the null hypothesis in the area of leadership under desired supervisory practices was rejected.

Table 12: Comparison of Mean Perceptions of the Supervisory Officials when Grouped According to Educational Preparation Concerning to the Actual and Desired Supervisory Practices

	EDUCATIONAL PREPARATION				
PRACTICE	**Education Graduate**	**Non - Education Graduate**	***F - computed value**	**Significance**	**Decision**
ACTUAL	4.10	4.33	1.67	Not Significant	Ho; not rejected
Instruction					
Communication	4.44	4.50	0.09	Not Significant	Ho; not rejected
Staff Development	4.31	4.50	0.78	Not Significant	Ho; not rejected
Evaluation	3.70	4.30	9.51	Significant	Ho; rejected
Leadership	4.29	4.33	0.03	Not Significant	Ho; not rejected
Classroom Visitation	4.18	4.33	0.46	Not Significant	Ho; not rejected
DESIRED					
Instruction	3.95	4.30	1.53	Not Significant	Ho; not rejected
Communication	4.47	4.50	0.02	Not Significant	Ho; not rejected
Staff Development	4.29	4.50	0.51	Not Significant	Ho; not rejected
Evaluation	4.11	4.50	1.40	Not Significant	Ho; not rejected
Leadership	4.11	4.50	1.06	Not Significant	Ho; not rejected
Classroom Visitation	3.99	4.17	0.31	Not Significant	Ho; not rejected

*F - critical value (5% level of significance, 1 & 34 df) = 4.13

As shown in Table 12, the F-computed values in most areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 4.13 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by supervisory officials when they were grouped according to educational preparation was accepted. However, the null hypothesis in the area of staff development under actual supervisory practices was rejected.

Table 13: Comparison of Mean Perceptions of the Teachers when Grouped According to Seminars Attended Concerning the Actual and Desired Supervisory Practices

	SEMINARS ATTENDED					
PRACTICE	**Local**	**Regional**	**National**	***F - computed value**	**Significance**	**Decision**
ACTUAL						
Instruction	3.87	3.48	3.86	1.59	Not Significant	Ho; not rejected
Communication	4.12	3.88	4.05	0.71	Not Significant	Ho; not rejected
Staff Development	3.94	3.92	4.01	0.08	Not Significant	Ho; not rejected
Evaluation	3.85	3.72	4.02	0.76	Not Significant	Ho; not rejected
Leadership	4.03	4.30	3.87	1.16	Not Significant	Ho; not rejected
Classroom Visitation	3.96	4.10	3.72	1.64	Not Significant	Ho; not rejected
DESIRED						
Instruction	3.81	3.87	3.62	0.56	Not Significant	Ho; not rejected
Communication	3.88	4.07	3.89	0.27	Not Significant	Ho; not rejected
Staff Development	3.93	4.23	3.76	1.32	Not Significant	Ho; not rejected
Evaluation	4.06	4.50	3.82	2.69	Not Significant	Ho; not rejected
Leadership	4.06	4.57	3.71	5.18	Significant	Ho; rejected
Classroom Visitation	3.99	4.33	3.96	1.24	Not Significant	Ho; not rejected

*F - critical value (5% level of significance, 2 & 131 df) = 3.07

As shown in Table 13, the F-computed values in most areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 3.07 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by teachers when they were grouped according to seminars attended was accepted. However, the null hypothesis in the area of leadership under desired supervisory practices was rejected.

Table 14: Comparison of Mean Perceptions of the Supervisory Officials when Grouped According to Seminars Attended Concerning the Actual and Desired Supervisory Practices

	SEMINARS ATTENDED					
PRACTICE	**Local**	**Regional**	**National**	***F - computed value**	**Significance**	**Decision**
ACTUAL						
Instruction	3.67	4.19	4.17	2.27	Not Significant	Ho; not rejected
Communication	4.33	4.60	4.40	0.96	Not Significant	Ho; not rejected
Staff Development	4.53	4.38	4.30	0.37	Not Significant	Ho; not rejected
Evaluation	3.60	3.62	3.91	1.67	Not Significant	Ho; not rejected
Leadership	4.00	4.46	4.25	0.98	Not Significant	Ho; not rejected
Classroom Visitation	4.40	4.11	4.23	0.43	Not Significant	Ho; not rejected
DESIRED						
Instruction	3.93	4.11	3.97	0.19	Not Significant	Ho; not rejected
Communication	4.33	4.82	4.32	4.52	Significant	Ho; rejected
Staff Development	4.87	4.27	4.28	1.16	Not Significant	Ho; not rejected
Evaluation	4.33	3.78	4.35	2.33	Not Significant	Ho; not rejected
Leadership	4.33	3.95	4.27	0.60	Not Significant	Ho; not rejected
Classroom Visitation	4.33	3.67	4.15	2.05	Not Significant	Ho; not rejected

*F - critical value (5% level of significance, 2 & 33 df) = 3.28

As shown in Table 14, the F-computed values in most areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 3.28 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by supervisory officials when they were grouped according to seminars attended was accepted. However, the null hypothesis in the area of communication under desired supervisory practices was rejected.

Table 15: Comparison of Mean Perceptions of the Teachers when Grouped According to the Research Conducted Concerning the Actual and Desired Supervisory Practices

	RESEARCH CONDUCTED				
PRACTICE	**Local**	**None**	***F - computed value**	**Significance**	**Decision**
ACTUAL	3.91	3.75	1.16	Not Significant	Ho; not rejected
Instruction					
Communication	4.17	3.99	2.45	Not Significant	Ho; not rejected
Staff Development	4.06	3.84	3.02	Not Significant	Ho; not rejected
Evaluation	4.00	3.67	8.08	Significant	Ho; rejected
Leadership	4.16	3.88	4.53	Significant	Ho; rejected
Classroom Visitation	3.79	3.84	0.17	Not Significant	Ho; not rejected
DESIRED					
Instruction	3.90	3.66	2.73	Not Significant	Ho; not rejected
Communication	3.99	3.80	1.94	Not Significant	Ho; not rejected
Staff Development	3.97	3.89	0.36	Not Significant	Ho; not rejected
Evaluation	4.03	4.09	0.14	Not Significant	Ho; not rejected
Leadership	4.09	3.99	0.54	Not Significant	Ho; not rejected
Classroom Visitation	4.15	3.87	5.23	Significant	Ho; rejected
*F - critical value (5% level of significance, 1 & 132 df) = 3.91					

As shown in Table 15, the F-computed values in most areas of the supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 3.91 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by teachers when they were grouped according to the research conducted was accepted. However, the null hypothesis in the area of classroom visitation under desired supervisory practices and evaluation and leadership under actual supervisory practices was rejected.

Table 16: Comparison of Mean Perceptions of the Supervisory Officials when Grouped According to the Research Conducted Concerning the Actual and Desired Supervisory Practices

	RESEARCH CONDUCTED					
PRACTICE	**Local**	**Regional**	**None**	***F - computed value**	**Significance**	**Decision**
ACTUAL	4.24	3.80	4.00	2.15	Not Significant	Ho; not rejected
Instruction						
Communication	4.59	4.00	4.28	3.60	Significant	Ho; rejected
Staff Development	4.47	4.00	4.16	2.37	Not Significant	Ho; not rejected
Evaluation	3.95	3.40	3.59	3.07	Not Significant	Ho; not rejected
Leadership	4.45	3.10	4.21	7.56	Significant	Ho; rejected
Classroom Visitation	4.36	2.90	4.14	13.84	Significant	Ho; rejected
DESIRED						
Instruction	4.15	3.20	3.88	2.69	Not Significant	Ho; not rejected
Communication	4.50	3.60	4.57	3.79	Significant	Ho; rejected
Staff Development	4.61	3.40	3.97	8.76	Significant	Ho; rejected
Evaluation	4.45	3.00	3.85	6.88	Significant	Ho; rejected
Leadership	4.54	3.00	3.72	8.09	Significant	Ho; rejected
Classroom Visitation	4.28	3.00	3.70	6.13	Significant	Ho; rejected
*F - critical value (5% level of significance, 2 & 33 df) = 3.28						

As shown in Table 16, the F-computed values in most areas of the supervisory practices were found significant since the computed F-values exceeded the F-critical value of 3.28 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by supervisory officials when they were grouped according to the research conducted was rejected. However, the null hypothesis in the areas of instruction, staff development, and evaluation under actual supervisory practices and instruction under desired supervisory practices was accepted.

Table 17: Comparison of Mean Perceptions of the Teachers when Grouped According to their Membership in Organizations Concerning the Actual and Desired Supervisory Practices

PRACTICE	MEMBERSHIP IN AN ORGANIZATION		*F - computed value	Significance	Decision
	Local	National			
ACTUAL					
Instruction	3.79	4.02	1.82	Not Significant	Ho; not rejected
Communication	4.04	4.32	3.30	Not Significant	Ho; not rejected
Staff Development	3.87	4.35	8.30	Significant	Ho; rejected
Evaluation	3.81	4.00	1.43	Not Significant	Ho; not rejected
Leadership	3.99	4.20	1.29	Not Significant	Ho; not rejected
Classroom Visitation	3.88	4.23	5.19	Significant	Ho; rejected
DESIRED					
Instruction	3.70	4.20	6.94	Significant	Ho; rejected
Communication	3.82	4.31	6.98	Significant	Ho; rejected
Staff Development	3.87	4.24	3.84	Not Significant	Ho; not rejected
Evaluation	4.00	4.38	4.06	Significant	Ho; rejected
Leadership	4.02	4.18	0.84	Not Significant	Ho; not rejected
Classroom Visitation	4.00	4.13	0.58	Not Significant	Ho; not rejected

*F - critical value (5% level of significance, 1 & 132 df) = 3.91

As shown in Table 17, the F-computed values in the areas of instruction, communication, evaluation, and leadership under actual supervisory practices and development, leadership, and classroom visitation under desired supervisory practices were found not significant since the computed F-values did not exceed the F-critical value of 3.91 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by teachers when they were grouped according to their membership in an organization was accepted. However, the null hypothesis in the areas of staff development and classroom visitation under actual supervisory practices and instruction, communication, and evaluation under desired supervisory practices was rejected.

Table 18: Comparison of Mean Perceptions of the Supervisory Officials when Grouped According to their Membership in Organizations Concerning to the Actual and Desired Supervisory Practices

	MEMBERSHIP IN AN ORGANIZATION					
PRACTICE	**Local**	**Regional**	**National**	***F - computed value**	**Significance**	**Decision**
ACTUAL	4.33	4.22	3.83	7.96	Significant	Ho; rejected
Instruction						
Communication	4.65	4.60	4.12	8.75	Significant	Ho; rejected
Staff Development	4.51	4.54	4.03	5.33	Significant	Ho; rejected
Evaluation	4.02	3.52	3.59	4.68	Significant	Ho; rejected
Leadership	4.57	4.24	3.93	6.49	Significant	Ho; rejected
Classroom Visitation	4.44	3.74	4.05	6.15	Significant	Ho; rejected
DESIRED						
Instruction	4.11	3.92	3.91	0.44	Not significant	Ho; not rejected
Communication	4.66	4.44	4.23	3.03	Not significant	Ho; not rejected
Staff Development	4.63	4.36	3.89	6.62	Significant	Ho; rejected
Evaluation	4.72	3.60	3.63	20.81	Significant	Ho; rejected
Leadership	4.63	4.20	3.54	9.49	Significant	Ho; rejected
Classroom Visitation	4.33	3.36	3.83	5.44	Significant	Ho; rejected
*F - critical value (5% level of significance, 2 & 33 df) = 3.28						

As shown in Table 18, the F-computed values in most areas of the supervisory practices were found significant since the computed F-values exceeded the F-critical value of 3.28 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the actual and desired supervisory practices as perceived by supervisory officials when they were grouped according to their membership in an organization was rejected. However, the null hypothesis in the areas of instruction, and communication under desired supervisory practices was accepted.

Significant Differences Between the Overall Perceptions of Principals/Assistant Principals and Subject Area Coordinators of the Actual and Desired Supervisory Practices.

Table 19: Comparison of the Overall Perceptions of Principals and Coordinators on Supervisory Practices

	MEAN PERCEPTION		t-value		
PRACTICE	PRINCIPALS	COORDINATORS	(computed)*	Significance	Decision
ACTUAL:					
Instruction	4.00	4.16	-0.789	Not Significant	Ho; not rejected
Communication	4.40	4.46	-0.293	Not Significant	Ho; not rejected
Staff Development	4.46	4.32	0.588	Not Significant	Ho; not rejected
Evaluation	3.76	3.80	-0.181	Not Significant	Ho; not rejected
Leadership	4.00	4.34	-1.273	Not Significant	Ho; not rejected
Classroom	4.20	4.21	-0.026	Not Significant	Ho; not rejected
Visitation					
					Ho; not rejected
DESIRED:					Ho; not rejected
Instruction	3.96	4.02	-0.192	Not Significant	Ho; not rejected
Communication	4.20	4.52	-1.321	Not Significant	Ho; not rejected
Staff Development	4.20	4.35	-0.473	Not Significant	Ho; not rejected
Evaluation	4.20	4.17	0.088	Not Significant	Ho; not rejected
Leadership	4.20	4.17	0.063	Not Significant	Ho; not rejected
Classroom	3.80	4.05	-0.727	Not Significant	Ho; not rejected
Visitation					
*t-critical value (5% level of significance, 34 df) = 2.032					

As shown in Table 19, the t-test resulted in negative computed t-values which indicated that the coordinators had higher ratings than the principals. However, the differences in the mean

ratings in all areas of the supervisory practices were found not significant since the computed t-values did not exceed the critical t-value of 2.032 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the overall perceptions of principals/assistant principals and subject area coordinators of the actual and desired supervisory practices was accepted.

Significant Differences Between the Overall Perceptions of Teachers and Supervisory Officials in Terms of Actual and Desired Supervisory Practices in Relation to Specified Areas Considered.

Table 20: Comparison of Overall Perceptions of the Teachers and the Supervisory Officials on the Actual and Desired Supervisory Practices

	MEAN PERCEPTION		t-value		
PRACTICE	Teachers	Supervisory Officials	(computed)*	Significance	Decision
ACTUAL:					
Instruction	3.83	4.14	-2.456	Significant	Ho; rejected
Communication	4.09	4.45	-3.153	Significant	Ho; rejected
Staff Development	3.95	4.34	-3.005	Significant	Ho; rejected
Evaluation	3.84	3.80	0.369	Not Significant	Ho; not rejected
Leadership	4.03	4.29	-1.919	Not Significant	Ho; not rejected
Classroom Visitation	3.94	4.21	-2.259	Significant	Ho; rejected
DESIRED:					
Instruction	3.79	4.01	-1.525	Not Significant	Ho; not rejected
Communication	3.90	4.47	-4.024	Significant	Ho; rejected
Staff Development	3.93	4.33	-2.722	Significant	Ho; rejected
Evaluation	4.06	4.17	-0.737	Not Significant	Ho; not rejected
Leadership	4.04	4.18	-0.903	Not Significant	Ho; not rejected
Classroom Visitation	4.02	4.02	0.009	Not Significant	Ho; not rejected
*t-critical value (5% level of significance, 168 df) = 1.974					

As shown in Table 20, the t-test resulted in negative computed t-values which indicated that the supervisory officials had higher ratings than the teachers. However, the differences in the mean ratings in the actual supervisory practices in the areas of instruction, communication, staff development, and classroom visitation were found significant since the computed t-values exceeded the critical t-value of 1.974 at a five percent level of significance. The differences in the mean ratings in the desired supervisory practices in the areas of communication and staff development were found significant since the computed t-values exceeded the critical value of 1.974 at a five percent level of significance. Hence, the null hypothesis that there are significant differences in the overall perceptions of teachers and supervisory officials of the actual and desired supervisory practices was rejected. On the other hand, the differences in the mean ratings in the actual supervisory practices in the areas of evaluation and leadership were found significant since the computed t-values did not exceed the critical t-value of 1.974 at a five percent level of significance. The differences in the mean ratings in the desired supervisory practices in the areas of instruction, evaluation, leadership, and classroom visitation were found significant since the computed t-values did not exceed the critical t-value of 1.974 at a five percent level of significance. Hence, the null hypothesis that there are no significant differences in the overall perceptions of teachers and supervisory officials of the actual and desired supervisory practices was accepted.

Conclusion

Based on the findings of the study, the following conclusions were drawn. The actual supervisory practices as perceived by both teachers and supervisory officials in relation to instruction, communication, staff development, evaluation, leadership, and classroom visitation were very effective and most items had the decision to continue which means that most of the supervisory practices were exercised properly by the supervisory officials while the desired supervisory practices as perceived by both teachers and supervisory officials in relation to instruction, communication, staff development, evaluation, leadership, and classroom visitation were very desirable and all the items had the decision to introduce. Hence, most teachers and supervisory officials were looking forward to integrating these items into the actual supervisory practices in their respective departments. The differences in the mean ratings in all areas of the supervisory practices were insignificant. Hence, the null hypothesis that there are no significant differences in the overall perceptions of principals and subject area coordinators of the actual and desired supervisory practices was accepted. The differences in the mean ratings in some areas of the supervisory practices were insignificant. However, the null hypothesis that there are no significant differences in the overall perceptions of teachers and supervisory officials of the actual and desired supervisory practices was accepted.

This study suggests allocating meetings for teachers, coordinators, assistant principals, and principals should be organized and held to discuss the identified overall gaps in their views on the actual and desired supervisory practices and to collaboratively find ways to bridge the said gaps in the areas of instruction, communication, staff development, evaluation, leadership, and classroom visitation. Also, teacher performance evaluations should be re-evaluated by administrators; teachers and supervisory officials should talk about possible ways to make performance evaluations more effective and less subjective.

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SMART Measuring Device: Utility Model for School Laboratories

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Abstract
This utility model helped to addressed the challenges in the insufficiency of laboratory apparatus in schools and improved the quality teaching of science curriculum through technology-aided device. There are thirty-nine (39) respondents consist of thirty (30) students, six (6) teachers and three (3) random engineers served as respondents of the study. Data were gathered through the use of researcher-made validated questionnaire comprised of (I) Checklist to test the content and instructional and technical quality and (II) open-ended questions to be answered by the students for their experiences while using the utility model. The statistic tools used were mean and standard deviation for descriptive statistics. Experiences of students were analyzed and synthesized in a thematic analysis. Results revealed that the present status of supply and devices in science laboratories were all inadequate or less equipped. Also, the developed utility model for school laboratory was "very acceptable" in terms of content and instructional and technical quality. Furthermore, the experiences of the students focused on how the utility model was used during the conduct of the activity. It measures the volume, weight and density properly and accurately, and in an interesting, very convenient, efficient, and specific manner. In which, positive feedbacks on the experiences of the students in using SMART Measuring Device was met.

Keywords: Utility Model, SMART Measuring Device, Very Acceptable, Laboratory, Experiences

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Introduction

Laboratory is the heart of science in which the individual could put theory into practice (De Borja et. al, 2020). It is believed that the laboratory is an important means of instruction in science since late in 19th century to present as it helps to increase the level of understanding (Townsend, 2012).

The use of the laboratory helps to develop scientific attitudes of the students towards the learning of subject matter especially practical concepts that develop scientific skills for problem solving (Omiko, 2015). Duit and Tesch (2010) in their study said the experiment plays a truly significant role in science instruction as they believed that hands-on needs to include minds-on. Which means that not all experiments including those that are beautifully designed result in the outcomes that are expected, and it should need to be staged adequately in such a way that hands-on and minds-on must occur.

Science laboratory experiments and laboratory experiment aid in developing scientific learning amongst student and in cultivating deeper and profound interest (De Borja et. al., 2020).

The K-12 Curriculum in the Philippines focuses on the "learning by doing" as a practical discipline that is an inquiry approach, which also requires hands-on, as well as minds-on, and hearts-on activities that feature the importance of active learning of the students. Aligned with the goal of the curriculum, the science curriculum is a learner-centered and inquiry-based discipline that provides learners with competencies necessary in the society and the work field. It requires learners to engage directly with materials needed for understanding the scientific concepts and for developing their scientific skills (Abas et. al., 2020).

However, teaching science needs to be addressed as many public schools in the country are challenged by the lack or insufficient of science laboratory facilities and equipment, including learning materials which are adhered and proven from the literature of this study. With this, some science teachers may resort to skipping or even not having the teaching with Higher Order Thinking Skills also known as HOTS on some laboratory activities if improvising materials are not possible. Hence, it hinders the realization of some competencies needed by the learners.

The inadequacy of laboratory facilities and equipment and insufficient laboratory rooms which are conducive for the teaching-learning process hinders the effective teaching strategies of the teacher (Masbaño, 2016). There is an indeed lesser focus when it comes to Science laboratory. Issues arose as an inadequate number of laboratory rooms as against the number of students, lack of materials, enough training of Science teachers in this venture, and most especially, safety, readiness and resilience of schools during laboratory experiments accidents (De Borja et. al 2020).

To address the present concern, technologies started to emerge successfully which enhances the learning and teaching process that supports science education through interactive learning environment that enables the students to participate and learn (Alijuhani, 2018).

With the statements aforementioned above, the development of utility model for laboratory activities known as SMART Measuring Device would help to address the challenges in the insufficiency of laboratory apparatus in school and improve the quality teaching in science curriculum through technology-aided device.

The SMART Measuring Device is a one-of-a-kind utility model that can do the function and task of graduated cylinder, Erlenmeyer flask, beaker and balance which makes the learning more interesting, fun, aligns to modernization and high-technology, as well as helps in the conduct of science laboratory experiments in a short period of time.

This study aimed to develop a utility model to enhance the learning performance of the Basic Education (BEd) students and it specifically sought to answer the following questions below:

1. What is the present status of science laboratories in secondary schools, particularly on the availability of materials, supplies and device?
2. What are the features from prior arts on measuring devices for liquids that can be used as basis for innovations?
3. What innovative smart measuring device can be developed?
4. How acceptable is SMART Measuring Device: Utility Model for School Laboratories as evaluated by Teachers, Engineers and Students?
5. What are the experiences of the students in using the SMART Measuring Device?

Purpose of the Study and Research Design

The Input-Process-Output (IPO) was used in the study. It aims to have an output through a process with the use of the utility model that answers the statement of the problem. Furthermore, the acceptability of the utility model fills in the gaps between the teaching-learning process and the inadequacy/unavailability of laboratory apparatuses in school.

The respondents performed laboratory activities using the utility model. The acceptability of the SMART Measuring Device was divided into (I) Content and (II) Instructional and Technical Quality. The SMART Measuring Device substitutes the unavailability of laboratory apparatuses that could measure the mass and volume of common materials (i.e. water, dishwashing liquid, isopropyl alcohol and mineral oil) needed in laboratory activities.

The respondents of the study were randomly selected and instructed to perform laboratory activities with the use of SMART Measuring Device. According to Cherry (2021), the term “random sample” is a subset of individuals randomly selected by researchers to represent an entire group as a whole. The goal is to get a sample people that is representative of the larger population.

Methods

This section explains the methodology utilized in this study. This includes the respondents, research instruments, data collection procedures and data analysis procedure.

Respondents

The acceptability of the SMART Measuring Device as utility model for school laboratories was based on the evaluated data of the learners, teachers and engineers.

Students

The randomly selected thirty (30) students from the Kalibo Institute Inc.- Senior High School Department determined the acceptability of the utility model as it was used during the laboratory activities. They answered the checklist and the interview questions in a researcher-made instrument. The only requirement of the respondents was they had a science subject on the said school.

Teachers

The Teachers being referred to in this study were the six (6) teachers who are teaching in Kalibo Institute Inc. The teachers' teaching experience and educational attainment did not affect the study. They answered the checklist that was already prepared by the researcher and was previously validated.

Engineers

Three (3) engineers evaluated the acceptability as well as the development of the utility model. These engineer experts are electronic engineers and have finished their 5 (five) year course. The school that they last attended and their attainment of the electronic engineers' licensure examination did not affect the study. These people answered the validated checklist in the researcher-made instrument.

Instrumentation

SMART Measuring Device was used as the main laboratory apparatus during the laboratory activity of the respondents. A researcher-made instrument was used to validate the acceptability of the utility model. The instrument was consisted of thirteen (13) item test. The validated test items were categorized into content (1-5), instructional and technical quality (6-10) and three (3) sets of interview questions answered by the students only.

The checklist and interview part was validated by a panel of experts to assure the quality of the data gathered by the researcher. The researcher-made instrument was comprised of:

Checklist

Part I contained the personal background information of the respondents such as the respondents' age, gender, and where they had their last school attended. Part II Content and Part III Instructional and Technical Quality were composed of 15 statements that measured the acceptability of the content and the instructional and technical quality of the utility model. In order to obtain the level of acceptability of the utility model, each statement has its scale which has an equivalent numerical value corresponding to the responses.

The Scale Indicators Scale was scored as follows:

Raw Score	Description
1	Not Acceptable
2	Fairly Acceptable
3	Moderately Acceptable
4	Acceptable
5	Very Acceptable

Mean scores and responses were analyzed and interpreted as follows: on the analysis, mean and standard deviation were used. The mean score determined the level of acceptability (Very Acceptable, Acceptable, Moderately Acceptable, Fairly Acceptable and Not) and the standard deviation was used to describe the variability from the mean. The said evaluation form assessed the acceptability of the utility model of the SMART Measuring Device for school Laboratories.

Table 1: Ranges for Interpretation

Lower Bound	Upper Bound	Interpretation
1.00	1.80	Not Acceptable
1.81	2.60	Fairly Acceptable
2.61	3.40	Moderately Acceptable
3.41	4.20	Acceptable
4.21	5.00	Very Acceptable

The table shows the range scale used in interpreting the responses of the respondents in order to determine the acceptability of the SMART Measuring Device.

Interview Guide

The interview guide used in this study was composed of three (3) open-ended questions answered by the students only. It helped the researcher to determine the experiences of the students while using the SMART Measuring Device in the laboratory experiments.

Data Gathering Procedure

The researcher wrote a letter of request addressed to the principal of Kalibo Institute Inc. – Senior High School Department to allow her to conduct/administer the study in the said school. The researcher, through the assistance of the head of the Senior High School Department gathered the respondents in a room for implementation. Instructions were read carefully to the students and teachers to make them understand what they are going to do.

The researcher explained and guided the respondents on how to perform the laboratory activities using the utility model. The students and teachers performed three (3) laboratory activities using the SMART Measuring Device. These include: Activity 1 – Exogenic Process, Activity 2 – Solutions and Activity 3 – Banana DNA.

Furthermore, the researcher administered the utility model to the students and teachers who were there the entire conduct of the study. The data collected were processed and analyzed by the use of SPSS (Statistical Package for Social Sciences) software.

Analysis Phase

In science subject, laboratory apparatuses are important. There are studies that give insight to the shortage and lack of laboratory apparatuses. Hence, here are some of the verifications about it.

De Borja (2020) strongly suggests that the government should support the funding of Science laboratories and at the same time decrease class size for the students to reach optimum development of learning as they believe that science experiments will help students to have better retention and appreciation of the science concepts.

The inadequate number of functional laboratories and apparatus taught the teachers how to improvise on certain laboratory materials as well as help the schools to discover ways of improvising the laboratory equipment from local and available materials in order to achieve learnings in the classroom. The Province of Northern Iloilo Polytechnic State College (NIPSC), a model school in implementing STEM curriculum in the district faces a problem on unavailability of the laboratory materials for hands-on activities and limited science textbooks to conduct the lesson (Tupas, 2019).

The status of laboratory materials in NIPSC resulted in the study of Delos Santos (2021) which states that the low mastery of science competencies is caused by lack of hands-on activities due to inadequate laboratory apparatus and absence of functional laboratory rooms.

The School 1 in Kalibo, Aklan, School 2 in 2nd Congressional District and School 3 in 1st Congressional District both from Iloilo Province currently have concerns on laboratory apparatuses to be used during hands-on activities. The present apparatuses were not functional and less in number considering the population of students during the conduct of science activities. These lead the teachers not to demonstrate the activity in class which in turn hinders the teaching-learning process. With the data gathered from three different schools, it was found out that all laboratory apparatuses are “less equipped” which means that it is less in number and the worst case was its not functional.

Having the concerns mentioned, there were prior arts that are already present today that serve as the strong basis of the researcher for the development and innovation of the SMART Measuring Device as a utility model for school laboratories.

The first one is Method of Determining Viscosity and Density of Liquid and Apparatus by Antonovich (2015). This looks into the continuous measurement of viscosity of a liquid during a process directly on an apparatus, for liquid where viscosity varies time over a wide range, including high-viscosity liquid.

Next is Measuring Device, Bisector Vernier Caliper by Alshamali Ismael (2021). This is about a mechanical measuring device that demonstrates its importance in industrial workshops and other engineering venues. It has also been developed into one of the most important mechanical measurement devices in an industrial workshop. The main result of this study was merging traditional Vernier Caliper which could solve technical problems in a workshop and save time, money and effort.

Finally is the Smart Fluid Measurement Device by Muhib Ali (2019). He presented a paper that provides the design and development of Smart Fluid Measuring Device for indicating the

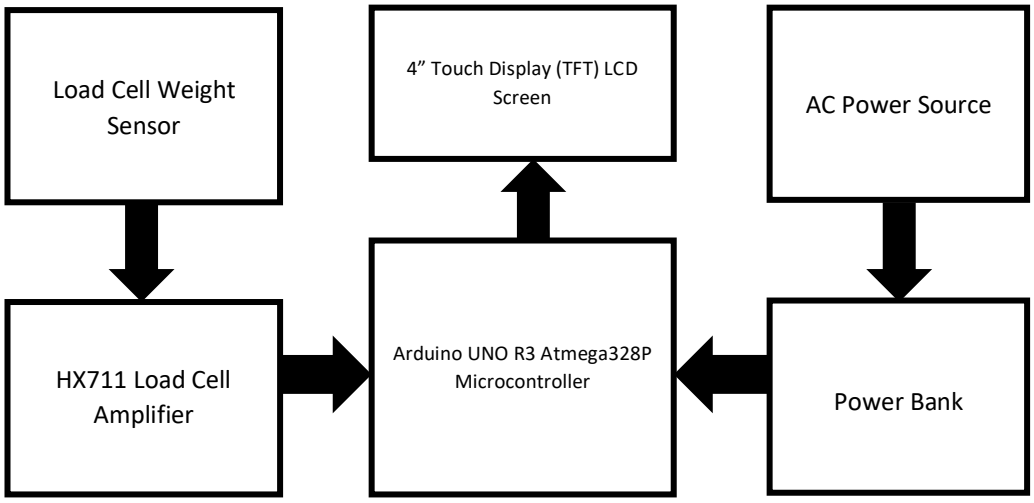
amount of liquid dispensed through a liquid dispenser where the system helps to avoid fuel corruption at fuel pumps by estimating the correct amount of the liquid that has been dispensed.

Design Phase

The main objective in designing the utility model was to be used as measuring device for school laboratories that may fill-in the gaps between the learning environment and the teaching-learning process. It is a fact that measuring devices are important in the conduct of laboratory activities inside the science laboratories.

During the designing phase of the utility model, there were things that were put into consideration to have a very acceptable laboratory apparatus to be used in school laboratories.

The size of the model was one of the primary considerations. The researcher wanted to design a handy laboratory apparatus and with a 3-dimensional feature to tilt the screen for easy reading of data. The capacity of the load cell and the power source were also considered to have alternative options in case there is no commercial power source to be used. The components used during the designing of the utility were also made sure to be in good quality and should be functional in order to come up with an excellent output. To illustrate how the components are connected with each other as a whole functional system, a block diagram serves as an illustration and a description of how it works.



The usage of the device starts by switching on the power. The screen will display two (2) options to select, whether the user will measure the weight or volume of the substance. In measuring the weight, click the "Weight" option. Place the container on the platform then click the "Tare" option, so that it will not include the weight of the container. Add the solid substance to be measured and the screen will display the value.

For the volume option, the steps are similar on how to measure the weight. Click the "Volume" option and it will displace four (4) types of liquid substances. The device was programmed to measure four (4) different types of liquid substances. This was based on the commonly used liquid substances in the school laboratory. Just select the substance to be measured.

Development Phase

Development Phase were consisted of five (5) stages:

I. Collaboration of researcher with the electrical engineer experts in preparations of making the Container, Liquid Substance and Command from the User and in creating a program for the microcontroller to operate the micro load cell.
II. Generating the program for the microcontroller to receive the input from the user using the touchscreen (LCD Screen).
III. Creating a program for the microcontroller to display the info on the touch screen.
IV. Programming that will convert the density of the liquid being measured.
V. Testing the functionality of the system. Once ready to be used as utility model, the next step of the researcher is to test the functionality of the system by using it in the laboratory activities. This were answered by the Teachers, Engineers and Students through a prepared and validated researcher- made instrument.

The utility device was calibrated to ensure the accuracy as to function (process) and data (output) prior to the day of the implementation and conduct of the study.

Implementation Phase

The utility model was used in three (3) different laboratory activities conducted by the researcher and respondents in a face to face set-up following the health protocols. The table below shows the laboratory activities conducted with the use of the utility model.

Table 2: How Utility Model Replaced the Insufficiency of Laboratory Apparatus During the Conduct of Activities

Activity Title	Laboratory Apparatus Replaced by the Utility Model	Qty.	Function of the Utility Model
Activity 1: Exogenic Process (Earth and Life Science)	Beakers	3-6 pcs.	Used to measure the amount of water
	Weighing Scale	1 unit	Measures the accurate weight of sand (100 grams), agricultural soil (100 grams) and clay (100 grams)
Activity 2: Solutions	Beakers	6-9 pcs.	Measures the amount of water (100ml)
	Weighing Scale	1 unit	Used to measure the right weight of salt (NaCl) (15 grams, 30 grams, 60 grams
Activity 3: DNA	Graduated Cylinder	2-3 pcs.	Measures the dishwashing liquid (20ml) and alcohol (10ml)
	Beaker	2 pcs	Measures the right amount of water (120ml)
	Weighing Scale	1 unit	Measures the right amount or right weight of salt (20 grams)

The insufficiency of laboratory apparatus was taken into consideration in order to use the utility model in the different science laboratory activities.

The acceptability checklist in the researcher-made instrument was also accomplished by the respondents. Moreover, the interview questions were only answered by the respondents for the researcher to obtain their experience while using the utility model. Their evaluation were incorporated in the final draft of the instrument.

Simulation Phase

The utility model of the researcher and engineers was tested if it is functional. As the researcher-made laboratory activities met the science objectives from the curriculum guide of DepEd, the respondents used the utility model on the laboratory experiment. The research respondents were the following: Engineers, Teachers and Students. Then, the researcher-made checklist was given to the respondents to answer. After which, the accomplished laboratory activity sheets were collected and recorded. An interview on the thirty (30) students about their experiences on the utility model while using it on the given laboratory activity was done by the researcher. The responses that were gathered involves collecting and analyzing non-numerical data to understand concepts, opinions, or experience of the users who were using the utility model.

Statistical Data Analysis Procedure

The data gathered for the study were subjected to computer-processed descriptive, using SPSS (Statistical Package for Social Sciences) software.

Mean --was used to obtain the mean scores to describe the respondents' response on the effectiveness of the device that had been used on the laboratory activities.

Standard deviation --was used to determine the homogeneity and heterogeneity of respondents' insights on the acceptability of the device on the laboratory activities.

Conclusion

The findings of the present study revealed that:

1. The present status of science laboratories in secondary schools, particularly on availability of materials, supplies and devices are inadequate and less equipped which leads to the difficulty on teaching science laboratory lessons.
2. There were prior arts that served as the basis of the researcher for the innovation of the SMART Measuring Device as a utility model for school laboratories. These are beaker, watch glass, graduated cylinder, weighing scale and Erlenmeyer flask. Also, some existing studies which include the Smart Fluid Measurement Device, Measuring Device, Bisector Vernier Caliper, and Method of Determining Viscosity and Density of Liquid and Apparatus were taken into consideration and were used as reliable sources.
3. The innovative SMART Measuring Device that the researcher developed achieved the positive feedback on the developed utility model after using it on the sample laboratory experiments. To highlight, there were five (5) stages in the development phase of SMART Measuring Device: Utility Model for School Laboratories and these are the following:

I. Collaboration of the researcher with the electronic engineer experts in preparations of making the container, liquid substance and command from the user and in creating a program for the microcontroller to operate the micro load cell.
II. Generating the program for the microcontroller to receive the input from the user using the keypad.
III. Creating a program for the microcontroller to display the info on the LCD screen.
IV. Programming that will convert the density of the liquid being measured.
V. Testing the functionality of the system. Once ready to be used as utility model after the study achieved having it, the next step of the researcher is to test the functionality of the system by using it in the laboratory activities. These were answered by the teachers, engineers and students that through a prepared and validated researcher- made instrument.

4. The SMART Measuring Device: Utility Model for Laboratories was evaluated by Teachers, Engineers and Students and was found out to be very acceptable as it is the result when the said utility model was used in the laboratory activities.
5. A thematic analysis that sum-ups the positive feedbacks on the experiences of the students in using the SMART Measuring Device was met. These are: Measuring volume and weight properly and accurately, interesting, very convenient, efficient, exciting, specific, applicable to school laboratory, very high-technology, gaining more knowledge and wisdom, unique, accurate and can influence other learners to learn.

Implications

The findings of the present study have led to certain implications for theoretical and practical concepts for the SMART Measuring Device: Utility Model for School Laboratories.

For Theoretical

The findings revealed in this study was anchored and supported by the Input-Process-Output (IPO) and Independent Learning Theory. In the development and usability of the utility model, the Input-Process-Output (IPO) model was used as it is a functional graph that identifies the inputs, outputs and required processing tasks needed to transfer input into output. As the study used an IPO model, the researcher added the prior arts for the input that were also related to the study. On the process, it includes the design and development of the utility model as well as the implementation and the evaluation. Finally, the output is known to be the SMART Measuring Device. Through this, the independent learning theory as a self-directed learning that an individual can choose what they want to learn, how deeply they wish to learn about something and methods or processes involved learning, EveWebb (2021) became part of the study.

For Practical

This is applicable for school administrators, science educators, students who are having science subjects and laboratory personnel. There is an importance of using labs/activities because it inspires and increases understanding of science that was evident not only in survey results but from statements students made as well (Lizabeth Ann Townsend, 2012). This study was the first of its kind as it has an outcome which is the SMART Measuring Device as a utility model for school laboratories. Its findings contributed to the people who are significant to the study.

Also, it may be encouraged to give support to laboratory experiments or activities in schools, and promote creative learning with the advancement of science since it has full of worth. This can formulate objectives, select subject matters and design science curricula that would inspire students to love their science subjects and make them conscious of the scientific ideas that they may apply. To add, those who are having science subjects will practice their skills and knowledge that they already have. With the use of the utility model, learning is easy and more interesting. Moreover, results of this study may encourage and motivate laboratory personnel to exercise what they had already learned in the past and apply it on how to use the SMART Measuring Device. Lastly, the results of the present study may help individuals especially those on the field of science that there is an effective laboratory device such as this.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are advised:

- School administrators may be encouraged to support laboratory experiments or activities in schools and promote creative learning with the advancement of science since it has full of worth. Coping with the rapid change of the world of science and technology is indeed needed.
- Science educators may achieve the objectives, select subject matters and design science curricula. They could also motivate the students to love their science subject by engaging and using the utility model on the science laboratory experiments. Through this, the students will be conscious of the scientific ideas that they may apply.
- Students who are having science subjects should practice the skills and knowledge that they already have especially in using the utility model on each laboratory activity that they may have. With the use of the utility model, learning is easy and more interesting on their part.

Laboratory personnel may motivate and assist the students when using the utility model. It is also an advantage on their part that they already learned how to use the existing laboratory equipment which they can apply when using the utility model.

Department of Education (DepEd), should support and be open to the modern technologies that would help the students, teachers and schools in order for them to be globally competitive in the field of science.

Delimitation of the Study

This study is focused on the development of SMART Measuring Device: Utility Model for School Laboratories to address the acceptability of the utility model and aid the inadequacy of laboratory apparatus of the school. Thirty (30) students, six (6) teachers of Kalibo Institute, Inc., and three (3) random engineers who completed a 5-year college program served as respondents of the study.

A researcher-made questionnaire was employed as the data-gathering tool to determine the acceptability of the utility device. The researcher-made questionnaire was validated by a panel of validators considering their expertise. Experts' recommendations were the basis for the finalization of the researcher-made questionnaire for conducting the research study.

For the utility model, the researcher collaborated with the electronics engineers for the development of the device or the utility model.

The utility model is only capable to measure a maximum weight of 1 kg, and 1liter volume when water is being measured. With the built-in rechargeable DC power supply, the device is operational for a maximum of 10 hours in the absence of the commercial power.

The device is limited to measure four (4) different types of liquid substances since the selected ones are the common liquids that are being used during school laboratory activities; but other types can also be added by programming the microcontroller.

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Kalibo Institute, Inc. staff and students for serving as the respondents of the study and for allowing the researcher to conduct the study in the said school.

Nanay Jacquilyn, Tatay Mario, Siblings Marlo and Engr. Mark Ian, Dearest Deok Geun, Mother-in-law Youngsuk and Father-in-law Hee Ju for the unconditional love, and prayers; My little one, John Shiloh.

And, above all, to the Almighty God, for the opportunity to conduct this study.

Appendices

Appendix A

RESEARCH INSTRUMENT

Name: (Optional)_____ _____ Age: _____
Gender: [ ] Male Status: [ ] Student
[ ] Female [ ] Teacher
Other/s (please specify) _____
Last school attended: _____

Direction: This questionnaire will measure the acceptability of the utility model that was used in the laboratory activity. Please read each statement carefully and check the appropriate column that is most applicable to you. Please answer all items. Be assured that your responses will be kept confidential and will be used for research purposes only. Below are the meanings of the choices:

Very Acceptable (VA) -- if the statement describes fully acceptable. (100%)
Acceptable (A)-- if the statement somehow describes it's acceptable. (80%)
Moderately Acceptable (MA) – if you are not sure if the statement describes that is acceptable or not (50%)
Fairly Acceptable (FA)-- if the statement describes partly it is acceptable. (40%)
Not Acceptable (NA) – if the statement does not in any way describe it's acceptable.

	NA (1)	FA (2)	MA (3)	A (4)	VA (5)	Remarks
A. CONTENT						
1. Objectives on the laboratory experiment are met.						
2. Appropriate to the level of K to 12 Basic Education Curriculum (K to 12)						
3. Designed for science laboratory experiments.						
4. Attained the higher order thinking skills (HOTS) such as critical thinking, creativity, inquiry, problem solving, among others.						
5. Motivated the students through provisions of engaging the laboratory activity.						
TOTAL SCORE = _____ AREA MEAN= _____						
	NA (1)	FA (2)	MA (3)	A (4)	VA (5)	Remarks
B. INSTRUCTIONAL AND TECHNICAL QUALITY						
6. Appropriate on the instructional reasons.						
7. Accurate and has a real-time result outcome.						

8. Efficient.						
9. Navigate easily.						
10. Stimulates the learner's creativity.						
11. Better than the existing laboratory apparatus or devices.						
12. Appealing and interesting.						
13. Used in the laboratory experiments.						
14. Possessed consistent interface components and visual cues (buttons, menu, icons, label, messages, etc.)						
15. Safe.						
TOTAL SCORE = _____ AREA MEAN= _____						

Mean Score: _____ Over-all: _____

C. Interview Questions: (Applicable only for the students)

1. How does the smart measuring device for school laboratories work as you used it in the laboratory experiment?

   _____

2. How would you describe your experience on using the smart measuring device for school laboratories?

   _____

3. Would you recommend the smart measuring device for school laboratories on other students and why?

   _____

_____

Signature Over Printed Name of Evaluate Date

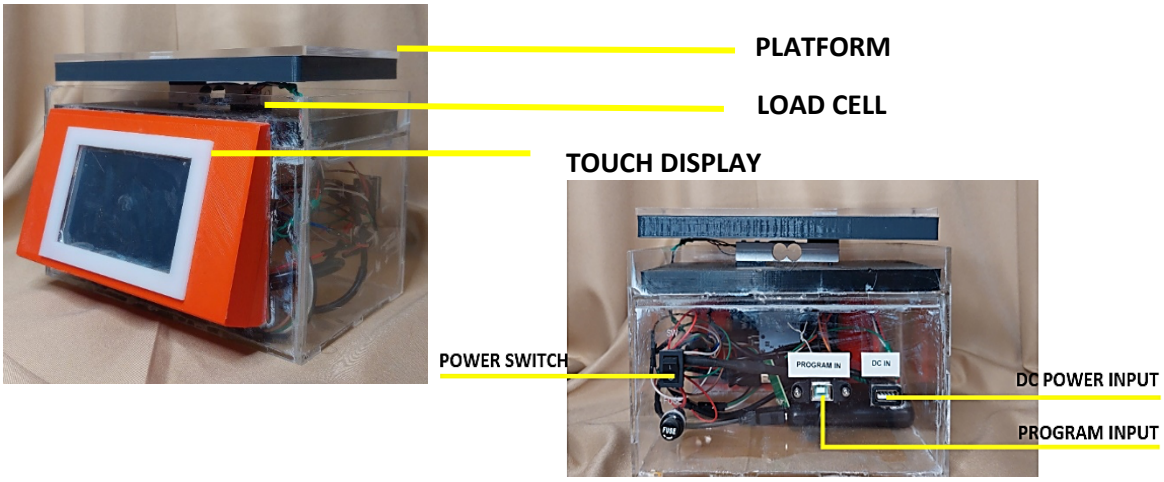
Thank you for completing this questionnaire.

MARIAN C. FAGTANAC
(Candidate, M.A. Ed. Biological Science)

Appendix B

DOCUMENTATION

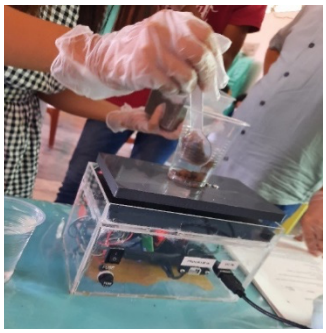
A. The SMART Measuring Device



B. Researcher with the respondents and utility model







C. Students' experiences using the utility model

As an entire group	Question No. 1	Question No. 2	Question No. 3
Student No. 1	Easy to use	So easy to use	Yes, it helps the students to have right amount of measurement.
Student No. 2	Helps to measure smoothly and not hard to use.	It is fun using it.	Yes, easy to use and can be very helpful.

Student No. 3	Weight and volume appeared quickly.	Exciting, easy to handle and we finished our activities on the given time.	Yes, I want those students to experience what I've been experienced and it is big help.
Student No. 4	The device worked well.	It meant the exact weight and grams of the matter that we needed.	Yes, we can use it and know the exact weight of our activity.
Student No. 5	Very easy to use and very high-technology device.	Easy for us to measure by using it.	Yes, easy to use and it gives you an accurate amount or anything you need to measure.
Student No. 6	Very interesting and works well.	The device is very interesting and it is working well.	Yes, because it is efficiency capability.
Student No. 7	Works well, but sometime has hard time on tapping the screen.	Good and very specific kind of device.	Yes, it's efficiency capability and specific can help my fellow students.
Student No. 8	Easy to use.	It is fun while using the device.	Yes, easy to use and it is really helpful.
Student No. 9	I am amazed as well as very acceptability.	Awesome and through this device we will gain more knowledge and wisdom.	Yes, to influence other students and to gain lots of learning.
Student No. 10	The device works well.	Very fine and very specific.	Yes, they can have interest because it is a specific device.
Student No. 11	It is easy to use.	I felt good, amazing and easy to use.	Yes, it is easy to use and good for laboratory set-up.
Student No. 12	Easy to used and it can help to students.	All good and very specific on getting the measurement.	Yes, efficiency capability and specific.
Student No. 13	The device is easy to use and easy to understand.	Very safe and it is easy to use.	Yes, not harmful and easy to use.
Student No. 14	Easy to use and it can help the students.	A device that is very high-technology and very fast to observe.	Yes, it's efficiency, capability and being specific.
Student No. 15	Easy to use.	The device is good and it was amazing.	Yes, because it needs in the laboratory.
Student No. 16	The device is easy to use.	A good experience as well as helpful.	Yes, because the device is in good condition and unique.
Student No. 17	It is easy to use.	Good, helpful in terms on modern technology.	Yes, because the said device is really need in the laboratory experiment.
Student No. 18	Easy to use.	It is good and a very specific kind of device.	Yes, because of its efficiency and capability.

Student No. 19	Easy to use and can help the students.	Good and a advanced technology device.	Yes, the device is in good condition and unique.
Student No. 20	The device is easy to use.	Amazed and easy to use as well as it helps a lot.	Yes, easy to use and also you learned so fast. It engaged students well where it is not hustle to use.
Student No. 21	Easy to use.	The device is useful and helps a lot especially on measuring.	Yes, it is easy to use and will give you a less work.
Student No. 22	I felt very amazed.	An awesome one.	Yes, I'll describe to them what are the used of this device.
Student No. 23	The device is easy to use.	It is fun and easy.	Yes, because it is modern and easy to use as well.
Student No. 24	Amazing and easy to use.	It was great and not hustle at all.	Yes, one of the easiest to use and modern.
Student No. 25	The device is easy to navigate.	It is interesting and boost individuals' creativity while using the device.	Yes, good device for a new modern generation and a new learning activities.
Student No. 26	The device works well.	It worked well.	Yes, sometimes the button is hard to press but it is useful for school laboratories.
Student No. 27	Very convenient, fun using it and very helpful.	The device is very interesting.	Yes, the device is highly recommended and it is very convenient.
Student No. 28	It works perfectly, suits to laboratories, easy to use and it's related to modern technology.	Amazed and I was attracted to the device since it easy and not hustle to use.	Yes, features were very nice and student friendly kind of device.
Student No. 29	It worked efficiently and it is easy to use.	A handy type of laboratory school equipment.	Yes, highly recommended and the activity flows activity because it is easy to use.
Student No. 30	Easily gives you an accurate result, also related to our modern technology.	I am amazed and happy. In which it can help other students.	Yes, the device is very easy to use and accurate, real time result outcome, not hustle to students using this.

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Simulation Based Teaching: A Case Study on Perceptions of Nurse Educators at the University of Botswana

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Abstract
Background: Simulation based education has gained momentum in nursing education. During the advent of COVID 19, simulation-based teaching and learning became a useful strategy employed in nursing education globally as the traditional way of delivering content was not possible. Nurse educators are pivotal to the teaching and learning environment that help learners to develop both technical and problem-solving skills essential for patient care. It is crucial therefore, to examine nurse educators' perceptions on simulation teaching and learning.
Objective: To explore the perceptions of nurse educators regarding the use of simulation teaching and learning strategy.
Methods: A qualitative exploratory case study was conducted, and four (4) nurse educators were purposively selected for data collection. With the permission of participants, individual semi-structured interviews were tape-recorded. Through content analysis, data were systematically analysed and interpreted. Four themes emerged from the study namely, simulation learning as having merits if implemented in a well-resourced environment, positive experiences of facilitating simulated learning, lack of direct interaction of students with patients and challenges of inadequate resources.
Conclusion: The nurse-educators perceived a well-resourced environment, simulation learning as having potential to benefit students. Further research on simulation teaching and learning strategy is needed to expose perceptions of nurse educators at a larger scale.

Keywords: Simulation Teaching, Simulation Learning, Perceptions, Nurse Educator

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Introduction

Simulation as a form of clinical teaching can assist nursing students to develop essential skills required for safe patient care (Mothiba, et al., 2020). The advent of both infectious and chronic diseases has strained the nursing workforce because of high acuity and large numbers of the infected and deaths leading to a critical shortage of nurses (WHO, 2022: ICN, 2022). Hence, the demand for training institutions to increase the enrolments with subsequent need for advanced clinical teaching strategies. The focus of simulation is to promote acquisition of psychomotor and critical thinking skills that are indispensable in the nursing profession. Simulation enables nursing students to learn and practice in an environment that resembles the hospital or any purposefully designed healthcare situation before they start work as professionals (Koukourikos et al., 2021). The method allows students to develop confidence and overcome fear of performing nursing care activities in the live environment (Mothiba, et al., 2020; Relloso, et al., 2021). The demand for increased clinical staff created a discrepancy in ratio of learners to an educator. The increase in enrolment has been experienced by training institutions globally with Botswana inclusive,thereby placing a burden on teacher-student contact time (Goswami et al., 2021). Additionally, equipment and training resources are also in short supply. As a result, student enrolment that is not commensurate with human resources, student supervision, and exposure to clinical skills and assessment is a huge challenge. The recommended teacher-student ratio is 1:10 for the undergraduate program experiential learning (ICN, 2022; Goswami et al., 2021; Letourneau, 2020) and 1:3 in the live clinical area in India (Goswami et al., 2021). However, the high student to teacher ratios have led to a reduction in supervisory time, as well as the number of clinical activities demonstrated and assessed leading to the exploration of different teaching strategies such as live simulation, virtual simulation, and the use of mannequins (Zarifsanaiey et al., 2016).

There is paucity of literature on simulation teaching and learning in Botswana. Two (2) articles were found, one conducted simulation on emergency medical services (EMS) providers and the other, on medical students and intern doctors (Kosoko et al, 2019; Mwandri, 2017). The two studies proved that simulation was an effective tool to use in teaching and learning. The results of these studies are essential as they provide a clear picture of simulation in the local context, hence, they serve as the basis for bench marking by nursing schools in the country. Given the demand on training of nurses globally, studies on simulation teaching and learning are needed to inform the nurse educators. Therefore, a study on the perceptions of nursing educators regarding simulation teaching and learning is critical. The importance of this study, emerges on the dearth of studies on simulation in nursing schools in the local context.

Objective

The study explored the perceptions of nurse educators regarding the use of simulation teaching and learning strategy at the University of Botswana (UB).

Methodology

Design

An exploratory qualitative case study design was undertaken. Purposive sampling selected nurse educators who taught a simulation-based course-Introduction to Nursing and Practice 1 in the academic years 2020 to 2022 to examine their perceptions on the simulation teaching and learning.

Study Setting

The study was conducted in the School of Nursing, Faculty of Health Sciences, University of Botswana. The school of nursing offers undergraduate and graduate programs that are taught by the nurse educators mostly prepared at masters and doctoral levels, while also supported by clinical nurse educators who hold masters degrees.

Participants

There were eight nurse educators eligible for participation, five (5) declined while three consented and in addition, out of four clinical nurse educators, only one (1) consented. In total, the study sample constituted four (4) participants who facilitated the simulation-based course (Introduction to Nursing and Health Practice I) in the academic years 2020 to 2022 at UB. Introduction to nursing and health practice 1 is one of the basic foundational courses offered to first year nursing students.

Data Collection

Faculty at the School of Nursing were informed through email about the study and invited to participate. A semi-structured interview guide which contained three (3) questions was used. The guide was pre-tested on two nurse educators who were not part of the study. Two (2) trained research assistants collected data. One was responsible for asking questions, and the other one was taking field notes and recording the interviews. Arrangements were made with eligible participants, and they were met to sign the consent form after the study was explained to them. An online meeting link was shared on the date and time suitable for them on Microsoft Teams 365. Participant responded to the following interview questions: i).What are your experiences about simulation teaching? ii). What are the challenges that you have experienced during simulation teaching? and iii). Has simulation affected students' critical thinking ability?.Data were collected on-line, and audio recorded using Microsoft Teams 365 platform. The interviews lasted 30-45 minutes.

Data Management and Analysis

Data were kept safe by the principal investigator using a google protected password. Audio recordings were listened to and compared with fields notes by an independent experienced qualitative researcher. Data were analysed by independent experienced qualitative researcher. The content analysis method involving analysing narrative data for prominent themes in sentences was done. Initial units were coded and named as per the content that was gleaned, then collapsed into categories which were later collapsed into themes or the sub-headings that were used to organize the findings.

Ethical Considerations

Ethical clearance was granted by Institutional Research Board (IRB) in the University of Botswana. Nurse educators consented to participate in the study.The principal investigator and co-authors are faculty members at the School of Nursing, too uphold confidentiality and avoid bias, two independent research assistants collected data while an independent retired nurse educator transcribed and analysed the data.

Results

Four participants were interviewed. The sample comprised 1 male (25%) and 3 females (75%). Their ages ranged between 51 and 61 years and 50% had attained masters' degree while the remaining a doctoral degree.

Table 1: A Summary of Participants' Demographic Characteristics

	Variable
1	Age (N = 4)
	Range: 51-61 years
	Mean: 57 Years (SD= 4.24)
	Median: 58 Years
2	Male/Female (N = 4)
	Male: 1 (25%)
	Female: 3 (75%)
3	Educational Qualification (N = 4)
	Masters' Degree: 2 (50%)
	Doctoral Degree: 2 (50%)
4	Religion (N = 4)
	Christianity: 4 (100%)

Themes Emerging From the Data

Merits of Simulation Learning

Participants reported that if the nursing laboratory was well resourced, it would have merits that include the following: (1) reduction of chances of reality shock as simulation provides learners with an opportunity to translate theory to practice before they encounter real world practice, (2) an opportunity for learners to satisfy their inherent curiosity as they can repeat skill rehearsal and rectify any errors in skill practice without any fear of causing harm to patients, and (3) immediacy of feedback because both learners and educators can make on-spot reflection on skill performance such that the learners get immediate feedback on their skill performance. (4) One participant mentioned, that when implemented in an ideal environment, simulation teaching and learning can ease the burden of work in situations where there are staff shortages because students can go into the laboratory and rehearse skills without the company of educators.

Staff's Positive Experiences

There was not much that could be labelled "staff's positive experiences" in facilitating simulated teaching and learning. One participant indicated that students often created own time to be at the skills laboratory to horn their skills and that equipment was always at the students' disposal under the supervision of the nurse educator. The participant reflected that:

> *students often create extra time during off-hours or weekends to come and practice… equipment is always available and offers them an opportunity to horn their skills.use it without fear of overriding on human rights.* (Participant ID 1)

Challenges Experienced by Staff

Participants reported shortage of resources as the main challenge they met in facilitating simulated teaching and learning. The shortage of resources was said to be compounded by the large numbers of students, that resulted in too many students for an individual staff member at skill demonstrations and rehearsal sessions. Under inadequate resources, participants listed space, staff, and equipment that was poorly mainatained and not usually serviced on time. Inadequate resourcing of the laboratory often meant that students could not rehearse skills. Participants reported that it was not unusual to find 24 students to a laptop watching a video; and each one struggling to position him/herself so he/she could have a space to view the small screen. Other hassles frequently encountered in the learning environment were shortage of wash basins, electrictrical outlets or plugs to connect gadgets such as computer and electronic monitors, and water. One participant rhetorically lamented:

> *The space is not enough, the resources are scant…., you would find that there are 20 students per lecturer, making it difficult to demonstrate to students and watch all of them return demonstrate…. if it were 5 students per lecturer, maybe it could work.* (Participant ID 2)

The participants also observed that the high number of students studying under a poorly resourced environment was compromising learning as it was limiting students' contact hours. Faced with high number of students to whom an educator needs to demonstrate a skill within a given time, educators found it difficult to ensure that each student performed return skill demonstration to their satisfaction. A concerned participant stated:

> *I had to demonstrate bed making to students; but because of time, students did not do it as I would have loved; as they did not do full-scale; if it were 5 students per educator, maybe it could work.* (Participant ID 3)

The inadequate time for return demonstrations resulted in many students going for assessment when they had not mastered nursing practice skills thus challenging them to achieve the required competences. As the same respondent said:

> *Students do a return demonstration (time allowing) …not all of them. We just go straight into assessment, which is not okay because rightfully, they are supposed to do three return demonstration before the educator can assess, especially that we are doing a critical course 'nursing' which is about life….* (Participant ID 4)

Participants unanimously indicated that in a well-resourced simulation learning environment, students would usually go into the laboratory at their private time and rehearse skills. However, as the situation obtained at the nursing school laboratory, such an opportunity was limited for only two main reasons: (1) the laboratory did not have personnel constantly to see to it that students came in, and engaged with mannequins. (2) because the student numbers were high, and mannequins were limited, the laboratory was always booked for students-staff sessions; if students were not booked for the simulation laboratory, then they were attending classes for theory classroom teaching and learning.

The use of low fidelity mannequins in the simulation laboratory was a concern to staff members; with three of them raising the same concern and one of those bringing up the issue more than once during the interview. Participants felt that the mannequins were not challenging

the students to think as they were not programmed to behave in a particular way to stimulate some form of interaction that would resemble real-life situations. They reported that talking mannequins could bring students experiences nearer to the real-world situation than what they were working with. The low fidelity mannequins were said to stifle students' critical thinking and limiting their ability to transfer what they were learning to clinical situations. The participantss frustration was echoed by the following comments:

> *…students were not able to analy ze the situations effectively and critically because of several reasons……. lack of high-fidelity mannequins impeded the learners to acquire more practical sense of real scenarios.* (Partcipant ID 4)

The participants tended to use the phrase, "*it's not working for us*" that may translate to "*intended learning is not being realized.*" It was not working to use mannequins that could not communicate; it was not working to have 24 students at a laptop; it could work if there were five students to a lecturer or educator.

Lack of training in facilitation of simulated based teaching and learning was a challenge that cropped up as observed by one participant.The participant reported that lack of knowledge about using the equipment as he/she had not been given any orientation and was learning during engagement with students. A situation that created a lot of discomfort to the educator.

Limitations of Simulated Learning

Most particiapnts did not say much about shortcomings of simulated learning as a teaching strategy, but one participant reported that simulation learning compromised the students' opportunity to learn the etiquette of interacting with patients in real clinical settings. Other remarks, rather than being perceived as attributes of simulation learning, were a function of the learning environment as participants experienced it, and they were discussed at their appropriate place.

Discussion

The study provides insight into the perceptions of nurse educators regarding simulation-based teaching and learning in the local context.Study participants demonstrated that simulation-based teaching and learning is important in nurse training and education and also identified specific merits, challenges and limitation associated with the approach. The nurse educators expressed positive perceptions about simulation-based learning and teaching provided the necessary resources are available. They perceived simulation-based teaching and learning to be an effective strategy for the development of critical skills required for safe practice in the nursing profession. Similarly, nurse educators in Kenya, Madagascar and Tanzania have applauded simulation-based learning and teaching because it provides learning opportunities to students that extend beyond traditional classroom (Nyamu et al., 2018; Tjoflåt et al., 2012). This is especially valuable in low and middle income settings where resources are often limited. Other health-related professions have also reported the proliferation of simulation centers in medical schools as they provide a safe environment for acquisition of skills (Touchie, Humphrey-Murto & Varpio, 2013). Simulation allows learning of the skill with a simulated patient thus providing an opportunity to practice at a full scale. In the current study, merits of simulation based teaching and learning have been reported. Nurse educators perceived the strategy as helpful in the reduction of reality shock which could otherwise undermine the development of confidence on a novice learner in their first encounter with real patients in

clinical settings. The results are similar to the systematic review by Alrashidi et.al (2023) who showed that simulation learning was strongly associated with improvements in self-confidence when nursing students were communicationg with patients and their colleagues thereby uplifting the standard of patient care.

The findings are also supported by studies conducted in various parts of the globe. For instance, a study conducted in Norway by Solheim & FloView (2021) and another in Lesotho by Moabi et al., 2021). Further, simulation not only reduce chances of reality shock, but takes place in an environment that is less threatening and supportive hence no risk of harming the patient. Simulation allows learners to repeat skills until they are perfected, and the learner is satisfied. Similar results have been cited by Campos et al., (2020), who confirms that simulation software and tools enhance the teaching and learning proceses by allowing learners to use clinical practice scenarios .Nurse educators in our study shared that there was immediacy of feedback for both learners and educators that comes with simulated teaching and learning. However, literature has buttressed on limited feedback opportunities that is common when learners are left to perform self-directed learning processes (Touchie, et al., 2013). In terms of number of patients, simulation was found to ease the burden of limited resources as learners share the same mannequins without the risk of causing fatigue and invading privacy of patients. Simulation allows learners to develop skills and gather hands-on experience simultaneously.

Although simulation-based learning and teaching is deemed one of the best tools to combine theory and practice as well as learning from mistakes in a safe supportive environment (Akselbo et al, 2023), it is not without challenges. The current study highlighted challenges such as inavailability of resources pertaining to laboratory space, limited number of the nurse educators to cater for the large student population, lack of high-fidelity mannequins, reduced contact time with students and lack of skill in using available machines and equipment by those facilitating simulation teaching and learning. These challenges have been reported regionally and internitionlly in studies conducted in Lesotho (Moabi & Mtshali, 2022), Ghana (Salifu et al 2022) and in Greece(Koukourikos et al., 2021) and in some parts of India (Kim et al., 2020). However, in most developed countries, these were not reported as challenges because their nursing laboratories are well resourced with high fidelity mannequins (Sofer, 2018). High-fidelity simulation has been reported to enhance attainment of skills such as communication, problem -solving, critical thinking and workng as a team (Mishra & Trivedi, 2023). In this study, nurse-educators reported being overwhelmed by the student to staff ratios that were linked to reduced contact time because educators strived to fulfil the teaching learning requirement to cover content and skills.

Some scholars noted that despite the upward trend in the use of technological systems in nursing education, there is still a gap in its acceptance (Gause, Mokaola & Rakhudu, 2022) because it is scarce, and it is not well understood (Alt-Gehrman, 2019). The lack of acceptance may be attributed to factors relating to finance, shortage of faculty, decreased clinical sites for learning and the increase in number of students applying to nursing schools (McKitterick, Jayasekara, & Parker, 2023: Alt-Gehrman, 2019). These challenges were experienced in the current study. One other attribute leading to lack of acceptance is failure of implementors to adapt simulation tools owing to resistance to change from traditional teaching to technological one (Baayd, et al., 2023). The results, however, were also consistent with the local study conducted on medical trainees where low-cost simulation was reported as useful for training and assessment in a resource-constrained country like Botswana (Mwandri et al., 2017). In contrast, elsewhere, simulation even with high fidelity manniquins was perceived with some contempt by students as they regarded the simulated patient situation as articficial and thus

were not able to accept the purposes and objectives of simulated teaching and learning (Au, et. al., 2016).

Simulation was perceived as limited in that it denied students the opportunity of interacting with patients. In our study, nurse educators perceived that the use of low fidelity simulators did not challenge students'critical thinking abilities. Literature has provided that high fidelity simulators enhanced learner intrinsic motivation and inculcated solid foundation in knowledge, clinical reasoning, critical thinking, and reflection (Becnel, 2022), and skills, and attitude needed during real patient care (Koukourikos et al., 2021). It can enhance active participation of learners in knowledge building (Solheim & FloView, 2021). Learners in the current study are limited in this regard. But other sources have buttressed that even with high fidelity simulators some learners misunderstood simulation as they tended to treat the SimMan as not real human being (Alu, et.al., 2016).

Study Limitations

This study is not without limitations. The sample size was small hence a case study. Face to face interviews were not possible due to time constraints on the part of participants. The self - selection of participants limited to those who had only participated only in the teaching and learning in a simulated environment has limited our sample size. Also, due to the arrangement of the bachelor of nursing science program, only a few number of nurse educator can participate in simulated teaching and learning in a given academic year.

Implications for the School of Nursing

Participants suggested a few approaches that they believed could improve learning.

1. Blending simulation and real-life learning in one semester such that the two-run side-by-side could ease transfer of theory to practice.
2. Making provision for controlled rooms such that staff can observe students' skill rehearsal in such a way that the latter will feel less intimidated.
3. The school needs to have diverse mannequins such that each would be appropriate for a given skill that a student wants to learn at a particular point in time. For instance, skills such as intravenous infusion, physical assessment, and cardio-pulmonary resuscitation need mannequins that are appropriately designed for the purpose.
4. Having dedicated personnel to see to it that equipment is functioning and that it is regularly serviced.
5. Having realistic student-staff ratios to ensure that both staff skill demonstrations and students' return demonstrations are allotted realistic time. For instance, ratios could be decongested from 20 students per staff member to about 5 students per staff member. Improved ratios could make it possible that each student to perform three return demonstrations per a given nursing practice skill.

Implications for the University of Botswana

Avail the budget to develop a highly equipped simulation laboratory with needed human and material resources. Some of the material resources can be secured in short or medium term are laptops to enable students to have access to observe and watch procedural skills demonstrations and also perform return demonstrations.

Implications for Nursing Education

The study presents evidence that simulation teaching and learning is a useful strategy that can improve learning outcomes. But nurse educators have also pointed to some limitations of the strategy if certain conditions are not met. This therefore, implies that a conducive environment should be advocated for to ensure that simulation teaching and learning is fully exploited for nursing education in the context of Botswana.

Implication for Research

There is need for replication studies that will use large sample sizes, evaluate the uptake of simulation from many eductors perspective and those that focus on patient outcomes and the need for researchers with similar research agenda to collaborate and to conduct multisite studies on simulation.

Conclusion

This was the first study to explore the perceptions of nurse educators regarding the use of simulation teaching and learning strategy in the local context. It was premised on the adoption of simulation as a teaching and learning strategy to adresss challenges that accompanied nursing education since the advent of COVID-19.

The findings showed that nurse educators had some positive experiences, merits as well challenges with simulation teaching and learning. The highlighted points were simulation provided a safer environment for learning skills before students were confronted with live-situations, as well development of critical thinking ability. However, the limited resources for securing adequate equipment such as computers, high-fidelity manniquins and shortage of nurse educators were perceived as hinderances for enhanced simulation teaching and learning. Taking into consideration the limitation of the current study, further robust investiagtion is recommended.

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Suggestions on Artificial Intelligence-Assisted Tools for Teaching and Learning English Writing Skills

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Abstract
With the rapid advancements of technology in the 21st century, artificial intelligence (AI) has a place in many facets of our lives, including education. In recent years, AI-powered technologies have demonstrated significant improvements in teaching and learning, particularly in the growth of writing abilities. AI tools have the potential to boost critical thinking abilities, promote student engagement, identify areas for growth, and deliver individualized feedback. Many educators are now able to use AI-assisted tools to support students in strengthening their writing skills thanks to the growing integration of technology in education. This research paper aims to explore the potential of AI-based tools and provide suggestions on the effective utilization of AI-assisted tools to enhance the teaching and learning of English writing skills. Additionally, it emphasizes how AI-assisted tools can promote self-directed learning by allowing students to practice and refine their writing skills independently. The report also addresses potential drawbacks and challenges with AI tools, including over-reliance, ethical considerations, and restrictions on dealing with higher-order writing skills.

Keywords: AI-Assisted Tools, Writing Skills, Technology

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Introduction

1. Problem Identification

English writing skills are crucial for academic and professional success, forming the foundation for effective communication. Effective writing skills are recognized as fundamental for academic achievement and professional success. Proficiency in written communication is not only essential for academic performance but also a critical skill in various professional fields. The current state of English writing skills in education reflects a dynamic interplay of historical legacies, contemporary challenges, technological advancements, and global perspectives. Acknowledging the evolving landscape of writing instruction is essential for educators, policymakers, and stakeholders as they navigate the complexities of preparing students for the demands of the 21st century. As we continue to explore innovative approaches and leverage technology, a holistic understanding of the current state of English writing skills is crucial for shaping the future of education and equipping learners with the tools they need to thrive in an interconnected world.

2. Need for Innovative Approaches to Address These Challenges

The integration of technology in education has introduced new possibilities for enhancing English writing skills. Digital tools and platforms have become integral components of the writing process, offering opportunities for collaborative learning, instant feedback, and personalized instruction. The advent of online resources, writing software, and interactive platforms has created a more engaging and dynamic learning environment, challenged traditional paradigms, and encouraged innovative approaches to writing instruction.

The integration of technology necessitates a shift in the roles of educators from traditional knowledge providers to facilitators and guides. Educators are now responsible for cultivating digital literacy skills, critical thinking, and adaptability in students. Embracing technology requires continuous professional development, encouraging educators to stay abreast of technological advancements and incorporate them into their teaching practices.

3. Exploration of AI-Assisted Tools as a Potential Solution

The advent of AI has laid the groundwork for a revolution in education by offering an entirely new realm of possibilities and paths for exploration. Artificial Intelligence (AI) is transforming industries, with a profound impact expected in education. Integrating AI into education will revolutionize teaching methods, personalize learning, and enhance educational efficiency. AI entails computer systems performing tasks requiring human intelligence like learning, reasoning, and problem-solving using machine learning algorithms to analyze data, make predictions, and improve performance continually. The future of education is promising with AI at its core.

4. Objectives of the Study

The primary objective of this study is to comprehensively evaluate the impact of AI-assisted tools on enhancing English writing skills. Firstly, the study aims to assess the effectiveness of these tools in improving students' proficiency in written communication. Secondly, it seeks to identify the key features and functionalities that contribute to the success of AI tools in supporting English writing instruction. By examining the specific attributes that make AI tools

effective, the study intends to provide valuable insights for developers and educators alike. Lastly, the research endeavors to offer practical suggestions for the seamless integration of AI into English writing instruction. Through this multifaceted approach, the study aims to inform educational stakeholders on the best practices and strategies for leveraging AI technology to enhance the teaching and learning of English writing skills.

1. To assess the effectiveness of AI-assisted tools in improving English writing skills
2. To identify key features and functionalities of successful AI tools
3. To provide practical suggestions for integrating AI into English writing instruction

Literature Review

A. Overview of AI in Education

1. Historical Perspective of AI in Education

Artificial intelligence (AI) has become an increasingly integral part of the educational environment, transforming teaching, and learning processes in profound ways. The integration of AI-powered technologies into educational settings has a remarkable history, spanning back to the early developments in the field of computer-assisted instruction (CAI) in the 1950s (Carbonell, 1970).

The history perspective of AI in education begins with the 1950s invention of PLATO (Programmed Logic for Automated Teaching Operations) at the University of Illinois (Bitzer et al., 1961). PLATO was one of the earliest revolutionary computer-based educational systems to use simple AI techniques for providing personalized, interactive learning experiences, although it was limited in scope and capability.

By the 1970s and 1980s, the emergence of Intelligent Tutoring Systems (ITS) marked a significant evolution, leveraging advances in cognitive science and AI to offer adaptive, personalized instruction (Carbonell, 1970). These systems employ natural language processing to support educators with ongoing, sustainable training and support that is helping us move forward in our work to promote prosperity for all students.

Throughout the 1980s and 1990s, the development and integration of AI-based educational systems like natural language processing, educational games, and simulations continued to enhance educational tools. An example from this period is the AutoTutor system, which simulated conversational interactions to facilitate learning in natural language (Graesser et al., 2001).

In the 21st century, AI integration in education has dramatically increased, focusing on personalized learning, automated grading, and virtual educational assistants. Notable modern innovations include the Cognitive Tutor Algebra system, which uses cognitive models to provide real-time feedback (Ritter et al., 2016), and ChatGPT by OpenAI, a conversational AI launched in 2022 that delivers detailed responses based on user prompts, reflecting the ongoing advancement and application of AI in educational contexts (Tlili et al., 2023).

2. Studies on the Impact of AI on Language Learning

In recent years, the development of Artificial Intelligence (AI) technologies into language learning has been a subject of significant research and exploration. AI-powered tools and

systems can alter the way individuals acquire, practice, and master new languages. This section will review the findings of previous studies that have examined the impact of AI-assisted language learning (AIAL) tools in improving language proficiency.

The development of Intelligent Tutoring Systems (ITS) has been a major factor in language learning. These AI-driven systems can provide personalized, interactive instruction and feedback to language learners, addressing their unique strengths, weaknesses, and learning preferences (Graesser et al., 2001). Studies have demonstrated that ITS can lead to improved language proficiency, increased learner engagement, and more efficient use of instructional time (VanLehn, 2011).

AI-powered technologies have also been employed to facilitate the process of providing feedback and error correction to language learners. Natural language processing algorithms can analyze learners' responses and generate personalized feedback, highlighting areas for improvement and providing targeted guidance (Roscoe & McNamara, 2013). Research has indicated that this type of automated feedback can be as effective as human-provided feedback in increasing students' efficiency, save teachers' time, and provide more accurate and consistent feedback (Harry, 2023).

The use of conversational AI, such as chatbots and virtual assistants, has emerged as a promising approach for providing language learners with opportunities to practice their communication skills (Yang et al., 2022). These AI-powered systems can engage learners in natural language dialogues, providing real-time feedback and guidance to assist in the development of speaking and listening proficiency (Young & Shishido, 2023).

AI-powered language learning platforms have also enabled the development of multimodal language learning experiences, integrating authentic materials, multimedia resources, and real-world scenarios (Huang et al., 2021). Virtual reality (VR) and augmented reality (AR) technologies creates fully immersive virtual environments that transport learners to English-speaking settings, providing authentic language exposure and opportunities for real-time communication (Sinthiya, 2023). These immersive experiences deepen students' cultural awareness, empathy, and cross-cultural communication abilities.

While the implementation of AI in language learning has demonstrated promise, it is important to acknowledge the potential limitations and ethical considerations associated with these technologies. Concerns have been raised regarding algorithmic bias, data privacy, and the potential for AI to exacerbate educational inequities (Zawacki-Richter et al., 2019). As the use of AI in language learning continues to evolve, it will be essential to address these challenges and ensure that these technologies are developed and implemented in a responsible and inclusive manner.

Previous studies on the impact of artificial intelligence on language learning have highlighted the impact of AI technologies in fostering language acquisition, cultural understanding, and communication skills. From intelligent tutoring systems to conversational AI and multimodal learning experiences, AI-powered language learning platforms offer innovative solutions to meet the diverse needs of language learners (Yuan, 2023; Jeon, 2024). As the field continues to evolve, it will be crucial to consider the ethical and practical implications of AI in language education. By leveraging insights from research studies, educators, researchers, and policymakers can harness the full potential of AI to promote effective, inclusive, and engaging language learning experiences for learners worldwide.

B. Existing Approaches to Teaching English Writing

1. Traditional Methods and Their Limitations

The teaching of English writing has evolved significantly over the decades, transforming from more traditional, teacher-centered approaches to more student-centered and process-oriented approaches. This session presents an overview of traditional methods employed in teaching English writing and outlines their limitations, highlighting the need for innovative approaches to address contemporary challenges in writing instruction.

One of the traditional methods in teaching English writing is the Model-Based Approach. Outlined by (Badger & White, 2000), this method involves students examining and emulating high-quality writing samples. It focuses on replicating the structure, language, and rhetorical strategies of these model texts. Although modeling can provide students with a clear structure and style to follow, it may also hinder their creativity and writing style.

As described by (Tribble, 1996), the Product-Oriented Approach emphasizes on the final written product, prioritizing accuracy, organization, and coherence of the text. It helps students develop mechanical skills in writing, but may lack relevance to real-world writing, potentially leading to student disengagement and low motivation.

According to Nunan (1991), Controlled Composition involves structured writing exercises like fill-in-the-blanks or sentence combining to build specific writing skills gradually. However, this limited exposure to authentic writing activities may inhibit the development of critical thinking, creativity, and a unique writing voice.

The Grammar-Translation Method, discussed by Larsen-Freeman and Anderson (2011), focuses on explicit grammar rules and translation exercises. It aims to acquire grammatical accuracy and vocabulary knowledge, but often at the expense of meaningful communication and fluent writing. Students may struggle to apply grammar rules in authentic writing contexts and may lack opportunities for creative expression and critical thinking (Richards & Rodgers, 2001, as cited in Inna, 2021).

The traditional methods of teaching English writing, such as the model-based approach, product-oriented approach, controlled composition, and grammar-translation method, have contributed to the evolution of writing instruction (Nunan, 1991). However, these methods have inherent limitations that may hinder students' development as proficient and confident writers. As the field of English writing instruction continues to evolve in the digital age, it is essential to consider the strengths and weaknesses of these traditional methods and explore innovative approaches that can better meet the needs of 21st-century learners.

2. The Integration of AI in English Writing Instruction

Technological interventions have revolutionized English writing instruction, offering innovative solutions to enhance students' writing skills, creativity, and critical thinking abilities. The integration of Artificial Intelligence (AI) technologies into the teaching and learning of English writing has become an area of growing interest and exploration. AI-powered tools have the potential to transform various aspects of the writing process, from ideation and drafting to revision and feedback. This section will examine the benefits and challenges associated with

the integration of AI in English writing instruction to ensure responsible and effective implementation.

AI-driven systems personalize instructional content and pace to fit individual student needs and learning styles, promoting a more personalized, flexible, and inclusive educational experience (Claes et al., 2016; Roscoe & McNamara, 2013; Dong, 2023). These results offer practical implications for teachers, students, and educational technology developers, highlighting the potential for AI-powered pedagogy to transform traditional teaching methods and improve student learning outcomes.

However, there are also challenges associated with using AI in education. Concerns include privacy, security, the cost of technology, potential biases in AI algorithms (Harry, 2023), and an overreliance on automated systems that could diminish critical thinking and creativity (DuBose & Marshall, 2023). Ethical considerations like accessibility, transparency, fairness, and informed consent are crucial for the responsible deployment of AI tools in educational settings (Zawacki-Richter et al., 2019; Harry, 2023). Addressing these concerns will be crucial for the responsible integration of AI in English writing instruction.

The integration of AI in English writing instruction offers promising benefits for enhancing students' writing skills and fostering meaningful learning experiences. However, the challenges associated with algorithmic bias, lack of human interaction, and ethical considerations must be carefully addressed to ensure that the implementation of these technologies enhances, rather than hinders, the teaching and learning of English writing. Through this exploration, educators can gain insights into the opportunities and challenges inherent in leveraging AI to enrich English writing instruction, fostering a more engaging, inclusive, and effective learning environment for students.

3. Gaps in the Existing Literature

Identifying gaps in the integration of AI tools to enhance English writing instruction is essential for refining and improving educational practices. Many schools and educational institutions may lack access to AI-powered writing tools due to financial constraints or inadequate technological infrastructure. This gap in access limits the potential benefits of AI-enhanced writing instruction and exacerbates inequalities in educational opportunities. Educators and students may vary in their proficiency with AI tools and technologies. Educators may lack adequate training and support to effectively integrate AI tools into their teaching practices. The absence of professional development opportunities focused on AI-enhanced writing instruction can hinder educators' ability to leverage these technologies effectively. Educators may struggle to incorporate AI-enhanced writing instruction seamlessly into existing curricula or teaching methodologies, limiting the integration's impact on student learning outcomes. Some students may struggle to navigate and effectively utilize AI-powered writing tools, hindering their ability to fully engage with and benefit from these resources.

Addressing these gaps requires concerted efforts from educators, policymakers, technology developers, and other stakeholders. Strategies to bridge these gaps may include investing in technology infrastructure, providing training and support for educators, ensuring the ethical use of AI tools, and prioritizing equity and inclusion in technology integration initiatives. By addressing these gaps, stakeholders can work towards realizing the full potential of AI tools to enhance English writing instruction and support student learning and achievement.

Methodology

1. Overview

This study employs a quantitative research approach to assess the effectiveness of AI-assisted tools in improving English writing skills, identify key features of successful AI tools, and provide practical suggestions for integrating AI into English writing instruction.

2. Subjects

The study participants consist of 24 teachers and 111 students ranged from 18 to over 40 years old recruited from the Faculty of Foreign Languages at HUFLIT university. The teachers are selected based on their experience in teaching different English writing courses, while the students represent a diverse range of proficiency levels and educational backgrounds. As seen in figure 1, 30% of these participants had from 3-5 years in teaching and learning English writing skills and 92% had much experience in using AI-based writing tools such as ChatGPT, Grammarly, QuillBot, WordAI, etc.

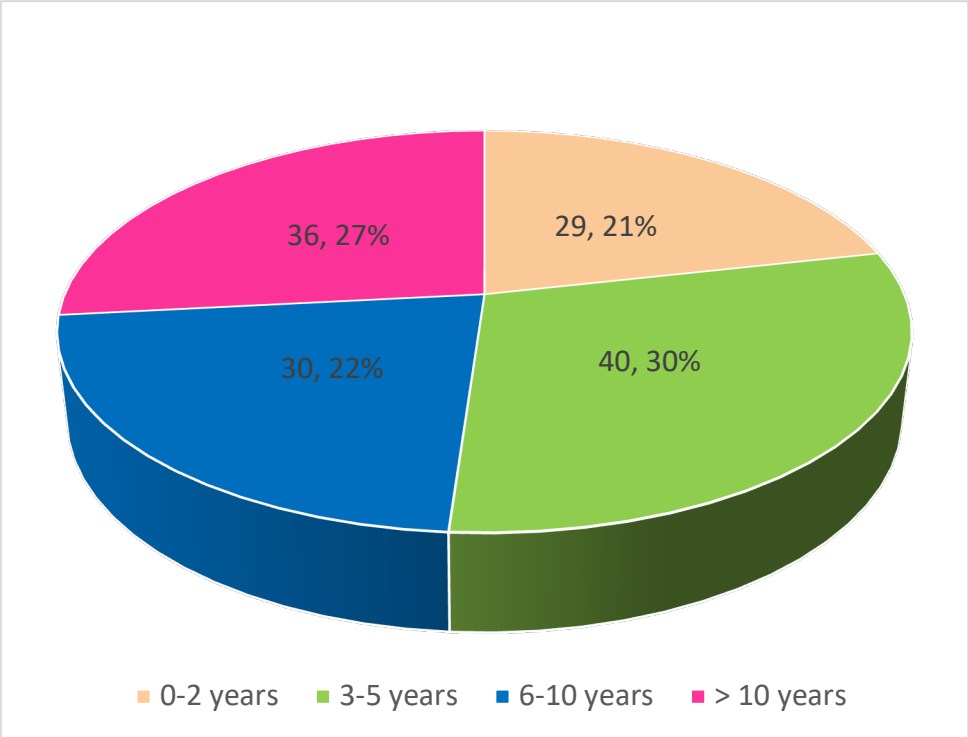


Figure 1: Number of Years in Teaching / Learning English Writing Skills

3. Materials

The primary instrument used for data collection is a questionnaire developed using Microsoft Forms. The questionnaire includes 10 closed-ended questions and 1 open-ended questions designed to assess participants' perceptions of AI-assisted tools, identify key features of successful AI tools, and obtain practical suggestions for integrating AI into English writing instruction.

4. Data Collection and Analysis

The researcher delivered the questionnaire to teachers and students of the Faculty of Foreign Languages through the shared link. Then, we analyzed the responses to find out what they evaluated the effectiveness of AI integration into their writing process, realized the key features and functionalities of AI-based writing tools and provided some useful suggestions for implementing AI writing tools. The responses gathered from the online survey were reported in percentages and displayed in charts and tables. After the general survey is completed, the statistics will be exported into this study.

Results and Discussions

1. The Effectiveness of AI Tools in Improving English Writing Skills

The findings of the initial closed question in the questionnaire demonstrate a clear endorsement of AI tools in enhancing English writing capabilities. The data is represented on a Likert scale from 1 (no improvement) to 5 (significant improvement), across five key areas of writing skills improvement. The remarkable insight from figure 2 is the substantial agreement on AI tools' effectiveness in identifying and correcting writing errors, with approximately 49.6% of respondents giving the highest rating of 5. Moreover, 43% of the participants rated the use of AI to enhance grammar, spelling accuracy, and vocabulary of written communication with a 4 out of 5. Then, when it comes to enriching writing style and tone, and boosting creativity in writing, nearly half of the respondents are also favorable with a 4 out of 5 ratings, indicating a slight improvement of AI's impact in these more subjective areas of writing. Lastly, AI's contribution to increasing learners' self-efficacy, self-regulated learning, and reducing cognitive load is affirmed with the majority of responses (60.7%) between 3 and 4. Overall, the graph presents the strong effectiveness of AI in improving English writing, with notable approval for error correction and positive impact on grammar, style, creativity, and learner autonomy.

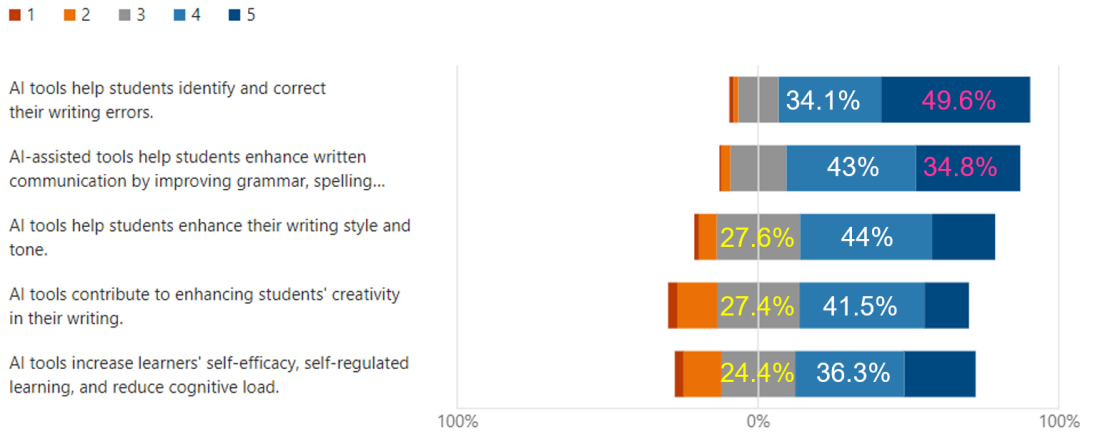


Figure 2: The effectiveness of AI Tools in Improving English Writing Skills

2. The Key Features and Functionalities of AI Tools

The result in Table 1 provides insights into the perceived effectiveness of AI tools in relation to their features and functionality in the context of enhancing English writing proficiency. First of all, the feature that AI tools offer grammar and spell-check functions received the highest

endorsement, with 44.8% of respondents rating it at a 5 indicating a strong confidence in AI's role in improving technical writing skills. Next, adaptive learning paths provided by AI tools increased significantly, with 44.4% of participants attributing a 4 out of 5, indicating recognition of personalized learning's importance in writing instruction. The NLP capabilities of AI are also well-regarded, with 43% of responses at a 4, suggesting appreciation for the sophistication of AI in producing content. However, when assessing the contribution to more accurate and context-aware feedback, the opinions are more divided, with 37.3% rating it at a 4 and a significant 29.9% at a 3, indicating some room for improvement in the context-sensitivity of AI tools. Finally, the integration of AI, NLP, and machine learning in refining writing skills and producing higher-quality work shows a spread across the mid-range of the scale, with 38.3% rating a 4, suggesting a positive but cautious recognition of these advanced features in AI writing tools. In summary, Table 1 reveals that AI tools are highly valued for their grammar and spell-check functions, adaptive learning paths, and NLP capabilities in enhancing English writing skills, yet it also highlights a demand for better context-aware feedback and a tempered but optimistic view on the integration of AI and machine learning for skill refinement.

	1	2	3	4	5
AI tools offer grammar and spell-check functionalities in enhancing overall writing proficiency.	**0.7%**	**3.7%**	**14.9%**	**35.8%**	**44.8%**
AI tools provide adaptive learning paths for English writing instruction.		**3%**	**31.6%**	**44.4%**	**21.1%**
AI writing tools utilize the power of natural language processing (NLP) to generate content with more efficiency.		**3.7%**	**32.6%**	**43%**	**20.7%**
AI tools contribute to more accurate and context-aware feedback.		**6.7%**	**26.1%**	**37.3%**	**29.9%**
The integration of AI, NLP, and machine learning enable writers to sharpen their skills and produce high-quality content effortlessly.		**4.5%**	**29.3%**	**38.3%**	**27.8%**

Table 1: Key Features and Functionalities of AI Tools

3. The Challenges of Integrating AI Tools Into English Writing Instruction

Figure 3 indicates several major obstacles educators and students may face when incorporating AI into learning environments. The most significant challenge, indicated by 83 responses from the participants, is dependency and overreliance on AI, suggesting that students may become too dependent on technology, potentially at the expense of developing their own skills. The second most cited challenge is the lack of technical proficiency, with 74 responses, which leads to a gap in the necessary technical proficiency to effectively use AI tools among educators or learners. Ineffective human-AI collaboration received 66 responses, highlighting issues with the interface between AI systems and users. The lack of data quality and quantity, with 56 responses, raises concerns about the inputs used to train AI systems and their impact on the output quality. Ethical issues, though less frequently mentioned with 44 responses, remain a significant area of concern, likely related to privacy, data security, and the fairness of AI applications. Lastly, the lowest number of responses, 37, concerns robustness and security risks, which could reflect a relatively lower awareness or occurrence of these issues in educational settings. All in all, this distribution of concerns underscores the importance of addressing both technical and human aspects of AI integration into educational programs.

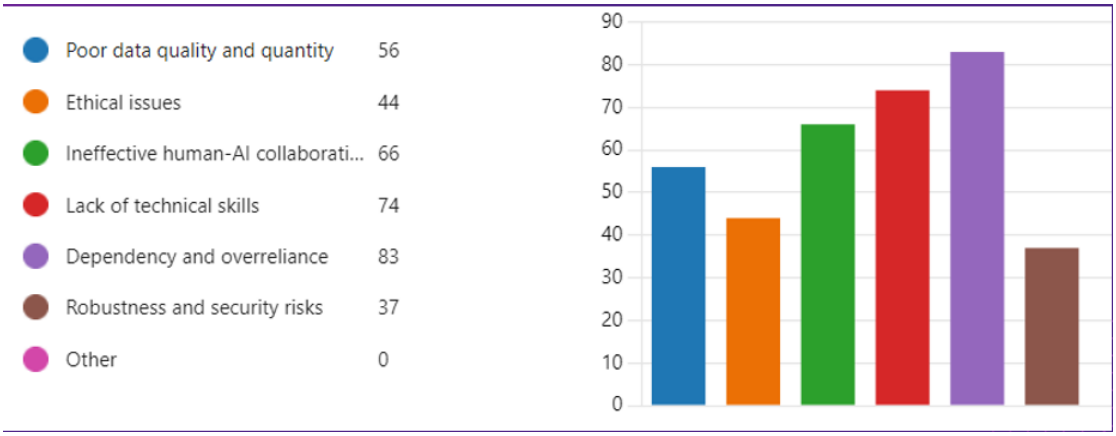


Figure 3: Challenges of Integrating AI tools into English Writing Instruction

Conclusion

In conclusion, the results from the questionnaire highlight the growing consensus on the benefits of AI tools in improving English writing proficiency. With considerable support for their ability in error correction, grammar, spelling, and vocabulary enhancement, AI tools demonstrate robust potential to enhance technical aspects of writing. Additionally, they demonstrate promise in enriching writing style and creativity, although there is a need for growth in these subjective areas. The integration of advanced features such as adaptive learning, NLP, and machine learning is welcomed, but with a cautious approach that recognizes the need for improvement, particularly in context-sensitive feedback. However, these positive developments come with challenges, particularly the risk of overreliance on technology, a gap in technical skills among users, and ethical concerns. Addressing these issues is essential to ensure that the integration of AI into English writing instruction maximizes benefits while minimizing potential drawbacks, paving the way for an educational environment that leverages AI to support, rather than supplant, the development of comprehensive writing skills.

To enhance the integration of AI tools in English writing instruction effectively, it is recommended that online courses and tutorials are the most favored training methods among educators and students, with a count of 115 respondents, likely due to their convenience and accessibility. Furthermore, workshops and seminars and peer-to-peer mentoring are the second and third most popular methods that both teachers and students desire for interactive and collaborative learning environments. However, it may be beneficial to explore the reasons behind the low engagement with in-house training sessions to enhance their effectiveness or to reconsider their format to meet educators and students' needs.

Suggestions for Integrating AI Into English Writing Instruction

The results from the last open-ended question revealed some suggestions for successful integrating AI into English writing proficiency and were summarized as follows:

1. Integration of AI Tools Into Writing Curriculum

Educators should integrate AI-assisted tools such as Grammarly and Quillbot into the writing curriculum as supplementary resources. These tools can be incorporated into writing assignments to provide students with real-time feedback on grammar, style, and vocabulary usage. By integrating AI tools into the curriculum, students can receive personalized feedback on their writing, allowing them to identify and correct errors more efficiently.

2. Promotion of Peer Collaboration

Encourage students to use AI-assisted writing tools collaboratively with their peers. Peer collaboration can enhance the learning experience by fostering discussions about writing conventions, language usage, and effective communication strategies. Additionally, peer collaboration allows students to provide feedback to their peers, further reinforcing their understanding of writing concepts and improving their own writing skills.

3. Explicit Instruction on AI Tool Utilization

Provide explicit instruction on how to effectively utilize AI-assisted writing tools. Educators should teach students how to interpret and implement the feedback provided by AI tools in their writing. This includes teaching students how to discern between different types of feedback (e.g., grammar correction, style improvement) and how to apply this feedback to revise and enhance their writing.

4. Emphasis on Critical Thinking Skills

Emphasize the development of critical thinking skills alongside the use of AI-assisted writing tools. While AI tools can provide valuable feedback on technical aspects of writing, they may not address higher-order writing skills such as argumentation, analysis, and synthesis. Therefore, educators should design writing tasks that require students to engage in critical thinking and problem-solving, challenging them to think deeply about the content and structure of their writing.

5. Consideration of Ethical and Privacy Concerns

Educators should be mindful of ethical and privacy concerns associated with the use of AI-assisted writing tools. It is essential to educate students about data privacy issues and the potential biases inherent in AI algorithms. Additionally, educators should encourage students to critically evaluate the suggestions provided by AI tools and to use them as one of many resources for improving their writing, rather than relying solely on automated feedback.

By implementing these suggestions, educators can harness the power of AI-assisted writing tools to enhance the teaching and learning of English writing skills, while also promoting critical thinking, collaboration, and ethical considerations among students.

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The Effect of Online Learning on Students' Academic Performance: A Case Study of Accounting Students in Indonesia

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Abstract
The Covid-19 pandemic has drastically transformed the educational landscape. Online education has become the new normal for many students worldwide. Although online learning is perceived as cost- effective, how online education impacts accounting students' academic performance remains a subject of debate, particularly in developing countries such as Indonesia. Similar research has been extensively conducted in developed countries, but conflicting results have been found in developing countries such as Indonesia. This research aims to evaluate the effectiveness of online learning for accounting students taking all their courses online. A survey method is employed for data collection, using a survey design with 32 items questionnaire, with reliability values ranging from 0.8 to 0.85.this study was conducted across 10 public and private universities in West Java. West Java was chosen asthe survey area because a significant number of universities in Indonesia are concentrated in this region, including areas such as DKI Jakarta, Bandung, and Bogor. The survey targets accounting students currently working on their final project, as all courses are taken online. The assessment of e-learning efficiency is based on students' responses regarding engagement, ease of communication, accessibility, and students' learning experience. The findings of this research are expected to provide profound insights into the effectiveness of e-learning in the context of accounting education at the tertiary level, particularly in developing countries. The implications of these findings can serve as a foundation for the improvement and development of more effective teaching strategies in shaping the skills of accounting students.

Keywords: Online Learning, Students' Academic Performance, Accounting Students

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Introduction

The impact of the Covid-19 pandemic has affected various sectors around the world, including the education system, and Indonesia is no exception. Since March 2020, the Ministry of Education and Culture of the Republic of Indonesia has adjusted education policies in response to this situation, where online learning has become the new norm in the learning process as a response tothe Covid-19 pandemic. But even though the Covid-19 Pandemic has passed, online learning hasbecome a new habit for students and lecturers in higher education (Samara et al., 2023). The literature shows that the actual use of e-learning has been widely used in developed countries, andproven to be successful in improving student satisfaction and performance (eg: Aldholay et al., 2018; Samara et al., 2023; Xhomara, 2021). However, Indonesia as a developing country has noteffectively adopted online learning, as several studies conducted during the pandemic show that online learning has the potential to reduce student performance (Aghni et al., 2022; Ashari & Nugrahanti, 2022; Istiyana & Fatmawati, 2020).

Some previous studies also explain the severe challenges that hinder the integration of quality e-learning in universities, especially in developing countries (Basir et al., 2021). The obstacles that often arise can come from teachers such as the lack of skills in using various functions of online learning applications, or from students such as the lack of facilities (internet and laptops) that do not support the implementation of effective online learning. Although the Indonesian government continues to address this issue through the provision of online learning grants and the BANGKIT program, the effectiveness of online learning success in providing student satisfaction and good performance still requires further research.

This study aims to examine the effectiveness of online learning on academic performanceof accounting students at private and public universities in Indonesia. Accounting study program was chosen as the sample because Accounting is a field of study that is considered challenging bystudents. Accounting is considered as one of the more challenging areas of college due to its complex concepts and formulas. It requires extensive and in-depth knowledge of accounting principles and techniques for proper account regulation. Traditional accounting subjects such as accounting first principles, accounting theory, financial accounting, and general accounting are very demanding on students (Wann, 2023). If students do not master one stage, it will be difficultfor them to continue to the next stages. In online-based learning, it requires strong learning motivation from students in order to understand accounting teaching materials well.

Online learning needs to be developed because online learning offers several advantagesover traditional education, including flexibility, convenience, control over the pace of learning, and affordability (Samara et al., 2023). This method of learning provides greater control over thelearning environment, where students can learn quietly without distractions or in a more traditionalclassroom setting (Dumford & Miller, 2018). With this learning method,students' learning ability, communication skills, critical thinking, and problem solving ability canbe improved (Pei & Wu, 2019; S. Lockman & R. Schirmer, 2020). In addition, students also develop abetter sense of independence over their learning and take responsibility for their learning progress.By considering these aspects, we believe that online learning can be beneficial and influence students' educational process (Blackmon & Major, 2012) mentioned that, along with thedevelopment of online learning, it is important to study students' overall experience in online learning environment. Therefore, this study can contribute to the development of online learning process, especially in developing countries such as Indonesia.

Literature Review

Online Learning in Higher Education

Learning involves the process of teaching and learning in a learning environment with the aim ofincreasing the knowledge of each individual. In particular, online learning refers to learning interactions that occur through the internet network, or often referred to as online-based learning.In the context of online learning, students interact with lecturers using the help of the internet, andtechnological tools such as laptops, smartphones, and computers become important to support thelearning process that can be done in various places and times.

Online learning has a unique and attractive feature for both students and lecturers in undergoing the learning process between busy activities and distance. Due to its unique nature, universities continue to strive to improve the quality of online learning to increase student satisfaction and retention. Since the emergence of the Covid-19 pandemic has forced educational institutions to shift from face-to-face learning to online-based education and teaching, which can only be done with the help of appropriate technological practices (Bao, 2020). Online learning provides many advantages for both students and instructors, including students can learn anywhere without space and time constraints such as traditional classes, students can study quietly without distractions (Mukhtar et al., 2020), online learning can improve students' learning ability and communication skills (S. Lockman & R. Schirmer, 2020). In addition, students also develop a sense of responsibility for their learning progress (Yuhanna et al., 2020).

Challenges to Online Learning in Higher Education

According to Widodo et al. (2020) many students argue that online learning is seen as less good than traditional learning because online learning is not enough to handle students' lecture materials.In online learning, students and teachers have limited capacity to process information, and there isa possible combination of learning modalities that can result in cognitive overload that impacts theability to learn new information effectively (Patricia Aguilera-Hermida, 2020).

Another aspect that becomes a dilemma in the implementation of online learning is anxiety related to pandemic conditions experienced by students and lecturers, as well as poor internet connection constraints, which can have a negative effect on their performance (Adedoyin & Soykan, 2023). In addition, a lack of confidence in the new technology they use for learning, in the absenceof cognitive engagement and social connections can have a suboptimal impact on student learningoutcomes (Bower, 2019). Research results show that the lack of guidelines and online learning facilities and infrastructure, lack of socialization and peer support, and the delivery of online lectures that are less understandable to students are the main challenges faced during online learning in Indonesia (Lubis et al., 2021).

Method

Data and Analysis

This research uses primary data, which is data in the form of respondents' answers, obtainedand collected through survey method by distributing questionnaires through whatsapp in the form of google-form. The survey method was chosen because this research is very important to see students' perceptions of their experiences related to online learning and its impact on their academic performance. Survey method accommodates to test the actual perception of respondents(accounting students), and respondents are the most trusted source for certain types of information.(Nazari et al., 2006). The sample was drawn from accounting students who were in their final year,as they were the ones who experienced online learning fully. Respondents were accounting students from the 10 largest public and private universities in West Java in 2023. West Java was chosen as the area for distributing questionnaires because most of the big and best universities in Indonesia are gathered in the West Java region, including in the DKI Jakarta, Bandung, and Bogorareas.

Respondents were asked to provide their experience of online learning at their college. The online learning experience was measured by an instrument developed by (Samara et al., 2023). While the measurement of students' academic performance is also based on the measurement developed by Samara et al. (2023). Statement items are measured using a 5-point Likert scale, namely scale 1 (strongly disagree), to scale 5 (strongly agree). Data analysiswas conducted using variant-based techniques, namely *Partial Least Square* (PLS), using PLS 3.08 software.

Participant

A total of 138 questionnaires from 10 major universities that have accounting majors have been collected and can be processed. The ten universities consist of 7 private universities and 3 public universities in West Java, thus the respondents are divided into two, namely those from private universities (96 people), and public universities (42 people). The demographics of the respondentsin total showed 66.7% were female, and 33.3% were male. While the age of most respondents is at the age of 21-22 years (80%), namely students who are in the 6th and 7th semester (89%).

Result and Discussion

Reliability and Validity of the Measures

The reliability test results are shown in Table 1. Table 1 shows Cronbach's alpha for the learning experience variable question 0.899, Cronbach's alpha for the ease of communication variable question 0.914, Cronbach's alpha for the student's engagement variable question 0.893 andCronbach's alpha for the student performance variable question 0.898 so that all four reflect satisfactory internal consistency reliability.

Table 1. Reliability Test

Questionnaire	Cronbach's alpha	Critical Value	Description
Learning Experience	0,899	0,7	Reliable
Ease of Communication	0,914	0,7	Reliable
Student engagement	0,893	0,7	Reliable
Student Performance	0,898	0,7	Reliable

Meanwhile, for validity testing, the correlation coefficient value is used. The validity test results show that for all questions, the correlation coefficient value is in the range of 0.445 to 0.864 whosevalue is ≥0.3, so that each question used in this study is declared valid.

Comparative Analysis of Students Engagement in Public Versus Private Universities

Descriptive statistics show that student engagement in online learning overall responses have an average value of more than 3, higher than the acceptable median value of 3 on a 5-point Likert Scale. The highest response was on the question regarding students' confidence when engaging in online classes, with a mean score of 3.5652. Furthermore, the results of the Mann-Whitney test used to compare the two groups of students (public vs private university) regarding student engagement are shown in Table 2. The results revealed statistically insignificant differencesfor almost all questions tested regarding students' learning experience in online learning, except for indicator A3 (When others share their ideas in the live online class, I can add my thoughts freely). Then on indicator A7 (Can get direct support from lecturers during online lectures). In indicator A3, students from private universities are more free to add their thoughts in online classesthan students from public universities. Likewise for indicator A7, students from private universities more often get direct support from lecturers during online lectures than students frompublic universities.

Table 2. Results of Students Engagement Comparison of public versus private universities

Indicator	Overall	Private	Public	*Mann-Whitney U*	Z	p-value	*Cohen effect*
A1	3,2609	3,3542	3,0476	1696,50	-1,549	0,121	0,321
A2	3,5652	3,6042	3,4762	1867,00	-0,716	0,474	0,123
A3	3,2899	3,4375	2,9524	1483,00	-2,562	0,010	0,469
A4	3,3913	3,2917	3,6190	1654,00	-1,754	0,079	0,328
A5	3,4493	3,4792	3,3810	1988,00	-0,138	0,890	0,105
A6	3,3696	3,4583	3,1667	1664,00	-1,701	0,089	0,263
A7	3,1087	3,2813	2,7143	1370,00	-3,094	0,002	0,520

Comparative Analysis of Ease of Communication of Students at Public Versus Private Universities

The results of the comparison test in the ease of communication section contained in Table3 show that there are many significant differences in the ease of communication question items between students at public universities and students at private universities. The significant difference shows that students from private universities have a higher average score than studentsfrom public universities. This indicates that students at private universities find it easier to communicate their ideas during online lectures, easy to communicate and collaborate with fellowstudents, easy to get help from lecturers, and find it easy to communicate and meet

lecturers evenduring online lectures. The results that do not show differences are for question items B4 and B5,which are about there are no restrictions on obtaining explanations of course material and time arrangements that suit students' schedules.

Table 3. Comparison Results Ease of Communication public versus private university

Indicator	Overall	Private	Public	*Mann-Whitney U*	Z	*p-value*	*Cohen effect*
B1	3,0797	3,2188	2,7619	1496,00	-2,501	0,012	0,444
B2	2,9348	3,0938	2,5714	1502,00	-2,444	0,015	0,441
B3	3,6522	3,9167	3,0476	1020,50	-4,821	0,000	0,952
B4	3,4348	3,4896	3,3095	1783,00	-1,129	0,259	0,174
B5	3,9420	3,9688	3,8810	1848,00	-0,860	0,390	0,107
B6	3,2319	3,3542	2,9524	1576,50	-2,117	0,034	0,378
B7	3,1159	3,2500	2,8095	1572,00	-2,119	0,034	0,380
B8	2,9203	3,1146	2,4762	1402,50	-2,949	0,003	0,588
B9	3,1739	3,3125	2,8571	1501,50	-2,457	0,014	0,403

Comparative Analysis of Students' Learning Experience at Public Versus Private Universities

There is not much significant difference in students' learning experience in the online learning environment, as measured by Mann-Whitney, as shown in Table 4. Almost allvariables have an average score of more than 3, with the highest response being the question of online classes making students' learning schedules flexible which has a score of 4.1594.

Table 4. Results of Learning Experience Comparison of public versus private universities

Indicator	Overall	Private	Public	*Mann-Whitney U*	Z	*p-value*	*Cohen effect*
C1	3,8043	3,7500	3,9286	1782,00	-1,154	0,248	0,203
C2	2,9565	3,3125	2,1429	802,00	-5,805	0,000	1,162
C3	3,8188	3,8958	3,6429	1726,00	-1,444	0,149	0,262
C4	2,9420	3,2604	2,2143	1006,00	-4,820	0,000	0,954
C5	3,3116	3,3229	3,2857	1942,50	-0,355	0,722	0,037
C6	3,4928	3,5104	3,4524	1944,00	-0,350	0,726	0,061
C7	3,1449	3,0000	3,4762	1506,00	-2,461	0,014	0,479
C8	3,8913	3,9688	3,7143	1703,00	-1,536	0,124	0,279
C9	3,8043	3,7292	3,9762	1703,00	-1,555	0,120	0,288
C10	4,1594	4,1771	4,1190	1933,00	-0,416	0,677	0,068
C11	3,8406	3,7500	4,0476	1835,50	-0,890	0,374	0,296

A significant difference was shown in indicator C2 (receiving timely feedback from my lecturer regarding all assignments and exam results during online classes). Then on indicator C4 (easy to meet my lecturer during office hours), and indicator C7 (feeling disturbed at home during online classes). For indicator C2, students from private universities feel that they receive feedback from lecturers more timely than students from public universities. Likewise, for indicator C4, students from private universities find it easier to meet lecturers during working hours than students from public universities. As for indicator C7, students from public universities feel that itis more disturbing to run online lectures at home than students from private universities.

Comparative Analysis of Student Performance at Public Versus Private Universities

Analysis of students' performance showed that online classes made them feel more responsible, which had the highest mean score (3.6594), followed by improved communication skills (3.3261), but understanding of accounting course materials had the lowest score (2.9203) during online classes.

Table 5. Results of Student Performance Comparison of public versus private universities

Indicator	Overall	Private	Public	*Mann-Whitney U*	Z	*p-value*	*Cohen effect*
P1	3,2464	3,3542	3,0000	1576,00	-2,111	0,035	0,335
P2	2,9203	3,0833	2,5476	1446,00	-2,724	0,006	0,474
P3	3,6594	3,7083	3,5476	1808,00	-1,012	0,312	0,172
P4	3,2971	3,5208	2,7857	1255,00	-3,635	0,000	0,684
P5	3,3261	3,4167	3,1190	1655,00	-1,734	0,083	0,282

Comparative analysis of student performance in online learning in Table 5 shows significant differences in indicator P1 (online classes make me think more creatively), indicator P2 (online classes make me able to understand accounting course materials more efficiently), and finally indicator P4 (online classes make me able to maintain good grades and GPA in every accounting course). In indicator P1, students from private universities think more creatively after attending online classes than students from public universities, then for indicator P2, students from private universities feel more able to understand accounting course materials than students from public universities. Likewise, for indicator P4, students from private universities are more able to maintain good grades and GPA in each accounting course than students from public universities.

Hypothesis Testing

The Effect of Online Learning on Student Performance

The results of this study prove that online learning reflected in student engagement, ease of communication, and learning experience can affect student performance. The statistical test resultsshown in Table 6 indicate that each hypothesis in this study is significantly supported. Furthermore,the three dimensions of online learning contribute (influence) of 65.0% (R^2) to student's performance.

Table 6. Hypothesis Testing

Hypothesis		*t-test*			*F-test*		Result
		β	**t-test**	***p-value***	**F-test**	***Sig***	
1	Student engagement → student performance	0.226	2.240	0.027			Supported
2	Ease of Communication → student performance	0.300	3.068	0.003			Supported
3	Learning experience → student performance	0.350	4.336	0.000			Supported
4	Online Learning → student performance				82.886	.000	Supported

Comparative Analysis of the Effect of Online Learning on Student Performance

The results of the comparative analysis test conducted earlier show that the biggest difference between online learning in public and private universities is in terms of ease of communication. Students at private universities find it easier to communicate their ideas during online lectures, easy to communicate and collaborate with fellow students, easy to get help from lecturers, and findit easy to communicate and meet lecturers even during online lectures. This can be an input for academics at public universities to be able to pay more attention to the ease of communication between lecturers and students, because the ease of communication that is established can help students to ask questions and understand accounting material better, and can develop student ideasand develop lecturers' creativity both cognitively and interpersonally.

Furthermore, to get a more thorough understanding of which online learning dimensions have the most influence on student performance in private versus public universities, the researcher conducted further testing separately for each sample group. Table 7 shows the comparison of eachdimension of online learning on student performance in private versus public universities.

Table 7. Comparison of the Effect of Online Learning on Student Performance

Independent Variable	Private University			Public University		
	β	**t-test**	***p-value***	β	**t-test**	***p-value***
SE (X1)	0,122	0,871	0,386	0,430	3,774	0,001
EoC (X2)	0,287	2,149	0,034	0,275	2,363	0,023
LE (X3)	0,415	3,819	0,000	0,304	3,214	0,003
R	0,764			0,919		
R Square	0,583			0,844		
F-test	42,908			68,444		
p-value	0,000			0,000		

The test results in Table 7 show that online learning has a greater influence on public universities (R^2 = 84.4%) than on private universities (R^2 = 58.3%). In private universities, learning experience has the greatest influence (t-value = 3.819) on student performance. Whereas in publicuniversities, student engagement provides the greatest influence (t-value = 3.774) on student performance, which is inversely proportional to private universities which show no effect (p-value= 0.386).

Discussion

This study aims to examine whether online learning affects student performance at public and private universities. Online learning is assessed by three events which include student engagement,ease of communication, and learning experience. The results show that there is not much differencebetween public and private university students regarding student engagement and online learningexperience, but the biggest difference occurs in ease of communication. Students at private universities find it easier to communicate both in class when conveying their ideas, collaborating with their peers, and outside of class when interacting with lecturers and peers. Furthermore, the results of this study also show that there are significant differences in the performance of public and private university students, especially online classes make private university students feel theycan think more creatively, better understand accounting material, and better maintain their GPA.

Although previous research in Indonesia shows conflicting results (e.g. Aghni et al., 2022; Ashari & Nugrahanti, 2022; Istiyana & Fatmawati, 2020). However, the results of this study show that online learning can positively affect their performance. These different results may be due to different research areas and universities. Another thing that may affect the difference in the resultsof this study is the presence of respondents from state university students. Students at state universities usually have better academic competence and learning motivation than students from private universities, this is due to the strict selection of students at state universities in Indonesia, and usually students who are not accepted at state universities will enter private universities.

A separate test in this study also shows that in private universities, learning experience hasthe most influence on students' performance, because they feel that through online learning they have more time to open learning videos and learn them slowly. In addition, students at private universities feel that lecturers are very helpful in online learning, where they easily respond to students' questions through online chat, and also quickly provide feedback from each assignment given. However, student engagement at private universities does not affect their performance, thisis due to the tendency of students who are less active in conveying their ideas when discussing accounting materials at private universities are often tolerated by their lecturers, so it does not affect student performance. Whereas at public universities, student involvement actually has the greatest influence on student performance. This is because lecturers at public universities relativelydo not tolerate students who are not actively interacting during material discussions, because theyare considered not to have studied the material before the discussion took place.

Conclusion

This study explores the perceptions of accounting students at public and private universities regarding online education on improving academic performance. A total of 138 accounting students at public and private universities in Indonesia participated in this study. The results showed that most of the participants considered online education to be beneficial in improving their academic performance. This study found that learning experience is the most important factorin online learning for private university students. Easy-to-understand and accessible coursematerials, and timely feedback from lecturers, as well as ease of contacting lecturers and quick responses make students at private universities better able to understand accounting materials andmake them better able to maintain their GPA. Private universities that want to improve online learning programs need to pay attention to items of student learning

experience, including effectivecommunication between lecturers and students. Students who can communicate effectively with lecturers tend to feel more comfortable asking questions about material they do not understand, or sharing their academic problems. This has the potential to increase students' learning motivation and academic performance. In contrast to private universities, student engagement is the most important factor in online learning at public universities. State universities that want to improve their online learning programs should focus on improving student engagement.

The findings of this study can help other universities in designing distance learning programs, where universities need to strive to ensure high student engagement, effective communication, and positive learning experiences can be the cornerstone of a successful distancelearning program. Although distance learning methods have many advantages, this study may notbe able to capture the long-term impact of online learning on students' academic performance. Another limitation is the generalizability of the findings, as the respondents were from Indonesianuniversities which may have different education systems and cultural backgrounds from other countries. This study recommends that future research needs to test a larger and more diverse groupof respondents. Future research could also compare online learning methods with hybrid learningmethods, which consist of online learning combined with offline face-to-face learning on the academic performance of public versus private university students. The findings in future researchcan provide more comprehensive results, as well as provide more diverse inputs for universities.

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A Blended Learning Course in Engineering Materials: Course Design and Analysis

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Abstract
"Engineering Material II" is a Year 3 undergraduate major elective course that offers fundamental training to students who are interested in pursuing a career in materials-related fields or advanced study programs. Over the past three years during pandemic, this course has been taught in both real-time online mode and mixed mode, which combines online and face-to-face elements. Taking into account the positive feedback from students regarding the online components and the benefits of face-to-face interactions, we have successfully integrated and transformed this course into a blended learning mode. This paper addresses the challenges encountered during the conversion process and outlines our approach to designing a cohesive blended learning course. We aimed to ensure a seamless transition between online and face-to-face modules while truly achieving a blended learning experience. Additionally, the paper evaluates students' engagement with a video analytics tool, providing insights into their involvement throughout the course.

Keywords: Blended Learning, Course Design, Video Analytics

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Introduction

Blended learning mode has emerged as an effective hybrid teaching mode which combines both online (or digital) learning module and the conventional face-to-face module. Over the past few years, especially during pandemic, blended learning has evolved into an effective educational method across various domains, including K-12 education, higher education, as well as in corporate training.

In higher education field, blended learning has found applications in a diverse range of fields. For example, Bos – van den Hoek et al (2023) has discovered that blended learning improved the healthcare professionals' skills, knowledge, and confidence in supporting shared decision making in palliative cancer care. Sun et al (2024) has conducted a comprehensive review and have found extensively use of blended learning in teaching business English major courses during 2012 – 2022. Niu et al (2023) have investigation the undergraduate nursing student education and concluded that blended learning is more effective than traditional courses in acquiring knowledge and skills and improving the critical thinking capability and with a positive effect on the nursing students' mental health.

The rapidly increased adoption of blended learning across various subject fields has led researchers to investigate its effectiveness on learning outcomes and impact on learners. For example, de Brito Lima et al (2022) have studied the learners' behaviors, uses of resources, and learning pathways, finding correlations between the engagement and performance for secondary schools. Li et al (2024), using the application cases in foreign language education, have emphasized that adoption of blended learning as the main pedagogical approach needs departmental level implementation as the driving force. Wang et al (2024) have researched the effect of role assignments and timing in online discussions on blended learning outcomes and have found little impact. Müller et al (2022) have applied flow theory to describe the positive effect of course flexibility and course interaction, which play an important role in students' perceived learning quality. This highlights the importance of instructors keeping course flexibility and interactions in mind during the course design stage. Mariam et al (2024) have studied the factors that may induce the future intentional use of blended learning in business and management educations, revealing the significance of initial learning experiences with blended learning and the perceived quality of online teaching. However, there is little study in effective tools for analysis and evaluation of students' engagement in blended learning in higher educations. In this paper, we have described how we use video analytics to assist us in the course design and monitor students' engagement throughout the blended learning process.

MECH 3420 Engineering Materials II has been taught in Fall semesters since 2017, with face-to-face-mode in 2017 – 2019, online mode in 2020, and mix-mode in 2021. During the face-to-face mode, I used online resources: such as online videos to explain and demonstrate different fabrication process of engineering materials; and online quizzes for assessment. Through the entire teaching process, I noticed that some students benefit more from face-to-face teaching mode, while some find more advantages in online teaching mode. Since students have experienced different advantages from both face-to-face and online teaching modes and enjoyed the mix-mode teaching and learning as well, I am highly motivated to combine the face-to-face and online elements together to benefit the whole student group and maximize the learning outcomes of this course. Therefore, we successfully converted this course into a blended learning course in 2022 and offered the course in blended learning mode in 2023.

Transition Between the Online Sessions and the Face-to-Face Sessions

The original course is composed of three modules, as shown in Figure 1, where the topics of each module and each chapter are listed.

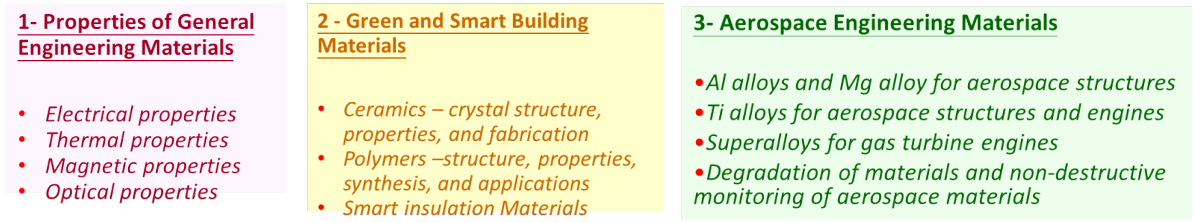


Figure 1: Three modules in this course.

A blended learning course in general contains alternating online learning and face-to-face learning sessions. To convert this traditional course into the blended learning format, we have carefully determined what contents are best suited for online sessions and what other contents are best covered in the face-to-face instructions. The design of online sessions and in-class activities has posed tremendous challenges, particularly in ensuring smooth and seamless transitions for students between the self-paced online learning and face-to-face instructions.

(1) Self-Paced Online Learning

Using Chapter 2 – Electrical Properties as an example, Figure 2 shows the self-paced online learning approach. Chapter 2 is devised into five sub-sections, each in an individual video clip, i.e. (1) electrical conduction; (2) electron band structures in solids; (3) semiconductivity; (4) semiconductor devices; (5) dielectric behavior and other electrical characteristics of materials. Upon completing the watching the five video clips, students are then encouraged to participate in a range of online graded discussions, which may involve answering online questions, or analyzing a chart or a graph (as shown in Figure 2), or investigating a simple case study. The objective of the online graded discussion is to assess students' comprehesion of theoretical concepts and principles.

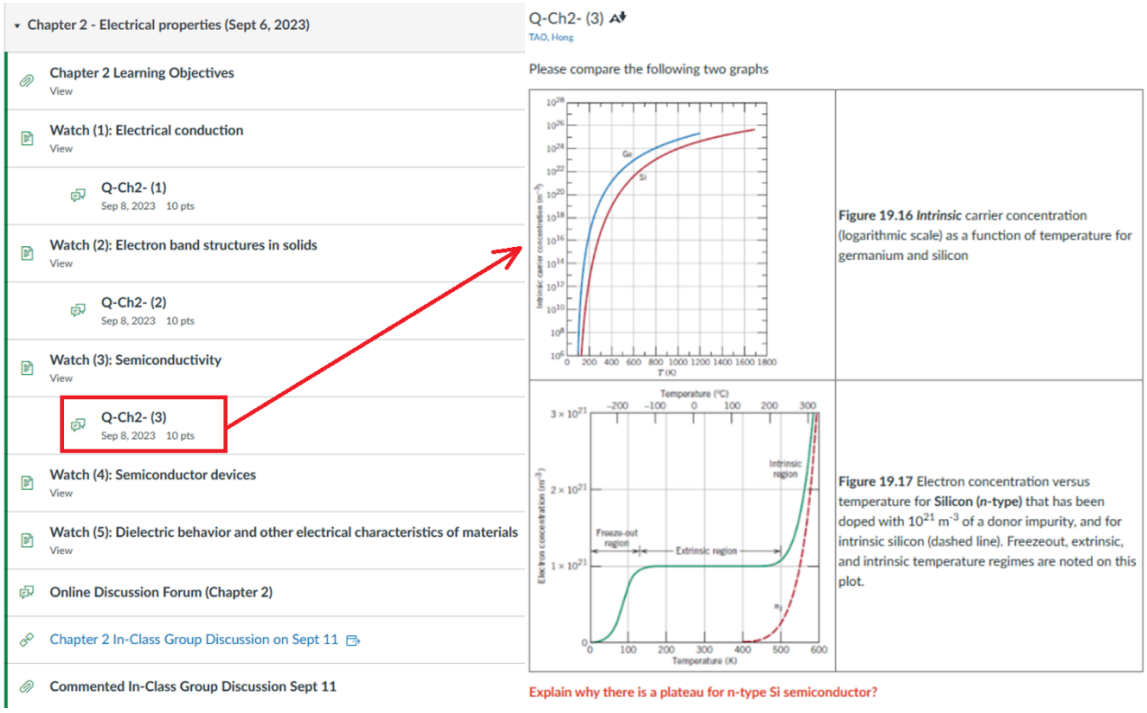


Figure 2: Self-paced online learning: an example.

(2) In-Class Activities

In the face-to-face learning sessions, students are organized into small groups and are seated at tables facing each other. This type of seating arrangement has facilitated collaborations and enabled students to effectively communicate their ideas and address any questions in case applications. The face-to-face instruction sessions consists of two main activities: the graded group discussions and the higher-level thinking practices.

The graded group discussions involve reflection of self-paced online learning questions and clarification of the parts that students find the most challenging. To streamline the grading process, we have utilized MIRO as the collaborative platform for group discussions, as shown in Figure 3. Each group member may contribute their answers and opinions to each question after the collaborative group discussions.

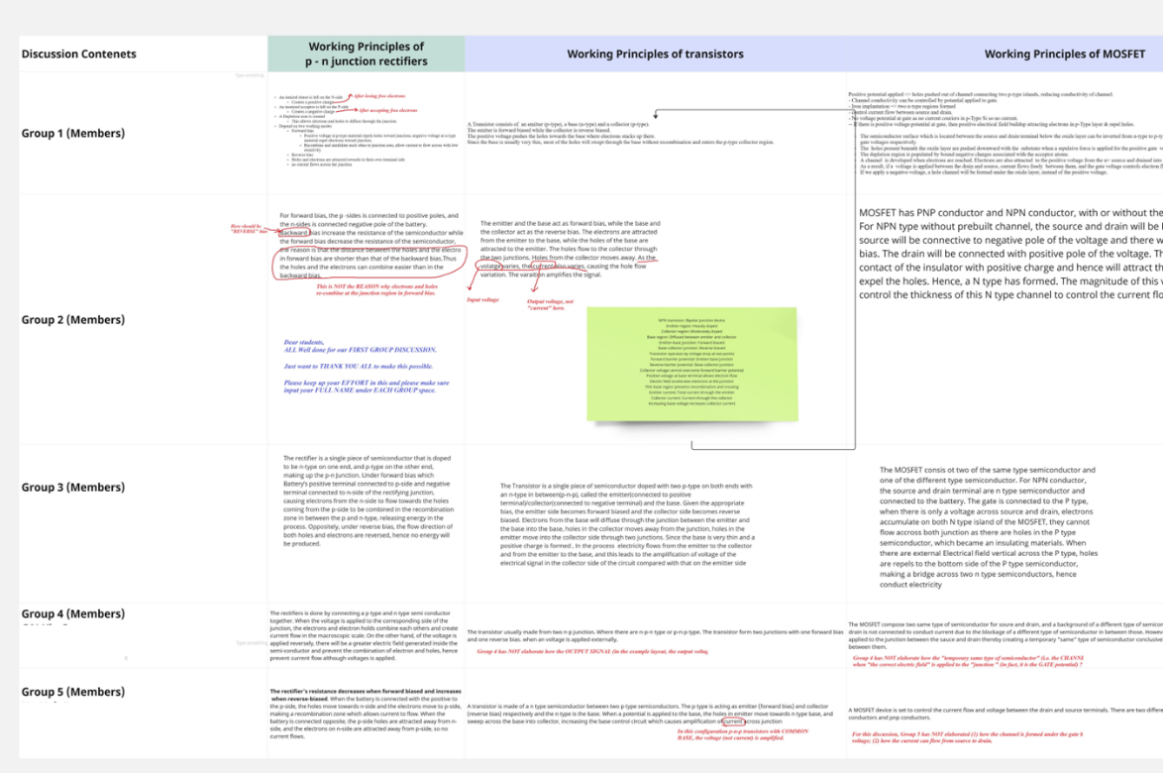


Figure 3: Graded group discussions using MIRO.

The other activity, higher-level thinking, generally involves students collaboratively working together through comprehensive calculations and industrial case application analysis for each chapter. For example, in Chapter 2, students have collaborated in calculation of the carrier concentration, electrical conductivity for intrinsic and extrinsic semiconductors. They also have analyzed the applications of piezoelectric materials.

When transforming this conventionally lecture-based course into a blended learning course, we have discovered that that it is more than just literally blending the online and face-to-face sessions together, it indeed requires careful allocating contents to the online and face-to-face sessions and devising engaging discussion topics that integrate the theoretical concepts and principles into interesting real-life industrial applications. This unique approach aims to create truly cohesive structures in this blended learning course, ensuring students experience seamless and smooth transitions between the online and face-to-face sessions.

Students' Engagement Analysis Using Video Analytics

Two key factors contribute to achieving our main goal of the seamless and smooth transitions between the self-paced online learning and face-to-face learning. The first key lies in the instructor, who has carefully devised each session to ensure its effectiveness. The second key lies in the students, because their active engagement is crucial to the success of a blending learning course. To assess students' engagement, we have employed an effective tool-video analytics.

Video analytics generates various types of reports and summaries, enabling us to monitor the video watching behavior both at the whole class level and at the individual level. Once students have started watching the online videos and performed online tasks, video analytics, as shown in Figure 4, exports an Excel file, containing a report summarizing the number of users

accessing the video, the number of access times, average duration, and average completion percentage of the video. We use the average completion percentage as an indicator of students' engagement, with higher percentage indicating greater engagement.

By leveraging this two key factors: careful course design from instructor side and active engagement from students' side, we have strived to achieve our goal of seamless transition and smooth learning experience between self-pace online learning and face-to-face instruction.

Video Name	Length	User	Accessed	Avg. Duration	Avg. No. of Times	Avg. % of Completed	Start Record	End Record
Electrical_Conduction	7:13	12	17	4:40	0.6	55.9	6/9/2023	10/9/2023
Electron_Band_Properties_in_Solids	6:24	17	38	10:54	1.7	89.6	4/9/2023	11/9/2023
Semiconductivity	10:45	17	34	20:26	1.9	89.0	4/9/2023	11/9/2023
Semiconductor_Devices	7:27	14	24	6:46	0.9	69.2	5/9/2023	11/9/2023
Dielectric_Behavior_and_Other_Electrical_Characteristics_of_Mate	7:49	13	18	8:34	1.1	76.8	5/9/2023	11/9/2023
MECH3420 Course Introduction	2:58	3	6	3:32	1.2	100.0	4/9/2023	11/9/2023
What is Blended Learning?	1:46	2	2	0:39	0.4	48.1	4/9/2023	6/9/2023

Students' engagement for Chapter 2

Total average % completed of all videos 75.5

Video Name	Length	User	Accessed	Avg. Duration	Avg. No. of Times	Avg. % of Completed	Start Record	End Record
C6_V1_Ionic_Arrangement_Geometries	4:01	15	26	5:02	1.3	90.8	26/9/2023	8/10/2023
C6_V2_Crystal_Structures_of_Ceramics	4:59	15	19	9:16	1.9	82.0	27/9/2023	4/10/2023
C6_V3_Silicate_and_Carbon_Structures	9:19	13	21	10:13	1.1	82.8	27/9/2023	8/10/2023
C6_V4_Imperfections_in_Ceramics_and_Phase_Diagrams_of_Ceramics	9:18	14	24	12:56	1.4	74.8	27/9/2023	8/10/2023
C6_V5_Mechanical_Properties_of_Ceramics	4:00	8	13	5:09	1.3	90.9	29/9/2023	4/10/2023
C6_V6_Types_Applications_and_Processing_of_Ceramics	13:29	8	11	14:27	1.1	90.3	29/9/2023	4/10/2023

Students' engagement for Chapter 6

Total average % completed of all videos 85.3

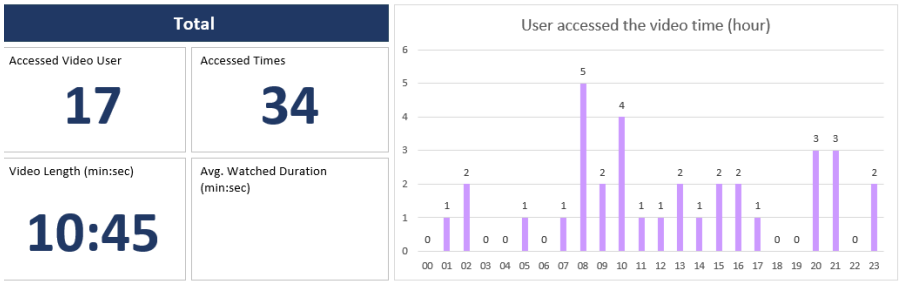
Video Name	Length	User	Accesse	Avg. Duratio	Avg. No. of Times	Avg. % of Complet	Start Record	End Record
C13_V1_Importance_of_Corrosion_Control	2:43	11	13	2:29	0.9	86.7	17/11/2023	24/11/2023
C13_V2_Electrochemical_Consideration_of_Corrosion	12:14	14	28	15:13	1.2	74.0	17/11/2023	24/11/2023
C13_V3_Forms_of_Corrosion	5:53	12	19	9:13	1.6	88.1	20/11/2023	27/11/2023
C13_V4_Corrosion_Prevention_and_Oxidation	6:31	12	16	6:11	1.0	77.7	20/11/2023	27/11/2023
C13_V5_Degradation_of_Polymers	4:27	8	10	4:48	1.1	87.3	20/11/2023	24/11/2023

Students' engagement for Chapter 13

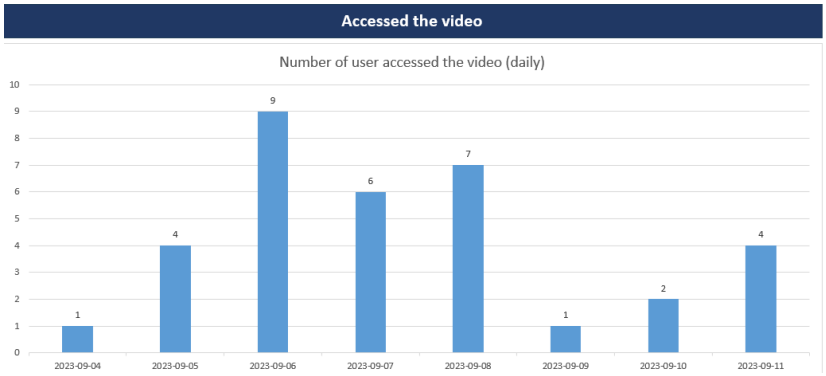
Total average % completed of all videos 82.8

Figure 4: The whole-class video list report for Chapter 2, 6, and 13.

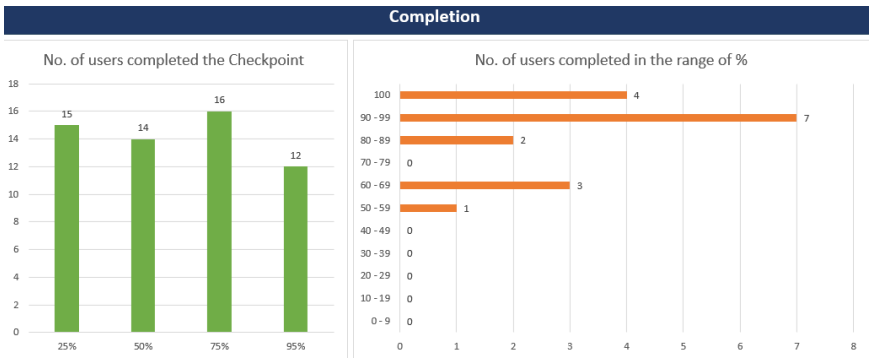
The Excel file also summarizes the breakdown components for each video clip. As showcased in Figure 5, besides the number of access users and accessed time, other details such as the number of users accessing the video for each hour of a day (Figure 5 (a)) and for each day in a week (Figure 5 (b)), number of users who have completed at checkpoint of 25%, 50%, 75%, and 95% (Figure 5 (c)), and the number of users distribution in the range of completion percentages (Figure 5 (d)) are also presented in the report. An interesting observation from Figure 5 (a) is that more students access the video clip between 8 to 10 o'clock in the morning and between 8 to 9 o'clock in the evening. Additionally, more students access to the video from September 6 to September 8, 2023, compared to the other days. Based on the results shown in Figure 5 (c) and (d), we consistently encourage students to complete the video watching in all future chapters.



(a)



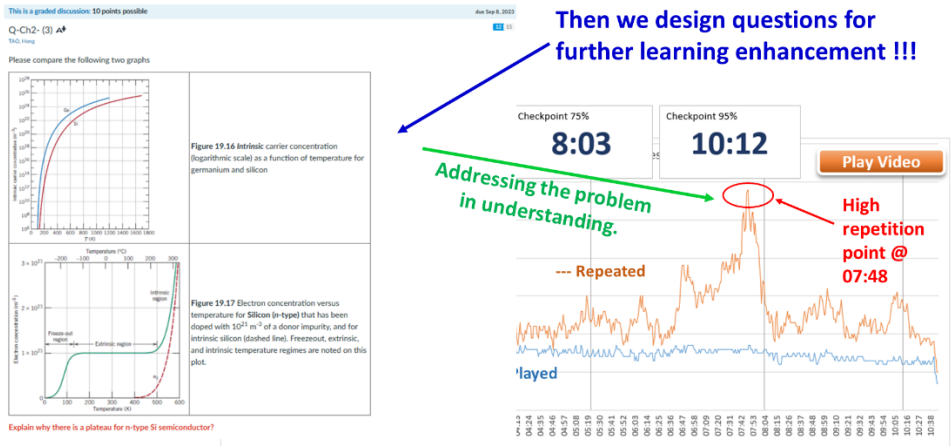
(b)



(c) (d)

Figure 5: Video analytics breakdown components.

By analyzing these statistics and patterns, we aim to increase the completion rate and promote higher students' engagement. Among the various output generated by the video analytics Excel file, we have found a valuable tool: the curve showing the played and repeated access over the elapsed time, as depicted in Figure 6 (b). The curve displaying repeated access exhibits several peaks, with the highest repetition occurring at the time 07:48. Upon reviewing the course contents corresponding to the time at 07:48, we have identified it as the section describing the plateau in the graph of electron concentration versus temperature for extrinsic semiconductors, as depicted in Figure 6 (a). This indicates that students find this specific point challenging and difficult to comprehend. In response, we have incorporated online questions targeting this specific point of challenge and provided additional elaborations in the face-to-face instructions. Using this valuable tool to identify the challenge point, we have addressed it with greater emphasis, facilitated better understanding and alleviated difficulties faced by students.



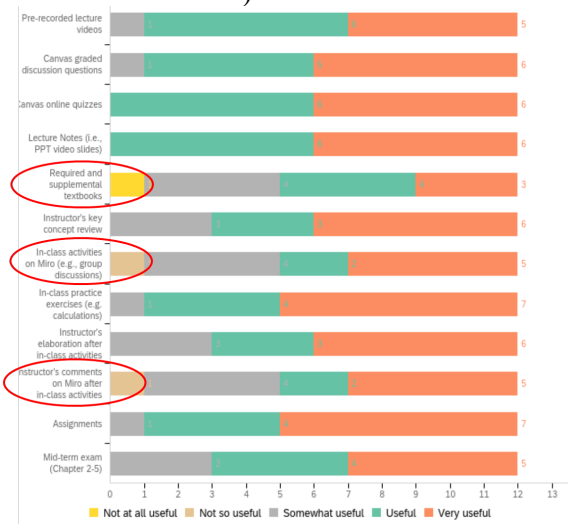
(a) (b)

Figure 6: The curves (b) of played and repeated versus time indicate the watching pattern, which guides our course design and re-design (a).

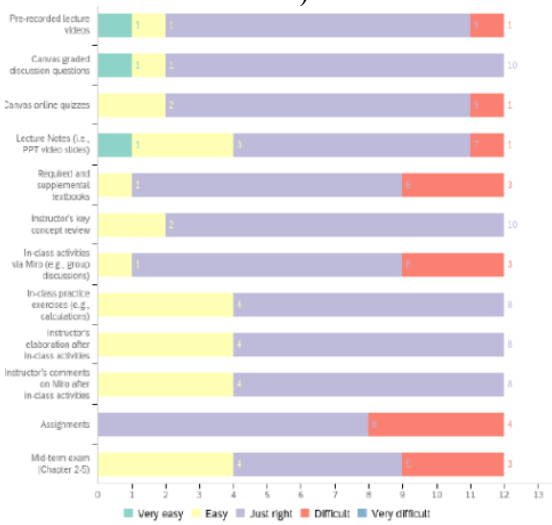
End-of-the-Course Evaluation Results

To gain a comprehensive understanding of the blended learning course, we have conducted the end-of-the course evaluation survey, and the survey questions (Q1 to Q8) and survey results are presented in Figure 7. Based on the survey results, students have generally found most course components useful, with three exceptions, i.e. required and supplemental textbook, group discussions on MIRO, and instructor's comments on MIRO. While most students feel each course component is at an appropriate difficulty level, a small number of students feel several components challenging. Students are satisfied with the various aspects of pre-recorded videos and the design of in-class activities. They have found the pre-recorded videos useful for preparation of the in-class activities, which, in turn, are helpful for them to prepare for assignments and assessments. Majority of the students think the work-load is just right, dedicating 1 to 2 hours to prepare for both online tasks and in-class activities. These survey results have provided valuable insight into the strength and weakness of the blended learning course. The feedback received will help us further improve some course components and enhance the overall learning experiences for future students.

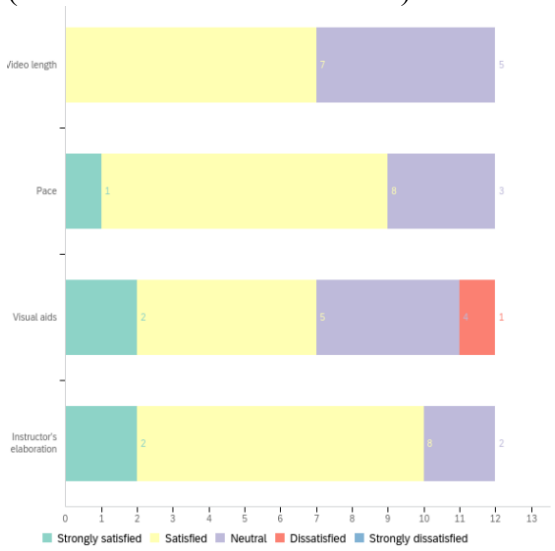
Q1 - Please rate the usefulness of each of the following course components. (Check one circle for each line).



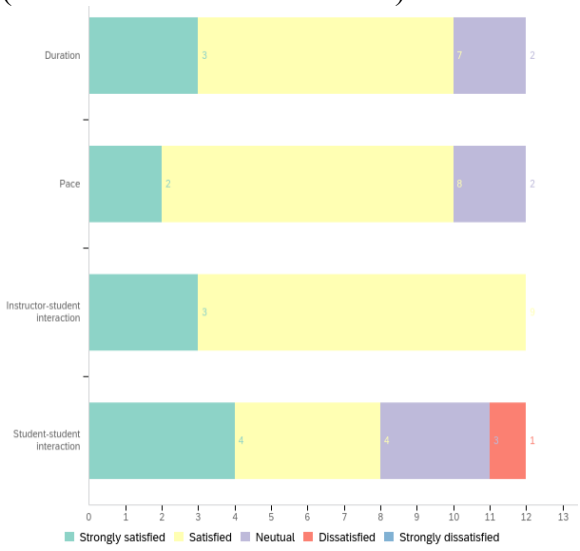
Q2 - Please rate the difficulty level of each of the following course components. (Check one circle for each line).



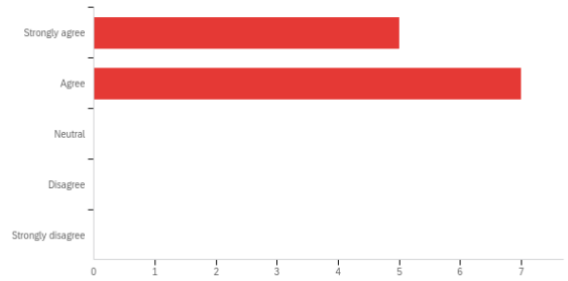
Q3 - Please rate the pre-recorded lecture videos according to the following aspects. (Check one circle for each line).



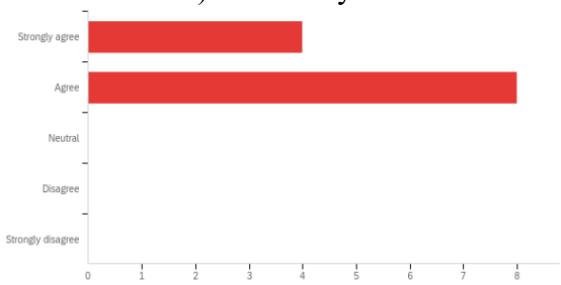
Q4 - Please rate the face-to-face in-class sessions according to the following aspects. (Check one circle for each line).



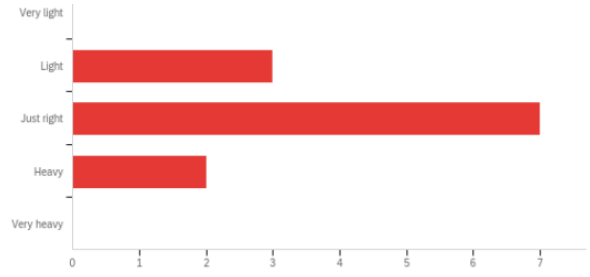
Q5 - Do you agree that the Pre-recorded lecture videos help you to prepare the in-class activities effectively?



Q6 - Do you agree that the face-to-face in-class sessions help you to prepare for the major assessments (e.g., assignment and mid-term exam) effectively?



Q7 - How do you find the workload of this BL course when compared to other traditional courses?



Q8 - What is the average time per week you spent preparing for the face-to-face session in this BL course? (e.g., the time spent watching pre-recorded lecture videos, doing the graded discussion questions, taking the online quizzes, and readng the textbook(s), etc.)

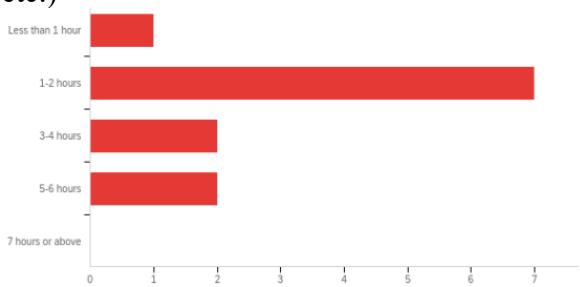


Figure 7: Survey questions and survey results of the end-of-the-course evaluation.

Conclusion

MECH 3420 Engineering Material II has been successfully transformed from a traditional lecture – based course into a blended learning course. The strength of both online and face-to-face teaching and learning are combined together to maximize the learning outcome and to benefit the whole student group. With careful allocation of contents, well -balanced online and face-to-face sessions, integration of theoretical concepts into real-life industrial application cases, the video analytics findings about students' engagement, we have created a cohesive blended learning structure and ensured smooth and seamless transitions between the online and face-to-face instructions.

With the received feedback from students and survey results as the guidelines, we will continue to improve the course design, adjust the course contents, balance the difficulty of some course components and the work load.

Acknowledgements

I sincerely thank the research assistant Mr. Cifuentes Medina David for his great project work in assisting conversion of the traditional lecture-based course into the blended learning format. I would also extend my appreciation to HKUST CEI blended learning support team for their professional support and expertise throughout the design process and implementation of this blended learning course.

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Testing Measurement Invariance of Synthesizing Mind Model of Thai Students: Multi-group Analysis

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Abstract
Nowadays, information flows quickly without any limitations on distance. Humans possessing synthesizing mind do not waste time when synthesizing the deluge of data, are able to select useful data and avoid data causing danger. This study aimed to examine the consistency of the synthesizing mind model with empirical data and to study invariance of the synthesizing mind model of students classified in accordance with the demographical variable of gender. The research sample consisted of 580 lower secondary school students. The research instrument was a 30 item self-report survey on synthesizing mind developed according to the 4 factors of synthesizing mind including access, synthesize, evaluate, and create. An analysis of Second Order Confirmatory Factor showed that the synthesizing mind model is consistent with empirical data. There was no invariance of the synthesizing mind model between the groups of male and female students.

Keywords: Measurement Invariance, Synthesizing Mind, Gender, Factor Analysis

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Introduction

Nowadays, it is the era of rapid economic and social changes due to the power of Information Technology (IT). These rapid changes in the global society (James et al., 2010) directly affect Thai society in the aspects of economy, politics, education and society. The advancement of technology allows the deluge of information. Educational management plays an essential role in cultivating learners to have effective thinking so that it can be applied as a tool for data management, knowledge quest and learning in the present and the future world. Teaching learners to be effective thinkers is an urgent aim for educational management because thinking is a significant tool that learners can be further applied in information management in the rapidly changing world and for things that may happen in the future. Many countries across the world have realized the importance of preparing learners with high potential who are ready to live their lives in the world with unexpected future.

As mentioned earlier, educational management for thinking development is an urgent matter for Thailand, especially emphasizing on development of analysis and synthetic thinking abilities. These abilities enhance sequential thinking processes. Beyer (1983) mentioned that critical thinking involved processing data through analytical thinking and synthesizing thinking. Similarly, Gardner (2007) summarizes that synthesizing mind is an ability to gather information from several sources for selection and evaluation, leading to classify issues or significant factors and create new information technology meaningful to themselves and others. It is a creative and innovative concept since people are currently facing increasing amount of information. Gardner (2007) receives the concept of Synthesizing Mind from Murray Gell-Mann, a Nobel Prize winning physicist from America. He stated 15 years ago that the most significant mind in the 21st century is synthesizing mind. Especially, in the current world where information flows quickly without any limitations on distance, humans possessing synthesizing mind do not waste time when synthesizing the deluge of data, are able to select useful data and avoid data causing danger. Importantly, cultivating the youth with synthesizing thinking ability is similar to building a shield against the threat for their future. Furthermore, synthesizing mind is more complicate than analyzing because it brings what is analyzed together or classify matters. This allows new knowledge creation and thorough and insight understanding which can be applied beyond analyzing level. Therefore, synthesizing thinking is significantly essential to those who seek success in working life, personal life and peaceful life in the society (Gelen, 2015; Hartnett-Edwards, 2013).

The researcher is interested in investigating the synthesizing mind model of learners in Thai context. The investigation was carried out with lower secondary school students. Invariance of the measuring model in accordance with the demographical variable of students' gender was conducted since there might be the differences of mental characteristics between males and females in different environment. That is, different environment may differentiate the variables to be measured (Herrera, Grossman, Kauh, Feldman, & McMaken, 2007; Karcher, 2008). The researcher wanted to know whether students with different gender are similar or different and how they are similar or different. The present study addressed the following research objectives. First, it aimed to examine the consistency of the synthesizing mind model with empirical data. Second, it aimed to study invariance of the synthesizing mind model of students classified in accordance with the demographical variable of gender.

Objective

This research aims to 1) examine the consistency of the synthesizing mind model with empirical data, and 2) study invariance of the synthesizing mind model of students classified in accordance with the demographical variable of gender.

Methodology

1. Sample

The research sample consisted of 1,555,060 lower secondary school students (Grade 7 – 9) under the Basic Education Commission across the country. The concept of Hair at al. (2010) called rule of thumb was applied to identify the size of the research sample. It is said that a size of the sample should consist of at least 10 – 20 persons per one parameter. Since there were 10 observable variables in this study, 29 parameters were identified. As a result, the appropriate size of the sample consisted of at least 580 students. The cluster random sampling was employed to each region. The stratified random sampling was applied to select schools in each province. Lower secondary school level was selected to be stratified. The sample size was proportionally identified by the rule of three.

2. Measure

In this study, the researcher examined the variables from the 4 factors of synthesizing mind including 1 access, 2 synthesize, 3 evaluate, and 4 create.

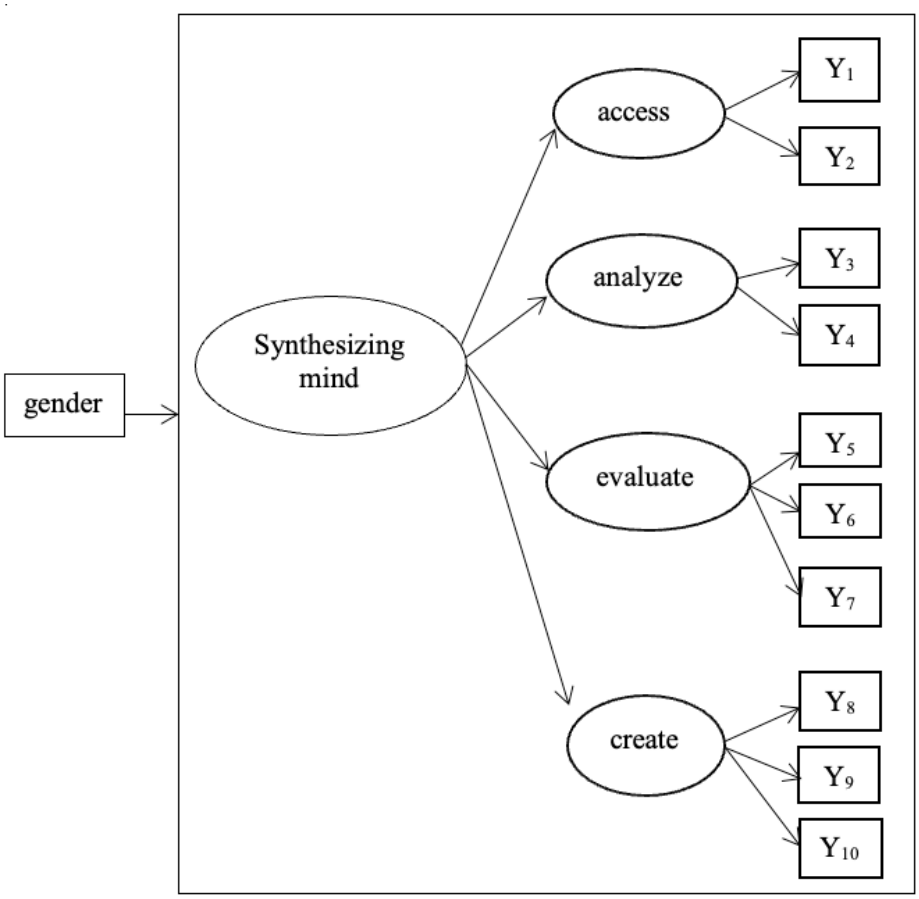


Figure 1: Conceptual Framework

The research instrument was a self-report survey on synthesizing mind developed according to the 4 factors of synthesizing mind. The survey was divided into 2 sections as follows.

Section 1: General information survey consisting of gender, grade and age. The question items were in a checklist format.
Section 2: Synthesizing mind test consisting of 30 items based on the 4 factors of synthesizing mind. The test provided 5 rating alternatives including 1= not at all true to 5 = very true. The rating alternatives were conversed for negative question items.

3. Construction of Research Instrument

The researcher carried out the following steps to construct measuring tool of synthesizing mind.

1) Identify objectives of research instrument construction.
2) Study theories, documents and research related to synthesizing mind to be used as guidelines to create operational definitions for constructing measuring test.

Table 1: Definitions and factors of synthesizing mind

Technical terms/ Factors	Definitions	References
Synthesizing mind	An ability to gather information from several sources for selection and evaluation, leading to classify issues or significant factors and create new information technology meaningful to themselves and others. It is a creative and innovative concept and an ability to create new things with structures or roles different from the existing ones.	- Gardner (2007) - Harrison & Bramson (2002) - Tallim (2003) - Thoman & Jolls (2008)
Access	Expression of Information Technology with full and rapid receiving, understanding of content, seeking information from several sources and not overly limited to one source. Ability to synthesize different types of information consistently.	- Partnership for 21st Century Skills (2011) - Tallim (2003) - Thoman & Jolls (2008) - Baran (2004) - Potter (2013) - Wood (2011) - Hobbs (2007) - Bachmair & Bazalgette (2007)

Technical terms/ Factors	Definitions	References
Analyze	Expression of informing or explaining in order to analyze truths, exaggerated offers, advantages, disadvantages from data of information technology influencing themselves and others by selectively receiving information and to give reasonable reasons to support it.	- Partnership for 21st Century Skills (2011) - Tallim (2003) - Thoman & Jolls (2008) - Baran (2004) - Potter (2013) - Wood (2011) - Hobbs (2007) - Bachmair & Bazalgette (2007)
Evaluate	Decision making demonstrating whether to believe or not, to receive or refuse information from different sources that has been analyzed information innovative and useful for themselves and others, leading to interpretation and translation of meaning of information.	- Partnership for 21st Century Skills (2011) - Tallim (2003) - Thoman & Jolls (2008) - Baran (2004) - Potter (2013) - Wood (2011) - Hobbs (2007) - Bachmair & Bazalgette (2007)
Create	Expression of presenting data from information technology, body of knowledge and opinions appropriately and directly through different forms with innovative and creative ideas.	- Partnership for 21st Century Skills (2011) - Tallim (2003) - Thoman & Jolls (2008) - Baran (2004) - Potter (2013) - Wood (2011) - Hobbs (2007)

3) Define operational definition of synthesizing mind from what has been studied and identify questions.
4) Write 30 questions according to the operational definition consisting of 4 main factors and 10 sub-factors.
5) The constructed test was examined by 5 experts to justify whether the questions were able to accurately measure students according to the operational definition and whether the language was appropriate or needed revision. The IOC was 0.6-1.00. Then, the constructed test was revised according to the suggestions.

6) The approved test was used among 100 students to verify its reliability, using Cronbach's Alpha. The reliability of synthesizing mind indices was at 0.96.
7) The revised test was employed to collect data from the sample to verify construct validity and measure invariance of model in accordance with the demographical variable of gender.

Results

The sample consisted of 580 lower secondary school students including 290 male and female students equally or 50 percent. A majority of the students or 210 students was in Grade 9 (36.21%). Most of the students or 239 students was 15 years old (41.21%).

1) Analytical results of the second order confirmatory factor analysis of the synthesizing mind model

Statistical value of KMO was at 0.873 and Bartlett's Test value was at a statistical significance of 0.01. Therefore, indicator information of synthesizing mind was highly appropriate for the next factor analysis.

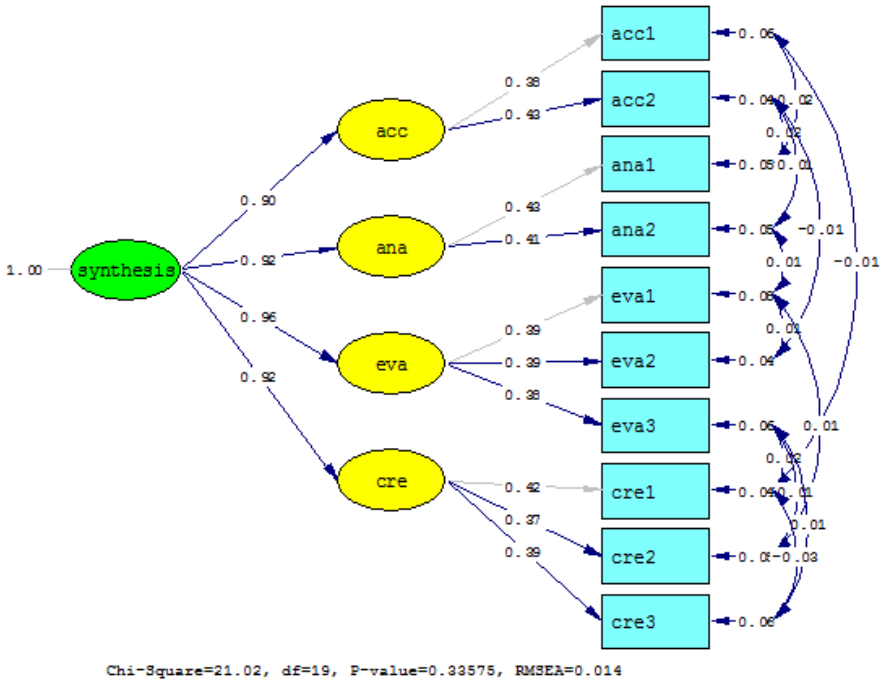


Figure 2: Factor analysis model and indicators of synthesizing mind

According to Figure 2, the developed synthesizing mind model was consistent with empirical data. The consistency between the model and empirical data was statistically significant as follows. The chi-square was at 21.02 (P=0.336) with the degree of freedom at 19, GFI was at 0.993, AGFI was at 0.979, RMR was at 0.002 and RMSEA was at 0.014.

Factor analysis model and synthesizing mind indices showed the consistency with empirical data. When factor loading was considered, the factor loading was significantly at .01. This showed that factor analysis model and synthesizing mind indices possessed construct validity.

2) Analytical results of invariance of the synthesizing mind model of students classified in accordance with the demographical variable of gender

For the testing measurement of invariance of the synthesizing mind model, the researcher employed the developed synthesizing mind model to verify the validity of the model until the model was consistent with empirical data (2= 21.01, P= 0.336, df= 19, GFI= 0.993, AGFI= 0.979, and RMSEA= 0.002). The testing was carried out in accordance with the demographical variable of gender of the 2 groups consisting of 290 male students and 290 female students each.

Table 2: Results of testing on invariance of the synthesizing mind model

Model according to assumption	χ^2	P	RMR	RMSEA	GFI	CFI	RFI	NFI
1.Format	0.12	0.94	0.00	0.00	1.00	1.00	1.00	1.00
2.Format, LX	6.35	0.39	0.01	0.01	1.00	1.00	0.99	1.00
3Format, LX, TD	42.50	0.00	0.05	0.05	0.99	0.99	0.98	0.99
4.Format LX, TD, PH	Test ended							

According to Table 2, the synthesizing mind measuring model between the groups of male and female students demonstrated invariance of the model format and of the parameters of regression coefficient of observable variables on exogenous latent variables. Therefore, the developed synthesizing mind test did not demonstrate variance among students' gender as shown in Figure 3 and 4.

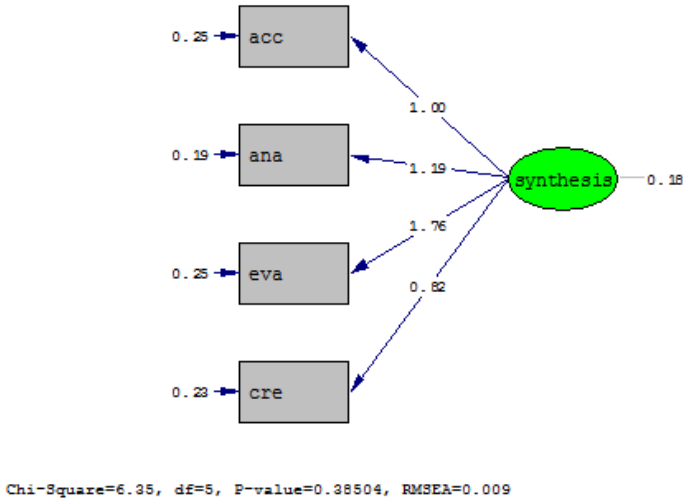


Figure 3: Parameters of invariance of male students when LX=IN

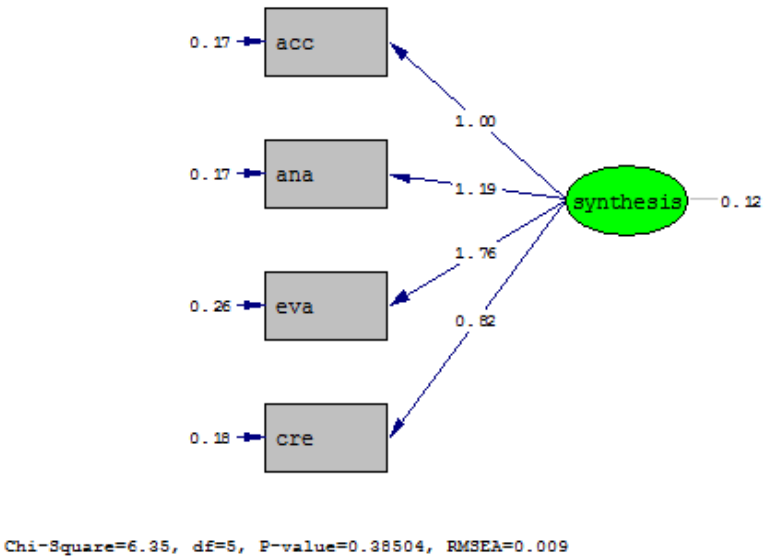


Figure 4: Parameters of invariance of female students when LX=IN

Conclusion and Discussion

According to the results mentioned above, this study shows interesting points as follows.

1) The validity result between the synthesizing mind model of Thai students and empirical data made from second order confirmatory factor showed that the model was consistent with empirical data. Since the researcher studied related documents and literature about synthesizing mind written by several scholars, the model was developed to be consistent with empirical data. The factor with the highest factor loading was evaluation probably due to the fact that the schools trained the students to be diligent for knowledge quests, to seek different sources of information and to be information collectors. Sufficient information database can be advantages. The collected information was analyzed to classify information innovative and useful for themselves and others, leading to interpretation and translation of meaning of the information (Gardner, 2020; Altındağ, & Sinemoğlu, 2018).

2) The testing result of structural equation model invariance of multi-groups of synthesizing mind indices among students classified in accordance with the demographical variable of gender showed that there was invariance of model format. That is, the 4 factors could be employed to measure synthesizing mind in both male and female students. This is consistent with the theory of Bollen (1989) stating that a model from 2 groups of population demonstrates a format with invariance when all variables in that model and structural relationship between the variables in both models is the same. In other words, matrix parameters of both models are similar and have the same size. In addition, mode of parameters in that matrix is fixed parameters, free parameters and constrained parameters. However, parameter values are not necessarily equal.

Suggestion

1) The synthesizing mind test should be interpreted together with observation form, interview form and other evaluation tools to obtain information consistent with the truth, accurate and can be guidelines for student behavior development.

2) Comparative studies using other demographical variables such as race, region or organization etc. for testing measurement of invariance should be further examined to identify whether there is invariance of measurement. This will allow interesting information beneficial for development of synthesizing mind model.

3) There are several issues about synthesizing mind to be investigated. For instance, casual factors influencing possession of synthesizing mind which probably composes of different factors essential to development of synthesizing mind should be further studied.

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Arts-Based Pedagogy for Promoting Diversity: A New Approach in Global Citizenship Education

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Abstract
This paper discusses the potential of incorporating arts-based pedagogy in global citizenship education. This novel educational approach is to increase young people's awareness of diversity and guide them to become tolerant global citizens through art-making. Goal 4, among the seventeen Sustainable Development Goals (SDGs) created by the United Nations, aims for "quality education," and one of its subdivided categories called Target 4.7 indicates the necessity of developing global citizenship among students for cultural diversity. Paying attention to diversity in global contexts beyond the dichotomy of the Global North and the Global South is getting increasingly important. What kinds of art-making are effective in education so that the youth can transform themselves to be active global citizens? A combination of ethnographic observation and interviews was conducted in Phnom Penh, Cambodia. In conceptualizing this study, I apply the concept of the "rhizome" proposed by Deleuze and Guattari (1987). Theoretically, this study deepens our understanding of the "rhizome," that is, multiplicity beyond the dichotomy, which emerges from art-making. Practically, this research shows some art-making practices corresponding to the objectives of global citizenship education.

Keywords: Art-Making, Diversity, Global Citizenship, Rhizome

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Introduction

It is becoming highly important in today's digitalized and interconnected world to nurture global citizenship of young people. Goal 4 of the seventeen Sustainable Development Goals (SDGs) aims for "quality education," and one of its subdivided categories called Target 4.7 indicates the necessity of developing global citizenship among students for cultural diversity (United Nations, 2015). According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), global citizenship education (GCED) intends to help students:

- develop an understanding of global governance structures, rights and responsibilities, global issues and connections between global, national and local systems and processes;
- recognise and appreciate difference and multiple identities, e.g. culture, language, religion, gender and our common humanity, and develop skills for living in an increasingly diverse world;
- develop and apply critical skills for civic literacy, e.g. critical inquiry, information technology, media literacy, critical thinking, decision-making, problem solving, negotiation, peace building and personal and social responsibility;
- recognise and examine beliefs and values and how they influence political and social decision-making, perceptions about social justice and civic engagement;
- develop attitudes of care and empathy for others and the environment and respect for diversity;
- develop values of fairness and social justice, and skills to critically analyse inequalities based on gender, socio-economic status, culture, religion, age and other issues;
- participate in, and contribute to, contemporary global issues at local, national and global levels as informed, engaged, responsible and responsive global citizens. (2015, p. 16)

Since the UNESCO provided teaching suggestions to achieve these objectives in 2015, considerable effort has been made to integrate GCED into various subjects by using conventional media (i.e., newspapers, magazines, and television) and implementing such activities as studying/volunteering abroad, discussing controversial topics, group work, reflecting, and storytelling (D'Antoni & Mayes, 2023; Gaudelli & Schmidt, 2018; Santisteban, et al., 2018). On the other hand, little attention has been paid to how creative practices in the classroom would be beneficial for learners.

This study lays emphasis on incorporating arts-based pedagogy in global citizenship education. Recently, some scholars have displayed the significance of art-making in promoting students' global citizenship (Hutzel & Shin, 2022; Juntunen & Partti, 2022). For example, Hutzel and Shin (2022) describe what a crucial role the arts play in the present day:

> Demands for problem-solving for global consequence have been increasingly evident in recent years as the Covid-19 pandemic swept across the earth without regard for geography, cultural identity, or socio-economic status. Such global demands have also revealed fissures across the globe in individuals' sense of shared responsibility and general cultural awareness, a reminder of the need for public education to not only teach science but also teach for cultural and critical competence. Art education in particular has an expressed responsibility to center culture and criticality within curriculum and pedagogy practices and scholarship. (vi)

Juntunen and Partti (2022) assert the importance of employing various art forms including "… drama, movement, cartoons, poetry, soundscapes, rapping, singing, drawing, and so forth" (p. 5) beyond the disciplinary boundaries and point out that "… interdisciplinary arts practices can

be particularly powerful in providing opportunities to perceive and engage with the world" (p. 15). Cultivating an understanding of diversity around the world beyond the dichotomy of the Global North and the Global South is urgently needed. Focusing on the case of Cambodia, what kinds of art-making are effective in education so that the youth can transform themselves to be active global citizens?

Conceptual Framework

To explore the above question, I apply the concept of the "rhizome" discussed by Deleuze and Guattari (1987). Its unique characteristics are illustrated thus:

> The rhizome is reducible neither to the One nor the multiple. It is not the One that becomes Two or even directly three, four, five, etc. It is not a multiple derived from the One, or to which One is added (n + 1). It is composed not of units but of dimensions, or rather directions in motion. It has neither beginning nor end, but always a middle (*milieu*) from which it grows and which it overspills. (Deleuze & Guattari, 1987, p. 22)

Here, I consider that the "rhizome" corresponds to complexity, fluidity, and variety. Employing the concept as such enables the researcher to be positioned in the middle, which is free from dichotomization. This study combines qualitative and visual research methods and seeks to delineate "*milieu*" as a new space emerging from art-making.

After times of political and social instability including the civil war, Cambodia has been pushing ahead with reconstruction (Chandler, 2008). According to the Ministry of Education, Youth and Sport (MoEYS), improving the literacy rate of those in remote areas was one of the urgent tasks for the Cambodian government in the 2000s. At the same time, accelerating Information and Communication Technology (ICT) media literacy was regarded as a pivotal factor for Cambodia's restoration (MoEYS, 2004).

In the "Education Strategic Plan 2019-2023" released in correspondence to the SDGs, MoEYS states that the country's education is in transition: "Cambodia has reached a new development stage in its education sector response to global and regional contexts" (2019, p. 15). The document addresses the following four educational objectives:

1. To inculcate and nurture national consciousness, integrity and a sense of national pride through fostering common ideas, values and aspirations in order to forge national unity and national identity.
2. To develop learners in a holistic and integrated manner who are physically, intellectually, emotionally, aesthetically and spiritually balanced.
3. To produce knowledgeable, skilful and competent human resources as required by the labour market for a diverse, knowledge-based economy who can compete globally and regionally.
4. To prepare lifelong learners for an inter-connected and inter-dependent world, who can act effectively and responsibly at local, national, regional and global levels for a more peaceful and sustainable world. (MoEYS, 2019, p. 15)

The outcome of practicing education as such is clearly expressed:

> Cambodia will have healthy, well-prepared and motivated learners who are committed to learn regardless of their background and are provided with conducive learning environments. They will be supported by professionally competent and qualified teachers, as well as their family and community. When they graduate, they will be

> equipped with both hard and soft skills, sound moral judgement, emotional intelligence and a strong sense of national and global citizenship that enables them to contribute to and actively participate in society. (MoEYS, 2019, pp. 16-17)

In this way, it becomes obvious that Cambodia hopes to generate citizens who not only render services to the growth and prosperity of the nation but also act jointly with many global citizens around the world. Applying Deleuze and Guattari's concept and exploring art practices conducted by some research participants living in Cambodia and the researcher herself, this study aims to present a rhizomatic praxis that goes beyond the dichotomy of the Global North and the Global South and can be employed in global citizenship education.

Methodology

This paper draws on my doctoral dissertation combining qualitative and visual research methods such as interview, ethnographic observation, and filmmaking (Hara, 2012) and centers on the voices of the research participants living in Phnom Penh, Cambodia (see Table 1). They suggest that digital technology is deeply rooted in their everyday lives, and among technological inventions, cellphone is the most popular tool they use. Their comments demonstrate that it is used mainly for making phone calls, sending text messages, and photographing. Rath in his 20s is a university student living in Phnom Penh, and digital technology is very close to his daily life. He explains why he decided to major in Information Technology (IT): "Because I like computer, technology." He utilizes a cellphone as a tool for sharing information such as sending pictures he took to his friends and receiving pictures from them.

The diffusion of digital technology is closely connected with the enhancement of teaching and learning the arts. According to a designer/artist Mr. S C working at the Royal University of Fine Arts (RUFA) in Phnom Penh, both handwork and production using digital technology such as computer software programs are essential for creative practices:

> Students often use computers to create their works. We have sixteen computers. So for design, we provide them with a lot of time to study using design programs like, uh, Adobe Photoshop, AutoCAD or something like that for sketching in 3D on computer. And for painting and making sculpture, we also teach them how to create painting, using an IT program. But for the assignment that the teacher gives them, they cannot do that by using computers because we need them to gain skills by hand.

Mr. K.D teaches ethnomusicology and traditional Khmer musical instruments at RUFA. He indicates that both books and computer play a significant role in cultivating students' knowledge and skills in music: "Students majoring in composition use computers for composing now. For theory they do research in the library and use books." He points out that students are competent for expression by both musical instrument(s) and computer: "Students use computers and compose using the keyboard on computer. … They use piano and computer."

In addition, the following research participants talk about experience in learning with technology from a student's perspective. Mr. Pheak majoring in IT responds to my questions as follows:

R (Researcher): What classes do you take at university?

Mr. Pheak: I study computer skills such as typing.

R: Do you use software applications like Word or Excel frequently?

Mr. Pheak: I learn all of them as well as typing.

He continues to say, "When I do homework, I use computer," and suggests that he makes the most of computer in his studies. As a graduate of the Faculty of Fine Arts, RUFA, Kleng mentions the popularization of digital technology among the youth in Cambodia and asserts the need to enhance skills in handling certain software programs for art-making:

> These communication tools and technology are now getting popular among young people in Cambodia. Like me, like my skill, I do interior design and I used to study 3D Studio (renamed 3ds Max), AutoCAD, and Adobe Photoshop a little bit. But before that, I have never practiced this kind of skill. We need to practice more and then we get it. But I didn't have any equipment, either. … I need to spend some time using these software programs. I say to myself, 'You're getting old now; you need to do this.'

Thus, the everyday practices of the research participants living in Phnom Penh reveal the close ties with digital technology and its impact on art-making.

Name in Pseudonym	Occupation	Place of Residence
Bav	Artist	Phnom Penh
Diamond	Security guard	Phnom Penh
Mr. K.D	Educator at RUFA/Classical Cambodian musical instrument player	Phnom Penh
Kleng	Artist	Phnom Penh
Mr. Naor	Salesperson selling cellular cards to the public	Phnom Penh
Mr. Pheak	University student majoring in IT	Phnom Penh
Pit	Manager of a food supplier	Phnom Penh
Rath	University student majoring in IT	Phnom Penh
Mr. S C	Artist/Designer/Educator at RUFA	Phnom Penh
Ms. T S	Director of the Women's Media Centre of Cambodia	Phnom Penh
Mr. Thy	University student majoring in Law	Phnom Penh

Table 1: List of research participants.

Teaching and Creating Fine Arts

Mr. S C is devoting his energies to enhancing the quality of teaching and learning fine arts at RUFA. Using digital technology can lead to an inspiration for artists in creating works. Mr. S C indicates that photographing with his digital camera is useful in obtaining ideas for his artworks:

> Mr. S C: I carry a camera with me, when I travel. The artists: Every time we have a camera. (laugh)
>
> R: What pictures do you like to take with your camera?
>
> Mr. S C: Uh, it's up to the situation. Sometimes I like to take pictures of landscapes. If in a city, I like to capture some of the landscapes. Some of the pictures I take, I take some of the, what to say, the abstract thing in a city—something like not known because this is the image that we don't think before.
>
> R: When you create painting, do you use those pictures as a base?
>
> Mr. S C: Yes. I use the pictures I took as a base for painting. This is my collection. If needed, I can search something from it.

He suggests that the trend in the arts does shift and it is essential for artists to dare to express their ideas and concepts to the audience through artworks:

> Mr. S C: We have some artists popular among the students, who impress them with abstract art and contemporary art. But these arts are only seen at galleries. Some students who graduated from this school now have a gallery and they create modern artworks. I think that in Cambodia, people know about modern art; step by step they know.
>
> R: I make films, especially experimental ones. But when I show an experimental film at a conference, some people do not understand or even dislike it.
>
> Mr. S C: Sure. The same can be said about working on the canvas. People may not understand abstract art. But for painting or drawing, if you put a topic and explain it, they read and look, and they can see; they can understand something. But if your picture does not have a topic or some explanation, they do not know because this is abstract; it is very difficult. Film also, I see. (laugh) This is art. The media used for creating artworks are like this. So we are the artists who have to explain concepts to them. There are lots of concepts that we cannot see.

His words above imply that a piece of artwork creates "*milieu*," a space where the artist representing her/his concept and the audience interpreting it meet and sometimes collide. His students are encouraged to be in this "*milieu*":

> R: You indicated the school tries to combine the two concepts—Khmer art and Western art. What do you think about artists who create works showing the view of transnationality, living beyond borders?

> Mr. S C: I think that our perspective is also like that. We will do the high level of art like what you see in Asia and in the world. For me, I think that abstract art is not difficult in terms of skills but it is difficult conceptually. So if you have ideas and you have a concept for your work, then it is very easy to make art. But it is difficult to make a concept itself. I try to guide students here how to make a concept and how to do research so that they can bring themselves to the upper level in making abstract art or something like that.

Hence, it is reasonable to suppose that Mr. S C's practice of teaching and creating fine arts embodies a rhizomatic praxis undoing the dichotomy of Khmer art and Western art and coincides with the UNESCO's educational goals to "… develop and apply critical skills …" (2015, p. 16) as well as "… recognise and examine beliefs and values …" (2015, p. 16).

Teaching and Playing Music

Mr. K.D teaches ethnomusicology and classical Cambodian musical instruments at RUFA. He describes the phenomenon seen in the learning environment:

> Mr. K.D: Students compose using the notation like Do, Re, Mi, Fa, Sol, La, Si because the Cambodian music scale system is from France. If we need to sing a song, it must be in Do, Re, Mi, Fa, Sol, La, Si, Do. We understand A-B-C or numbers (scales) for ourselves but we have always been using Do, Re, Mi, Fa, Sol, La, Si until now because Cambodia was a colony of France. So France brought everything to Cambodia but now I and other people keep this Do, Re, Mi, Fa, Sol, La, Si. We practice everyday and I teach solfège, the notation; I must sing in Do, Re, Mi, Fa, Sol, La, Si.
>
> R: Do they like to compose modern or traditional music?
>
> Mr. K.D: Now students combine traditional Cambodian music and Western music and some students like to compose Western music. But looking at them everyday, I think students like combining the traditional and Western music.

Mr. K.D thus points out the impact of France on the cultural formation of Cambodia in the colonial times. He then starts to give a detailed account of the background:

> R: How about traditional Khmer musical instruments? Do you use Do, Re, Mi, Fa, Sol, La, Si?
>
> Mr. K.D: Yes. Traditional Cambodian music did not think about this before because we lost documentation a long time ago. I don't know if it was in my father's or my grandfather's generation but before I was born, I think, uh, Cambodia had notation for traditional music, not Do, Re, Mi, Fa, Sol, La, Si. But in Cambodia there were many wars. In the Pol Pot times, you know, everything was destroyed. After the revolution, from 1979 we started from there again.
>
> R: When you play traditional musical instruments, how do you memorize a new song? Do you use the Western scale?
>
> Mr. K.D: Before adopting the Western scale, to play traditional Cambodian musical instruments, my father and grandfather taught me orally and one to one. Traditional

> music had been passed down orally from generation to generation. There is no document, no notation, and I remember. For example, a hundred pieces must be in my head. … I studied notations with a Western music teacher. I think unless I study like this, everything will be lost.

In this way, Mr. K.D mastered the Western music scale and notation and now applies them to teaching and performing the traditional Cambodian musical instruments. He indicates the reason for doing it as follows:

> By recording with the musical notes, we hope to keep the culture, not to lose it. … We borrow the scale from the Western and we borrow the notation from the Western to write a traditional Cambodian piece. If it is not done like this, I think in the future we will lose everything without document.

In addition, he suggests that the utilization of the Western music scale and notation enables the music teacher and the students to restore classical Cambodian music that was almost forgotten and build up something new together with reference to the past:

> My students create new music pieces. Sometimes they make another interpretation. They make another way; they make another form. Today I think a certain music piece like this but my students have another way. For composing from the material in the past, sometimes I take like this and they get like that. Sometimes I take like this and they approach through another way; they go to another way. Traditional Cambodian music is like this because, uh, it is not fixed.

Thus, it becomes clear that from documenting traditional Cambodian music by making full use of the Western music scale and notation emerges a rhizomatic praxis transgressing the dichotomy. Acknowledging fluidity and variety in teaching and learning traditional Cambodian music corresponds to the UNESCO's educational goals to "… recognise and appreciate difference and multiple identities …" (2015, p. 16) as well as "… develop attitudes of care and empathy for others and the environment and respect for diversity …" (2015, p. 16).

Filmmaking

The last case is filmmaking carried out by the researcher herself. A short film titled *The Art of Becoming* visualizes what "*milieu*" looks like in the context of the reciprocal relationship between the research participants and me as a researcher/filmmaker. I take part in the film as a calligrapher, performer of hand gestures called *mudrās* as well as a musical instrument and voice-over. Drawing on Saunders (1960) describing various forms of *mudrās* in Buddhism, I enacted fourteen hand gestures in the created film. The words of the research participants correlate with the meanings of *mudrās* respectively. For instance, the third one *an-i-in*, Saunders states that "[t]he left hand represents concentration …" (1960, p. 73) and "[t]he right hand represents wisdom …" (1960, p. 73). What becomes clear from Mr. S C's words below is that as an artist/designer/educator, he concentrates on passing down the wisdom of art creation to the younger generation:

> … Some of the pictures I take, I take some of the, what to say, the abstract thing in a city—something like not known because this is the image that we don't think before. … I think that in Cambodia, people know about modern art; step by step they know. … I try to guide students here how to make a concept ….



Figure 1: The third *mudrā* extracted from *The Art of Becoming*.
14 minutes digital video. 2012. © Hiroko Hara, 2012.

The fourth *kongō-gasshō* portrays "… the co-existence of the two inseparable worlds …" (Saunders, 1960, p. 77). As its articulation, I refer to what Mr. K.D remarks:

> … We borrow the scale from the Western and we borrow the notation from the Western to write a traditional Cambodian piece. If it is not done like this, I think in the future we will lose everything without document. … Traditional Cambodian music is like this because, uh, it is not fixed.

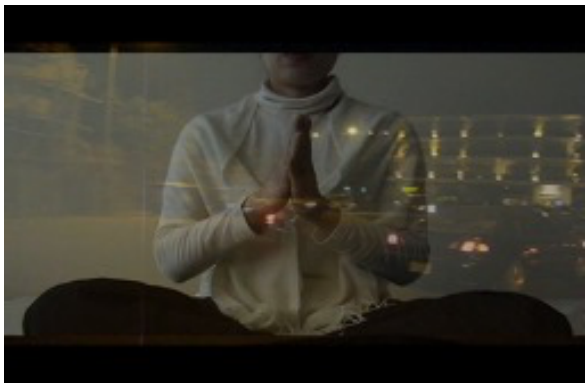


Figure 2: The fourth *mudrā* extracted from *The Art of Becoming*.
14 minutes digital video. 2012. © Hiroko Hara, 2012.

The created film consists of five sections: Earth, Fire, Wind, Water, and Void (see Hara, 2016). Each segment includes an image capturing my handwriting with a brush and voice-over reading poetry aloud. The space between the segments contains a portion of various images and voice-overs of the research participants. Through a layer of images, sounds, and voices, the film places emphasis on complexity, fluidity, and variety, which function as a driving force to hinder dichotomization.

Conclusion

This paper has attached importance to incorporating arts-based pedagogy in global citizenship education by focusing on the creative practices carried out by the research participants living in Cambodia and the researcher herself. It has become clear that art-making turns to a rhizomatic praxis interweaving the East and the West; it embodies "*milieu*" negating the dichotomy of the Global North and the Global South. The educational goals of Cambodia have been renewed in accordance with the SDGs, and this paper has shown that the research

participants' creative practices in the classroom contribute to raising young people's awareness of diversity and guiding them to become active global citizens. To further investigate the possibilities of integrating arts-based pedagogy into global citizenship education, there is a need to apply diverse art forms to teaching and learning various subjects. As I have argued earlier, the diffusion of digital technology cannot be overlooked. It is suggested that a practical use of cellphones be instrumental in linking art-making to nurturing global citizenship of the young generation. The researcher's filmmaking practice serves as a model that can correspond to the objectives of global citizenship education and be employed in the classroom. It encourages students to use their cellphones for photographing and filmmaking so that they can deepen an understanding of the contents of the respective subjects and gain skills to become tolerant global citizens simultaneously.

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Identifying Success Factors for Effective Online/Distance Learning Implementation

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Abstract
The study seeked to explore the various aspects related to online or distance learning in the current scenario of online education due to and after the Pandemic and identify factors that will be effective for the implementation of a successful distance learning by looking at different perspectives of the relevant stakeholders involved. Literature was reviewed to establish what previous studies have contributed to the research problem of the study. The study, which was purely based on survey method involved the data from primary and secondary sources. Samples for primary data included students and the faculty members from Modern College of Business and Science. The study used sampling methods for collecting the data for the research warrants from respondents. The secondary data was collected from different sources including books, and journals. The data was analyzed by making use of (i) Arithmetic Mean (ii) Coefficient of Variation (iii) Growth Rates, (iv) Analysis of Variance (ANOVA), (v) Simple Regression (vi) Multiple Regression analysis. Recommendations were made available to relevant parties such as faculty, students, higher education institutions, other researchers, and policy makers to focus on the Design of the Distance Learning program emphasizing on the key factors identified as having an impact on the quality of the delivery of the program and thus the student learning experience.

Keywords: Distance Learning, Learning Experience, Access to Suitable Equipment and Program Design

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1. Introduction

Distance Education is a system of offering education or training through a distant media, often through a means of correspondence using a traditional mail system and in modern times digitally. In this system the students and teachers are not always required to be physically present on the school or college premises. Distance Education was first initiated by Sir Isaac Pitman some, 150 years ago when students in far off towns wished to participate and learn shorthand. This process helped overcome the barriers of distance, time, and place. The success of this venture led to the establishment of more courses being offered formally and thus established the Sir Issac Pitman Colleges across England. This encouraged students to study from home and before long, correspondence schools were established in UK and US too. As the process evolved, practical lessons or classes and assessment methods were incorporated in these courses and came to be known as blended or hybrid learning process. In modern times, e-learning, online learning, virtual classroom is typical or synonymous to the term distance learning.

Distance Learning has several advantages such as including many students from a wider geographic region, offering a wide range of subjects, courses, timings, and duration to meet this wide demographic distribution of students. As per Dr. Raymond Huntington, from the Huntington Learning Center (Huntington, R., 2020), advantages include independent learning, bringing focus back to learning, it is easy to get ahead/extend the learning. Disadvantages include the struggle for some students with so much forced independence, reduced or minimal opportunity for interaction and collaboration and the risk of falling behind schedules in the absence of strong instructor support and monitoring. The disadvantages surrounding distance learning have been improved significantly with e-Learning, Online and Digital platforms with the advent of the internet revolution.

2. Background of the Proposed Study

Through this study we have explored the various aspects related to online or distance learning, and attributes leading to either the success or failure of online learning. To achieve this, identified the student feedback in areas surrounding requirements, motivation, readiness, and expectations of an online learning method, together with teacher competence, availability of a robust learning management system etc. (Firat, M., Bozkurt, A., 2020; Basuony, M.A.K., et. Al., 2021). In the emerging digital scenario combined with the onset of the Pandemic in 2020, there were several established open education resource platforms, online academies and reputed universities offering distance education with the opportunity to induct thousands of students into one batch.

Online / Distance learning has been generating significant opportunities to an ever-expanding audience, across borders and has been transforming learning delivery and assessment methods and the ever-increasing rationale are a) expanding access to potential students, b) increasing participant capacities, c) capitalizing on the emerging market opportunities such as during the Pandemic, d) Healthy competition resulting in institutional transformation, and having to adapt to the emerging digital technologies and student requirements (Olson, P. W., 2005).

The complete shift to online learning during the COVID 19 pandemic was unexpected and unplanned for most, impacting both, the learning experience, and the readiness of educational institutions to meet the fast-changing requirements of digital learning (Maheshwari, G. 2021). E-learning is the process of accessing the web-based technological tools that might be used in

the classroom or outside the class (Thomas, S., Maheshwari, G., 2017); while Online learning is the process of delivering or conducting classes outside the classroom as is done in distance learning (Oblinger et al. 2005). There are several factors which affect the effectiveness of online learning process such as available technology, user-friendly learning management systems, student engagement activities, assessment types, teacher student interactions etc. (Wijekumar, K., Ferguson, L., & Wagoner, D. 2006; Shuey, 2002).

3. Research Problem (Literature Review)

Some term the global market scenario as pre and post COVID economic fallout and changed the way mankind has lived in the past years (Lu, Stratton & Tang, 2020). The most devastating impact of the pandemic, besides the healthcare systems has been the disruption in education systems due to COVID-19 pandemic, affecting nearly 1.6 billion learners globally. There is now an urgent need and action from nations to define innovative ways to restart and manage business, particularly in the education sector, which has been one of the most badly affected sectors (Bocar et al., 2022; Loayza & Pennings, 2020; Crawford et al., 2020).

Given the socio, economic interdependence globally, all sectors of the marketplace have experienced the impact of the COVID-19 and it includes the education sector. (McKibbin & Fernando, 2020). Physical distancing, combined with curfews and lockdowns have exacerbated social isolation and altered established teaching and training practices worldwide, impacting student learning experience. The opportunity therefore lies in innovation and improvisations in teaching methodologies. This includes, using technologies in IT and Communication, and enhancing learning management systems (Pokhrel, S., Chhetri, R., 2020).

The disruption during COVID 19 has raised challenges concerning operational continuity, development, and future of education as we know it today. An independent research revealed that the corporate education market contributed 16% of reserves on the overall online learning initiatives in 2000. With the Internet of Things, technology is an opportunity that helps in the evolution of corporate learning at all levels of education, particularly higher education (Abdelmeneim, Said, Hassan, & Malek, 2020).

In the dynamic online environment today, the identification, choice and implementation of a robust online e-learning system is the initial challenge of colleges and universities. Several e-learning systems offer several significant features, however, the successful implementation of these features has depended on various aspects which have either not been identified or supported technologically. Hence, this study aimed to delve into various factors impacting distance learning and thus identify key areas of improvement (Almaiah, M.A., et, al., 2020).

A study conducted showed the relevance of teaching, professional behaviors, lesson planning and online connectivity as being significantly positively associated with online learning (Mustafa, F., Et, al., 2020). Educational institutions are facing the same challenges while preparing for distance learning in response to the pandemic (Micah Castelo 2020).

According to Kristina Ishmael, senior project manager of the teaching, learning and tech team for New America's Education Policy program the key factors to consider are:

a) Access to Devices and the Internet: The initial uncertainty surrounding COVID-19 soon gave rise to pertinent questions on the ongoing study methods, such as availability of digital devices. This naturally raised the question on availability of finances and the availability of

devices in the market and schools, Ishmael says. Most homes may have only one device at home while the number of users had increased due to the online environment, says Eileen Belastock, director of academic technology for Mount Greylock (Mass.) Regional School District.

While olleges and public schools have been well-connected to high-speed internet broadband, homes have not. “The most recent data shows that about 14 percent of our current K–12 population doesn’t have connectivity at home; that’s about 7 million students, in the US” Ishmael says. That would mean that even if the students were provided devices, they were not useable. However, several broadband providers globally, were quick to offer attractive internet connectivity option to speed up the process of online work.

b) Re-design course learning outcomes and instructions to student needs and abilities: Most schools and colleges learning management systems such as Moodle or google classroom, however there may be alternate learning methods or provision of instructions, such as the use of e-mails, WhatsApp or even by mail for primary education. Coaching students to help them adapt to the online learning environment together with IT support is very important,” says Eileen Belastock, director of academic technology for Mount Greylock (Mass.) Regional School District.

With the advent of Internet Communication Technology (ICT), digital collaborative tools such as Microsoft Teams, that have accessibility support built into it and the Immersive Reader tool (which reads information aloud to students) and language translation features, all features have become user-friendly and readily available for a switch to online learning, if the need arises (Khan & Magd, 2021; Khan & Magd, 2023).

c) Faculty and student professional development: Providing the devices and internet connectivity alone did not improve quality of learning environment, it depended on the professional development of faculty and students, as well. The use of web tools such as Zoom or MTeams has seen an unprecedented growth during the pandemic. Institutions are beginning to think of innovative ways of partnering with teachers and students to design delivery and assessment methods which can be more engaging, participative while meeting the course learning outcomes. A mandate to up-skill to meet this transformative environment.

d) Data privacy and security protocols: All the above activities cannot be at the cost of privacy. Phishing, data security, threats of malware and spycams where data is vulnerable to cyber-crimes and should be reinforced with cyber-hygiene practices.

The ever changing and exponential expansion in the opportunities for providing online courses coupled with the increasing interest in eLearning have resulted in the increased offerings of eLearning opportunities by Higher Education Institutes (HEI) And as the technologies become efficient, reliable and easily accessible, HEI are cashing in on the potential. Parallelly, it is important to identify and mitigate challenges affecting the effective implementation of eLearning Courses. These include influential factors such as planning, readiness, management, pedagogical, technological, faculty, evaluation methods, etc having a direct impact on the successful implementation of eLearning Programs. (Al-Balushi, S., & Al-Balushi, H, 2023).
The studies conducted by Mohapatra, B.P.; Nanda, S.S.; Hiremath, C.V.; Halagatti, M.; Das, S.C.; Das, A. have identified an array of factors instrumental for implementation of an effective online/distance learning experience. These include:

- Institutional support in the form of Leadership buy-in, adequate resourcing, policy guidelines and procedural requirements.
- Technological readiness in the form of reliable technology and infrastructure as well as the upskilling faculty.
- Course design needs to be engaging and interactive with clearly defined learning objectives and equally effective assessment tools and methods.
- Faculty support with enhanced competence building in online teaching.
- Student support with reliable and accessible technical support, academic advising and opportunities for social engagements.

Educational institutions and policymakers have improved the opportunities for a successful implementation of online/distance learning experience.

Critical Success Factors

Distance learning has been researched by many around the world in search for the most practical and effective system implementation in higher education institutions. Due to different educational systems around the world, researchers have found that not all critical success factors work similarly to another country's system.

In the western countries, several researchers came up with different critical success factors. For instance, Barclay et al., (2018) investigated the CSF in an online learning environment in the Carribean's higher educational system and came up with a category of four factors; e-learning systems, institutional, instructors and learners. The author went on explaining on how these factors could influence the success of the e-learning in the country. Stacey & Gerbic, (2008) on their study had similar views on three of Barclay's factors, instructors, students, and institution. The authors also added pedagogical considerations as they believe traditional face-to-face pedagogy isn't effective to use on an e-learning system.

On the other hand, Elkaseh et al., (2015) after a comprehensive analysis on several research papers identified eight completely different factors than the other authors: Educational Technology, Computing Experience, Attitude, Social Influence, Curriculum Development, Language, Teaching and Learning Styles, and Demographic. Furthermore, leadership, structure and cultural issues, design issues, technological issues and delivery issues are quadrants that were identified by HE practitioners in a study done by McPherson & Baptista Nunes, (2006).

Noorulhasan et al., (2017) conducted a mixed study method investigating Saudi Arabian Universities to find out critical success factors of e-learning and categorised them into dimensions; students, instructors, design and content, system and technological, and institutional management service. Furthermore, on a study done on South African Universities by Mbodila et al., (2019) grouped CSFs into eight categories; resources, institutional, ethical, evaluation, social interaction, management, pedagogical, and technical. Additionally, maximization of LMS usage, sustainability plans, adoption of renowned best practices, e-learning collaboration, training, learning readiness, and online contents and curriculum development were the CSFs proposed by Odunaike et al., (2013).

Critical success factors of e-learning can be identified in terms of general higher education institutions' requirements to help in its implementations but also it can be used to identify the success factors of a more specific aspect of an e-learning system. For instance, with teaching language online. Alberth, (2011) was able to group the CSFs into six criteria: student

characteristics, institutional design (pedagogy), provision of support for both instructors and students, teacher characteristics, technology, and language skills characteristics.

Research Objectives

Identify factors influencing the effective implementation of a distance learning system to impart online learning during and after the pandemic, bearing in mind the organic growth in opportunities in Information and Communication Technologies (ICT) owing to the internet revolution.

For an online/distance learning to be successful in its implementation and the delivery of said contents, a driving factor or platform should be developed and put in place. Therefore, another objective of this research was to identify the technologies/trainings required for a seamless transition from face-to-face to online or distance learning. As technology is the key driver to online education for faculty and students to interact with each other, the research has dug deeper on the types of technologies that would be effective and efficient in the delivery process.

Besides critical success factors identified on page 5, the research objective included identification of a structured measurement process which may include the use of Deming's Cycle of PDCA (plan, do, check and act) to ensure evaluation of effectiveness of a distance learning system where, readiness, management, both administrative and leadership, support or resourcing, pedagogical, available technology, faculty and institutional readiness, and online ethics can be defined, implemented, monitored and continual improvement can be achieved (Al-Fraihat, 2017).

4. Significance of the Research

The study focused on gathering different factors that certain groups of people could use or consider for having a successful implementation of distance learning educational institutions. Furthermore, the results of this study will be beneficial to the following:

- ***Faculty****:* The results of this study helped faculty members in educational institutions with a framework that identified the factors that should be considered in designing and delivering their courses.
- ***Students****:* The results of this study shed light to the students in what is required of them in terms of meeting the course standards. Distance learning leans more on student self-centered classroom thus requiring students to dive more into research. With research, students have been able to navigate the ropes of having an effective path to distance learning.
- ***Guidance Staff****:* The results of this study has helped the guidance of staff understanding the roles of both students and faculties.
- ***Educational Institutions****:* The results of this study will help other educational institutions not only in Oman but also around the world to try and see whether the identified factors could also apply to them in having an effective implementation and operation of their distance learning model.
- ***Future Researchers****: The results of this study will serve as reference material for future researchers who will pursue research on the same subject matter or who wish to conduct extensive research on the study.*

5. Research Methodology

Both primary and secondary research methods have been used in this research. The secondary research method for this study has been the literature review. Looking into different articles regarding both blended and distance learning has been the first step towards identifying the factors for effective distance learning. Primary research in this study considered the following:

Research Instruments: The research instruments used are surveys and questionnaires. The survey was conducted across different HEIs in the Muscat region and MCBS through online survey tools/software. First section asked for the profile of the respondents. The tool for profile determined the age, gender, student/faculty etc. The rest of the sections were directed to the respondents depending on whether he/she is a student or faculty to get their perspectives on the matter. questionnaires and survey from the recipients were collected by using online surveys in google forms or survey monkey. The responses were analyzed based on the significance to the objectives and have been represented using statistical tools using the variables applied for the study.

Data Reliability and Validity: The study is seen as reliable when different researchers can use it under stable conditions with consistent results. This study will help the researchers to make reliable comparisons and institutions to rely on the factors identified to effective distance learning and evaluate on whether it would work for the institute. Researchers can ensure minimal errors to ensure a greater reliability score on the study because validity is directly correlated. Once a study is reliable, researchers, faculty, students, and institutions consider it valid and trustworthy to be used for their own benefits. Standard and effective data collection techniques have been adopted to ensure the data is reliable and valid data is gathered from the entire survey process related to the research objectives. Definite variables have been identified to examine the research problem considering different parameters that have been observed existing in the present education system and were tested for response from different levels of academicians on their opinion. The respondents were categorized based on the various parameters to get reliable data and responses accurately. Data to remain reliable, the surveys and questionnaires have been administered to different levels and categories of respondents to rule out any disparity in information.

Data has also been checked for the extent of reliability by using Pearson correlation coefficient analysis to ascertain the responses, consistent across the entire focus group. The Data after analysis has been compared with similar results from reviewing previous literature to validate the results of the present study. Researcher has also considered ensuring the validity of the research instrument in measuring what its intended to deliver through construct validity, content validity, and criterion validity.

Data Analysis: the research study requiresd use of software for performing statistical analysis of the data. SPSS software has been used for this purpose. Graphical representation of the data was done using MS Excel version 2016.

Table 1: Demographic Information

Demographic Variable		
Gender	**Frequency**	**Percentage**
Male	136	62.4
Female	82	37.6
Age (Years)		
Up to 29	26	11.9
30 – 39	124	56.9
40 – 49	40	18.3
50 & above	28	12.8
Occupation		
Student	64	29.4
Faculty	154	70.6
Years of E Learning Experience		
Up to 1 year	62	28.4
Two years	74	33.9
Above Two years	82	37.6
Possess Laptop		
Yes	2	.9
No	216	99.1

N= 218

Out of the 218 respondents, the majority were male, with 136 (62.4%) identifying as male and the remaining 82 (37.6%) identifying as female. In terms of age, most respondents fell within the range of 30 to 39 years, with 124 (56.9%) falling into this category. A total of 26 (11.9%) respondents were below 29 years old, 40 (18.3%) were between 40 and 49 years old, and 28 (12.8%) were above 50 years old. When it comes to laptop ownership, only two (0.9%) respondents possessed their own laptop, while the vast majority of 216 (99.1%) did not. Among the participants, 154 (70.6%) identified as faculty, while 64 (29.4%) identified as students, making faculty the majority. Lastly, in terms of e-learning experience, most respondents, 82 (37.6%), had more than two years of experience, followed by 74 (33.9%) with two years of experience, and 62 (28.4%) with up to one year of experience, indicating that most respondents were experienced in e-learning.

Table 2: H_o: Gender is not associated with level of perception

Gender	Level of Perception			Total
	Low	Moderate	High	
Male	28	74	34	136
	(20.6)	(54.4)	(25.0)	(100.0)
Female	14	50	18	82
	(17.1)	(61.0)	(22.0)	(100.0)
Total	**42**	**124**	**52**	**218**
Df:2	**Chi-square : 0.915**		**P Value: .633**	**Not Significant**

Male respondents have shown higher level of perception. Male respondents also have low level of perception. Examining this further indicate that male respondents have high level of perception towards distance learning. As the calculated P value is greater than 0.05 there does

not exist any significant association between gender and level of perception. Hence, the null hypothesis is accepted.

Table 3: H_o: Age is not associated with level of perception

Age (Years)	Level of Perception			Total
	Low	Moderate	High	
Up to 29	6	16	4	26
	(23.1)	(61.5)	(15.4)	(100.0)
30 – 39	18	72	34	124
	(14.5)	(58.1)	(27.4)	(100.0)
40 – 49	12	20	8	40
	(30.0)	(50.0)	(20.0)	(100.0)
50 & Above	6	16	6	28
	(21.4)	(57.1)	(21.4)	(100.0)
Total	**42**	**124**	**52**	**218**
Df:6	**Chi-square : 6.332**		**P Value: .387**	**Not Significant**

Respondents whose age ranges between 30 and 39 years have a high level of perception. Respondents whose age ranges from 40 to 49 years have low level of perception. As the calculated P value is greater than 0.05 there does not exist any significant association between age and level of perception. Hence, the null hypothesis is accepted.

Table 4: H_o: Possess Laptop is not associated with level of perception

Possess Laptop	Level of Perception			Total
	Low	Moderate	High	
Yes	0	0	2	2
	(0.0)	(0.0)	(100.0)	(100.0)
No	42	124	50	216
	(19.4)	(57.4)	(23.1)	(100.0)
Total	**42**	**124**	**52**	**218**
Df:2	**Chi-square : 6.444**		**P Value: .040**	**Significant**

Respondents who possess laptops have a high level of perception. Respondents who do not possess have low level of perception. As the calculated P value is less than 0.05 there exists a significant association between possessing a laptop and level of perception. Hence, the null hypothesis is rejected.

Table 5: H_o: Occupation is not associated with level of perception

Occupation	Level of Perception			Total
	Low	Moderate	High	
Student	20	36	8	64
	(31.2)	(56.2)	(12.5)	(100.0)
Faculty	22	88	44	154
	(14.3)	(57.1)	(28.6)	(100.0)
Total	**42**	**124**	**52**	**218**
Df:2	**Chi-square : 11.655**		**P Value: .003**	**Significant**

Faculty members have a high level of perception and students have low level of perception. As the calculated P value is less than 0.05 there exists a significant association between occupation and level of perception. Hence, the null hypothesis is rejected.

Table 6: H_o: Years of Experience is not associated with level of perception

Years of Experience	Level of Perception			Total
	Low	Moderate	High	
Up to 1	10	40	12	62
	(16.1)	(64.5)	(19.4)	(100.0)
Two	14	40	20	74
	(18.9)	(54.1)	(27.0)	(100.0)
Above Two	18	44	20	82
	(22.0)	(53.7)	(24.4)	(100.0)
Total	**42**	**124**	**52**	**218**
Df:4	**Chi-square :2.366**		**P Value: .669**	**Not Significant**

Respondents who use distance and digital learning for two years have a high level of perception. Respondents who use distance and digital learning for more than two years have a high level of perception. As the calculated P value is greater than 0.05 there does not exist any significant association between years of experience and level of perception. Hence, the null hypothesis is accepted.

Table 7: H_o: Gender is not associated with intensity of training

Gender	Intensity of Training			Total
	Low	Moderate	High	
Male	18	90	28	136
	(13.2)	(66.2)	(20.6)	(100.0)
Female	22	38	22	82
	(26.8)	(46.3)	(26.8)	(100.0)
Total	**40**	**128**	**50**	**218**
Df:2	**Chi-square : 9.449**		**P Value: .009**	**Significant**

Female respondents require high level of intensity of training. Female respondents also require low level of intensity of training. As the calculated P value is less than 0.05 there exists a significant association between gender and intensity of training. Hence, the null hypothesis is rejected.

Table 8: H_o: Age is not associated with intensity of training

Age (Years)	Intensity of Training			Total
	Low	Moderate	High	
Up to 29	2	20	4	26
	(7.7)	(76.9)	(15.4)	(100.0)
30 – 39	20	70	34	124
	(16.1)	(56.5)	(27.4)	(100.0)
40 – 49	10	22	8	40
	(25.0)	(55.0)	(20.0)	(100.0)
50 & Above	8	16	4	28
	(28.6)	(57.1)	(14.3)	(100.0)
Total	**40**	**128**	**50**	**218**
Df:6	**Chi-square : 8.980**		**P Value: .175**	**Not Significant**

Respondents whose age ranges are between 30 and 39 years require a high level of intensity of training. Respondents whose age ranges are above 50 years require a low level of intensity of

training. As the calculated P value is greater than 0.05 there does not exist any significant association between age and intensity of training. Hence, the null hypothesis is accepted.

Table 9: H_o: Possess Laptop is not associated with intensity of training

Possess Laptop	Intensity of Training			Total
	Low	Moderate	High	
Yes	0	0	2	2
	(0.0)	(0.0)	(100.0)	(100.0)
No	40	128	48	216
	(18.5)	(59.3)	(22.2)	(100.0)
Total	**40**	**128**	**50**	**218**
Df:2	**Chi-square : 6.782**		**P Value: .034**	**Significant**

Respondents who possess laptops require a high level of intensity of training. Respondents who do not possess require a low level of intensity of training. As the calculated P value is less than 0.05 there exists a significant association between possessing laptop and intensity of training. Hence, the null hypothesis is rejected.

Table 10: H_o: Occupation is not associated with intensity of training

Occupation	Intensity of Training			Total
	Low	Moderate	High	
Student	18	38	8	64
	(28.1)	(59.4)	(12.5)	(100.0)
Faculty	22	90	42	154
	(14.3)	(58.4)	(27.3)	(100.0)
Total	**40**	**128**	**50**	**218**
Df:2	**Chi-square : 9.028**		**P Value: .011**	**Significant**

Faculty members require a high level of intensity of training. Students require a low level of intensity of training. As the calculated P value is less than 0.05 there exists a significant association between occupation and intensity of training. Hence, the null hypothesis is rejected.

Table 11: H_o: Years of Experience is not associated with intensity of training

Years of Experience	Intensity of Training			Total
	Low	Moderate	High	
Up to 1	6	48	8	62
	(9.7)	(77.4)	(12.9)	(100.0)
Two	20	34	20	74
	(27.0)	(45.9)	(27.0)	(100.0)
Above Two	14	46	22	82
	(17.1)	(56.1)	(26.8)	(100.0)
Total	**40**	**128**	**50**	**218**
Df:4	**Chi-square :15.298**		**P Value: .004**	**Significant**

Respondents who use distance and digital learning for two years require a high level of intensity of training. Respondents who use distance and digital learning for two years also require a high level of intensity of training. As the calculated P value is less than 0.05 there exists a significant association between years of experience and intensity of training. Hence, the null hypothesis is rejected.

Table 12: H_o: Level of perception is not associated with intensity of training

Level of Perception	Intensity of Training			Total
	Low	Moderate	High	
Low	22	20	0	42
	(52.4)	(47.6)	(0.0)	100.0)
Moderate	18	102	4	124
	(14.5)	(82.3)	(3.2)	100.0)
High	0	6	46	52
	(0.0)	(11.5)	(88.5)	100.0)
Total	**40**	**128**	**50**	**218**
Df:4	**Chi-square :197.323**		**P Value: .000**	**Significant**

Respondents who have a high level of perception towards distance and digital learning require a high level of intensity of training. Respondents who have low level of perception towards distance and digital learning require low level of intensity of training. As the calculated P value is less than 0.05 there exists a significant association between perception towards digital and distance learning and intensity of training. Hence, the null hypothesis is rejected.

Intensity of Training – Correlation

To examine the nature and quantum of association of variables with intensity of training, correlation analysis were used. Variables considered for Chi-square have been considered for correlation test too. Out of six variables selected for correlation analysis, three variables have been found to be significant. Possessing a laptop is found to be significant at five per cent level. Occupation and Perception are found to be significant at one per cent level *(Table 13).*

Table 13: Variables

Variables	R	r^2
Gender	-0.034	0.001
Age	-0.098	0.010
Possess Laptop	-0.156*	0.024
Occupation	0.200**	0.040
Years of Experience	-0.027	0.001
Perception	0.920**	0.846

Table 14: Level of Perception and Intensity of training

Variable	Average	Standard Deviation	Low	Moderate	High
Level of Perception	57.83	25.50	32.33	32.34-83.32	83.33
Intensity of Training Required	57.84	26.02	31.82	31.83-83.85	83.86

Possess Laptop: Possessing a laptop and training are negatively correlated. Respondents who possess a laptop require a high level of training. The coefficient of determination (r^2) shows that possessing laptop contributes 2.40 per cent of the variation in the level of training.

Occupation: Occupation and training are positively correlated. Faculty members require a high level of training. The coefficient of determination (r^2) shows that occupation contributes 84.60 per cent of the variation in the level of training.

Perception: Perception and training are positively correlated. Faculty members who have a high level of perception towards distance and digital learning require a high level of training. The coefficient of determination (r^2) shows that perception contributes 4.00 per cent of the variation in the level of training.

Determinants of Training - Multiple Regression Analysis

To find out the variables that determine satisfaction, all the variables included for correlation analysis have been regressed on customer satisfaction Index. The following regression equation has been framed to ascertain the impact of the select independent variables on customers' satisfaction.

$T = a + b_1 Gen + b_2 AGE + b_3 PL + b_4 OCC + b_5 YOE + b_6 PER + e$

where,

T	=	Training
a	=	Intercept Term
$b_{1....}b_6$	=	Regression Coefficients
GEN	=	Gender
AGE	=	AGE
PL	=	Possess Laptop
OCC	=	Occupation
YOE	=	Years of Experience
PER	=	Perception
e	=	Error Term

Table 15: Determinants of Training

Variables	Regression coefficient	Standard error	t	Sig
Gender	1.389	1.458	0.952	0.342
Age	-2.054*	0.915	-2.245	0.026
Possess Laptop	-12.138	7.264	-1.671	0.096
Occupation	0.333	1.738	0.192	0.848
Years of Experience	0.793	0.867	0.914	0.362
Perception	0.932**	0.028	33.696	0.000

* Significant at five per cent level ** Significant at one per cent level

Constant	Std. Error of Estimate	R^2	R^2 Adjusted
18.325	8.211	0.849	0.853**

Age: The regression coefficient indicates that age negatively influences training. Respondents who are within the age of 29 years require a high level of training.

Perception: The regression coefficient indicates that perception positively influences training. Respondents who have a high level of perception towards distance and digital learning require a high level of training. The value of R^2 is found to be significant at the one per cent level. This shows that the regression equation framed is a good fit. Around 85.30 per cent of variation in training is due to the select variables.

Perception Towards Distance and Digital Learning

To ascertain respondents' perception towards distance learning, a Weighted Average Rank test is employed.

Table 16: Perception towards Distant Learning

Statements	5	4	3	2	1	Total	Mean Score	Mean	Rank
Multimedia tools/technologies	56	18	62	54	28	218	674	3.09	1
	280	72	186	108	28				
Scalability of the system	46	22	70	52	28	218	660	3.03	2
	230	88	210	104	28				
Sufficient e-learning initiatives	54	26	38	68	32	218	656	3.01	3
	270	104	114	136	32				
Alternative submission of assignments	52	32	40	48	46	218	650	2.98	4
	260	128	120	96	46				
Web site contained useful features	52	22	44	66	34	218	646	2.96	5
	260	88	132	132	34				
Web technology handled effectively	48	22	56	52	40	218	640	2.94	6
	240	88	168	104	40				
Easy access to Web site	58	20	42	42	56	218	636	2.92	7
	290	80	126	84	56				
Easy To Use tools e.g Ms Teams	54	26	42	40	56	218	636	2.92	7
	270	104	126	80	56				
Easy to navigate e-learning platforms	54	24	40	48	52	218	634	2.91	8
	270	96	120	96	52				
Prompt feedback	50	20	46	58	44	218	628	2.88	9
	250	80	138	116	44				
Availability of Info on Open Educational Resources	48	20	48	60	42	218	626	2.87	10
	240	80	144	120	42				
User friendly e-learning system	52	18	46	50	52	218	622	2.85	11
	260	72	138	100	52				
High broadband Internet Connection	42	34	54	26	62	218	622	2.85	11
	210	136	162	52	62				
Interactive course	48	24	46	48	52	218	622	2.85	11
	240	96	138	96	52				
System reliability and availability	50	20	48	46	54	218	620	2.84	12
	250	80	144	92	54				
Management Support	50	30	36	36	66	218	616	2.83	13
	250	120	108	72	66				
IT/Technical support	48	18	58	38	56	218	618	2.83	13
	240	72	174	76	56				
Online test/quizzes	54	18	38	40	68	218	604	2.77	14
	270	72	114	80	68				
Information was well structured/presented	47	24	38	50	59	218	604	2.77	14
	235	96	114	100	59				
Clear communication between users	50	16	40	48	64	218	594	2.72	15
	250	64	120	96	64				

The result of weighted average rank test disclose that majority of respondents perceive that multimedia tools and technologies are very essential for distance and digital learning followed by scalability of the system, sufficient e learning initiatives, etc.

Table 17: Scalability of Distance Learning System

Statements	5	4	3	2	1	Total	Mean Score	Mean	Rank
Language Support	64	18	58	50	28	218	694	3.18	1
	320	72	174	100	28				
Learn from past performance	54	14	60	60	30	218	656	3.01	2
	270	56	180	120	30				
Positive attitude of users	56	12	52	64	34	218	646	2.96	3
	280	48	156	128	34				
Instructor encouraged student interaction	58	20	42	48	50	218	642	2.94	4
	290	80	126	96	50				
Measure teaching effectiveness	46	22	48	62	40	218	626	2.87	5
	230	88	144	124	40				
Training for users	50	14	50	56	48	218	616	2.83	6
	250	56	150	112	48				
Teacher as facilitator	50	22	40	50	56	218	614	2.82	7
	250	88	120	100	56				
Student commitment	48	18	50	46	56	218	610	2.80	8
	240	72	150	92	56				
Staff willingness to learn new system	46	18	34	46	74	218	570	2.61	9
	230	72	102	92	74				

Conclusions

In recent years, online and distance learning has gained significant traction as an alternative or complementary method to traditional face-to-face education. The global pandemic further accelerated its adoption. However, the success of online or distance learning programs depends on various factors that need to be considered and addressed.

As an outcome of this study, it is concluded that there are numerous critical success factors for the Effective Online/Distance Learning Implementation. In terms of perception, the critical factors are found to be:

- Multimedia tools/technologies;
- Scalability of the system;
- Sufficient e-learning initiatives;
- Alternative submission of assignments;
- Web site contained useful features;
- Web technology handled effectively;
- Easy access to Web site;
- Easy To Use tools e.g Ms Teams;
- Easy to navigate e-learning platforms; Prompt feedback;
- Availability of Info on Open Educational Resources ;
- User friendly e-learning system;
- High broadband Internet Connection;
- Interactive course;
- System reliability and availability;
- Management Support;
- IT/Technical support;
- Online test/quizzes.

Information was well structured/presented; Clear communication between users. However, in terms of e-learning initiatives of all the factors the critical success factors are:

- Language Support;
- Learn from past performance;
- Positive attitude of users;
- Instructor encouraged student interaction;
- Measure teaching effectiveness;
- Training for users;
- Teacher as facilitator;
- Student commitment;
- Staff willingness to learn new system.

Thus, it can be recommended that effective implementation of online and distance learning will require a holistic approach that encompasses various success factors. Starting with building a robust technology infrastructure, adopting appropriate pedagogical approaches, setting clear learning objectives, supporting instructors and students, implementing effective assessment strategies, and ensuring quality assurance are critical for successful online learning experiences. By addressing these key factors, educational institutions can maximize the potential of online learning to provide accessible, engaging, and effective education for students in the digital age.

Limitations & Scope of Future Research

This study had certain limitations. Firstly, the research was confined only in Muscat and covered only Higher Educational institutes. Secondly, the respondents were not experts in the field, instead were a combination of working and non-working population. Thirdly, the variables used in the research for our analysis were limited and could be further explored in future research to obtain a more holistic area of study, together with using other statistical tools for finding additional and fresh solutions to the challenges facing the eLearning sector.

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Enhancing Online Education: A Practical Approach to Empower Educator in Email Communication

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Abstract
The global shift towards online education, precipitated by the Covid-19 pandemic, has revealed critical challenges stemming from a lack of preparedness. As we approach a post-pandemic era, it is imperative to reimagine education within the digital realm to fortify our educational systems against future uncertainties. A particular concern is student engagement and interaction, requiring educators to devise innovative strategies for active participation. This research serves as a foundational exploration of online education, with a specific emphasis on empowering educators with practical tools to navigate this evolving landscape. By providing a structured and interactive training system, along with an email communication guide for teachers in the online learning environment as a work product, through a comprehensive literature review, this research contributes to the enhancement of the online learning experience for both educators and students. The platform aims to foster effective communication skills among educators, ultimately creating a more engaging learning environment.

Keywords: Online Education, Student Engagement, Educator Empowerment, Educational Technology Innovation, Remote Learning Challenges

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Introduction

The global shift to online education, triggered by the Covid-19 pandemic, exposed substantial challenges due to unpreparedness (Abushammala et al., 2021; UNESCO, 2020). As we approach a post-pandemic era, there's a critical need to rethink education digitally, ensuring resilience to future uncertainties. Instructors must creatively engage students, making this research a foundational exploration of online education, specifically focusing on empowering educators with tools for navigating this evolving landscape.

Problem Statement: Pre-pandemic education relied on face-to-face interactions, immediate feedback, and nuanced in-person communication. The shift to online platforms necessitates a paradigm shift, with a key concern being communication, especially through emails. Online communication, often asynchronous, lacks the immediacy of face-to-face interactions, emphasizing the significance of effective email communication.

Email Communication: Emails are pivotal in online education, serving as a primary channel for information dissemination, feedback, and discussions. This research focuses on email communication due to its pervasive role and challenges. The asynchronous nature demands nuanced skills from educators, considering potential misinterpretations and delays.

Research Question: How can educators acquire essential skills for seamless online instruction, particularly in email communication?

Objective: This research aims to address challenges in online communication, emphasizing emails, by developing a structured training system. The goal is to empower instructors for effective communication with online learners.

Review of Literature

The global shift to remote learning due to the COVID-19 pandemic has disrupted educational institutions, posing challenges for students and educators worldwide (Abushammala et al., 2021; Khalil et al., 2021; Nassr et al., 2020; Thapaliya, 2023). Amidst these challenges, an opportunity has emerged to reshape education through innovative practices that can positively impact the system (Rapanta, 2021). This literature review aims to identify effective online education practices, including building community, supporting well-being, personalized feedback, meeting diverse learner needs, refining digital platforms, and adding curriculum flexibility (Dabbagh & Kitsantas, 2012; Liu et al., 2020; Zhu et al., 2020; Tang, 2022; Thabrew et al., 2023). Implementing these strategies has the potential to enhance student engagement, motivation, and learning outcomes in the online environment.

The COVID-19 pandemic significantly disrupted global education, leading to widespread closures and challenges (Abushammala et al., 2021; Khalil et al., 2021; Nassr et al., 2020; Thapaliya, 2023). A study by Khalil, Humayun, and Jhanjhi (2021) provides an overview of the pandemic's impact on the educational system, offering insights into challenges faced and recommendations for policymakers. The abrupt transition to remote learning affected 1.6 billion learners in over 190 countries, with financial viability becoming a concern for private institutions. Thapaliya's study (2023) focuses on New Zealand, exploring lecturers' experiences during emergency remote teaching and highlighting the need for crisis management plans (Thapaliya, 2023).

In Australia and New Zealand, Pather et al. (2020) investigated the challenges faced by anatomy education during the pandemic, emphasizing the need for community care, effective communication, and flexibility in managing the transition. Abushammala and Manchiryal's study (2021) in Oman surveyed students from post-secondary private institutions, revealing discontent with online education arrangements and financial challenges. Malaysian universities also faced challenges due to students' lack of readiness for online learning (Nassr et al., 2020).

Grewenig et al. (2020) highlighted the impact of teacher support on low-achieving students, revealing a significant reduction in daily learning time. Tang's examination (2022) emphasized the unequal impact of the pandemic on diverse backgrounds and proposed strategies for flexible curricula and enhanced support.

Rapanta et al.'s article (2021) addressed post-pandemic challenges in higher education, suggesting a shift towards innovative teaching and learning approaches. Effective practices identified include creating a sense of community, providing personalized support, and considering diverse learner needs.

In-depth studies by Rovai (2002), Shea et al. (2006), Thabrew et al. (2023), Dabbagh and Kitsantas (2012), Zhu et al. (2022), and Liu et al. (2016) delve into specific practices. These include fostering a sense of community, instructor and peer interactions, personalized support, and addressing diverse learner needs. Blended learning, feedback, and formative assessment are also identified as effective approaches (Rovai, 2002; Shea et al., 2006; Dabbagh & Kitsantas, 2012; Zhu et al., 2022; Liu et al., 2016; Hattie & Timperley, 2007; Nicol & Macfarlane-Dick, 2007).

In conclusion, the literature review supports the adoption of effective practices in online education to overcome the challenges posed by the COVID-19 pandemic. These practices include building a sense of community, providing personalized support, addressing diverse learner needs, and ensuring timely and effective responses. By incorporating these strategies, educators can enhance the quality of online education and improve student satisfaction in the post-pandemic era.

Rationale

The literature review highlights the transformative impact of COVID-19 on education, emphasizing the shift to online learning (Abushammala et al., 2021; Khalil et al., 2021; Nassr et al., 2020; Rapanta, 2021; Thapaliya, 2023). Effective online education requires a nuanced approach, with communication playing a crucial role (Dabbagh & Kitsantas, 2012; Liu et al., 2020; Zhu et al., 2022).

Recognizing the importance of timely and effective email communication in online education, our research focuses on a systematic training system tailored to email interactions. This system includes simulated scenarios and sample emails as references, aligning with best practices (Thapaliya, 2023; Dabbagh & Kitsantas, 2012).

The literature also emphasizes the need for increased investment in online education resources, particularly in instructor training. Our research aims to address this gap by providing instructors with skills and confidence through a structured training system centered

on email communication, aiming to enhance student engagement, and learning outcomes (Rovai, 2002; Shea, Li, & Pickett, 2006).

The research presents a prototype email training program, serving as an initial iteration for educators. While not intended for full-scale deployment, this prototype allows testing and evaluation of key features, with subsequent phases focusing on refinement, additional features, and rigorous testing for real-world effectiveness and usability in educational settings. Ultimately, the study contributes to enhancing the online learning experience for both educators and students, emphasizing the critical importance of investing in instructor training in the context of online education.

Method

Scenarios

The following 12 scenarios presented in the email communication training system as shown in Table 1 are thoughtfully designed to address a wide range of challenges identified in the literature. By providing instructors with the tools and strategies to navigate these scenarios, the training system equips them to effectively communicate and support students in the evolving landscape of online education.

These scenarios align closely with the findings of various studies, reflecting the multifaceted nature of the issues faced during the COVID-19 pandemic. For instance, the scenario involving unequal access to education mirrors the real-world experiences of students like Isabella, Alex, and Jamal, who face disparities in access to technology and internet connectivity (Abushammala et al., 2021; Khalil et al., 2021; Nassr et al., 2020; Thapaliya, 2023). By guiding instructors in providing tailored support and alternative solutions, the training system empowers them to address the specific needs of students with limited resources, ultimately fostering inclusivity and equal opportunities for learning.

Similarly, scenarios centered around low-achieving students' struggles resonate with the findings of Grewenig et al. (2020) and emphasize the importance of targeted support for students facing academic challenges. Through these scenarios, the training system equips instructors with effective strategies to motivate and guide struggling students towards improved performance, aligning with the literature's call for personalized support (Grewenig et al., 2020).

Furthermore, scenarios addressing physical and psychological readiness align with studies by Thabrew et al. (2023) and Tang (2022), highlighting the significant impact of mental well-being and preparedness on students' learning experiences. The training system prepares instructors to provide valuable resources and guidance to students like Sophia, Alex, and Emily, thereby promoting a supportive and nurturing online learning environment (Thabrew et al., 2023; Tang, 2022).

Lastly, the scenarios related to the loss of hands-on experiences echo the sentiments of students like Ethan, Jay, and Amy, who grapple with the challenges of transitioning to virtual lab environments (Pather et al., 2020). By introducing instructors to innovative solutions and resources, the training system empowers them to facilitate meaningful and engaging learning experiences, even in virtual settings, aligning with the literature's emphasis on refining digital platform structures and resources (Liu et al., 2016).

The tips provided for addressing the loss of hands-on experiences for students, including Ethan, Jay, and Amy, align with the literature's recognition of the challenges posed by the shift to online learning, particularly in fields requiring practical application (Pather et al., 2020). Acknowledging the students' frustration and disappointment reflects the literature's emphasis on understanding and empathizing with the unique challenges students face in virtual learning environments (Rapanta et al., 2021). The suggestions to supplement virtual lab experiences with resources such as interactive simulations and virtual platforms resonate with the literature's call for innovative approaches to replicate hands-on experiences in online settings (Liu et al., 2016). Encouraging students to seek out virtual communities or forums reflects the literature's recommendation for creating a sense of community and providing avenues for peer collaboration and support (Rovai, 2002; Dabbagh & Kitsantas, 2012). Overall, the tips aim to address the specific challenges of students in disciplines heavily reliant on hands-on experiences by offering alternative solutions and fostering a supportive online learning environment.

In conclusion, the scenarios within the email communication training system are meticulously designed to reflect the complex realities of online education. They draw on the insights gleaned from the literature review, providing instructors with practical tools to address a wide array of challenges. By immersing instructors in these scenarios, the training system equips them with the skills and confidence necessary to communicate effectively and support students in the dynamic landscape of online education. This approach not only enhances the online learning experience but also contributes to the broader goal of creating an inclusive and engaging educational environment.

Scenario	Student Profile	Challenges	Tips for Instructors	Literature Emphasis
Unequal Access to Education	20-year-old Isabella from a rural area	Limited access to high-speed internet and technology	- Acknowledge Isabella's situation - Offer alternative solutions for accessing course materials - Suggest local or community resources - Consider alternative assignments	Addressing unequal access to education during the COVID-19 pandemic (Rapanta et al., 2021; Thapaliya, 2023)
Unequal Access to Education	Dedicated Alex with a slower laptop	Challenges in completing assignments due to slow laptop	- Advise closing unnecessary applications - Recommend upgrading memory or storage - Suggest utilizing offline resources or local libraries	Innovative approaches and community support in overcoming access challenges (Rapanta, 2021; Thabrew et al., 2023)
Unequal Access to Education	Motivated Jamal with limited access to technology	No personal computer or reliable internet connection	- Acknowledge Jamal's situation - Offer alternative solutions for completing assignments - Provide guidance on optimizing learning with available resources - Recommend offline tools and inquire about institutional technological resources	Flexibility and accommodation of diverse learning styles (Rovai, 2002; Liu et al., 2020)
Low-Achieving Students' Struggles	25-year-old Amy, a female student	Meeting passing grade but quiet with overdue assignments	- Express understanding and concern - Inform about late submission policy - Offer support and encourage communication	Personalized support and addressing individual challenges in online education (Thapaliya, 2023; Grewenig et al., 2020)

Low-Achieving Students' Struggles	18-year-old Sam, a non-binary student	Missed deadline and incomplete submission	- Address situation with empathy and encouragement - Communicate issues with the submission - Offer specific suggestions for improvement - Provide resources or support options	Creating a supportive and empathetic learning environment (Rapanta et al., 2021; Dabbagh & Kitsantas, 2012)
Low-Achieving Students' Struggles	20-year-old Alex, a male student	Consistently submitting below-average assignments	- Express concern about performance - Encourage seeking help and additional resources - Provide specific suggestions for improvement	Proactive strategies to address challenges faced by low-achieving students (Grewenig et al., 2020; Zhu et al., 2022)
Physical and Psychological Readiness	Sophia, 32-year-old student with anxiety	Struggling with online learning isolation	- Provide mental health resources - Encourage routine with self-care practices and social connections	Recognizing and supporting diverse well-being needs of learners (Rapanta et al., 2021; Thabrew et al., 2023)
Physical and Psychological Readiness	Alex, 23-year-old non-binary fitness instructor	Difficulty adjusting to sedentary online learning	- Offer tailored advice on effective workouts - Provide tips on maintaining healthy posture	Recognizing the impact of online learning on physical health (Rapanta et al., 2021)
Physical and Psychological Readiness	Emily, 28-year-old single parent	Overwhelmed by parenting responsibilities	- Acknowledge unique situation - Provide practical tips on time management and self-care	Addressing challenges faced by students with diverse responsibilities (Rapanta et al., 2021; Dabbagh & Kitsantas, 2012)
Loss of Hands-on Experiences	Ethan, 24-year-old chemistry major	Difficulty grasping concepts without hands-on experience	- Acknowledge frustration - Provide resources for virtual labs and simulations - Encourage connecting with peers facing similar challenges	Recognizing the importance of practical experiences in learning (Rapanta et al., 2021)
Loss of Hands-on Experiences	Jay, 22-year-old engineering student	Struggling to translate theory into practice	- Express understanding - Suggest virtual engineering platforms - Encourage participation in virtual communities	Emphasizing the importance of practical application in engineering (Rapanta et al., 2021)
Loss of Hands-on Experiences	Amy, 25-year-old biology major	Struggling to replicate hands-on experiences online	- Empathize with disappointment - Recommend virtual lab platforms - Encourage engagement in online biology communities	Acknowledging the value of hands-on experiences in specific fields (Rapanta et al., 2021)
Physical and Psychological Readiness	Sophia, 32-year-old student with anxiety	Struggling with online learning isolation	- Provide mental health resources - Encourage routine with self-care practices and social connections	Recognizing and supporting diverse well-being needs of learners (Rapanta et al., 2021; Thabrew et al., 2023)
Physical and Psychological Readiness	Alex, 23-year-old non-binary fitness instructor	Difficulty adjusting to sedentary online learning	- Offer tailored advice on effective workouts - Provide tips on maintaining healthy posture	Recognizing the impact of online learning on physical health (Rapanta et al., 2021)

Physical and Psychological Readiness	Emily, 28-year-old single parent	Overwhelmed by parenting responsibilities	- Acknowledge unique situation - Provide practical tips on time management and self-care	Addressing challenges faced by students with diverse responsibilities (Rapanta et al., 2021; Dabbagh & Kitsantas, 2012)

Table 1: Scenarios and Tips for Addressing Key Challenges in Online Education

Sample Emails and Justification

1. Unequal Access to Education

Unequal access to technology and high-speed internet is a prevalent issue, particularly in rural areas. This is consistent with findings from the literature review which highlight the challenges faced by students in remote or underserved areas (Abushammala et al., 2021; Khalil et al., 2021; Nassr et al., 2020). Providing guidance on how to overcome these challenges is crucial in ensuring equitable educational opportunities. Additionally, suggesting alternative assignments or assessments is in line with recommendations from previous studies that emphasize the need for flexibility in accommodating diverse learning environments (Dabbagh & Kitsantas, 2012; Liu et al., 2020; Zhu et al., 2022).

Student	Subject	Email Content
Isabella	Addressing Access Challenges for Effective Learning	Hi Isabella, I hope this message finds you well. I understand that you're facing challenges with limited access to high-speed internet and technology in your area, which is impacting your ability to fully participate in our online course. To help you overcome these access challenges, here are some suggestions: Offline Materials: I recommend downloading course materials during periods of higher connectivity. This way, you can access them offline when needed. Local Resources: Explore if there are any local resources or community centers that provide access to computers and high-speed internet. Some libraries also offer free usage of laptops and the internet. Optimize Learning: Prioritize assignments and activities that don't heavily rely on online resources. You can focus on readings, written assignments, and projects that can be completed with minimal internet usage. If you have any specific concerns about course activities, please let me know, and we can explore alternative options. Remember, your dedication to learning is commendable, and I'm here to support you in any way I can. Best regards, XXX
Alex	Optimizing Your Laptop for Smooth Online Learning	Hi Alex, I hope you're doing well. I understand that you've been experiencing challenges with your laptop's performance, which is affecting your online learning experience. Here are some tips to help optimize your laptop for smoother online learning: Close Unnecessary Applications: Make sure to close any unnecessary applications and browser tabs while working on course materials. This can help improve your laptop's performance. Clear Browser Cache: Regularly clearing your browser's cache can help prevent slowdowns when accessing online resources. Consider Upgrades: If possible, consider upgrading your laptop's memory or storage. This can significantly enhance its performance. Additionally, local libraries often provide free usage of laptops and internet, which can be a helpful alternative. If you have any further questions or need additional support, please don't hesitate to reach out. Your dedication to your studies is commendable, and I'm here to assist you in any way I can. Best regards, XXX

Jamal	Overcoming Technological Challenges for Successful Learning	Hi Jamal, I hope this message finds you in good health. I understand that you're facing challenges due to limited access to technology, which is impacting your ability to complete assignments and participate in online activities. Here are some strategies to help you overcome these obstacles: Priority Tasks: Prioritize assignments and activities that can be completed without the need for a personal computer or stable internet connection. Offline Tools: Utilize offline tools for studying, such as textbooks, printed materials, or handwritten notes. Borrowing Resources: Inquire if there are any technological resources available through the institution, such as loaner laptops or tablets, that you can borrow. I want to assure you that your determination to succeed is admirable, and I'm committed to working together to find solutions that support your learning journey. If you have any specific concerns or need further guidance, please feel free to let me know. Best regards, XXX

Table 2: Sample Emails for Scenarios of Unequal Access to Education

2. Low-Achieving Students' Struggles

Recognizing and addressing the struggles of low-achieving students is vital for their academic progress. This aligns with research indicating that providing targeted support and feedback can significantly impact student performance (Hattie & Timperley, 2007; Nicol & Macfarlane-Dick, 2007). Encouraging resubmission of assignments and providing specific suggestions for improvement is consistent with studies emphasizing the importance of formative assessment and self-regulated learning (Nicol & Macfarlane-Dick, 2007).

Student	Email Subject	Email Body
Amy	Supporting Your Progress in the Course	Hi Amy, I hope this message finds you well. I noticed that you've recently faced some challenges with the course assignments. It's completely normal to encounter difficulties, and I'm here to support you. If you're experiencing specific issues or have questions about the material, please don't hesitate to reach out. Additionally, remember that there are resources available, such as virtual office hours and study groups, to provide extra assistance. Keep up the good work, and let's work together to ensure your success in the course. Best regards, XXX
Sam	Feedback on Your Recent Assignment	Hi Sam, I hope you're doing well. I wanted to discuss the recent assignment you submitted. While the first half of the assignment was well-done, I noticed that the second half was missing. It's crucial to submit complete assignments to demonstrate your understanding of the material. I encourage you to review the assignment guidelines and ensure all components are addressed. If you have any questions or need further clarification, please feel free to reach out. I'm here to help you succeed in the course. Best regards, XXX

Alex	Supporting Your Academic Progress	Hi Alex, I hope this message finds you well. I wanted to discuss your recent quiz results, which indicate a struggle with understanding the material. It's important to address any challenges you're facing early on. I encourage you to attend virtual office hours or utilize additional resources available to you. Regular engagement with the course material can greatly enhance your understanding. If there are specific topics you find difficult, please let me know. I'm here to assist you in any way I can. Best regards, XXX

Table 3: Sample Emails for Scenarios of Low-Achieving Students' Struggles

3. Physical and Psychological Readiness

Online learning can present unique challenges, especially for students dealing with mental health concerns, physical health issues, or other personal circumstances. This is supported by research indicating that the shift to online learning can impact students' mental well-being (Thabrew et al., 2023; Rapanta et al., 2021). Providing resources and support for mental and physical well-being acknowledges the holistic nature of student success. Tailoring advice to address specific situations, such as anxiety or the need for physical activity, demonstrates a proactive approach to supporting students' overall readiness for online learning.

Student	Email Subject	Email Body
Sophia	Supporting Your Well-Being in Online Learning	Hi Sophia, I hope this message finds you in good spirits. I wanted to address the concerns you've shared about feeling isolated and anxious during our online course. Your well-being is a top priority, and I'm here to support you. I recommend establishing a routine that includes self-care practices, regular breaks, and opportunities for social connection, even in a digital environment. Additionally, please remember that there are mental health resources available both within our institution and externally. If you ever need someone to talk to or additional resources, please don't hesitate to reach out. Your success and well-being are important to us. Take care, XXX
Alex	Balancing Fitness and Studies in Online Learning	Hi Alex, I hope this message finds you well. It's completely normal to find it challenging to adjust to a more sedentary lifestyle while engaging in online learning. To maintain your physical health, I recommend incorporating short, effective workouts into your routine. Even a brief daily walk or simple stretches can make a significant difference. Additionally, paying attention to your posture during extended study sessions can help alleviate discomfort. Remember, your well-being is important. Finding a balance between fitness and studies will contribute to your overall success. Best regards, XXX

Emily	Creating a Balanced Routine for Success	Hi Emily, I hope this message finds you managing your responsibilities with grace. Balancing parenting and studies is undoubtedly a challenge, but it's also a tremendous achievement. To help you navigate this, I recommend establishing a structured routine that prioritizes essential tasks. Setting aside specific study times and moments for self-care is crucial. Additionally, don't hesitate to seek support from friends, family, or community resources. Your determination is admirable, and I'm here to support you every step of the way. Warm regards, XXX

Table 4: Sample Emails for Scenarios of Physical and Psychological Readiness

4. Loss of Hands-On Experiences

For students in fields requiring hands-on experience, the shift to online learning can be particularly challenging. This aligns with findings from the literature review that highlight the impact of the pandemic on practical learning experiences (Pather et al., 2020; Grewenig et al., 2020). Acknowledging the importance of practical application and providing alternative resources, such as virtual labs or simulations, shows an understanding of the unique needs of these students. Offering recommendations for virtual platforms and communities also encourages active engagement and collaborative learning experiences.

Student	Email Subject	Email Body
Ethan	Enhancing Your Virtual Lab Experience	Hi Ethan, I hope this message finds you well. I understand that you were looking forward to conducting experiments in our university's well-equipped chemistry laboratory. While online learning has shifted the way we approach experiments, there are still valuable resources available. I recommend exploring interactive simulations and virtual lab platforms that closely mimic real experiments. These platforms can provide a hands-on experience even in a digital environment. Additionally, connecting with other students facing similar challenges through online chemistry communities or forums can be a great way to share experiences and knowledge. If you have any specific questions or need guidance on virtual labs, please don't hesitate to reach out. I'm here to help you succeed. Best regards, XXX
Jay	Bridging Theory and Practice in Engineering	Hi Jay, I hope you're doing well. It's completely understandable that you're grappling with translating theoretical concepts into practice, especially with our labs moving online. To help bridge this gap, I recommend exploring virtual engineering platforms and simulations that offer hands-on experimentation and problem-solving experiences. These platforms can provide valuable practical exposure even in a digital format. Additionally, I encourage you to join virtual engineering communities or forums where you can collaborate with peers on projects and assignments. Sharing experiences and knowledge with others can be extremely beneficial. If you have specific questions or need guidance on virtual engineering tools, please reach out. I'm here to assist you in any way I can. Best regards, XXX

Amy	Maximizing Your Online Biology Experience	Hi Amy, I hope this message finds you eager to explore the world of biology. I understand that you were anticipating hands-on experiments in our advanced biology course, and the shift to online labs has been a challenge. To enhance your understanding, I recommend exploring virtual lab platforms offering interactive simulations and experiments that closely resemble real-world scenarios. Engaging with online biology communities or forums can also provide opportunities to discuss concepts and experiments with fellow students. If you have any specific questions or need guidance on virtual biology labs, please feel free to reach out. I'm here to help you succeed in your studies. Best regards, XXX

Table 5: Sample Emails for Scenarios of Loss of Hands-on Experiences

Technological Framework

The development of the email simulator strictly adhered to a minimalist technological framework, utilizing only JavaScript (JS), Cascading Style Sheets (CSS), the Bootstrap framework and Hyper Text Markup Language (HTML). This selection was based on its simplicity, accessibility, and broad compatibility, ensuring the widest possible user base.

User Interface Design

The user interface (UI) was designed with a focus on simplicity and intuitiveness. Clear navigation, easily distinguishable elements, and concise instructions were prioritized to create an accessible learning environment for instructors.

To augment the training experience, the email simulator incorporates a Random Scenario Generator feature. This functionality allows users to emulate the unpredictability of real-world scenarios. By clicking the "Generate Random Scenario" button, instructors can practice their communication and problem-solving skills in response to a wide array of challenges that they may encounter while interacting with students online. This feature is designed to provide a dynamic learning experience and ensure that educators are well-prepared for any situation they may face in the online educational landscape.

In addition, a sample email that closely aligns with the principles outlined in the literature review will be displayed after users craft their own email responses. This serves as an invaluable guide, offering instructors a concrete example of effective communication based on established best practices and research-backed strategies.

Hosting and Deployment

To maintain a cost-effective approach and ensure accessibility to a global audience, the email simulator was hosted on the GitHub platform (Wang, 2023). This decision was founded on GitHub's robust hosting capabilities, version control features, and widespread adoption in the developer community. Additionally, the public repository fostered collaborative development and provided transparency in the project's evolution. This choice aligns with modern development practices, enabling Continuous Integration (CI) and Continuous Deployment (CD) pipelines through GitHub Actions. This integration streamlines the process of testing and deploying new updates, ensuring a seamless user experience and facilitating rapid iteration in response to user feedback. By leveraging GitHub for both hosting and CI/CD, the email simulator benefits from a well-established platform that supports efficient development

workflows and global accessibility. This approach further underscores the commitment to providing a high-quality, accessible tool for educators navigating online education's evolving landscape.

Result

The development of the interactive email trainer prototype has culminated in a valuable resource for educators seeking to enhance their online communication skills.

These resources offer educators an opportunity to engage with the simulator and explore the various scenarios designed to address common challenges in online educational communication. Through this initiative, the aim is to equip instructors with the necessary tools to navigate the evolving landscape of online education effectively.

The Email Simulator interface is intuitively structured to facilitate a seamless user experience. Upon launching the simulator, users are greeted with a clear and concise layout:
Banner: As shown in Figure 1, at the top of the interface, a prominent banner introduces the purpose of the simulator, emphasizing the enhancement of online teaching skills through effective communication in digital learning environments.

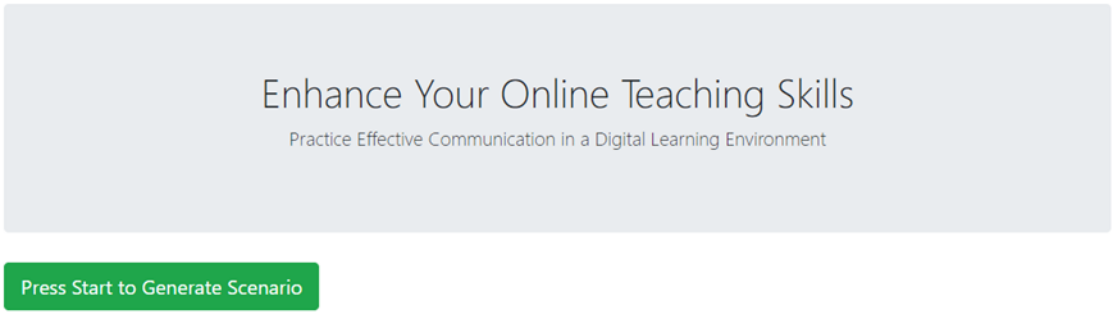


Figure 1: Initial Page Elements in Web Page Simulator

A conspicuous "Press Start to Generate Scenario" button initiates the simulation. This button triggers the generation of a scenario for the user to respond to.

Once the simulation is initiated, the scenario section is revealed. This section prompts the user to draft a response email based on the presented scenario. It includes the following elements (Figure 2):

Scenario Description: A clear heading contextualizes the scenario. It provides a brief overview of the situation that the user is expected to address in their response.

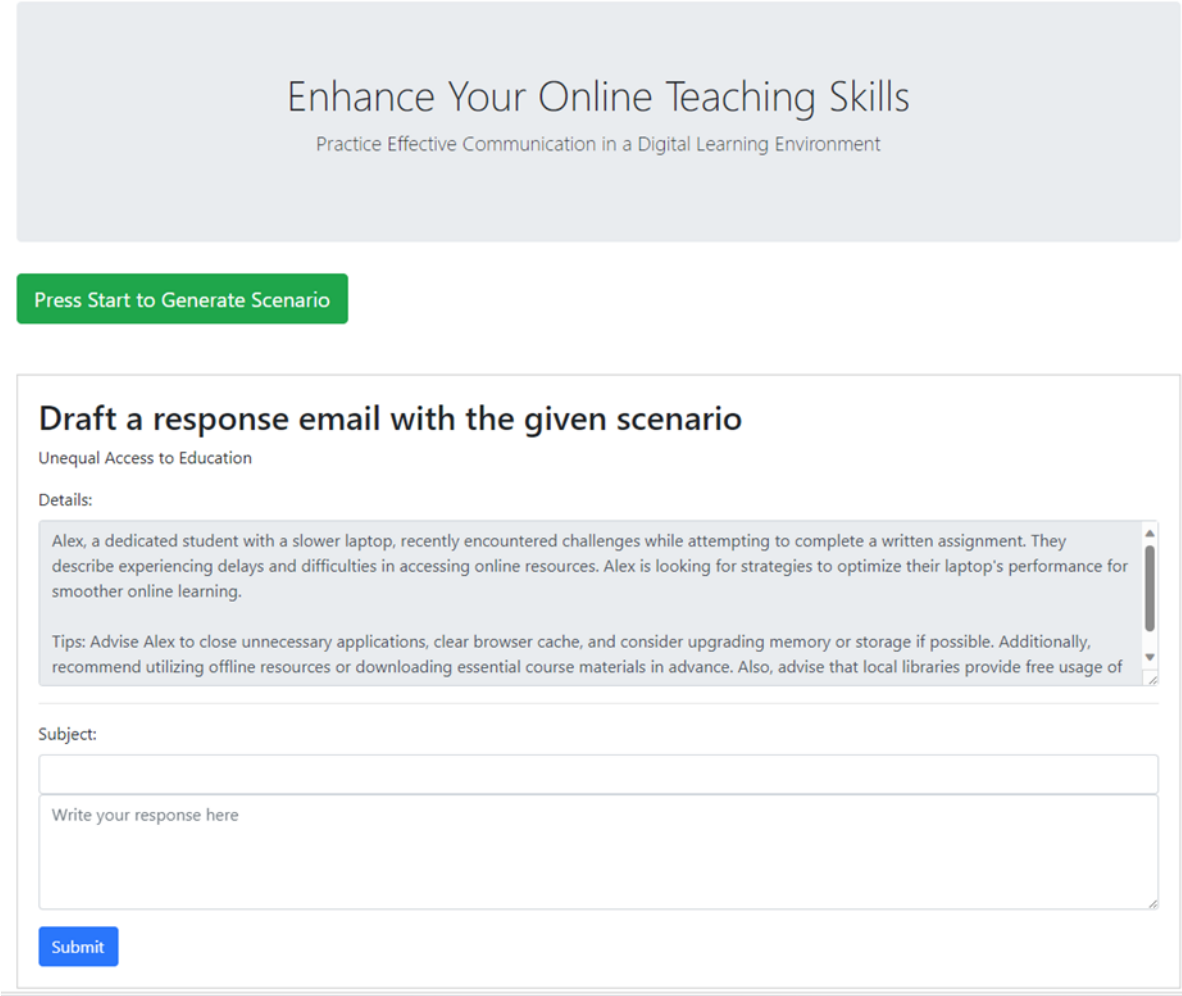


Figure 2: Scenario Generated in Web Page Simulator

Beneath the scenario description, a text area displays the details of the generated scenario. This text serves as the basis for the user's response.

User Response Input: A designated input field allows the user to specify the subject of their email. A text area is also provided for the user to compose their response. This is where educators can craft their email addressing the scenario.

Submit Button: The "Submit" button triggers the evaluation of the user's response.

Feedback Section: Initially hidden, this section is revealed upon submission of the user's response. It provides valuable feedback and guidance to the user. The section includes a text area where the feedback is displayed (Figure 3).

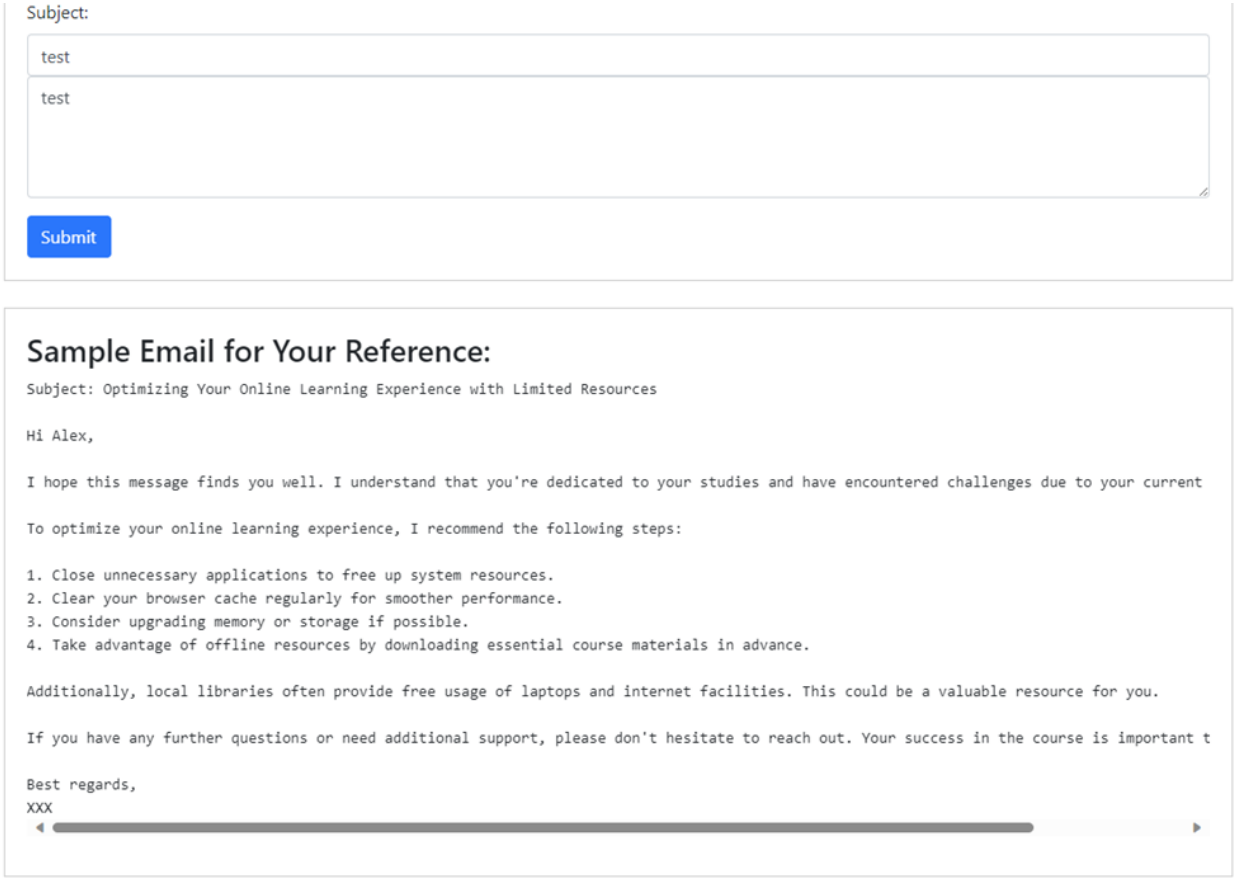


Figure 3: Sample Email Display in Web Page Simulator

The simulator employs a sophisticated scenario generation function that operates behind the scenes. This function selects scenarios from a set of 12 diverse scenarios, spread across 4 distinct categories as outlined in the methodology section. This approach ensures that users encounter a wide range of situations, guaranteeing both diversity and unpredictability in the scenarios presented. This level of detail not only enriches the user experience but also contributes to a more comprehensive training environment for educators.

In addition to scenario generation, the simulator provides an intuitive input interface that mimics the process of composing an email. This interface allows users to input both the subject and content of their response. This hands-on experience closely resembles the real-world task of email communication in an educational context. By incorporating this feature, the simulator aims to offer a holistic training environment that not only exposes educators to various scenarios but also allows them to practice the practical aspect of composing effective emails.

Following the review of the scenario and the generated email, users are prompted to compose their personalized response. Once submitted, the simulator then displays a pre-written email that is relevant to the specific scenario, as outlined in the methodology section. This selected sample email serves as a valuable reference, providing concrete examples of effective communication strategies tailored to the given scenario. This straightforward evaluation process ensures users receive comprehensive guidance for enhancing their online communication skills. It promotes a deeper understanding and application of effective communication strategies in various contexts. From here, users have the option to iterate the

process by pressing the "Press Start to Generate Scenario" button for new scenarios, allowing for more practice and exposure to diverse communication challenges (Wang, 2023).

Conclusion

In summary, this dissertation underscores the urgent need for structured training in online communication, particularly within the realm of email interactions, for instructors. This research proposes a practical approach to enhance the online learning experience, with a specific focus on effective email communication.

The development of the initial prototype of the interactive Email Simulator provides a valuable resource for educators seeking to enhance their online communication skills. There is a critical need not only to equip instructors with the necessary skills but also to provide them with guidance in crafting meaningful feedback. Future enhancements and expansions of the simulator's capabilities should prioritize supporting instructors in delivering effective feedback. By remaining committed to innovation and user-centric design, the aim is to continually improve the simulator's effectiveness and impact in the field of digital education.

As we look ahead, a compelling opportunity emerges for collaborative efforts between researchers and developers to create a user-friendly website. This platform is envisioned to serve as more than just a repository of effective online education practices; it aims to translate valuable insights into actionable guidance for educators. The comprehensive training provided on this platform would cover essential skills, including proficiency in navigating Learning Management Systems (LMS).

The focal point of this initiative is to empower educators, from seasoned professionals to aspiring teachers, by offering accessible resources and tools. It anticipates addressing the evolving landscape of online education comprehensively. One of the key initiatives on the horizon includes the identification of additional scenarios and the development of a full version of the Email Simulator. Moreover, emphasis will be placed on providing useful feedback to instructors based on their responses, ensuring a nuanced and constructive learning experience.

Through this collective endeavor, the goal is to ensure that educators are not just equipped but well-prepared for the future of education, fostering a community of practitioners who can navigate the challenges and opportunities presented by digital learning environments.

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The Role of Teacher's Knowledge in Promoting Task-Technology Fit for Early Childhood and Inclusive Technology-Based STEM Instruction

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Abstract
In technology-based STEM instruction, teachers' knowledge of how technology is being used in the instruction is crucial to initiate meaningful learning activities, particularly in early childhood and inclusive education. The objective of this research is to explore the teacher's belief in understanding technology characteristics and their attitudes toward task characteristics to introduce STEM in their classrooms. Drawing on a systematic literature review, which emphasized the significance of both task and technology characteristics, a qualitative study was conducted as part of the British Council Game-Based Learning for STEM education project. 52 teachers from greater Jakarta, Indonesia were engaged in a focus group discussion to explore their beliefs and practices in fostering STEM instruction through technology. The results show that even though the participants have a good understanding and positive attitude towards technology, they need more support in acquiring and adopting suitable technology for their pedagogical practices. The findings of this study have important implications for the design and the use of technology in early childhood and inclusive education STEM instruction.

Keywords: Teachers' Knowledge, Task-Technology Fit, STEM Learning, Early Childhood Education

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Introduction

The year 2007 etched itself not only in tech history but also, potentially, in the annals of education. Coinciding with Apple's revolutionary iPhone launch, the Programme for International Student Assessment (PISA) began registering a global decline in student performance (Schleicher, 2019). While causation can't be established with certainty, the correlation raises a critical question: in the age of ubiquitous smartphones, does the use of technology for entertainment purposes eclipse its use for learning leading to the decline of students' academic achievement? The answer, thankfully, isn't a binary Yes or No. It lies in a nuanced interplay between fostering responsible technology use and harnessing its potential to ignite meaningful learning, particularly in STEM (Science, Technology, Engineering, and Mathematics) fields for early childhood and inclusive education.

Recent studies conducted by PISA point towards excessive technology use for leisure as a potential factor impeding academic performance (OECD, 2023). Social media notifications, endless game worlds, and the alluring whirlpool of online distractions can undoubtedly siphon off focus and study time. However, demonizing technology as the sole culprit would be remiss. Smartphones and tablets, when wielded wisely, hold immense potential to propel STEM learning. Consider an interactive app that brings the vibrant rainforest onto a child's screen, sparking curiosity about ecological wonders. Or imagine a game that challenges young minds to build virtual bridges, igniting an early passion for engineering principles. Such thoughtfully designed technology can transform learning from passive absorption to active exploration.

This is where the role of teachers becomes paramount. In a technology-infused classroom, educators shift from mere providers of information to skilled orchestrators of a dynamic learning symphony (Etmer & Ottenbreit-Leftwich, 2010). Their knowledge of how technology integrates with the curriculum becomes crucial. A teacher adept at utilizing virtual reality simulations to delve into the human body can make anatomy lessons come alive for even the youngest learners. Similarly, an instructor who leverages educational coding platforms can introduce programming concepts in a fun and accessible way, fostering a future generation of tech-savvy citizens. Hence, studying teachers' knowledge about technology through the lens of task-technology fit (TTF) is crucial.

The TTF framework provides a nuanced understanding of how well a technology aligns with the specific learning goals and activities in a given context (Goodhue & Thompson, 1995). It moves beyond mere access to gadgets, delving into how teachers leverage features, troubleshoot challenges, and adapt technology to meet the diverse needs of their students. Examining teacher knowledge through this framework reveals not just their technical proficiency, but their pedagogical insights and ability to orchestrate meaningful technology-enhanced learning experiences.

Studying teacher knowledge in this context also equips us to bridge the gap between the promise of technology and its actual impact in classrooms. The "fit" is not static; it's a dynamic interplay between teacher expertise, student engagement, and the evolving nature of digital tools. By understanding how teachers perceive, evaluate, and integrate technology within their tasks, we can design better professional development programs, curate resources that resonate with their teaching styles, and ultimately, foster environments where technology complements, rather than dominates, the learning process.

Promoting TTF within early childhood and inclusive STEM instruction requires a nuanced approach. While standardized, top-down models may offer a degree of efficiency, they often fail to account for the unique needs and contexts of individual classrooms. Therefore, a bottom-up approach that leverages the knowledge and expertise of teachers is needed.

There are two main reasons why a bottom-up approach is best suited for our purposes. Firstly, due to the dynamic nature of early childhood education and the diverse needs of students, a one-size-fits-all technology implementation wouldn't be effective. Teachers, being in the school with the students, are best positioned to identify specific learning goals and tailor technology use accordingly. Secondly, fostering a sense of agency among teachers is essential. By empowering them to select and integrate technologies that align with their instructional practices, we promote ownership and a deeper understanding of how technology can enhance learning outcomes.

This bottom-up approach necessitates a strong understanding of our teachers' knowledge and comfort levels with technology. Through open communication, professional development focused on TTF principles, and collaborative exploration of technological tools, we can equip teachers to make informed decisions about technology integration. By prioritizing the teacher's role in achieving TTF, we create a more effective and inclusive STEM learning environment for young children.

Task Technology Fit

The TTF framework, proposed by Goodhue and Thompson in 1995, examines the relationship between a specific task and the technology designed to support it. It essentially asks how well the technology matches the demands of the task. This seemingly simple question holds significant weight in optimizing user experience and performance.

According to Goodhue and Thompson (1995), a good TTF is achieved when a technology's capabilities align with the requirements of the task. This fit can be assessed from two main perspectives: task characteristics and technology characteristics.Task characteristics encompass the nature of the work, such as complexity, repetitiveness, and the need for information processing. Technology characteristics, on the other hand, focus on the features and functionalities the technology offers.

For example, a data analyst working with complex datasets would benefit from a technology that provides robust data manipulation and visualization tools. Conversely, a customer service representative taking simple inquiries might find the same technology cumbersome and time-consuming. TTF emphasizes that a one-size-fits-all approach to technology doesn't work. Organizations that prioritize TTF ensure their chosen technologies effectively address user needs, ultimately leading to increased efficiency, user satisfaction, and improved performance.

The TTF framework provides a valuable lens for examining the role of teacher knowledge in early childhood STEM education. TTF emphasizes the importance of aligning technology capabilities with the specific demands of a learning task. In this context, teachers act as crucial actors in understanding these task demands. Their knowledge of student needs, learning styles, and classroom dynamics informs their technology preferences. The body of literature on the topic of teachers' preference for tangible tools that promote the use of technology to deliver STEM education showed that the concept of mediating artifacts is crucial to understanding this topic (Scanlon et al., 2019; Abrahamson & Lindgren, 2014; Guribye, 2015; Damşa, 2014;

Tchounikine, 2016; Sinha et al., 2015). These artifacts, whether digital or non-digital, bridge the gap between learners and abstract concepts. By understanding teachers' preferences for technological tools, we gain valuable insights into how technology can best function as a mediating artifact within the classroom and promote successful learning.

Mediating artifacts are regarded as tools that contribute to the facilitation and mediation of human activities and interaction (Guribye, 2015; Scanlon et al., 2019). Although related to the concept of computer-supported cooperative work (CSCW), which is the study of the fundamental role of computer systems in reducing complex activities (Schmidt & Simonee, 1996), mediating artifacts are also utilized in different contexts including aiding teachers' facilitation of learning and knowledge or skills mastery (Guribye, 2015; Braseth, 2021). In such classroom contexts, it has been shown that these artifacts could take the form of physical objects, such as tools or technologies, or textual forms such as symbolic represents and textbook tasks (Schiepe-Tiska et al., 2021; Sinha et al., 2015).

Additionally, the majority of the literature reviewed in this study highlighted a wide range of both technology-mediated and textual artifacts being utilized by STEM teachers to enhance their teaching. For instance, the adopted textual mediating artifacts included textbooks and instructional materials (Stains et al.,2018; Kelley & Knowles, 2016), lab manuals and experiment protocols (Van den Broek, 2010; Ghavifekr & Rosdy, 2015), and textual prompts and cues (Xie et al., 2015; Drijvers et al., 2020). The adopted technology-mediated artifacts on the other hand, included digital devices, sensors, data loggers, whiteboards, and other educational software and applications (Juškevičienė et al., 2020; Karahan et al., 2015; Gillen et al., 2007). However, there is an ongoing argument about which of the two types of mediating artifacts would better enhance STEM teachers' transfer of knowledge to students and allow for a more effective teaching approach (Vicente et al., 2022; Viberg et al., 2020; Koehler et al., 2013).

Nevertheless, the importance of both categories of artifacts in providing students with the opportunity to collaborate and explore diverse concepts remains fundamental in advancing STEM competencies across all fields. Likewise, there seems to be a unified perspective about the crucial role of both mediating artifacts in TTF Instruction. It has been suggested that achieving a synergy between both artifacts is imperative to facilitating the alignment between the assigned tasks and selected technology. Such a combination, therefore, contributes to bridging the gap between the task requirements and the technology capabilities to ensure that the latter effectively supports the former (Vanduhe et al., 2020; Webster & Hackley, 1997).

The overall findings can be summarised in the table below.

Table 1. Summary of Literature Review on TTF in STEM Learning

Thematic Category (preferred tool to deliver STEM education)	**Purpose**	**Is the preferred tool more related to task or technology characteristics?**	**References**
Instructional materials (such as textbook tasks, worksheets and handouts, lab manuals, and experiment protocols)	To provide structured information and explanations of STEM concepts that guide lessons, experiment protocols, and provide targeted content and examples applicable to the specific discipline	Task characteristics	Stains et al. (2018); Vicente et al. (2022); Schiepe-Tiska et al. (2021)
Educational software and applications & ICT (simulations, virtual labs, interactive learning platforms, interactive whiteboards, and educational games)	To afford opportunities for students to explore and experiment with STEM concepts in a virtual environment, thereby fostering engagement and understanding	A blend of Technology and Task Characteristics	Alan et al. (2023); Juškevičienė et al. (2020); Karahan et al. (2015); Gillen et al. (2007)
Digital devices and tools (laptops/i-Pads, etc.); Diagnostic assessment and skill practice (IXL, i-Ready Math)	To strengthen students' learning experience as well as measure and track student growth	A blend of Technology and Task Characteristics	Hover & Wise (2020); Makamure & Tsakeni (2020); Kier & Khalil (2018); Hardcastle, Herrmann-Abell, and DeBoer (2017)
Textual prompts and cues (in the form of questions, prompts for reflection, or sentence starters that aid students' responses)	To guide students' thinking and accelerate their understanding of STEM concepts.	Task characteristics	Vedora & Conant (2015); Xie et al. (2015); Van den Broek (2010); Finkel & Williams (2001)
Manipulatives or hands-on materials (such as blocks, puzzles, engineering design kits, etc.)	To help students engage in problem-solving, design thinking, and collaborative projects.	A blend of Technology and Task Characteristics	Roslina et al. (2022); Garden (2022); Freeman et al. (2014)

Focus Group Discussion

To understand the role of teachers' knowledge in promoting TTF for early childhood and inclusive technology-based STEM instruction, this research is guided by three research questions: 1) What is the state of teachers' general knowledge of using educational technology for classroom activities? 2) How do teachers perceive the importance of using technology for students to accomplish their learning tasks? 3) How can teacher knowledge, beliefs, and attitudes be leveraged to promote task-technology fit (TTF) in technology-based STEM instruction?

Focused group discussions (FGDs) with 52 teachers from the Greater Jakarta Area, Indonesia, were conducted to answer those questions on March 16, 2023. The participants filled in a general information survey and informed consent statement. After that, they went to seven break-out rooms to have the FGDs facilitated by faculties from Sampoerna University. Each group consists of seven to eight discussion participants. The FGDs were recorded and transcribed in Bahasa Indonesia (Indonesian Language). The recordings were then analyzed qualitatively to draw out the essence of participants' knowledge.



Figure 1. FGD documentations

The majority of the participants are early childhood teachers (73%), followed by upper primary (i.e. elementary school grade 4/5/6) teachers (13%), lower primary (i.e. elementary school grade 1/2/3) teachers (8%), and middle school teachers (6%). Since the participants were mostly early childhood teachers, they taught all subject matters (58%) in a thematic format as mandated by the curriculum. However, small portions of the participants specifically teach Bahasa Indonesia (17%), physical education (11%), math (6%), and a variety of subjects (8%) which include, but are not limited to, informatics, religion, and local language (i.e. Bahasa Sunda/Sundanese Language). In terms of teaching tenures, the participants consist of experienced teachers (54%) with 7-15 years experience of teaching, novice teachers (35%) with 0-6 years experience of teaching, and senior teachers (11%) with more than 15 years experience of teaching.

Results

The FGDs provided valuable insights into teachers' knowledge and perspectives on promoting TTF within early childhood and inclusive STEM instruction. Here are the key findings:

Broad Understanding of Technology. Contrary to potential assumptions, the discussions revealed that most teachers possess a solid understanding of the role of technology in the classroom. Notably, they recognized that technology encompasses not only digital tools but also non-digital resources. The results of the general information survey showed that 84.6% of the participants use smartphones to facilitate learning and 82.7% of the participants use traditional teaching realia (non-digital technology). The teachers even have a common vocabulary for indoor teaching realia, loose parts, and outdoor teaching realia that they call *Alat Peraga Edukasi* (APE). This broad understanding positions them well to make informed decisions about technology integration.

As an example of how technology-informed the teachers were, participant X commented: "*Kita buat modul dan video pembelajaran bersama dan dikumpulkan di Google Classroom*" that can be translated into "We made learning modules and videos together and collected (them) in Google Classroom." Some teachers also made learning materials for their students using Canva and uploaded them on TikTok. When asked from whom they learned to do that, they answered that they watched YouTube tutorials. They also believed that technology was an important part of their classroom. Their attitude towards technology use was 4.54 on a scale of 1 to 5. It means the teachers had a very positive attitude towards technology use in the classroom.

However, they also voiced a call for support. Only 67.3% of them get the Internet provided by the school. Many participants shared their stories of how hard it was to get an Internet connection during the pandemic. The majority of the FGD participants came from underprivileged communities. Hence, it was apparent that there were gaps in terms of the availability and access to the technology. Support was also needed regarding continuous professional development as shown in Figure 2.

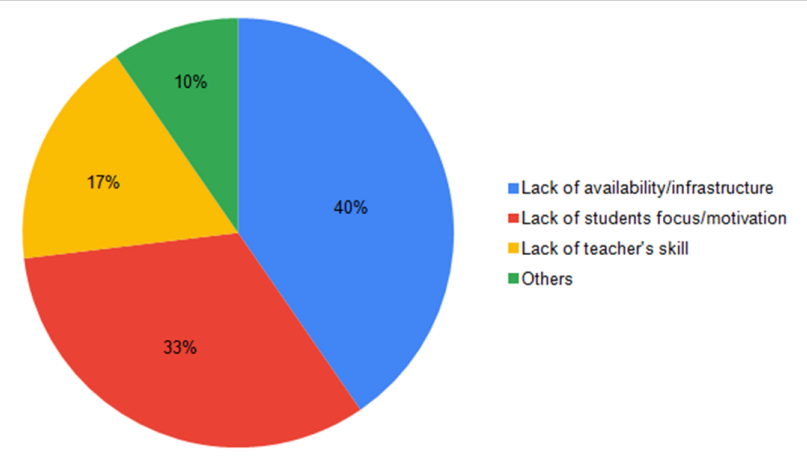


Figure 2. The area of problems where the teachers need support

Concerns Regarding Digital Technology. A recurring theme in the discussions was teachers' concerns about the potential negative impacts of digital technology on young learners. These concerns centered around issues like reduced attention span, social behavior problems, and the habit of instant gratification fostered by some digital interactions. This highlights the importance of selecting digital technologies that actively engage students and promote deeper learning experiences, rather than simply providing instant rewards.

For example, participant BP7 commented:

> "*Kalau dari Youtube itu bahasa anak-anak itu haduuh… Karena hasil dari tontonan, bahasa-bahasa gaul, meme yang viral itu, misal gurunya tanya ada yang mau bertanya dijawab anaknya 'kamu nanyea'.*"

That is translated into:

> "For example the language/attitude that the children acquired from YouTube *exclamation*… Because of the results of what they watch, slang language, and viral memes, when a teacher asks if they have a question, the students reply 'Are you asking me?'" (with attitude and impolite manner)

Emphasis on Movement-Based Learning. The discussions revealed a strong preference among teachers for technology that encourages student movement. This aligns with the established importance of physical activity in early childhood development. Technologies that integrate movement into learning activities can create a more engaging and developmentally appropriate STEM experience for young children.

For example, participant CP1 commented:

> "*... kalo jaman pandemi, yang sulit olahraga, karena suruh anak-anak bergerak tapi diluar jangkauan kita.Tidak bisa lihat mereka salah atau tidak. Pandemi itu benar-benar tantangan ...*"

That is translated into:

> "... the most challenging thing during the pandemic was physical education because we wanted the students to move but could not monitor them. We could not see whether the students did it correctly. The pandemic was indeed a challenging time ..."

Another example, participant MP5 commented:

> "*Nah, anak PAUD itu suka yang ada peraganya, sesuatu yang dia pegang, taktil, motorik, seperti playdoh, gunting-gunting, tempel-tempel itu mereka senang sekali. Lalu misal untuk tema air, udara, api, kita bisa pakai lilin ditutup — kita tanya itu kenapa begitu? Jadi anak itu harus melihat langsung, sesuatu yg konkrit.*"

That is translated into:

> "Ok, early childhood students like a demonstration, something they can touch, tactile, motoric, like playdough, cutting papers, stickers, those things they like a lot. And then for the theme of water, air, and fire, we can use candles to blow — we then ask, how can that be? So the children have to see it directly, something concrete."

Discussion

It can be implied from the results of the FGDs that there are two prominent essences of participants' knowledge regarding TTF. The participants' first voice is "I know what technology is, but I need some support." As shown in the results section, teachers understand

the broad scope of technological tools but sometimes the tool is unavailable or inaccessible. Therefore, responsible stakeholders like the government, the industry, or the universities might need to provide the infrastructure, the tools, or the professional development to support the teachers.

Their second voice is "I believe technology is important, but I have some concerns." Teachers' concerns regarding technology use for children, among other things, are "How can we mitigate bad influences from their online activities/consumptions?", "How can we mitigate the screen addiction risks if we introduce smartphones to children at an early age?", "How can technology-based STEM instruction facilitate early childhood needs to move or to do physical activities?", and "How can we bridge the gap between digital and non-digital technology?" Those questions implied that in promoting TTF, teachers are more drawn towards the task than what kind of available technology is to them. This aligns with the literature review on TTF for STEM learning mentioned earlier.

Those essences underscore the value of a bottom-up approach to TTF in early childhood STEM education. By recognizing teachers' existing knowledge base, addressing their concerns about digital tools, and incorporating movement-based learning opportunities, we can create a framework that fosters effective technology integration that aligns with the unique needs of early learners.

Conclusion

In answering the first research question regarding the state of teachers' general knowledge of using educational technology for classroom activities, we can say that it is good. They understand that technology is a broad term encompassing digital and non-digital technology. Their skills, however, are open for further development.

Regarding how teachers perceive the importance of using technology for students to accomplish their learning tasks, the answer is positive albeit they have concerns about some risk factors. This attitude further confirms that teachers do not take their teaching job lightly. They do care and are concerned about the well-being of their students. Hence, in integrating technology in the classroom, teachers weigh the task heavier than the affordances of the technology.

Finally, in answering how teachers' knowledge, beliefs, and attitudes can be leveraged to promote task-technology fit (TTF) in technology-based STEM instruction, there are opportunities for the stakeholders (e.g. government agencies, universities, etc.) to support teachers either in providing continuous professional developments or access to the technology that fits into the problems on the field. The bottom-up approach is indeed the key. Listening to the needs of teachers and students in school is a must. As UNESCO (2023) suggested, technological solutions to educational problems should not be centered around the technology itself, but it has to be human-centered solutions.

While a bottom-up approach to promoting Task-Technology Fit (TTF) in early childhood STEM education may require significant investment in time, cost, and professional development resources, the potential benefits outweigh the challenges. This approach fosters a sense of agency among teachers, empowering them to leverage their knowledge and understanding of their students' needs to curate inclusive learning environments. The resulting technology integration might not be a one-size-fits-all standardized solution. However, it holds

the power to be far more meaningful and responsive to the specific needs of each classroom. By prioritizing teacher knowledge and fostering their role in achieving TTF, we create a foundation for a more engaging, inclusive, and successful STEM learning experience for young children.

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Perceptions of Training Establishment Institute and Host Training Establishment in the Deployment Phases of the Teaching Internship Program

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Abstract
Being a teacher is not a simple task but rather a practice of patience, forbearance, and commitment to the profession and professional ethics. But before becoming an enhanced and effective classroom teacher, one must undergo a Teaching Internship or deployment. This study aims to determine the perceptions of the Training Establishment Institute (TEI) and the Host Training Establishment (HTE), the significant differences, and the best practices in the implementation of the Teaching Internship Program during the deployment phases and adapt from the best practices implemented by the respondent Private and Public Higher Education Institutions offering Teacher Education Courses. The data gathered were tallied and analyzed using descriptive methods. To answer the extent of implementation, weighted mean and ranking were used, while for the differences in the extent of implementation of the Teaching Internship Program between private and public, a t-test was used. Findings showed a high level of implementation in the deployment phases, and there are no significant differences in the performance of the teaching internship program in private and public HEIs in the province. For pre-deployment, private HEI has a greater mean of 3.73, while the public HEI has a mean of 3.64. In the deployment phase, private has a greater mean of 3.66 than the mean of the public HEI, which is 3.57. For post-deployment, private schools have a 3.68 mean, which is also greater than the mean of public schools, which is 3.61. Recommendations were proposed in the deployment phases of the Teaching Internship Program.

Keywords: Deployment, Perceptions, Implementation, Internship

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Introduction

Teaching Internship is a one-semester, 360-hour full-time teaching internship in basic education schools using a clinical approach under the mentorship of a cooperating teacher.[1] Here, students observe real class scenarios and learn how to mingle and approach elementary or high school students. They also experience daily classroom routines, instructions, classroom management, and actual teaching in front of a number of students. Philippine Commission on Higher Education Memorandum Order (CMO) No. 104, series of 2017, on the Revised Guidelines for Student Internship Program in the Philippines (SIPP) for all programs, Article 1, Section 1, "Internship program is meant to provide students with an opportunity to complement their formal learning with practical knowledge, skills, and desirable attitudes and to gain hands-on experience in a recognized Host Training Establishment (HTE).[2] This study is conducted to determine the perceptions of the selected public and private Training Establishment Institute (TEI) and Host Training Establishment (HTE) in the pre-deployment, deployment, and post-deployment phases of the Teaching Internship Program; determine the significant differences in implementing the Internship Program among the selected respondents from the private and public HEIs in the Bicol Region, Philippines; and adapt from the best practices implemented by the selected Private and Public Higher Education Institutions respondents offering Teacher Education Courses in the region to further enrich the implementation of the Teaching Internship Program.

Methodology

This research used a purposive sampling method for the respondents. The study's respondents were the private and public TEI administrators, Student-Teacher Coordinators/ Supervisors, HTE cooperating School Principals, Cooperating Teachers, and the selected Pre-Service Teachers from the Private and Public Education Institutions offering Teacher Education Programs in the region. The study employs a quantitative research design. Weighted mean/ranking method was used to determine the perceptions of the Training Establishment Institute (TEI) and Host Training Establishment (HTE) in the pre-deployment, deployment, and post-deployment phases of the Teaching Internship Program; and in determining the significant differences between the implementation of the Internship Program among the private and public TEIs in Bicol Region, Philippines. It used a researcher-made survey questionnaire comprising the following parts. Part I pertains to the demographic profile of the respondents. Part II relates to the extent of implementation of the Teaching Internship Program as perceived by the private and public TEIs offering Teacher Education courses or programs along the deployment phases, such as the pre-deployment, deployment, and post-deployment phase, while part III pertains to the best practices of both TEIs and HTEs. T-test was used to determine the significant differences in implementing the teaching internship Program among Public and Private HEIs in the region.

[1] Commission on Higher Education Memorandum No. 74 Series 2017.
[2] Commission on Higher Education Memorandum No. 104 Series 2017.

Results and Discussion

Pre-deployment Phase

Pre-deployment Phase refers to the activities and experiences that the TEI implements and the pre-service teachers' experiences before their actual internship with the selected cooperating schools.

Table 1 reveals that the top 3 indicators in the extent of implementation in the Pre-Deployment Phase of private schools include inviting speakers to discuss related topics like Lesson Planning, Classroom Management, Assessment, and others during seminars and community extension, which is highly implemented, followed by requesting Internship teachers to check lesson plan and conducting feedback on the demonstration teaching conducted during pre-deployment teaching; and conducting a survey on the student's preferred school for deployment during orientation and general assembly. It shows that private higher education institutions are considering the expertise of professional teachers from different schools to deliver topics related to classroom management, lesson planning, and assessment to enhance their students' knowledge and skills. Based on the interviews, these private institutions believed their students still needed to improve classroom management before deployment. Table 1 shows the perceptions of private and public Training Establishment Institute in the pre-deployment phase of the Teaching Internship Program.

Indicators	**Private**		**Public**	
Pre-Deployment Activities	**WM**	**I**	**WM**	**I**
1. Preparation of Requirements				
1.1 Securing Memorandum of Agreement, Medical Clearance, and notarized parent's permit.	3.71	HI	3.72	HI
1.2 Conducting an exit conference or interview with the Internship teacher or guidance counselor.	3.64	HI	3.50	HI
Average Weighted Mean	3.68	HI	3.61	HI
2. Orientation and General Assembly				
2.1 Conducting a survey on the student's preferred school for deployment.	3.77	HI	3.66	HI
2.2 Discussing the possible challenges/ expectations that Interns may encounter and the dos and don'ts during deployment.	3.62	HI	3.80	HI
Average Weighted Mean	3.70	HI	3.73	HI
3. Pre- Demonstration Teaching				
3.1 Requiring students to conduct pre-deployment demonstration teaching.	3.70	HI	3.82	HI
3.2 Requesting Internship teachers to check the Lesson Plan and conduct feedback on the demonstration teaching conducted.	3.82	HI	3.76	HI
Average Weighted Mean	3.76	HI	3.79	HI
4. Seminars/ Community Services				
4.1 Conducting seminars/ team buildings and extension activities related to teaching vocation and careers.	3.76	HI	3.39	HI

4.2 Inviting speakers to discuss topics like Lesson Planning, Classroom Management, Assessment, etc.	3.83	HI	3.60	HI
Average Weighted Mean	3.8	HI	3.50	HI
5. Pinning Ceremony				
5.1 Inviting administrators and guest speakers during the program.	3.73	HI	3.51	HI
5.2 Starting the program with an entourage and calling each student to come up on stage.	3.72	HI	3.13	HI
Average Weighted Mean	3.73	HI	3.32	HI
Grand Average Weighted Mean (Pre-Deployment)	3.73	HI	3.59	HI

Table 1. Perceptions of Private and Public Training Establishment Institutes in the Pre- Deployment Phase of the Teaching Internship Program

Legend: WM- Weighted Mean I- Interpretation
Scale: 3.25-4.00: Highly Implemented (HI);
2.50-3.24: Moderately Implemented (MI);
1.75-2.49: Slightly Implemented (SI);
1:00-1.74: Not Implemented (NI)

Attending different seminars and conferences is an essential activity as part of their program to improve the capacity of their students to achieve relevant competencies. Meanwhile, giving feedback on the quality of the lesson plans submitted by the students during pre-demonstration teaching is a very important part of the learning process for the students. Knowing the strengths and weaknesses of the students in terms of lesson planning would be beneficial for them to determine what areas they still need to improve. Likewise, it is part of the practice of most private schools to conduct surveys among students about their preferred school because knowing students' preferences is important to the institution. Table 2 shows the summary of the pre-deployment activities as perceived by the private and public TEI.

ACTIVITIES	**Private**			**Public**		
Pre-Deployment Activities	**M**	**EOI**	**R**	**M**	**EOI**	**R**
Demonstration Teachings	3.76	HI	2	3.79	HI	**1**
Preparation of Requirements	3.68	HI	5	3.61	HI	3
Seminars/ Community Services	3.83	HI	1	3.50	HI	4
Orientation and General Assembly	3.70	HI	4	3.73	HI	2
Pinning Ceremony	3.73	HI	3	3.32	HI	5
Overall Weighted Mean (Pre-Deployment)	3.73	HI		3.59	HI	

Table 2. Summary of Implementation During the Pre-Deployment Phase in Public and Private TEIs

Legend: M - Mean EOI - Extent of Implementation R- Rank
Scale: 3.25-4.00: Highly Implemented (HI)
2.50-3.24: Moderately Implemented (MI)
1.75-2.49: Slightly Implemented (SI)
1:00-1.74: Not Implemented (NI)

The activities under the pre-deployment phase, shown in Table 2, show that community services ranked first in the private school (M=3.83) while demonstration teachings ranked first

for the public school (3.79). On the other hand, preparation of requirements (3.68) is the least implemented activity among private schools, while Pinning Ceremony is the least one among public schools (M=3. 32).

Private institutions tend to do community services before their deployment phase. They are considering the importance of helping other stakeholders and individuals in the community. Public institutions engaged their time more in the pre-demonstration teachings before their deployment as their preparations for the everyday tasks performed by the pre-service teachers during the internship period. This is similar to the study of Bansiong, A. J. (2021), on Teaching Internship Apprehensions of Pre-service Teachers. In his research, he stressed the importance of preparations before the deployment of pre-service teachers to make the students more prepared mentally and emotionally.[3] However, the bottom indicators, which are the preparation of requirements to private institutions and the pinning ceremony to the public institutions, give implications that the study's respondents take it less highly implemented than the top indicators in implementing the Teaching Internship Program.

Deployment Phase

The deployment phase is the most awaited phase of the candidate for the Teaching Internship. This is the phase where students are deployed and experience the actual scenario of being a teacher. It allows pre-service teachers to apply what they have learned in the first three years of their course in actual classroom practices. Table 3 reveals the perceptions of both private and public TEIs in the deployment phase of the internship program.

Activities	**Private**			**Public**		
	M	**EOI**	**R**	**M**	**EOI**	**R**
Endorsing properly the Pre-Service Teachers to the cooperating school principal and coordinator	3.74	HI	**3**	3.83	HI	1
Conducting/ attending HTE orientation for the Pre-Service Teachers	3.76	HI	1.5	3.65	HI	2.5
Discussing the school's Curriculum and Teacher's Guide to be used as a reference in Lesson Planning.	3.70	HI	4.5	3.65	HI	2.5
Visiting and monitoring students, the HEIs' supervisor	3.62	HI	7.5	3.57	HI	8
Scheduling mentoring and coaching days with the student.	3.49	HI	9	3.44	HI	9
Coordinating with the HTE Principal and cooperating teachers regarding the concerns and challenges students and teachers encounter.	3.65	HI	6	3.58	HI	5
Conducting Quasi Teaching/ Student Consultation.	3.62	HI	7.5	3.58	HI	5
Inspecting the relevance of the instructional materials.	3.70	HI	4.5	3.49	HI	7
Attending observations during the final demonstration teaching of Pre-Service Teachers.	3.76	HI	1.5	3.58	HI	5
Requiring students to do a tree planting activity in the school where they are deployed.	3.38	HI	10	2.06	SI	10
Average Weighted Mean	**3.64**	HI		**3.44**	**HI**	

Table 3. Perceptions of Private and Public TEIs and HTE in the Deployment Phase of the Teaching Internship Program

[3] Bansiong, A. J. (2021). Teaching Internship Apprehensions of Pre-service Teachers. *Mountain. Journal of Science and Interdisciplinary Research (formerly Benguet State University Research Journal)*, *81*(2), 6-16.

Legend:	M - Mean	EOI - Extent of Implementation	R- Rank
Scale:	3.25-4.00	Highly Implemented (HI)	
	2.50-3.24	Moderately Implemented (MI);	
	1.75-2.49	Slightly Implemented (SI);	
	1:00-1.74	Not Implemented (NI)	

Based on the results of the study, the top 3 indicators in the extent of implementation in the Deployment Phase of private schools include conducting/attending Host Training Establishment (HTE) orientation for the Pre-Service Teachers (*WM*=3.76) which is highly implemented followed by attending observations during the final demonstration teaching of Pre- Service Teachers (*WM*=3.76) and endorsing the Pre- Service Teachers properly to the cooperating school principal and coordinator (*WM*=3.74).

Private HEIs believe in the significance of conducting orientation to the students because it provides basic knowledge and information regarding the rules and regulations of the establishment or institution. They also try to observe the pre-service teachers during final demonstration teaching to determine how far the students have gone through the internship process and what improvements they still need to work on before they become full-fledged professional teachers. They also conduct formal endorsement of pre-service teachers to the HTE to maintain harmony and let the students feel the support of the institution in their internship program.

This signifies that academic institutions would like to ensure the safety and security of the students in their workplaces by properly endorsing the HTE. Attending to the needs of the students and identifying their progress are being practiced by the HEIs. Moreover, based on the results of the study, the top 3 indicators in the extent of implementation in the Deployment Phase of public schools include endorsing the Pre-Service Teachers properly to the cooperating school principal and coordinator (*WM*=3.83), which is highly implemented, followed by conducting/ attending HTE orientation for the Pre-Service Teachers (*WM*=3.65) and discussing the school's Curriculum and Teacher's Guide to be used as a reference in Lesson Planning (*WM*=3.65). On the other hand, Public HEIs, give priority in endorsing properly the Pre-Service Teachers to the cooperating school principal and coordinator so that the students can really feel the support of their Student Teacher Coordinators and their respective teachers. This process also builds rapport with the principal on recognizing the coordinators who will serve as the focal person. They also attend HTE orientation to determine the necessary rules and regulations and other provisions their students will be responsible for during their internship. They also see to it that the students have a full grasp of the school's curriculum and teachers' guide in order to create and implement effectively their lesson plans.

Results revealed that all the indicators anchored to Article 7, section 14.2.2 and 17 of the CMO 104 series of 2017which is about monitoring and evaluation, and Host Training Establishments (HTEs) are highly implemented in both private and public Higher Education Institutions as the Commission on Higher Education Memorandum No. 104 Series 2017 section 1 stresses that the Internship Program is meant to provide students with an opportunity to complement their formal learning with practical knowledge, skills, and desirable attitudes and to gain hands-on experience in recognized Host Training Establishment (HTE).[2] Teaching Internship Program allows every student to experience actual experiences of their chosen vocation.

Post Deployment Phase

The post-deployment phase is the phase where pre-service teachers are done with their deployment observation, actual teaching, and final demonstration teachings and cleared from all the requirements of their respective cooperating schools. Table 4 shows the perceptions of the HTE's perceptions on the post deployment phase of the Teaching Internship Program in the region.

Based on the results of the study, the top 2 indicators in the extent of implementation in the Post-Deployment Phase of public schools include giving additional enhancement activities (*WM*=3.65) and requiring students to submit necessary outputs such as portfolios containing narrative/ accomplishment reports and others (*WM*=3.61) which are highly implemented. Table 4 reveals the perceptions of private and public TEIs and HTE in the post deployment phase of the Teaching Internship Program.

Activities	**Private**			**Public**		
	WM	**EOI**	**R**	**WM**	**HI**	**R**
Conducting post-conferences with the Pre- Service Teachers	3.64	HI	3	3.52	HI	4
Requiring students to submit necessary outputs such as portfolios containing narrative/ accomplishment reports and others	3.74	HI	1	3.61	H	3
Giving additional enhancement activities.	3.60	HI	4	3.65	H	1
Asking pre-service teachers to answer an evaluation of the whole teaching internship experience	3.69	HI	2	3.58	H	2
Overall Weighted Mean	**3.67**	HI		**3.59**	HI	

Table 4. Perceptions of Private and Public TEIs and HTE in the Deployment Phase of the Teaching Internship Program

Legend:	M - Mean	EOI - Extent of Implementation	R- Rank
Scale:	3.25-4.0	Highly Implemented (HI)	
	2.50-3.24	Moderately Implemented (MI)	
	1.75-2.49	Slightly Implemented (SI)	
	1:00-1.74	Not Implemented (NI)	

On the other hand, the top two (2) indicators in the extent of implementation in the Post-Deployment Phase of private HEIs include requiring students to submit necessary outputs such as portfolios containing narrative/ accomplishment reports and others (*WM*=3.74) and asking pre-service teachers to answer an evaluation of the whole teaching internship experience Conducting post-conferences with the Pre- Service Teachers (*WM*=3.69) which are also verbally interpreted as highly implemented.

Public HEIs also have the same weaknesses as private HEIs in giving additional enhancement activities and conducting post-conferences. This implies that these practices should be given more attention by these HEIs in maintaining the effectiveness of their interventions for internship programs.

A summary of the perceptions of the HTE and TEI in the extent of implementation of the deployment phases of the internship program among selected private and public HEIs in Region V, Philippines is shown in Table 5.

ACTIVITIES	**Mean**		**P-Value**	**I**
	Private	Public		
Pre-Deployment	3.73	3.64	.12	NS
Deployment	3.66	3.57	0.034	S
Post-Deployment	3.68	3.61	0.24	NS
p-value ≤0.05 Significant				

Table 5. Differences in the Implementation of the Deployment Phases of the Teaching Internship Program Among Private and Public HEIs

Legend: I= Interpretation S= Significant NS= Not Significant

Private TEI has a greater mean of 3.73 in the pre-deployment phase, while the public has a mean of 3.64. The p-value in the pre-deployment was 0.12, which is less than 0.05. This shows no significant difference in the implementation of the Internship program. In the Deployment Phase, Private TEI has a greater mean of 3.66 than the mean of the public TEI, which is 3.57. It has a p-value of 0.034, less than the greater 0.05, which signifies that the implementation of the internship program during the deployment phase is significant.

On the other hand, the mean of private schools during post-deployment is 3.68, which is greater than the mean of public schools, which is 3.61. p-value is 0.24 and less than 5%. This denotes no significant difference in the implementation of the Internship Program in the post-deployment of teaching internship students. The result shows that private and public institutions implement the same activities and programs in the pre-deployment phase of the Teaching Internship. In contrast, during the deployment, private institutions vary in terms of implementation. On the other hand, both private and public institutions implement similar activities in the post-deployment phase.

Conclusion

The following conclusions are derived based on the findings of the study:

1. There is a high level of implementation in the pre-deployment phase of the teaching internship program in the selected private and public TEIs in the Bicol region in terms of requiring students to conduct pre-deployment demonstration teaching, inviting speakers to discuss related topics like Lesson Planning, Classroom Management, Assessment; and conducting a survey on the student's preferred school for deployment.

The results imply that the public TEIs have mechanisms to evaluate the students' competencies by conducting demonstration teaching through formative and summative evaluation while allowing the students to identify some challenges ahead of time as part of their preparation in facing the real world of work inside the classroom. Khalil and Elkhider (2016) also conducted formative evaluation during the design and development phases to improve instruction and learning materials and ensure they are aligned with the learning goal and objectives towards

attaining learning outcomes and necessary competencies.[4] Likewise, Orosz and Ochua (2023) mentioned that demonstration teachings helped the student teachers since they could improve their teaching strategies and techniques to teach English.[5] Further, Okotubu (2020) found that demonstration teaching effectively improves students' academic achievement and knowledge retention as part of their training to become professional teachers.[6] Moreover, feedback from a cooperating teacher after the demonstration teachings is necessary to enhance the teaching learning process of the Pre-Service Teachers.

2. During the Deployment Phase in public and private TEIs, there is a high level of implementation in terms of inspecting the relevance of the instructional materials, properly endorsing the Pre-service teachers to the cooperating school principal and coordinator, and conducting/ attending HTE orientation for the Pre-Service Teachers.

Furthermore, public schools have also highly implemented the inspection of the relevance of the instructional materials used by the pre-service teachers. However, this is considered to have the lowest mean score. Some institutions need help to connect with their students during the scheduled mentoring and coaching sessions because some students must report regularly to their internship teachers. Abifarin (2019) also believed that the teachers or the student-teachers need to be very inquisitive, creative, and highly knowledgeable in identifying the appropriate instructional materials that will help them to teach any lesson brilliantly, effectively, and successfully. [7] However, choosing and preparing the suited and interactive instructional materials would be time-consuming on the part of the pre-service teachers.

3. The bottom three (3) indicators in the extent of implementation during the Deployment Phase of private schools include HEIs' supervisor visiting and monitoring the students (*WM*=3.62) and conducting Teaching/Student Consultation (*WM*=3.62), which are also highly implemented followed by scheduling the mentoring and coaching day with the student (*WM*=3.49) and requiring students to do a tree planting activity in the school where they are deployed (*WM*=3.38) with the least mean scores for private schools.

This imply that private HEIs also closely supervised the pre-service teachers during their internship by visiting them regularly in the schools where they were deployed. Asking for some challenges during the internship helps the students address their concerns immediately. Student Internship coordinators ensure students' mental well-being through constant communication and regular consultation. Kaur et al. (2021) emphasized that the challenges faced during an internship can function as stressors, which may inhibit student learning and harm their emotional and psychological well-being, influencing their identity as future teachers and their intention to continue as teachers.[8] Thus, monitoring the student's progress during the internship is an important duty and responsibility of the Student Internship Coordinators. Though this

[4] Bernstein, E., Herman, A. M., & Lysniak, U. (2021). A longitudinal examination of preservice teachers' beliefs toward implementation of competitive activities. Journal of Physical Education and Sport, 21(5), 2712-2721.
[5] Orosz, A., Recino, U., & Ochoa, M. C. (2023). Demo lessons and peer observation to enhance student teachers' competencies and exit profiles. *International Journal of Learning, Teaching and Educational Research*, *22*(6), 638-658.
[6] Okotubu, J. O. (2020). Effect of Demonstration Teaching Method on Students' Academic Achievement and Retention in Auto Mechanics Trade in Technical Colleges in Delta State. *International Journal of Education and Evaluation*, *6*(5), 6-13.
[7] Abifarin, M. S. (2019). Assessment of Instructional Materials Utilization by Teachers and Student-Teachers in the Classroom: The Essential Parameters. Glory-Land Publishing Company.
[8] Kaur, A., Kabilan, M. K., & Ismail, H. N. (2021). The Role of Support System: A Phenomenological Study of Pre-Service Teachers' International Teaching Practicum. Qualitative Report, 26(7).

indicator obtains one of the lowest scores, the sending institutions are doing their best to provide the services students need during the internship program.

4. There is a high level of implementation in the Post-Deployment Phase in public and private TEIs in terms of requiring students to submit necessary outputs such as portfolios containing narrative/ accomplishment reports and others and asking pre-service teachers to answer an evaluation of the whole teaching internship experience.

Private TEIs who always believed in the necessity for the students to submit a portfolio as evidence of their learning outcomes. These reports provide the necessary elements of their acquired knowledge and skills during their internship. They also evaluate the teaching internship experience by administering survey questionnaires to get essential student feedback. The survey result serves as baseline information that will be used to improve their program offerings continually. Jorre de St Jorre and Oliver (2018) also noted the importance of a portfolio where, in some professional courses, students received early and ongoing guidance on collecting evidence of their achievements for a portfolio.[9] Khan and Jawaid (2020) added that a portfolio is evidence of a task performed by the student, along with reflection on it. It focuses on the value of reflection to see how students appreciate the learning process and recognize their achievement as an important element of their success during internships.[10]

5. There is no significant difference in the deployment phases of the Internship program. The p-value in the pre-deployment was 0.12, which is less than 0.05. In the Deployment Phase, it has a p-value of 0.034, which is less than the greater 0.05, which signifies that the implementation of the internship program during deployment is significant. The post-deployment p-value is 0.24 and less than 5%, which denotes no significant difference in the implementation of the Internship program in the post-deployment phase of the teaching internship program.

The result shows that private and public TEIs implement the same activities and programs in the pre-deployment phase of the Teaching Internship. In contrast, during the deployment, private institutions vary in terms of implementation. On the other hand, both private and public institutions implement similar activities in the post-deployment phase. This has relevance to the study of Bernstein, E., and Herman (2021). On a longitudinal examination of pre-service teachers' beliefs toward implementation of competitive activities. In his study, one of the students mentioned his experiences with Lesson Planning and perceptions of the different activities while the internship was ongoing. This study identified the strong beliefs that PSTs held about competitive activities and how those beliefs influenced instruction. The PSTs became aware of these beliefs during student teaching as they experienced actual scenarios of Student Teaching.[11] This means that pre-service teachers are experiencing implementations of Teaching Internship activities, either locally or internationally. The experiences of the researcher's students are similar to the study's findings regarding the different activities performed during the pre-, during, and post-deployment phases of the Teaching Internship Program.

[9] Jorre de St Jorre, T., & Oliver, B. (2018). Want students to engage? Contextualise graduate learning outcomes and assess for employability. Higher Education Research & Development, 37(1), 44-57.
[10] Khan, R. A., & Jawaid, M. (2020). Technology enhanced assessment (TEA) in COVID 19 pandemic. Pakistan journal of medical sciences, 36(COVID19-S4), S108.
[11] Bernstein, E., Herman, A. M., & Lysniak, U. (2021). A longitudinal examination of preservice teachers' beliefs toward implementation of competitive activities. Journal of Physical Education and Sport, 21(5), 2712-2721.

6. Some of the best practices given by the respondents are having an exit conference after the internship with parents and stakeholders; constant follow-up of both HTE and TEI with Teacher Interns to know their social and psychological status; conducting seminars and teaching demonstrations prior to deployment; daily journal of insights learned; Conducting regular and post-conference with the PST. Using digital instructional tools to get pupils' attention during the conduct of demonstration teaching; Giving house rules prior to the start of the discussion, simple rewards such as smileys, simple tokens, additional points, and different appreciation claps to those students who behave and participate well in the class to maintain classroom management. According to the student respondents, wearing formal and attractive clothes and accessories of teachers could also be a best practice. Wearing a smile and having a sense of humor while teaching to catch the attention of the learner.

The reward system as one of the best practices has relevance to the result of the study made conducted by Kamron Phungphai and Atipat Boonmoh in their research entitled Students' Perceptions Towards the Reward to Enhance Their Learning Behaviors and Self-Development. The findings revealed that receiving rewards influenced students' positive emotions - enjoyment, excitement, relaxation, and engagement. The findings also showed that they were highly satisfied with the use of rewards which enhanced their self-development since a teacher used them as external goals. Rewards were used as positive reinforcement for learning behavior. The use of rewards was also used to build more powerful activities in the classroom.[12] However, teachers must not always do the reward system so the students do not get used to and over-familiar with the said strategy for they might be able to be more after and look for the rewards that teachers may give once they behave in the class, listen well to the discussion and give their best on the tasks assigned to them.

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Enhancing Biomedical Science Graduate Students' Research Communication Skills Through Entrepreneurial Activities

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Abstract
In Japan, graduates are expected to play a significant role in the development of 'knowledge professionals', which leads to the increased production of knowledge and value creation. As a result, graduate students are increasingly required to enhance and develop their transferable skills, including those not only related to conducting but also communicating research. Such students are committed to a research-centred lifestyle; students regularly conduct science research presentations in laboratories or academic conferences and have sufficient experience of academic presentation, but are not accustomed to communicating their research findings to non-technical people. Accordingly, the current work presents a method to lead students to enhance their research communication skills by focusing on the value of their research beyond such publications. A traditional medical oral presentation credit module was altered into one with pitch activities. The module was held in English for a group of graduate students in biomedical sciences at a national university in Japan. The participants were exposed to communicating the social significance and impact of their research through a mock entrepreneurial pitch on how their findings could impact society. According to the participants' self-reflection responses, the pitch activities contributed to enhancing their research communication skills.

Keywords: Graduate Education, Research Communication Skills, Pitch

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Introduction

In the shift towards Society 5.0 proposed by the Japan Cabinet Office, graduate schools in Japan are expected to play a significant role in the development of 'knowledge professionals', thereby leading to the increased production of knowledge and value creation. To this end, for universities to obtain graduate educational funding, graduate students are increasingly required to develop and enhance transferable skills including those not only related to conducting but also communicating research. Although students are committed to a research-centred lifestyle, they regularly conduct science research presentations in laboratories or academic conferences and have sufficient opportunities to gain academic presentation experience. However, they are not accustomed to communicating their research findings to non-technical people.

The current study investigates whether research communication skills can be increased via a provision of pitch activities rather than academic or scientific presentation in a traditional medical oral presentation and discussion module. Similarly, Train and Miyamoto (2017) examined whether opportunities to develop science communication skills could be incorporated into the content-heavy science curricula in biology. They integrated assignments into core and elective courses by summarising the incorporation of science communication assignments into the curriculum of the biology major, which resulted in improvement in the participants' confidence and perception of their communication abilities. Mason and Merga (2022) argue an increasing expectation exists that early career researchers be active in communicating their research with confidence to diverse audiences both in and outside academia.

This pilot study presents an attempt to lead students to enhance their research communication skills by focusing on the value of their research beyond such publications. We altered a traditional medical oral presentation credit module into a compulsory module with pitch activities. Accordingly, this approach exposed students to communicating the social significance or impact of their research through a mock entrepreneurial pitch on how they could return research findings to society. The module was conducted in English, the students' second language.

Why Research Communication?

Research communication is 'the process of interpreting or translating complex research findings into a language, format, and context that non-experts can understand' (Carter & Paulus, 2011). Why do researchers need research communication skills? When communicating own research to people, the audience wonders "why is the research important?" or "Is this research related to me?", finding a connection of interests in the communication. In this aspect, "value proposition" becomes important; however, some ordinary lectures at universities tend to start without clearly explaining the value proposition or societal impact of the lecture content.

Alpert (2016) provides evidence of a 'Research Communication Continuum' in which acquisition of communication skills with broader audiences contributes to greater efficacy in cross-disciplinary discourse among researchers. Society is becoming borderless resulting in increase in collaborations. As a result, ability to explain own research to non-technical people or to target listeners in different settings will be the minimum required skills in the following settings:

- Disciplinary level: experts in different research fields need to communicate for solving a research problem in common through interdisciplinary research.

- Educational level: collaboration between different education stages, for example university professors visit high school to teach or provide tailor-made lectures to the public.
- Organisational level: increased research collaboration between academia, industry, or government.

Each level can be expanded to beyond the national level to the global level; thus, research communication skills in English language will be required.

What is Pitch?

A science or academic presentation is generally given to an unspecified number of audience members, usually researchers who are already interested in the content and share the same field of expertise. Such presentation is typically used to explain findings in step-by-step manner. Moreover, a presentation is a form of transmitting information and is typically passive for audience. On the other hand, in a pitch, a speaker aims to communicate a certain purpose, and finishes with a call to action. The Cambridge Dictionary defines a pitch as 'to try to persuade someone to do something'. As such, a pitch is for an audience who has no prior knowledge about the content, to expect some kind of action in response to the talk, to promote oneself, and sell one's future plan such as idea/product/seeds/skills/. Therefore, a pitch goes beyond merely 'getting people to know'.

Different Types of Pitch

According to Ruiz-Madrid and Valeiras-Jurado (2020), two types of pitches exist: research and product pitches in the academic and business field, respectively (see Table 1).

Research pitches in the academic field	**Product (idea) pitches** in the business field
Emerging way of disseminating ongoing research to the general public.	Skill for entrepreneurs/start-ups, demonstrating product.

Table 1: Research and Product Pitch

Research pitches constitute an emerging method of disseminating ongoing research to the general public, such as the University of Queensland's 'Three Minute Thesis' competition. On the other hand, product (idea) pitches promote a product to the target audience specifically for seeking investment.

A product pitch can be further categorised into two types; an introduction/description of a company/product/service, or sales pitch demonstrating a product to be purchased or invested in by venture capitalists. Beckett (2022) describes demo and investor pitches in an entrepreneurial setting. A demo pitch emphasises traction and is focused on business whereas an investor pitch focuses on concepts, without traction. Traction means validation of one's demo product or service. A pitch is typically a skill for entrepreneurs and start-ups seeking collaboration usually regarding investment. At business conferences such as the *BIO International Convention* or *BioJapan*, the participating companies or organisations pitch to introduce and publicise their research or product.

Why Pitch?

As university and industry collaboration continues to proliferate, pitching has become an increasingly necessary skill for researchers. Universities are also subject to demands to implement research results into society. According to Gambhir and Tangkiengsirisin (2023), start-up pitches contain aspects typically found in spoken genres representing the characteristics of spoken text, which implies that the wording involves language used in oral communication.

A pitch and research communication are related. In particular, an 'elevator pitch' briefly explains who you are, what you do, and what you expect from the person you are speaking to within the length of an elevator ride. Lacka-Badura (2020) states the 'job search pitch', referred to as 'personal branding pitch', is viewed as a subgenre of an 'elevator pitch'. Such an approach is regarded as an essential communication technique to be used by students in future job search situations. The pitch is also a contributing skill and increases employability. Mou-Danha et al. (2019) conducted public speaking and capstone courses with the objective of helping students identify different components of an elevator pitch and assemble such pitches highlighting their strengths, an activity that ultimately increased students' sense of self-competence. Recent trends in communication training extend a long-held emphasis on business communication skill instruction, thereby suggesting that future communication research should focus greater attention on behavioural learning outcomes (Frei et al., 2023).

Pitch Approach in Teaching for Comprehensive View

'Pitch' is captured more as an element of business skills. Based on a module experience, Affolderbach (2022) discusses how participants can learn the necessary skills to connect theory with practice. Accordingly, students develop a project that they present in a TV show, *Dragons' Den*-style via a pitch to experts for evaluation, which is designed to help participants translate conceptual approaches into practice and results in enhanced transferable skills. May et al. (2022) investigates a universal design problem-based learning exercise in which each student team pitched their new product concept in class.

Methods

Participants

Participants in the module were 12 master's students who regularly conduct research in the Graduate School of Medicine.

Design

With the objective of enhancing research communication skills, the students were expected to be able to give pitches, capture their academic research as part of society, and discuss the translational idea of their research. The key points were as follows:

- Understand pitches in addition to academic presentations.
- Be aware of the value of own research in identifying and solving social problems.
- Capture how research is translated to society with an entrepreneurial mindset.
- Be able to communicate research to society, overall.

Step	Activity
1	Introduction - connecting research to the world
2	Role play 'Interview with leading scientists'
3	Pitch deck and elements
4	3-minute pitch
5	Reflection

Table 2: The module topics

Step 1: Introduction – Connecting Research to the World

A one-minute ice-breaking self-introduction was conducted. The introductory section mainly focused on returning one's research findings to society. Skill to connect their research to society by knowing and communicating the social impact and significance.

Started with a big and general picture. At the start of the course, the participants were asked to provide feedback on a range of basic questions:

1. What is your research theme?
2. Which UN SDGs does your research most closely relate to?
3. How important is societal impact to your research?
4. Should research funding be tied to demonstrable societal impact?

The participants discussed necessary basic skills for communicating the message to the target with a call to action. For example:

- Trusting relationship, create rapport.
- Talk confidently, no negativity, certainty, confidence: Japan has a culture of humility.
- Conscious decisions as time is limited.

Step 2: Role Play 'Interview With Leading Scientists'

	Interview questions
Q1	Whose problem is it?
Q2	What is the problem? What are the pain points?
Q3	Why do you want to solve the problem?
Q4	Why has the problem not been solved? What are the barriers?
Q5	What are other parties currently doing to address the problem?
Q6	What can you do to solve the problem?
Q7	What would be the significance if the problem could be solved?
Q8	From whom and what kind of cooperation do you need to solve the problem?

Table 3: Problem-solving brainstorming framework

The participants performed the following activity in groups of three.

1. One short-sentence answer to each question in Table 3.
2. Connect the answers without connecting phrases to shorten the scenario.
3. (For example, Let me move on to …') Shorten and simplify the entire answers.
4. Each participant gave a short one-minute summary.

Step 3: Pitch Deck and Elements

The students were introduced to the term 'pitch' in this step. An ordinary academic research presentation was compared with a pitch to facilitate discussion on what a pitch is and why pitch. The students were then instructed to compose their own story regarding how they would return

their research findings to society. As a warm-up exercise, students were shown video clips from *Dragon's Den*, *Shark Tank*, or a range of pitch competitions and instructed to find corresponding answers from the video clip to the list of interview questions presented in Step 2. Together, the participants discussed the differences between a pitch and the standard way of presenting their scientific research.

Differences included a pitch being composed in language that everyone can understand, short time frame for catching the attention of busy people, conveying information in narrative tone with impact, reducing to facts, not being overly detailed, and offering details after the pitch, thereby making people want to listen further in detail.

Pitch Elements

The video clips facilitated the realisation that a pitch is comprised of essential information transmitted as concisely as possible. A standard set of pitch elements are presented in Table 4.

Cover/Opener	Problem/Pain/ Opportunity	Solution/Product/ Product Demo
Customer/ Market size	Value proposition	Underlying Magic / Unique insights
Advantage/ Competitors	Traction	Business model/ Stakeholders
Go-to-Market	Investment/ Milestone	Team

Table 4: Pitch elements

These elements are compiled into a pitch deck. The participants are introduced to the essence of each aspect as elements. However, biomedical basic researchers may find it challenging to tackle the elements such as a business model. Therefore, the students watched further video clips from *Shark Tank*, for example, and tried to identify the essence and essential information corresponding to the element, business model, and so on. The students also summarised these points in a business model diagram based on stakeholder preferences.

Step 4: 3-Minute Pitch

The students created their own pitches based on their research theme. In this step, students were required to do the following:

- Answer each of the elements.
- Pick appropriate elements to build own deck.
- Connect the elements and compose a story to be conveyed in 3 minutes.
- Include at least 'Problem', 'Solution', 'Value proposition', and add a few more elements of their own choice.

Step 5: Reflection

At the end of the module, the students reflected by summarising what they achieved in scenario writing to be conveyed in 1 minute. All students also completed a reflection-based questionnaire.

Results

None of the participants were familiar with a pitch before taking this module. All 12 participants completed the self-reflection based questionnaire. Given the small sample size, we did not conduct statistical analysis and instead focused on descriptive statistics.

Q1.
Did the pitch activity increase your research communication skills?
Did the pitch activity contribute to enhancing your communication skills?

Yes	Somewhat	Neutral	A little	No
8	4	0	0	0

Q2.
Did you find a pitch is a necessary skill?

Yes	Somewhat	Neutral	A little	No
10	2	0	0	0

Q3.
Did the course activities (your pitch) with an experience-based learning approach provide you with more experience than other similar courses you have taken?

Yes	No	I have not taken any other similar courses before.
10	1	1

Q4.
By comparing your pre- and post-course levels, please clarify how your entrepreneurial skills improved.

Very much	Somewhat	Neutral	A little	Not at all
3	5	2	2	0

Q5.
Did the course benefit you in increasing your interest in entrepreneurial learning?

Yes	Somewhat	Neutral	A little	No
6	5	0	1	0

Q6.
Suppose you are assigned to offer a group of integrative biomedical graduate students a research communication course in an international setting.
How will you improve the course? What will you do differently?

Make each session shorter. If we don't know what a student says, we **use some Japanese**. If we can use Japanese a little, it will be easier to say something in class.
I would prepare a lecture on 'Pitch' for the students. After this lecture, I think the students who are highly specialized in a certain field should acquire the ability to output their own research and what they want to achieve in the future. I also thought it would be good to **have debates among students in addition to pitches**. I thought it would be a good idea to decide on a precise theme, and to further improve the ability to output ideas by exchanging each other's ideas.
I would like to conduct **more group work**.
First, **organise the necessary information** and try to **use as few technical terms as possible**. The necessary information should be further divided into the following categories: background, reasons for research, research content, and clinical perspectives. Finally, prepare slides and other materials according to the presentation time.
Since the **English proficiency of each student varies**, I would add slides and time to the lecture to check whether everyone is following in **both English and Japanese**. I think the content and overall structure of the lectures are very likely to lead to skill improvement, so I think it's okay to leave them as they are.

The written feedback in Q6 provided ideas and improvements that can be grouped into two main aspects: language concerns and activity format. Some participants thought use of Japanese language should be allowed and combined with English, especially when focusing on pitch specific terminologies. Some prefer to have debates among students in addition to pitch, or more group work.

Conclusion

This pilot study sought to establish whether regular biomedical science students are capable of developing research communication skills through the entrepreneurial activities involving pitches. Given the small sample size, the study focused more on the teaching approach. The student responses revealed the following key points:

- All the students became aware of pitches for the first time. The contents were new; they have not done any similar activities in the past.
- They learnt pitches and related terms are used in the arena of academia-industry collaboration or start-up purposes.
- Majority agreed that the module contributed to increasing research communication skills.
- Majority agreed that the module approach contributed to increasing their interest in entrepreneurial mindsets.

Limitations and Prospects for Improvement

Although a lack of business and entrepreneurial skills cannot be avoided, a pitch approach was an effective teaching package to nurture their translational mind and their research communication. However, the following limitations must be acknowledged:

- Sample size was small. A larger sample may lead to more dispersion in the results regarding whether students feel such approach helped enhance their communication skills.
- Conducted in non-native language; language follow up may be required. Research communication fluency may increase if conducted in Japanese.
- Cultural context; English is increasingly preferred as the language for pitching, particularly to international audiences.
- The focus was on improving oral research communication skills; written communication skills is a different issue that should be tackled in future research.

For researchers who may not possess sufficient English language skills, Mason and Merga (2022) note that interactive styles of communication may prove more challenging than more passive styles. Regardless of the native language, repeated practice and experience of speaking in public with mentors may increase confidence and skills.

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Design Reflective Practice Assessment Tools for Teacher on Learning Management System Using AI Adaptive Feedback

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Abstract
This research introduces an innovative framework for enhancing teacher professional development at ICE Institute and open university through the integration of artificial intelligence (AI) into reflective practice assessment tools within the Learning Management System (LMS). The primary goal is to offer educators personalized and data-driven insights to refine their instructional practices and foster continuous improvement. The proposed reflective assessment tool employs AI algorithms to systematically collect and analyse data, including student performance, engagement metrics, and interaction patterns specific to the open and distance education context. The AI-driven adaptive feedback system provides real- time, personalized feedback, emphasizing strengths, pinpointing areas for improvement, and suggesting targeted instructional strategies. Seamlessly integrated into the ICE Institute LMS, the user-friendly interface features a visual analytics dashboard, benchmarking capabilities, and direct access to professional development resources. The tool encourages teachers to formulate individualized continuous improvement plans based on the feedback, ensuring a tailored approach to professional growth. Privacy and ethical considerations are paramount, aligning the tool with ICE Institute commitment to data security and ethical AI use. The scalability of the tool facilitates widespread adoption, fostering a collaborative community of educators dedicated to refining teaching practices within the unique context of open and distance education. This research represents a significant advancement in leveraging AI to elevate reflective practices among teachers at ICE Institute, ultimately enhancing the quality of education delivery in the digital learning landscape.

Keywords: Assessment-Tools, LMS, AI-Driven Adaptive Feedback, Digital-Learning

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Introduction

In the era of information overload, recommender systems have become an essential tool in various domains, including Learning Management Systems (LMS). Recommender systems are widely used to help users find their desired items or services from a large collection of options. They can improve user satisfaction, loyalty, and retention, as well as generate revenue for the providers. However, designing effective recommender systems is challenging, as they need to deal with complex and dynamic user preferences, item features, and system environments.

The recommendation system plays a crucial role in enhancing the user experience in the Learning Management System (LMS). According to, although LMS has facilitated access to various learning materials, the primary challenge is how to create a personalized and efficient learning experience for each user. They also state that many current LMS still function primarily as information repositories. The recommendation system in LMS can provide recommendations for learning materials that align with individual interests, abilities, and needs by analyzing user learning patterns.

One promising approach to address these challenges is to use deep reinforcement learning (DRL), which combines deep neural networks with reinforcement learning (RL). Recently, Deep Reinforcement Learning (DRL) has shown promising results in various domains, including recommendation systems [2]. DRL can model the sequential interactions between users and items, and optimize the long-term user engagement, which is crucial for LMS.

In recent years, there has been a surge of interest in applying DRL to recommender systems, and many novel methods and applications have been proposed. Therefore, in this article, we aim to provide a timely and thorough review of the state-of-the-art DRL methods for recommender systems and discuss the challenges and opportunities for future research. This article proposes an innovative approach to implementing a DRL-based recommender system in an LMS, leveraging the DRL framework from "A Deep Reinforcement Learning Based Long-Term Recommender System" [3]. This framework has demonstrated impressive results in optimizing long-term recommendation accuracy, making it an ideal choice for our LMS recommender system.

We hope that this work will not only contribute to the ongoing research in the field of DRL and its application in recommender systems but also inspire further innovation in the application of DRL in LMS recommender systems.

Related Works

In the context of recommender systems, a significant contribution has been made by [3] of a study on a deep reinforcement learning-based long-term recommender system. This study proposed an innovative top-N interactive recommender system that leverages deep reinforcement learning to optimize long-term recommendation accuracy and adapt to user preferences over time. The recommendation process was modeled as a Markov decision process, where the agent (recommender system) interacts with the environment (user) and learns from the feedback. The agent uses a recurrent neural network to generate the recommendation list and a policy gradient algorithm to update the parameters. The model was evaluated on three real-world datasets and compared with several baselines. The results demonstrated that the model outperformed the baselines in terms of hit rate and NDCG for the long-term recommendation and could handle both cold-start and warm-start scenarios. The

study made four main contributions and discussed the implications of the proposed model for future research and applications.

Overall Framework

The main framework used in this research is based on the Deep Reinforcement Learning Based Long-Term Recommender System framework, particularly in the use of the pre-built warm-start model. The recommender system operates as a Markov Decision Process, where the agent interacts with the environment sequentially. The model learning process will be divided into two stages: supervised learning and reinforcement learning.

A. RNN

The input layer is designed to manage sequential data between users and courses over time. In addition to containing temporal information, the input data also includes labels representing the final values corresponding to the courses taken by the user. These values are then fed into the input layer. The RNN layer utilizes EMGRU, proven to capture more complex information compared to GRU. The output layer generates recommendations in the form of a Top-N list, using the softmax activation function that converts raw outputs into probability distributions for each course.

B. Supervised Learning

Supervised learning pre-training involves using historical user interaction data, which includes the courses taken and their corresponding final grades. In supervised learning, two hierarchical target variables are employed: the selected course and the final grade associated with that course.

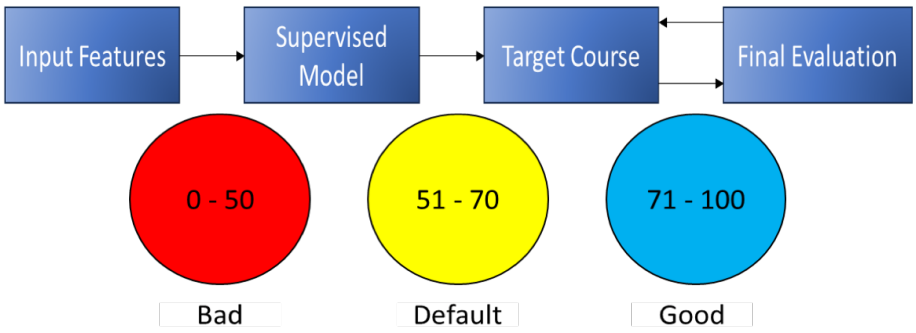


Fig. 1. Hierarki of historical user interaction data based supervised learning.

We apply categorization for value intervals, with different treatments for each target course value within a specific interval. Here, bad is equivalent to a negative value, while default and good are equivalent to positive values. Due to the nature of course values, which cannot be randomly assigned during the training process, we implement the creation of dummy data based on similar information from different users.

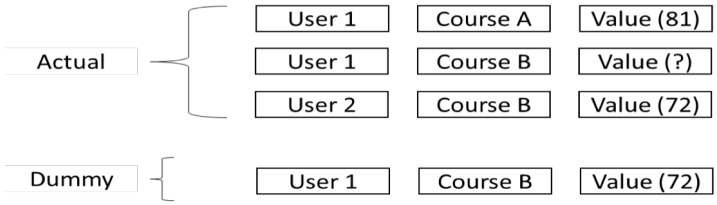


Fig. 2. Pengkategorisasian data process

Meanwhile, for user value data that has no similarity with other data, we apply the default value. This data is used to train the EMGRU model, which focuses on predicting the next Top-N recommended courses. The pre-trained weights saved by the model will serve as the foundation for the subsequent Reinforcement Learning (RL) training, allowing the RL agent to start training with knowledge of user preferences and sequential dynamics. This approach aims to build an initial representation of states and course relationships that are robust and provide an effective starting point for RL training.

C. Reinforcement Learning

Reinforcement Learning (RL) involves transitioning from a Supervised Learning (SL) environment to an RL environment aimed at optimizing policies for long-term recommendations while remaining adaptable to dynamic user preferences [5]. The process begins with initializing the agent with pre-trained weights obtained from the SL model using EMGRU. The agent then interacts with the environment or user, receives a state, takes action or recommends a course, and receives rewards based on user feedback. Rewards are not only based on the courses taken by the user but also on the final grades obtained in those courses. For each grade category (bad, default, good), different rewards are assigned, and the policy is updated using the RL algorithm called REINFORCE, which utilizes a policy gradient approach to maximize cumulative rewards. This learning process enables the agent to adapt to changing user preferences and dynamic real-world contexts, enhancing the model's effectiveness in generating accurate personalized recommendations.

Algorithm 1: Supervised Learning

Require:

- *Training set U (user interaction data)*
- *Learning rate η*
- *Maximum sequence length B*
- *EMGRU model architecture*

1: while not stop do
2: for each sequence (u, Iu) in U do
3: Initialize: - count ← 0 - su,0 ← zeros (initial state representation)
4: while count < |Iu| do
5: Generate training batch: - batch_sequences, batch_targets ← GetNextBatch(Iu, count, B)
6: Forward pass: - predictions ← EMGRU(batch_sequences)
7: Compute loss: - loss ← LossFunction(predictions, batch_targets)
*8: Backward pass and optimization: - θ ← θ - η * ∇θ loss*
9: count ← count + B
10: end while
11: end for
12: end while

Algorithm 2: Reinforcement Learning

Require:

- *Trained EMGRU model from SL stage*
- *Training set U (user interaction data)*
- *Learning rate η*
- *Maximum episode length B*
- *Discount factor γ*

1: while not stop do
2: for each user u in U do
3: Initialize: - count ← 0 - su,0 ← zeros (initial state representation) - mu ← ones (mask for uninteracted items)
4: while count < |Iu| do
5: Generate episode: - E, mu ← GenerateEpisode(Iu, mu, su,0, B) - [su,1, ˆau,1, fu,1, Vu,1, ..., su,B, ˆau,B, fu,B, Vu,B] = E
6: Calculate rewards: - Ru,t ← CalculateRewards(E)
*7: Update model parameters: - θ ← θ + η * ΣBt=1 γ^(t-1) * Ru,t * ∇θ log π(ˆat | su,t)*
8: Update state and mask: - count ← count + B - su,0 ← su,B - mu[i] ← 0 for each item i in E (exclude interacted items)
9: end while
10: end for
11: end while

Note:
U: Training set containing user interaction data.
η: Learning rate, controlling the model's update speed during training.
B: Maximum sequence length, the number of items considered in a single training batch.
θ: Model parameters (weights and biases) to be learned during training.
count: Counter tracking progress within a sequence.
su,0: Initial state representation for a given sequence.
∇θ: Gradient operator, representing partial derivatives of a function with respect to model parameters θ.
ΣBt=1: Summation notation, summing values from t=1 to B.
γ^(t-1): Discount factor raised to the power of (t-1), used for discounting future rewards in RL.
(u, Iu): A tuple representing a user u and their interaction history Iu.
|Iu|: Length of the interaction history for user u.

Design System

Designing reflective practice assessment tools for teachers on a Learning Management System (LMS) with AI adaptive feedback involves creating a system that allows teachers to reflect on their teaching practices and receive personalized feedback based on AI analysis. Here's a flow model system for such a tool:

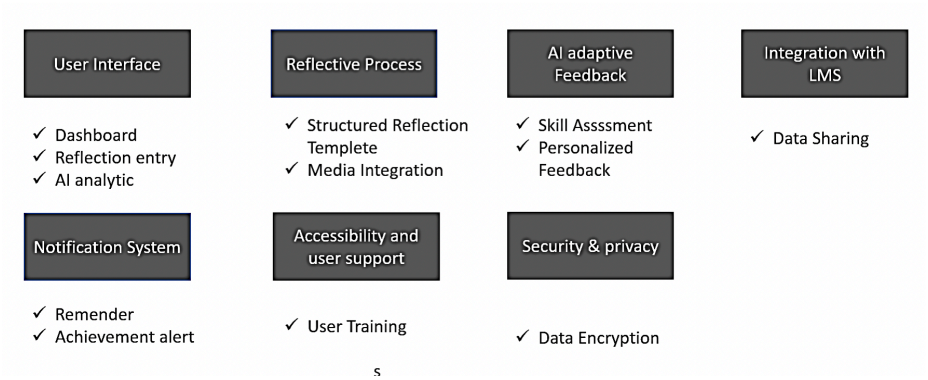


Fig. 3. Tools Design AI Learning Management System

We focus of the system development to be implemented in this AI-based LMS service is: Skill Assessment: Automated evaluation by AI of teaching skills and mapping strengths and areas for development.

Personalized Feedback: Tailored feedback with professional development recommendations. Suggestions for additional learning resources.

Assessment Tools: The LMS is designed for the use of Artificial Intelligence (AI) in assessment tools to enhance efficiency, objectivity, and provide in-depth insights into the performance or understanding of individuals (learners). In detail, the system design for assessments is created with automated evaluation, which can be in the form of Multiple Choice Exams, where the AI system can automate the assessment of multiple-choice answers without human intervention.

Furthermore, in enhancing the performance of the LMS with AI implemented in assessments, a design is also created for the evaluation system of Short and Long Answers, which will utilize Interactive Simulations. This involves the creation of interactive simulations overseen by AI to assess collaboration, leadership, or problem-solving skills.

Soft Skills Assessment: The implementation of the design in this system utilizes AI to analyze participant performance, adjusting the difficulty level and next materials according to individual needs. The final stage of the system's performance is the Learning Recommendations, tasked with providing learning recommendations based on assessment results to improve areas that require special attention.

Results and Discussion

Selection of the recommendation algorithm in the AI-based LMS involves a hybrid model called the Deep Reinforcement Learning-Based Long-Term Recommender System. This model integrates the assessment of learning outcomes as input for the recommendation system and incorporates personalized elements, such as adjusting the learning pace or suggesting additional course materials based on individual needs of the learners.

In the end, incorporating an interactive feedback mechanism allows users to provide feedback on the recommendations given. It is crucial to continually monitor and evaluate the performance of the recommendation system, integrating user feedback and learning data to enhance the accuracy and relevance of the recommendations.

The following are the results of the AI LMS design on the interactive online course platform:

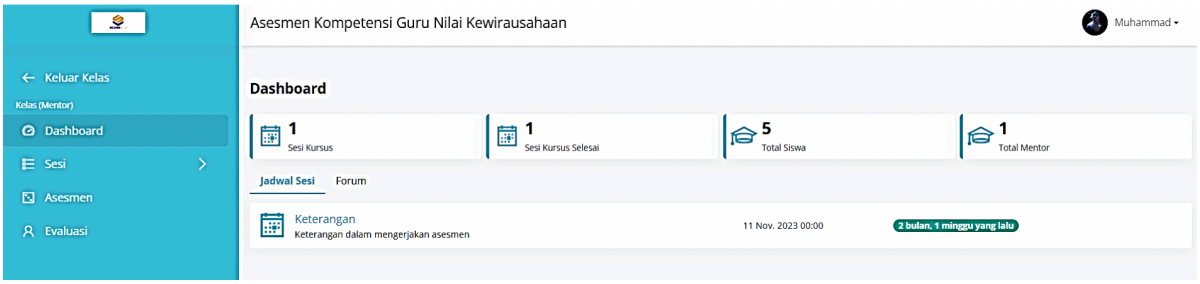


Fig. 4. Visualization of points regarding assessment results, including average scores, score distribution, and trends over time.

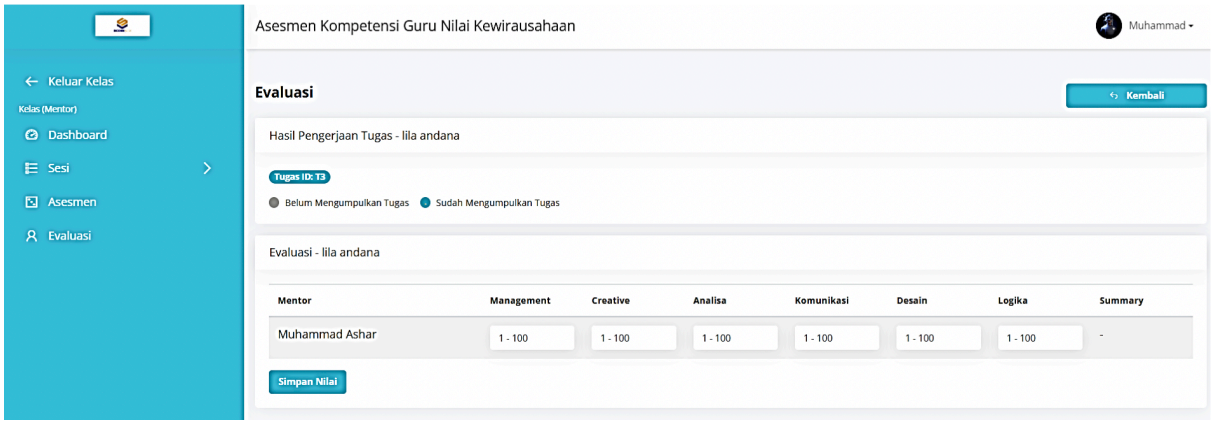


Fig. 5. Points to indicate the overall sentiment in student responses or reflections.

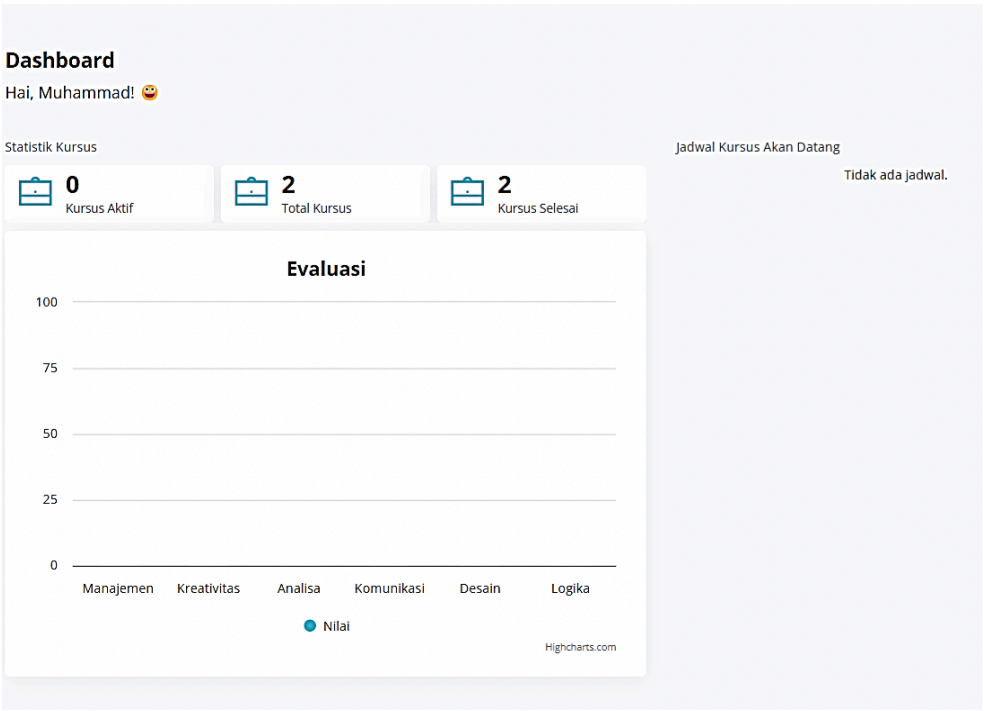


Fig. 6. Line chart depicting the progress of assessment results over time. Detailed captions of response outcomes to understand specific errors or strengths.

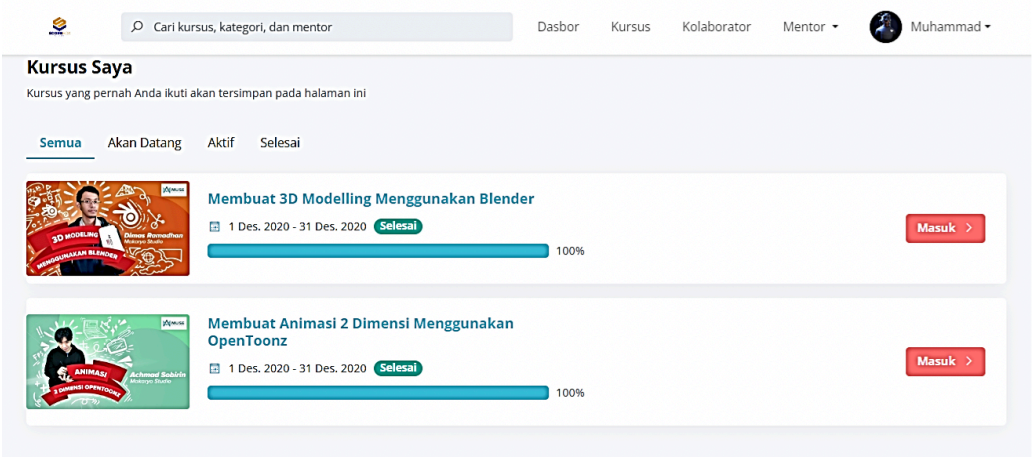


Fig. 7. List of learning or course recommendations based on assessment results and individual learning needs.

Conclusion

The research, therefore, presents an innovative approach towards building a personalized and adaptive AI feedback system. By incorporating final evaluations into the recommendation process, the model aims to provide more supportive and tailored recommendations, reflecting a comprehensive understanding of user preferences and performance across various courses. This adaptive feedback mechanism contributes to the overarching goal of creating an intelligent system capable of generating nuanced recommendations that go beyond traditional course data, thereby enhancing user experience and support Finally, Learning recommendations assigned to provide personalized learning recommendations based on assessment results to address areas that require special attention.

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Global Perspectives on Cool Japan: Exploring the Effects of an English-Medium Instruction Course in a Tokyo Study Abroad Program

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Abstract
This presentation reported on results from a research study examining the influence of a “Cool Japan” course on 35 international students participating in a unique 3-month cultural and language exchange program at a Tokyo university. Serving as an exploration point for connections and diverse cultural perspectives related to "Cool Japan," this Hybrid English Medium Instruction (EMI) course was designed for both Japanese and international students. Notably, this marked the first group of international students hosted by the university since the 2019 COVID-19 pandemic, a return that had been eagerly anticipated by students and faculty alike as a symbol of the university's return to normalcy after the disruptions caused by the pandemic. The presentation will discuss specific themes covered in the 'Cool Japan' course, and examine specific course content, to provide insights into how it encouraged critical thinking skills for students as well as promoted a deeper self-perceived appreciation for the content of “Cool Japan”. Utilizing an exploratory mixed-methods approach, the research combines qualitative insights from in-depth interviews and quantitative data gathered from a structured self-reported questionnaire. The findings reported from this study demonstrate the course's efficacy in promoting cultural exchange, enriching the educational experience not only for the international students in this investigation but also for the participating Japanese students highlighting the course's adaptability to the post-pandemic evolving global circumstances. This research sheds light on the course's role in enhancing cultural adaptability, fostering cross-cultural communication skills, and navigating the complexities of Japanese popular culture in our rapidly changing world.

Keywords: Cultural Exchange, Cool Japan, English-Medium Instruction (EMI), Study Abroad Program, Cross-Cultural Communication

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Introduction

In this presentation, the outcomes of a comprehensive study that examined the transformative impact of a "Cool Japan" course on international students participating in a Tokyo study abroad program. Against the backdrop of declining university enrollments in Japan and the unique challenges posed by the COVID-19 pandemic, our research sought to explore how a Hybrid English Medium Instruction (EMI) course could enhance cultural understanding and critical thinking skills among students from diverse backgrounds.

First, the presentation provided context by discussing the broader challenges facing Japanese universities, particularly the decline in enrollments. Then, it highlighted the importance of international education initiatives, such as study abroad programs, in addressing these challenges and fostering global perspectives among students. Next, the presentation outlined the specific focus of the study: the impact of a "Cool Japan" course on international students in a Tokyo study abroad program. Finally, it previewed the key components of the research, including the design of the course, the characteristics of the study abroad program, as well as the benefits of English-medium instruction (EMI) methodology with both the participating local and international students. Through a comprehensive analysis, the presentation aimed to shed light on the transformative potential of international education experiences in cultivating cross-cultural understanding and enriching the educational development of students participating in a study abroad program.

Decrease in Enrollments at Japanese Universities

In recent years, Japanese universities have faced a significant decrease in enrollments, posing challenges to the sustainability of higher education institutions in the country. According to projections, the number of 18-year-olds in Japan is expected to decline from approximately 1.1 million in 2022 to 790,000 by the year 2050 (Nikkei Asia, 2023). This demographic shift has contributed to a steady decline in university enrollments over the past few decades. For instance, in 1990, university enrollment in Japan stood at 2 million students, compared to an estimated 1.1 million in 2022 and a projected 880,000 by 2040 (Japan Times, 2023). In 2022, approximately 800 universities in Japan had 626,500 enrollment slots available, with more than 40% of private universities failing to meet quotas for the Academic Year 2021 (Nikkei Asia, 2023). This decline in enrollment has particularly impacted private institutions, where tuition and fees constitute a significant portion (70%) of their income. As a result, about half of Japan's 600 private universities operated below capacity in Academic Year 2022, with one-third reporting financial deficits in the previous academic year (Japan Times, 2023).

Efforts to address the decline in enrollments have included initiatives to attract international students. Projections suggest that enrollments could improve to about 85% if the number of international students increases to the average level of Group of Seven (G7) countries. However, even with this potential increase, there remains a shortfall of approximately 100,000 students annually, highlighting the ongoing challenges facing Japanese universities (Nikkei Asia, 2023).

These trends underscore the need for innovative strategies to address declining enrollments and ensure the long-term viability of Japanese higher education institutions. Initiatives such as study abroad programs and international collaborations may play a crucial role in attracting students from diverse backgrounds and fostering a global outlook among Japanese universities.

Context of the Study

The study was conducted in the context of a unique 3-month cultural exchange program at a small Tokyo university, which welcomed its first group of international students since the 2019 COVID-19 pandemic. The program is aimed to facilitate cross-cultural interactions and deepen students' understanding of Japanese language and culture. Thirty-five third-year students from diverse backgrounds, including the USA, Sweden, Ukraine, Uzbekistan, and Mongolia, participated in the program. During the 3-month program, all content courses were taught in English, allowing students to engage with course material regardless of their native language. Additionally, students had the opportunity to study the Japanese language as part of their curriculum, further enriching their cultural experience.

"Within this cultural exchange program, an English Medium Instruction (EMI) course titled “Cool Japan” was offered to all participating students. EMI, as an instructional approach, was utilized, where English is used as the primary language of instruction, even in contexts where it is not the native language. In the case of the "Cool Japan" course, a hybrid EMI facilitated the participation of both Japanese and international students, allowing them to engage with course content effectively. Through a combination of lectures, group discussions, and hands-on activities, the course provided students with a platform to explore various aspects of Japanese popular culture while enhancing their English language skills. This hybrid EMI approach fostered an inclusive learning environment where students from diverse linguistic and cultural backgrounds could collaborate and exchange ideas. Moreover, this EMI course was considered aligned with the program's broader goal of promoting cultural exchange and cross-cultural understanding among participants.

Specifically, EMI is a teaching approach where the primary language of instruction is English, irrespective of whether it is the native language of the students or the country where the instruction takes place (Kirkpatrick, 2014; Rose et al., 2018). Dafouz and Gray (2022) view EMI as the use of the English language to teach academic subjects, other than English itself, particularly in settings where English is a foreign or second language for some learners or teachers. This pedagogical approach has gained prominence in international education contexts, facilitating learning and communication in English across diverse linguistic backgrounds.

In the context of the "Cool Japan" course, hybrid EMI signifies that the course is primarily conducted in English, enabling both Japanese and international students to participate and engage effectively with the course content. This approach promotes inclusivity and fosters a shared learning experience among students from different linguistic backgrounds.

Moreover, the course adopted a hybrid EMI model, integrating elements of both English-medium instruction and English language learning. Japanese students participating in the program completed a spring term class focused on language acquisition, following the Soft Content and Language Integrated Learning (CLIL) approach (Ikeda et al., 2021; Villabona & Cenoz, 2021). This hybrid EMI model combines language instruction with content-based learning, allowing students to develop language proficiency while engaging with course material related to Japanese culture. The utilization of a hybrid EMI approach in the "Cool Japan" course aligns with the broader objectives of the cultural exchange program, which aims to facilitate cross-cultural interactions and enhance students' understanding of Japanese popular culture.

Hybrid EMI in Practice

Coursework involved both international and Japanese students engaged in collaborative group work on topics related to "Cool Japan" This collaborative effort aimed to foster a deeper understanding of Japanese culture and enhance language skills through learner autonomy and cultural immersion. The group work involved various stages, starting with initial planning sessions where students brainstormed ideas and selected topics of interest related to Japanese pop culture, traditional arts, cuisine, fashion, anime, and manga. These topics were chosen to reflect the diverse interests of the students and provide a comprehensive exploration of Japanese society.

During the execution phase, students worked together to conduct research, gather relevant materials, and prepare presentations. Students were encouraged to utilize a variety of resources, including academic literature, online databases, interviews with local experts, and field trips to cultural sites and events. Through this collaborative process, students increased their critical thinking skills, honed their research abilities, while deepening their understanding of Japanese culture. Group presentations served as a platform for students to showcase their findings and insights to their peers and instructors. Each group delivered their presentations in English, allowing for cross-cultural exchange and communication. Presentations were followed by interactive Q&A sessions, where students engaged in discussions, shared perspectives, and provided feedback to their peers.

Throughout the entire group work process, students were encouraged to take ownership of their learning and exercise learner autonomy. They had the freedom to explore topics of personal interest, take initiative in their research endeavors, and express their ideas creatively. This approach empowered students to become active participants in their own learning journey and develop a sense of ownership over their academic experiences in an international atmosphere.

Furthermore, the collaborative nature of the group work promoted language and culture enhancement for both international and Japanese students. By working together in multicultural teams, students had the opportunity to practice English language skills in a real-world context, improve communication abilities, and gain insights into different cultural perspectives. Japanese students, in particular, benefited from the exposure to diverse viewpoints and language models, which contributed to their language proficiency and intercultural competence while forging meaningful connections with their peers.

Course Feedback From Participants

International students expressed gratitude for the opportunity to immerse themselves in Japanese society and culture. One student remarked, "This program has allowed me to immerse myself in Japanese society, which I wouldn't have had otherwise." Interacting with Japanese peers was particularly impactful, as it helped break down language barriers and deepen their understanding of Japanese culture. As one student noted, "Interacting with Japanese students has helped me understand their culture on a deeper level and break down language barriers." Collaborating with Japanese students enriched the international students' learning experience by providing unique insights into Japanese culture. They appreciated the diverse perspectives brought by their Japanese peers, which enhanced discussions and deepened their understanding of Japan's societal norms and values. Furthermore, the inclusive environment created by Japanese students made them feel valued and respected, contributing to a more meaningful and enriching study abroad experience.

For Japanese students, the cultural exchange program offered opportunities for language improvement and personal growth. They found that explaining Japanese culture to international students not only helped them improve their English skills but also deepened their understanding of their own culture. As one student stated, "Explaining Japanese culture to the international students helped me learn about Japan and improve my English too!"Engaging in discussions about Japan in English also stimulated critical thinking skills among Japanese students. They found that discussing their culture in a foreign language encouraged them to reflect more deeply on Japanese society and its values. Moreover, Japanese students enjoyed the opportunity to share their culture with students from other countries, fostering enjoyment and interest in cross-cultural exchange.

Benefits and Challenges to Hybrid EMI

This hybrid EMI course "Cool Japan" course may be viewed as playing a crucial role in fostering a sense of inclusion among international students within the university community. By offering a curriculum that caters to both Japanese and international students, the course creates opportunities for cross-cultural interaction and collaboration. As a result, international students commented that they felt more integrated into university life, as well reporting they formed connections with their Japanese peers while participating in academic and social activities together. This increased sense of belonging enhanced the overall university experience for international students in this study.

The experiential nature of the "Cool Japan" course contributed to creating authentic learning experiences for all students involved. Through hands-on activities, cultural excursions, and interactions with local communities, students gained firsthand insights into Japanese culture and society. These authentic experiences went beyond traditional classroom learning and allowed students to engage with Japanese culture in meaningful and immersive ways. As a result, students remarked that they felt they developed a deeper appreciation for Japanese culture and a more nuanced understanding of its complexities.

The increased contact between student groups in the "Cool Japan" course may be viewed as facilitating an increased collaboration between Japanese and international students. Through group work, discussions, and presentations, students from different backgrounds came together to explore common interests and exchange ideas. This increased interaction breaks down cultural barriers and fosters mutual understanding and respect among students. As a result, both Japanese and international students benefited from exposure to diverse perspectives and experiences, thus enriching their educational journey and fostering a sense of global citizenship.

The positive effects of the "Cool Japan" course extend beyond individual classrooms to shape the overall international atmosphere within the university. As students engage in cross-cultural activities and interactions, they contribute to creating a more cosmopolitan and inclusive campus environment. This international atmosphere enhances the university's reputation as a global institution and attracts students from around the world. Moreover, it fosters a sense of openness and diversity that enriches the educational experience for all students, regardless of their cultural background.

While the Hybrid English Medium Instruction (EMI) "Cool Japan" course has proven to be beneficial for both international and Japanese students, several challenges and hurdles need to be addressed to enhance its effectiveness and accessibility. One of the primary challenges faced in the course is leveling language proficiency among students and adapting teaching

methodologies to accommodate diverse linguistic backgrounds. In a multicultural classroom where students have varying levels of English proficiency, it can be challenging to ensure that all students can fully engage with the course content. Strategies such as translanguaging and active learning techniques may need to be employed to create a supportive learning environment where students can effectively communicate and participate regardless of their language proficiency level (Martin-Beltran et.al, 2017).

Another issue that must be addressed is that while the "Cool Japan" course is designed to cater to both Japanese and international students, there may be barriers to accessibility for Japanese students, particularly in terms of language and cultural familiarity. Japanese students may face challenges in navigating course materials and discussions conducted primarily in English, especially if they have limited English language proficiency. Additionally, cultural differences in learning styles and expectations may impact Japanese students' participation and engagement in the course. Therefore, efforts should be made to ensure that the course is inclusive and accessible to all students, regardless of their linguistic or cultural background(Stigger, 2018). Efforts to overcome these hurdles will contribute to creating a more inclusive and enriching learning environment for all participants.

Conclusion and Future Implications

In conclusion, this presentation has provided insights into the influence of the "Cool Japan" course on international students participating in a 3-month cultural and language exchange program at a Tokyo university. Through a Hybrid EMI approach, the course served as a platform for exploring connections and diverse cultural perspectives related to "Cool Japan," benefiting both Japanese and international students. The findings of the research study demonstrate the course's potential effectiveness in promoting cultural exchange and enriching the educational experience for participants. Through qualitative insights and quantitative data analysis, the study revealed how the course encouraged critical thinking skills and fostered a deeper appreciation for Japanese popular culture among students. Additionally, the course's adaptability to post-pandemic global circumstances highlights its relevance in facilitating cross-cultural communication and enhancing cultural adaptability in today's rapidly changing world.

Looking ahead, several implications emerge for the future of the "Cool Japan" course and similar initiatives. Firstly, there is a need for the promotion of the course to attract more participants and enhance its visibility within the university community and beyond. Effective marketing strategies and outreach efforts can help increase enrollment and broaden the course's impact. Furthermore, refining the course content based on feedback and evaluation is essential for continuous improvement. Incorporating new themes, incorporating interactive learning activities, and integrating student feedback can enhance the course's relevance and effectiveness. Through faculty collaboration there is a potential for expanding the course to include other topics or disciplines, providing students with diverse learning opportunities and fostering interdisciplinary connections. By expanding the scope of the course offerings, the university can further enrich the educational experience for students and contribute to a more comprehensive understanding of Japanese culture and society as well as aid with dwindling enrollments.

Finally, the "Cool Japan" course holds promise as a vehicle for promoting cultural exchange, enhancing educational experiences, and preparing students for success in a globalized world.

Through ongoing promotion, refinement, and expansion, the course can continue to serve as a valuable platform for cross-cultural learning and engagement in Post-Pandemic Japan.

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The Magical Leadership Journey of Two Heroes Harry Potter and Neville Longbottom: A Comparative Analysis of Leadership Theories in Popular Culture

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Abstract
This paper compares and contrasts two key characters from the popular Harry Potter series about the process of becoming a leader and hero through two leadership theories. Harry, known as the "Chosen One", is viewed as a natural leader and hero based on the trait theory (Fleenor, 2006). In contrast, Neville, who is considered a leader and hero in the latter part of the series, is believed to have undergone training and acquired leadership skills, which aligns with behavioral theory (Khan et al., 2016). This study analyzes the factors contributing to their leadership development, including family backgrounds, personal experiences, critical events, and relationships with others portrayed in the series. The result shows that the combination of natural qualities and external influences shapes their development as leaders, which highlights the complexity of leadership development. The alignment and misalignment of Harry and Neville's journeys with the trait and behavioral theories of leadership in the Harry Potter series provide valuable insights for leadership education among young people. By examining the characters' experiences and identifying the factors contributing to their development as leaders, educators can develop more effective leadership curriculum and programs that incorporate stories of protagonists from popular culture who become leaders in different paths. This paper calls for more research on leadership theories in popular culture for children and adolescents, highlighting the importance of leadership education and inspiring young people to become leaders in their own lives.

Keyword: Leadership Education, Trait Theory, Behavior Theory, Harry Potter; Popular Culture

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Introduction

Have you ever read or watched the Harry Potter series? Have you ever wondered what it takes to be a great leader in the Wizarding World? J.K. Rowling's Harry Potter series has become a beloved classic, attracting audiences with its magical world and characters. The audience witnesses the growth of Harry Potter and Neville Longbottom, two characters who start with similar sufferings but become leaders in their own way at different times. Through analysis of their family backgrounds, personal experiences, critical events, and relationships with others portrayed in the series, valuable insights can be gained about the factors that contributed to their leadership development. Additionally, a deeper understanding will be achieved by comparing and contrasting their process of becoming a leader and hero based on two leadership theories. According to the trait theory (Fleenor, 2006), Harry, known as the "Chosen One", is viewed as a natural leader and hero. In contrast, Neville, who is considered a leader and hero in the latter part of the series, is believed to have undergone training and acquired leadership skills, which aligns with behavioral theory (Khan et al., 2016).

Join me on this academic exploration of Harry and Neville's leadership journeys. To better understand the leadership development of Harry and Neville, the following research questions will be explored:

1. How does Harry's development as a leader in the Harry Potter series align with the trait theory?
2. In what ways does Neville's growth as a leader in the Harry Potter series align with the behavioral theory?
3. How can the alignment of Harry and Neville's journeys with the trait and behavioral theories of leadership inform leadership education for young people, and how can this alignment be put into practice?

Roadmap

This paper will delve into the leadership theories of two key characters, Harry Potter and Neville Longbottom. First, I will provide an overview of their family backgrounds, personal experiences, and relationships with others in the series.

Then, I will briefly introduce and compare the two leadership theories: behavioral and trait theories. I will delve into the stories and examine what led Harry and Neville to become leaders in different contexts. Critical events that shaped their leadership roles include the death of their parents, the formation of Dumbledore's Army, and the final battle of Hogwarts.

Furthermore, I will examine two critical characters that greatly impacted Harry and Neville's leadership journeys. Professor Albus Dumbledore, a powerful and influential mentor to Harry, plays a significant role in guiding Harry toward his leadership role. On the other hand, Lord Voldemort, the biggest antagonist in the story, is responsible for Harry and Neville's parents' deaths, causing them to fight against him and eventually leading them to become leaders in their own ways.

Finally, I will call for more research on leadership theories in popular culture for children and adolescents, highlighting the importance of leadership education and inspiring young people to become leaders in their own lives.

Who Are the Heroes?

Harry Potter is a young orphan who lives with his abusive relatives, the Dursleys, until he finds out that he is a wizard and attends Hogwarts School of Witchcraft and Wizardry. Harry's parents were killed by the dark wizard Voldemort when he was just a baby. He was left with a lightning-shaped scar on his forehead due to the spell. Throughout the series, Harry, a brave Gryffindor, goes on numerous adventures with his friends, facing many challenges and obstacles, and ultimately defeats the biggest antagonist Voldemort. Harry's best friends, Ron and Hermione, bring unique perspectives and set of skills that complement his own, and their friendship allows them to face the challenges of the wizarding world together. Harry's relationships with other fellow students at Hogwarts also shape his leadership development. His rival, Draco Malfoy, for example, challenges Harry to stand up for his values and beliefs, while his friendship with Neville Longbottom highlights the importance of helping others to reach their leadership potential.

As a peer and follower of Harry, Neville Longbottom grows as a true leader in later parts of the story, providing an inspiring example of how one can overcome adversity, reach their full potential, and shine as a leader and hero. Neville is also a member of the Gryffindor house. Neville's family was deeply attacked in the resistance against Voldemort, and both of his parents were tortured to insanity by Voldemort's Death Eater, Bellatrix Lestrange. This traumatic event profoundly impacted Neville's life and greatly influenced his personal growth and leadership development. Neville is known for his timid character, and he was perceived by many as weak and bumbling. He struggles with self-doubt and lacks confidence. However, his true potential was revealed as he became more confident and stepped up as a leader, taking charge of Dumbledore's Army in Harry's absence.

Despite being underestimated, Neville proves to others that he is a capable and effective leader. He consistently demonstrates loyalty to his friends and is always willing to stand up against injustice. Eventually, he earns his peers' respect and ultimately plays a critical role in defeating Voldemort.

In the Harry Potter series, both Harry and Neville are portrayed as victims of the dark force. Harry became an orphan when his parents were killed by Voldemort, and he was forced to live with his cruel and neglectful relatives. Similarly, Neville's parents were tortured to insanity by Voldemort's Death Eaters, leaving him with his grandmother as his only caregiver. Both characters faced significant challenges and difficulties from a very young age, influencing their character development and leadership journeys.

Moreover, it is interesting to ponder the fact that Neville could have been the chosen one instead of Harry. Both were born at the end of July. Sybill Trelawney, a seer and Divination professor at Hogwarts, foretold that both could have potentially fulfilled the prophecy by defeating Voldemort (Rowling, 2003). The fact that Harry was chosen over Neville to be the one to defeat Voldemort could be explained by the power of fate and destiny, but it also emphasizes how individual choice and agency can affect one's future. Despite not being the chosen one, Neville still plays a vital role in the fight against Voldemort and demonstrates significant leadership power, which shows that one's leadership potential is not constrained by fate.

How Did They Become Leaders Differently?

Before exploring the analysis of the leadership of Harry and Neville, I will introduce the two leadership theories. Trait and behavioral theories employ two different approaches to understanding how one becomes a leader. The trait theory suggests that certain personality traits, such as intelligence, courage, and assertiveness, are inherent and essential to be a good leader (Fleenor, 2006). On the other hand, behavioral theory approaches effective leadership as not determined by inherent traits but by the leader's behaviors and actions (Khan et al., 2016). It emphasizes the importance of learning about becoming a leader rather than what traits they are born with from the beginning.

In the previous section, we have compared the similar childhood and sufferings between Harry and Neville. Due to the choice made by Voldemort, Harry became the “Chosen One” and is known as “The Boy Who Lived” when he was only one year old (Rowling, 1997). He did not fail the wizarding world’s expectations and hope and defeated Voldemort in the last book. Growing up with abusive relatives, Harry displayed outstanding “adaptability” and dealt with them in an isolated and obedient manner (Fleenor, 2006). After being introduced to the wizarding world by Hagrid and entering Hogwarts, he quickly becomes friends with many peers, especially Hermione and Ron (Rowling, 1997). He showed his kindness to his friends and became the leader of the “Gold Trio”. Even being treated badly by his rival Draco Malfoy and some fellow students from the Slytherin House, Harry could maintain his emotion and not let their negative behavior affect him to pursue the grand goal. He remained focused on his studies and missions and continued working hard to become a powerful wizard. When he learned from Hagrid and Dumbledore that he would be the one to defeat Voldemort, he did not hesitate or resist but was “eager to accept responsibility” and continued to learn and grow to be successful (Fleenor, 2006).

Besides, Harry is intelligent, vital physically, and demonstrates task competence in numerous events (Fleenor, 2006). For example, in the fourth book, "Harry Potter and the Goblet of Fire," Harry is one of the champions to participate in the Triwizard Tournament, which includes multiple tasks testing intelligence and physical abilities (Rowling, 2000). In another task in the last book, Harry takes on the responsibility of finding and destroying the remaining Horcruxes, showing his competence in planning and executing such a complex task independently and collaboratively. Harry’s successes in finishing these tasks demonstrate his excellent physical abilities, intelligence, and perseverance.

Harry consistently demonstrates remarkable and unbelievable courage facing lots of hindrances. He often puts himself in danger to protect others. Harry is also highly determined and resolute under challenging situations and refuses to give up even when things seem impossible. For instance, in the Order of Phoenix, he enters the Ministry of Magic to rescue Sirius and Ron’s father, even though he knows it is highly likely to be a trap (Rowling, 2003). He also shows excellent resolution in facing his own death in the Deathly Hallows. He accepts his fate and chooses to sacrifice himself to defeat Voldemort.

In addition, he is also trustworthy for people around him. He can keep secrets even in front of personal risk. For example, despite threats and torture, he keeps the truth about Snape's true identity from the Death Eaters in the Deathly Hallows. He is also loyal to his friends and allies and can do anything to protect them from getting hurt. He risks his own safety and life to save them. For example, in the Goblet of Fire, he rescues Gabrielle Delacour during the Triwizard

Tournament without caring about the scores and when he tries to rescue Ginny from the Chamber of Secrets in the second book (Rowling, 1998).

Besides, Harry demonstrates a strong empathy and understanding towards others, even those who have treated him badly. For example, he shows kindness and compassion towards Dobby, a house-elf who was mistreated by his masters (Rowling, 1998). Harry displays a keen comprehension of his friends and allies, prioritizing their well-being over his own. He is particularly empathetic towards those who have suffered loss or trauma since he has experienced the pain himself with his parents' deaths. For example, he helps Hagrid when he is grieving over the death of Aragog and supports Neville when he is struggling with his own fears and lack of confidence (Rowling, 1998).

Furthermore, Harry has a natural ability to inspire and motivate those around him. In the fifth book of the Harry Potter series, Harry, Ron, and Hermione form a secret organization called Dumbledore's Army in response to the Ministry of Magic's efforts to conceal news about Voldemort's return and their authoritarian policies at Hogwarts. As the most skilled and experienced fighter and wizard among the group, Harry takes on the role of leader, teacher, and coach for the group of students, using his knowledge of practical defense against the dark arts to instruct his fellow students in practicing defensive magics. He not only teaches the spells to the members for one-on-one and whole group sessions but also motivates them to believe in themselves and have strong hearts (Rowling, 2003). Harry's ability to connect with and understand the needs of his fellow students is also evident in the way that he tailors his teaching to each member's strengths and weaknesses. He also creates a sense of camaraderie and loyalty among the members of Dumbledore's Army by treating everyone with respect and valuing their contributions and voices.

Harry's natural charisma and passion for the cause of fighting Voldemort help to motivate and inspire his fellow members of Dumbledore's Army. Under his leadership, the group becomes a powerful and unbreakable force for resistance and rebellion against the oppressive power of Professor Umbridge and the Ministry of Magic (Rowling, 2003). Through Dumbledore's Army, Harry also learns important leadership skills such as communication and trust-building. He learns to rely on his friends and to distribute tasks and power to others to accomplish their goals more effectively as a team. For example, he delegates the task of finding and guarding the Ravenclaw Diadem to Luna Lovegood and Neville Longbottom while he continues with the mission of destroying the remaining Horcruxes (Rowling, 2007). This shows his trust in their abilities and commitment to the goal of defeating Voldemort in a collective effort.

Ultimately, Dumbledore's Army plays a critical role in the final battle against Voldemort and his Death Eaters. Many of its members, including Neville Longbottom, Ginny Weasley, and Luna Lovegood, become important fighters and leaders in the resistance. Harry's leadership of Dumbledore's Army helps to empower and motivate his fellow students to stand up against the Ministry of Magic and the evil forces. His ability to motivate people and create a sense of shared purpose and belonging is one of his most notable leadership qualities.

While Harry's leadership style aligns with the trait leadership theory, Neville's journey toward becoming a leader can be better explained through the behavioral theory of leadership. Throughout the series, Neville is portrayed as timid, clumsy, forgetful, and insecure, lacking confidence in his abilities and often getting bullied by his peers. Unlike Harry, who exhibited leadership qualities from an early age, Neville's leadership potential was not immediately apparent at the beginning. However, as the story progresses, Neville begins to show signs of

growth and development as a leader. He gradually becomes more assertive and confident in various events, especially after joining Dumbledore's Army and being mentored by Harry. Under Harry's guidance, Neville learns to hone his skills in spells and leadership, gradually building his competence and confidence as a leader based on his experience and what he has learned from others.

Neville's transformation makes a great appearance in the final book, where he assumes the role of the leader of Dumbledore's Army after Harry and his friends leave Hogwarts to find Horcruxes (Rowling, 2007). In this role, Neville displays a strong sense of responsibility, taking charge of the whole group and motivating them to fight against the Death Eaters and protect Hogwarts from the Death Eaters. His leadership is firm but compassionate when he encourages his fellow students to stay strong and fight for what they believe in. In comparison to his earlier character, Neville's transformation into a confident and capable leader is significant and thought-provoking. His development as a leader is a gradual process shaped by his experiences, mentors, and personal growth. From being hesitant and uncertain to taking charge and leading others, Neville's journey makes an outstanding example of how behavioral theory can help explain the development and growth of leaders. Through his experiences with Dumbledore's Army and his mentorship under Harry, Neville develops his skills, builds his confidence, and grows as a capable and inspiring leader at his own pace and way.

As Harry and Neville develop their leadership skills, they encounter two influential characters in the series: Dumbledore and Voldemort. They both significantly impact Harry and Neville's development as leaders. Dumbledore serves as a mentor and guide to Harry throughout the series, offering advice and wisdom to help Harry face the challenges as the Chosen One. Dumbledore is a wise master, and he is always calm and patient. He deeply understands human nature and is committed to justice and the greater good. His influence on Harry is profound because Harry learns valuable lessons about leadership, loyalty, and sacrifice from him. For example, in the fifth book, Dumbledore teaches Harry about the power of communication and the importance of building alliances in the fight against Voldemort (Rowling, 2000). In the sixth book, Dumbledore encourages Harry to take a more active role in preparing for the final battle and teaches him the importance of making difficult choices and sacrifices (Rowling, 2005).

Voldemort, on the other hand, demonstrates the opposite of Dumbledore's leadership style. He is a tyrant who rules his followers through fear, intimidation, and violence. He lacks empathy, and he enjoys manipulating others for his own good. Voldemort's influence on Harry is primarily negative, as Harry is forced to fight the evil and darkness within himself from a very young age and is left with the mission to defeat him. However, Voldemort's influence on Neville is more neutral. Neville's parents were tortured into insanity by Voldemort, and Neville grows up with a great fear of the dark wizards. However, when he becomes more involved in the fight against Voldemort, Neville begins to overcome his fear and develop the courage to stand up and fight him. Voldemort's influence on Neville serves as a catalyst for his growth as a leader. He learns to overcome his limitations and become a powerful wizard in the fight against Voldemort and the dark force.

Throughout the series, both Harry and Neville undergo significant growth and development as leaders, influenced by their experiences of different events and mentorship with various characters. Harry’s leadership skills are shaped early on by his experiences with Dumbledore, who serves as a mentor and guide throughout his time at Hogwarts. Dumbledore helps Harry to understand the importance of compassion, empathy, and selflessness in leadership, teaching

him to value the lives of others and always to do what is right for the greater world. Under Dumbledore's guidance, Harry learns to think strategically and critically and becomes good at solving problems under various circumstances. He has developed his ability to make tough decisions and work together with his allies in fights and difficulties.

Similarly, Neville's growth as a leader is heavily influenced by his experiences with Harry, who serves as a mentor and role model in the series. Harry's leadership of Dumbledore's Army helps to inspire and motivate Neville, giving him a sense of purpose and direction. During his interactions with Harry, Neville learns to believe in himself and to trust his own abilities, gradually building his confidence and competence as a leader.

When it comes to leadership development in Harry and Neville, one can possibly argue that they represent two different leadership theories. Harry's leadership style aligns with the trait theory, as he exhibits leadership qualities from an early age, which should be attributed to innate characteristics such as bravery, intelligence, and charisma. Harry's natural leadership is also shaped by the guidance and mentorship of influential figures like Dumbledore and Sirius Black, who help him develop his leadership skills through their own experiences. On the other hand, Neville's journey toward becoming a leader can be better explained by the behavioral leadership theory. Neville initially lacks confidence and is often bullied, but he develops as a leader after joining Dumbledore's Army and being mentored by Harry. Under Harry's guidance, Neville learns to follow Harry’s thinking, actions, and abilities, shining in the leadership role of Dumbledore's Army in the final book.

Despite these differences, it is important to note that both Harry’s and Neville's development as leaders is influenced by a combination of innate traits and environmental factors. Harry may have been born with certain qualities that make him a natural leader. However, it is the guidance and experiences he gains from mentors like Dumbledore and Sirius that allow him to develop these traits thoroughly. Similarly, while Neville's leadership potential may not have been immediately apparent, his leadership growth and development were shaped by his experiences in Dumbledore's Army and his mentorship under Harry. In both cases, it is the combination of natural qualities and external influences that shapes their development as leaders.

Conclusion and Implications

Harry Potter and Neville Longbottom are fictional characters, and their leadership development are open to interpretation. However, we can make some observations based on their behaviors and actions throughout the Harry Potter series. The examples provided above demonstrate how Harry and Neville's family backgrounds, personal experiences, and relationships with others in the series have influenced their leadership growth. Both Harry’s and Neville's development as leaders are shaped by a combination of innate traits and external factors, which highlights the complexity of leadership development. Moreover, the Harry Potter series showcases the significance of persistent effort and dedicated practices in coming of age and becoming a hero. Through the characters' struggles and successes, young people can learn the value of hard work and commitment in achieving their own leadership goals.

The alignment and misalignment of Harry and Neville's journeys with the trait and behavioral theories of leadership in the Harry Potter series can provide valuable insights for leadership education among young people. To effectively integrate the insights from Harry Potter and Neville Longbottom’s leadership journeys into youth leadership education, the following educational practices are recommended.

Developing a curriculum that centers around the analysis of literary characters, such as Harry and Neville, can help illuminate their leadership qualities and behaviors. The curriculum would involve lessons that explore these characters' decisions, actions, and growth, linking them to different theories of leadership. Discussing how personal challenges, inherent qualities, and other factors contribute to leadership development can provide students with insights into how they might develop similar traits and behaviors. Reflective practices are crucial in helping young people identify and develop their own leadership. Activities such as journaling or creating digital stories about their leadership experiences allow students to document and reflect on their personal growth and the effectiveness of different leadership styles they experiment with. Connecting students with mentors who exemplify strong leadership through both traits and behaviors can provide real-world role models and guidance. These mentors help bridge the gap between theoretical knowledge and practical application, offering advice and sharing their own experiences. Workshops and guest talks from experienced leaders can also inspire students and provide practical insights into the realities of leadership. Engaging students in community service projects where they can take on leadership roles is an excellent way to apply their learning in real-world contexts. These projects not only help students practice leadership but also benefit their communities, reinforcing the importance of responsible and effective leadership. By focusing on these educational practices, leadership education for young people can be enriched, making it more engaging and applicable to their everyday lives.

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Examining Underprepared Students

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Abstract
Universities in Japan have been suffering a shortage of applicants due to the declining number of 18-year-old population. To secure intake quotas and finance, many universities have been accepting many underprepared students, which may result in increases of academically low proficiency level students. In such a situation, roles of placement have become more important. Placement tests are given to new students to measure their knowledge in various subject areas. They are usually used for placing students into appropriate level of classes. It secures a proficiency-based learning, provide individuals equitable, relevant learning opportunities. With such diagnoses, it is possible to identify unprepared students who need appropriate and effective support while necessary intervention would be considered. However, for better understanding of these underprepared students, further information on individuals should be necessary. The aim of this study is to investigate underprepared students. Their English proficiency levels, vocabulary sizes, educational backgrounds, admission styles, their attitude and perception toward English learning, and GPA scores are revealed. The analysis involves numerical presentation, distributions, frequency, and correlations. The study found correlations among the above-mentioned factors. It is also found that distinctive characteristics of underprepared students when they are compared with other students whose proficiency levels are not low. It is hoped the results found it this study may help to build more appropriate and supportive educational environment as well as to have better predictions of early failure (possible drop out).

Keywords: Underprepared Students, Admission Styles, Systematic Support

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Introduction

According to the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the percentage of students proceeding to university has been steadily increasing, reaching a record high of 61.1% in 2023. The declining population of 18 year olds has resulted in various issues in tertiary level education, which remain unsolved. In 2023, it was reported that more than half the private universities in Japan are under-enrolled. These universities have been struggling to secure the intake quota. In such situations, universities widen the acceptable range to gain more applicants.

However, such a measure results in a decline in academic levels. Therefore, many universities are now dealing with underprepared students. Hence, it is essential to identify their problems and provide them with support to enable them to continue their education and graduate from university.

Statement of the Problem

Due to the declining birthrate as well as the college-aged population, many Japanese universities have been unable to gain applicants and are taking measures to secure the required number of students. Universities favor early admissions, wherein students gain acceptance during November or December instead of during the regular admission period from January to March. For early admission, students are not required to take subject tests, instead recommendations from their high school, their high school records, short essays written by them, and interviews are used for admission decisions. Another strategy used by universities is to enroll students from certain high schools (Shiteikou), thus assuring students of admission based on the recommendation of these high schools.

Such integrated selection methods, in which students are admitted without taking subject tests are becoming popular. According to the MEXT, the number of students enrolled through these methods has been increasing. Although these measures are effective in securing a certain number of applicants, students are not selected through university entrance exams, which may be the main cause of declining academic levels or the ability gaps among students.

Significance of the Study

In the current scenario, placement tests play an important role. Placement tests are administered to new students to assess their knowledge of various subject areas. These tests are used to place students into appropriate levels of classes. Moreover, through placement tests, unprepared students who require appropriate and effective support can be identified. A better understanding of such underprepared students including their proficiency levels, their background, and the difficulties they face is necessary to provide them with appropriate support.

Purpose of the Study

Therefore, this study focuses on students with low English placement scores. To better understand the needs of these students, further information on these individuals is required. The aim of this study is to examine students with low proficiency English. We examine their academic proficiency which includes their mathematics and Japanese placement scores,

vocabulary size, GPA, final examination scores in the spring and fall semesters, and their admission method. In addition, their attitude and perception toward English learning are also examined. The data is analyzed using numerical presentation, distributions, frequency, and correlations of data.

Background Information of the Study

Use of English Placement Test

The university examined in this study has been using an English placement test since 2007 to identify students with low English proficiency and to create special support classes for these students. This year, the number of students placed into the special support class increased and two of the students dropped out of university.

Japanese Students' Vocabulary Size

The vocabulary sizes of Japanese university students were tested using various measures. The following tests are well known and widely used.

Vocabulary size test by Nation and Beglar (2007).
Vocabulary Level Test (VLT) version 1 by Schmitt (2000) and VLT version 2 by Schmitt, Schmitt, and Clapham (2001).
Vocabulary levels dictation test by Fountain and Nation (2000).
Vocabulary size test by Mochizuki (1998).
Vocabulary size test for Japanese EFL learners using the new JACET list of 8,000 basic words by Hamada et.al. (2021).

The reliability and validity of most of these tests have been examined. The sizes estimated by Nation's test are about 2000 to 2500, while other measures indicate a range from 1541 to 4130, with averages of 2370 to 3800. A vocabulary size of 2000 to 3000 is considered adequate for daily conversation, whereas 5000 is needed for reading authentic text.

Current Situation in Japanese Universities

After the population of 18-year-olds peaked at 2.05 million in 1992, the number has since shrunk to almost half, and has been steadily decreasing. According to the Statistics Bureau of the Ministry of Internal Affairs and Communications Japan, the number of 18-year-olds was at a record low of 1.06 million as of December 2023.

Currently there are 793 universities in Japan, of which 616 (77.6%) are private. In 2024, three new private universities will be opened despite the decline in the population of 18-year-olds. In 2023, more than 50% of the universities could not meet the admission quota, which means that more than half the universities did not have sufficient applicants. It has been reported that this situation has hit universities hard, especially small and regional private ones, who find it difficult to attract students.

The following measures are being taken to fill the capacity.

1. Widening the range of acceptance: Universities are accepting students who would not have been accepted under previous conditions.

2. Using alternative admission methods: Besides, general admissions in which students take subject tests, students are admitted though other methods, such as integral admissions, recommendations, and high school route admissions. For these admissions, the focus is usually students' high school records, their essays, and interviews. According to the MEXT, the percentage of students admitted without taking the general examination reached 50.3 % in 2022, thus exceeding the percentage of applicants admitted through general examinations.

3. Encouraging early admissions: In Japan, the school year begins in April. Generally, university entrance exams are held in February or March. However, recent trends show that early admissions, wherein applicants are admitted in November or December of the previous year, are increasing. Typically, early admissions do not require subject tests. These admissions are based on integrated selection or recommendations, and student evaluations usually involve presentations, group discussions, and writing thematic essays.

Issue of Concern

To secure the admission quota and for financial reasons, universities are accepting more students with low academic levels or underprepared students. In such a situation, the primary role of entrance examinations, in which students' academic proficiency is measured, is declining. Moreover, there is a wide gap in students' academic proficiency levels, between those admitted through general admissions and those who have never taken subject tests. It has been reported that students admitted without taking subject tests tend to lag behind. Many universities are currently dealing with students with a low academic proficiency. Remedial education, pre-entry education, preparing for basic subjects, and freshman seminars have been introduced for students to learn the necessary skills needed for university classes.

Overview of the Current Study

Context
A small private university, which offers majors in rehabilitation (physical therapy and occupational therapy), human communication, and nursing, was examined.

Admission Style
In 2023 and 2024, 11% and 14% of students took general subject tests, respectively. Thus, in both the years, over 80% of students did not take subject tests.

English Education
English is a required course for the freshman and sophomore years. Content-based ESP (English for Specific Purposes) is used.

The Japanese higher education system has been struggling with a demographic decline in the university-aged population since the 1990s.

Participants
The participants were 26 first year students in the special class comprising students who achieved less than 30% on the placement test.

Methods Used in This Study
We reviewed students' records including their method of admission, their scores for three placement tests in English, Math, and Japanese, vocabulary size, GPA (Grade Point Average),

and final scores. Students' perception and attitude toward English learning were measured through an online survey conducted using Microsoft Teams. For the survey, 20 questions (Likert scale) were prepared based on the study by Agawa (2016). The questionnaire identified students' intrinsic/extrinsic motivation as well as negative and positive attitudes toward English learning.

Analysis

SPSS and Excel were used for numerical presentation, distributions, frequency, and correlation analyses.

English Placement Test

Figure 1 presents the longitudinal records of the placement test. Placement tests were introduced in 2007 to identify students' English proficiency and form a special group for students with an extremely low proficiency level so that instructors could provide them with extra support.

Figure 1 shows the changes in placement test scores over the last 17 years. The average placement score for the first year was 60.78, and has been falling ever since with a record low of 43.58 in 2022. The average score of the participants in the current study was 50.4. Moreover, the percentage of students who scored less than one-third, as well as those who scored less than half of the total score has been increasing. In 2007, only 15.74 % of students scored less than half of the total score on the test; however, in 2023, 53.30% of students did not score even half and 21.7% did not score even one-third of the total score.

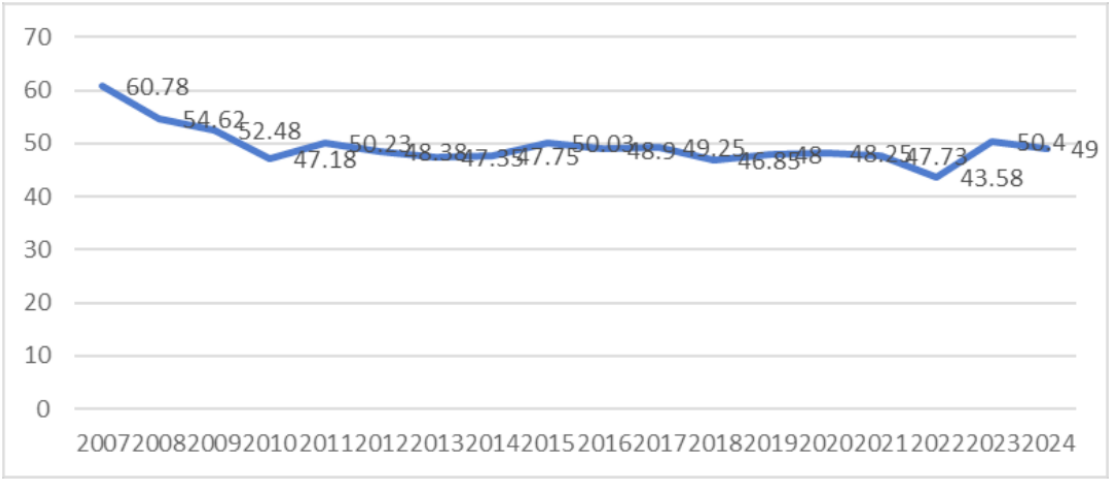


Figure 1: Average placement scores

Conclusion

Findings

Regarding the admission method of the participants, 48% and 40% of students in the special class were admitted through integrated admissions and high school recommendations, respectively. The remaining were admitted through general recommendations and some dropped out. Thus, all students in this class had never taken subject tests and were admitted early in November or December.

The average placement test scores for three tests are presented in Table 1.

	Average score of the special class	Average score of all new students
English	26.7	50.4
Mathematics	41	51
Japanese	42	56

Table 1: Results of three placement tests

As shown in Table 1, students in the special class with low scores in the English placement test also had low scores in the mathematics and Japanese placement tests.

The average vocabulary size of students in the regular and special classes were 2086 and 1541, respectively. Given that the average vocabulary size of Japanese university students is about 2370 and a vocabulary size of 2000 to 3000 is required for daily conversation, whereas 5000 is needed for reading authentic text, it appears that students in the special class had a small vocabulary size, which was not enough for daily conversation.

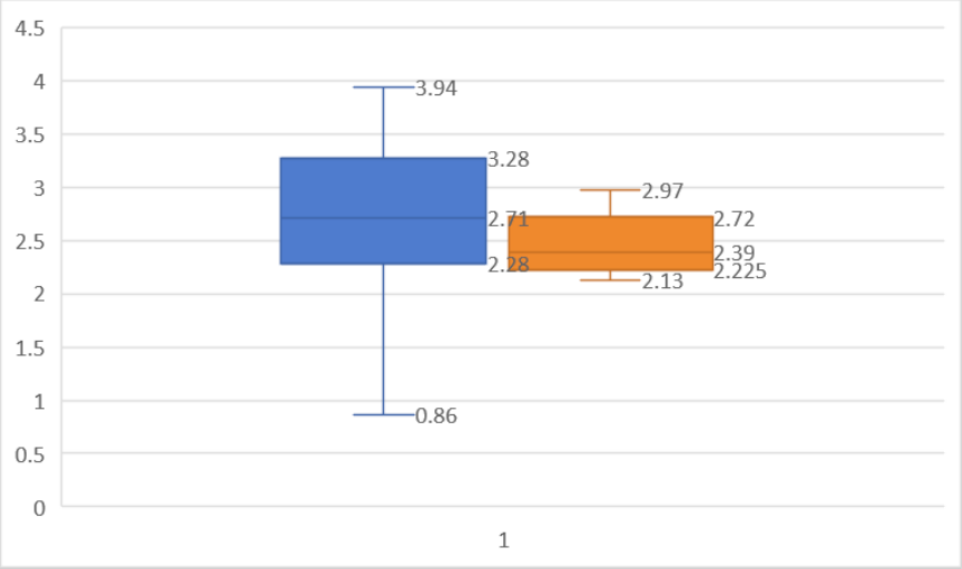


Figure 2: GPA

Figure 2 illustrates the box-whisker plot for GPA. The average GPA of students in the regular class was 2.69 while that of students in the special class was 2.56. Moreover, the interquartile range was extremely short for the special class.

Regarding the final examination scores of the spring and fall semesters, the following was observed. For the spring semester, the average score of the regular class was 74 and that of the special class was 67. For the fall semester, the average score of the regular class was 81 while that of the special class was 68.

Results of the Survey

To present the results, we compared the responses of students in the special class with those of other students. We focused on the percentage of students who either "strongly agree" or "agree" to a particular statement.

Statement	Special class	Regular class
I study English because I feel like to get exposed to English itself.	10	17
I study English out of a necessity to pass exams.	45	27
If I did not need to learn English, I would not.	50	30
I simply don't want to study English anymore.’	23	1

Table 2: Results of the survey

Table 2 shows that for the statement "I study English because I like the exposure to English", which indicates students’ level of intrinsic motivation, only 10% of students in the special class agreed compared with 17% of regular students.

The statement "I study English out of necessity, to pass exams," indicates extrinsic motivation. Of the students in the special class, 45% agreed with the statement while 27% of regular students answered affirmatively.

For the next statement, "If I did not need to learn English, I would not," which indicates students' negative attitude toward learning English, 50% of those in the special class agreed while only 30% of regular students agreed. About half of the students in the special class said that they would not.

The last statement "I simply don't want to study English anymore," also indicates students' negative attitude; 23% of students in the special class agreed while only 1% of regular students agreed. Thus, about a quarter of the students in the special class did not want to study English.

In this study, a correlation analysis was performed among variables. Table 3 indicates the results. A moderate correlation was found between the Japanese placement test scores and GPA ($p < 0.05$ .654). The GPA and final scores also show moderate-to-strong correlations. Moreover, a strong correlation ($p < 0.05$ .897) was found between spring and fall final scores.

		English	Math	Japanese	VST	GPA	Style	Spring	Fall
English	Pearson's correlation	1	.387	.341	-.149	.422	.273	.423	.277
	Significance (2 tails)		.154	.111	.499	.064	.230	.056	.251
	N	23	15	23	23	20	21	21	19
Math	Pearson's correlation	.387	1	-.077	.183	.218	.325	.233	.063
	Significance (2 tails)	.154		.786	.514	.496	.278	.443	.854
	N	15	15	15	15	12	13	13	11
Japanese	Pearson's correlation	.341	-.077	1	.132	.654**	.096	.461*	.524*
	Significance (2 tails)	.111	.786		.547	.002	.678	.035	.021
	N	23	15	23	23	20	21	21	19
VST	Pearson's correlation	-.149	.183	.132	1	-.165	.087	-.010	-.171
	Significance (2 tails)	.499	.514	.547		.486	.707	.965	.484
	N	23	15	23	23	20	21	21	19
GPA	Pearson's correlation	.422	.218	.654**	-.165	1	.077	.597**	.660**
	Significance (2 tails)	.064	.496	.002	.486		.761	.007	.002
	N	20	12	20	20	20	18	19	19
Style	Pearson's correlation	.273	.325	.096	.087	.077	1	.075	.142
	Significance (2 tails)	.230	.278	.678	.707	.761		.761	.573
	N	21	13	21	21	18	21	19	18
Spring	Pearson's correlation	.423	.233	.461*	-.010	.597**	.075	1	.897**
	Significance (2 tails)	.056	.443	.035	.965	.007	.761		.000
	N	21	13	21	21	19	19	21	18
Fall	Pearson's correlation	.277	.063	.524*	-.171	.660**	.142	.897**	1
	Significance (2 tails)	.251	.854	.021	.484	.002	.573	.000	
	N	19	11	19	19	19	18	18	19

**. P ＜001

*. P ＜005

Table 3: Correlational analysis

Summary of Findings

- It was found that the special class comprised students who entered the university through integrated selection, recommendations, and designated school admissions in November or December. These students did not take subject tests, which means that their academic performance was not measured before they entered university.
- This study found that students with low scores on the English placement test had low scores for other variables, such as the Math and Japanese placement tests, vocabulary size, GPA, and final exams. The survey results indicate that more students in the special class had low intrinsic motivation and high extrinsic motivation toward English learning. They had developed negative attitudes toward English learning.
- Two students dropped out of school during the study.
- In the correlation analysis, a moderate-to-strong correlation was found among various variables.
- Strong correlations were found between spring and fall final scores ($p < 0.05$ .897), Japanese placement scores and GPA ($p < 0.05.654$), and GPA and final exam scores.

Implications of the Study

The study revealed that those with low scores on the English placement test also had low scores for other variables and low motivation. Therefore, support for these underprepared

(early admission) students should be the focus. Various approaches can be used such as building a pre-education system as many students have a four-month period before starting university. Introducing on-line self-study site could also be considered. Online sites, where English is taught through games and music, video sharing websites, such as YouTube, or movies can be used to increase their motivation.

In April, it is often found that students do not know how to study. Therefore, it is suggested that students should be shown effective learning strategies or study techniques before starting school. Moreover, students should acquire good study habits and motivate themselves to study. This study found a strong correlation between Japanese placement scores and GPA. Improving Japanese language skills such as writing, summarizing, reading, and presentation skills could be the key to succeeding in college.

Finally but more importantly, students with learning disorders (LD) should be considered. In the special class, some students were identified as having LD or attention-deficit/ hyperactivity disorder (ADHD). In fact, an increased incidence of LD or ADHD among university students has been reported. Therefore, an early evaluation of students' basic academic abilities is urgently required to determine whether they are likely to complete college courses successfully. Hence, early diagnosis of LD or ADHD is noteworthy.

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The Effect of Educational Cash Transfer for Students From Low-Income Families on Students' Dropout Rate in Indonesia

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Abstract
The Indonesian government provides an educational cash transfer program for low-income families with children aged 6-21 so that the children can complete their education up to secondary level (*Program Indonesia Pintar – PIP program*). The Covid-19 pandemic from 2020 to 2022 might hamper the success of this program. Hence, this study aims to see how the PIP program affects the dropout rate of students from low-income families at the primary, junior, and senior secondary levels before and during the Covid-19 pandemic. This study uses cross-sectional data from the National Socioeconomic Survey (SUSENAS) of 2019 and 2021 and applies the propensity score matching (PSM) method. The results show that before the pandemic in 2019, the PIP program decreased the probability of dropping out for students from low-income families at primary and junior secondary schools but not for students at senior secondary schools. However, during the pandemic in 2021, the PIP program decreased the probability of dropping out for students in junior secondary and senior secondary schools but not for students in primary schools. The PIP program only significantly reduces the probability of dropping out for junior secondary students, both before and during the Covid-19 pandemic.

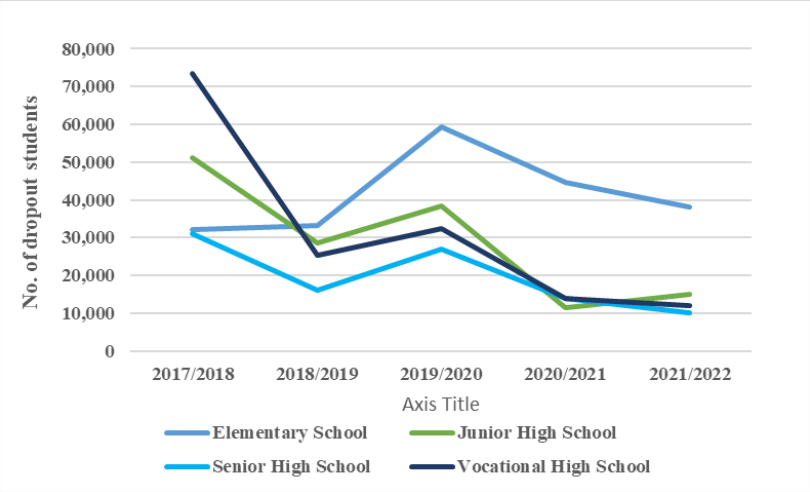
Keywords: PIP, Educational Cash Transfer, Dropout Rate, Low-Income Students, Propensity Score Matching

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Introduction

Education represents an investment in the future and a cornerstone for creating high-quality human resources. Inclusive education that fosters skills development is obligatory for every child, regardless of legal status, nationality, or citizenship (UNESCO, 2019). Education is advocated through Sustainable Development Goal 4 to achieve accessible, equitable, and quality primary and secondary education by 2030. To achieve this goal, every child must complete their education without dropping out (UNICEF, 2017). Despite education being a top priority on the global agenda, the dropout rate is still relatively high. According to UNESCO (2019), the total number of dropout children in 2018 amounted to 258.4 million. The dropout probability for high school students is four times higher than for elementary and twice as high as for junior high school students due to lack of early schooling opportunities, non-compulsory upper secondary education, and high school-aged children opting to work rather than continue their education (UNESCO, 2019).

Indonesia is among the countries facing the challenge of student dropout. According to the Ministry of Education, Culture, Research, and Technology of Indonesia (MoECRT), in the 2021/2022 academic year, there were 75,303 school dropouts in the country, with the highest number of dropouts being at the elementary school level (Figure 1). There was an increase in dropout rates at all levels of education during the 2019/2020 academic year due to the outbreak and spread risk of Covid-19. The number of dropout students has been relatively higher at the elementary school level since 2018/2019. However, the dropout rate was the lowest at elementary schools, with 0.24%. The dropout rate of junior high school students was 0.39%, senior high school was 0.55%, and vocational high schools was 0.65%.



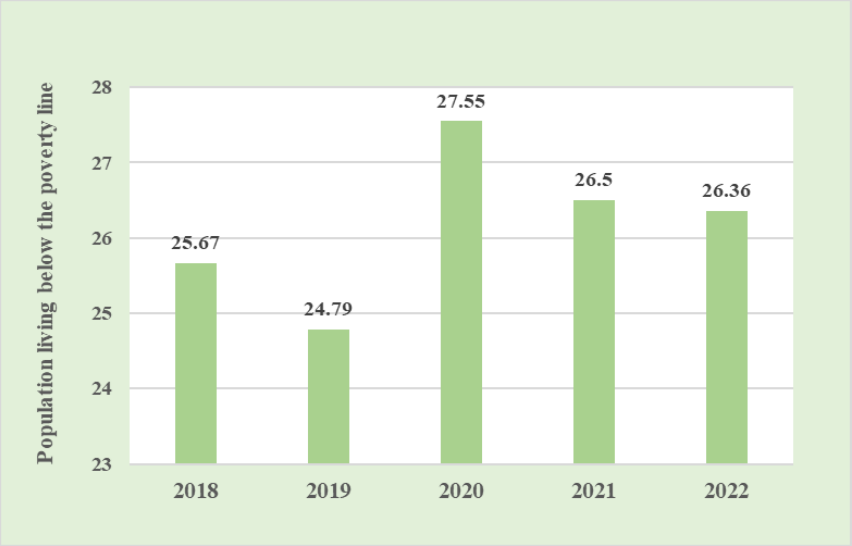
Source: MoECRT (2021), https://databoks.katadata.co.id (2022)

Figure 1: The number of school dropouts in Indonesia from 2017/2018 to 2021/2022

One of the main factors contributing to the increase in dropout rates in Indonesia is poverty. Most families (76%) stated that their children dropped out of school due to economic factors, with 67% unable to afford school fees and 8.7% needed their children to help support the family financially (Ali, 2009). According to UNICEF, 938 school-aged children in Indonesia dropped out due to the pandemic, with 74% due to lack of funds (https://databoks.katadata.co.id, 2021).

From 2018 to 2020, the population living below the national poverty line in Indonesia was at its highest in 2020. Figure 2 shows a significant increase of 11.13% of the population living

below the poverty line from 2019 to 2020. In 2022, nearly 26.4 million people were living below the poverty line. The number of child workers aged 10-17 also reached 1.17 million, an increase of 320,000 compared to 2019 (https://databoks.katadata.co.id, 2021). Children face a trade-off between working or going to school.



Source: BPS-Statistics Indonesia (2022)

Figure 2: The number of poor people in Indonesia, 2017/2018 to 2021/2022 (in millions)

One strategy for reducing dropout rates is the implementation of a conditional cash transfer program (CCT), which aims to improve the welfare and human capital investment to alleviate poverty (Edo & Marchionni, 2019; Glewwe & Kassouf, 2012; Mo et al., 2013; Azevedo & Robles, 2013). The Indonesian government provides conditional cash assistance to school-aged children (6-21 years old) from low-income families who can not access education named *Program Indonesia Pintar* (PIP program). The program provides assistance to the respective families so their children can complete their secondary education. It is interesting to examine the impact of the PIP program on dropout rates for students from low-income families, especially during the pandemic.

Several quantitative studies have discussed the impact of conditional cash assistance on child education in Indonesia (Anindita & Sahadewo, 2018; Listiyanto & Qibthiyyah, 2022; Purba, 2018; Setyadharma, 2018; Sihombing et al., 2022; Yulianti et al., 2015). Moreover, there were some qualitative studies have evaluated the effectiveness of the PIP program in several schools in Indonesia (Hafrienda et al., 2023; Kaidah & Ruslan, 2021; Uriyalita et al., 2020; Zahimu, 2019). Most of the studies found that the PIP program can support the education of children from low-income families. Still, there was limited evidence on how the program affects dropout rates, especially during the Covid-19 pandemic. Hence, how the PIP program affects the probability of student dropouts from low-income families needs to be further elaborated, especially during the pandemic. This study contributes to understanding how the PIP program prevents school dropout among students from low-income families, both before and during the Covid-19 pandemic.

Briefly on the *Program Indonesia Pintar* (PIP) Program

Cash transfer is one policy to enhance educational demand by providing cash assistance to support children in low-income families to attend schools. Unconditional cash transfer (UCT) assists low-income families without specific conditions, whereas the cash conditional transfers (CCT) assist with predefined requirements. *Program Indonesia Pintar* (PIP program) is one of Indonesia's conditional cash transfer (CCT) programs that ensures students from low-income families attend schools and can finish their education up to the secondary level. The PIP program is targeted at children aged 6-21 from poor and vulnerable families.

The PIP program was the enhancement of the previous program called the Poor Student Assistance (*Bantuan Siswa Miskin-BSM* program) in 2014. The PIP program allocates a fixed amount of cash for eligible students. Elementary students receive the assistance of IDR 450,000/year (approx. USD 28), junior high school students receive IDR 750,000/year (approx. USD 47), and senior/vocational high school students receive IDR 1,000,000/year (approx. USD 63) (MoECRT, 2020). The students can use cash from the PIP program to purchase books and stationery, school uniforms, school supplies, transportation to school, students' pocket money, additional course fees for formal education participants, as well as additional practice and internship fees or work placements (MoECRT, 2023).

The highest number of PIP program recipients was in 2018, with 18,699,376 students (Table 1). During the pandemic in 2020, the total number of PIP recipients decreased. However, while the recipients at other school levels decreased, the number of program recipients at the elementary school increased.

School Level	Year				
	2018	2019	2020	2021	2022
Elementary School	10,379,253	10,364,266	10,434,330	10,411,608	10,360,614
Junior High School	4,751,246	4,562,347	4,411,680	4,401,653	4,369,968
Senior High School	1,516,701	1,464,712	1,412,212	1,419,438	1,393,519
Vocational High School	2,052,176	2,007,074	1,834,669	1,852,279	1,829,167
Total	**18,699,376**	**18,398,399**	**18,092,891**	**18,084,978**	**17,953,268**

Source: MoECRT (2022)

Table 1: Number of PIP recipients from 2018 to 2022

There are challenges in the implementation of the PIP program. The delayed disbursement of the funds resulted in the students being unable to utilize the transferred funds (Zamjani et al., 2019). There are also some deviations in the utilization of the PIP funds. The cash was used for non-educational purposes, such as buying food supplies and paying family debts (MoECRT, 2017). Since 2021, the government has implemented the classification of students who are eligible to receive PIP. The students from households with family incomes in the lowest income categories, including very poor, poor, nearly poor, and vulnerable poor (decile classification of 1 to 4), and who are both recorded and not recorded in the Integrated Social Welfare Data (DTKS) of the Ministry of Social Affairs are eligible for the PIP program.

Literature Review

A number of previous studies have investigated the impact of conditional cash transfers (CCT) on dropout rates. For instance, Brazil's Bolsa Escola/Familia program has been shown to increase school participation and reduce the number of children working long-term (Peruffo & Ferreira, 2017; Glewwe et al., 2020). Similarly, Mo et al. (2013) confirmed the positive impact

of CCTs on dropout rates in rural China. In contrast, Churchill et al. (2021) found that Pakistan's Benazir Income Support Programme (BISP) positively and significantly impacted school enrollment and grade progression but did not affect dropout rates in the short term. In contrast to these findings, Canelas & Niño-Zarazúa (2019) found different results for Bolivia's Bono Juancito Pinto education assistance program, where the program successfully increased school participation rates.

Several studies in Indonesia have also examined the impact of educational assistance on low-income families. Applying data from the Indonesian Family Life Survey (IFLS) and Intention-to-Treat (ITT) analysis methods, Kharisma et al. (2017) found that JPS scholarships were effective in reducing dropout rates in primary education. However, they concluded that the impact of these scholarships could be further enhanced. The PIP program significantly increased educational expenditure. In this case, government cash assistance can reduce the likelihood of these students dropping out (Setyadharma, 2018). The BSM program can reduce dropout rates at every educational level for children from poor households (Yulianti et al., 2015). Other studies have indicated that PIP is more effective than BSM in reducing dropout rates, with the most significant impact occurring at the junior high level (Listiyanto & Qibthiyyah, 2022). Despite the diverse results of the impact of CCT on educational outputs, the most recent studies prove that educational assistance can reduce dropout rates.

Previous studies also show that the primary factors driving children's failure to complete their education can be attributed to the characteristics of the households in which they reside (Khiem et al., 2020; Mo et al., 2013; Wils et al., 2019). In these households, the role of parents, especially the household head (KRT), is of particular significance as the KRT is the primary decision-maker in every household decision, including education. A higher level of parental education is associated with a lower likelihood of children dropping out of school (Alcaraz, 2020). Households with higher poverty levels are more likely to be in households with primary employment status in the informal sector, where economic shocks are more prevalent compared to the formal sector. Moreover, the economic condition of a household can be gauged by the household per capita expenditure, with lower per capita expenditure indicating a smaller family needs fulfillment capacity. Another crucial aspect of a household's background is the number of children, which has a negative or inverse relationship with the availability of household resources to be distributed (Al-Samarrai & Peasgood, 1998).

Methods and Data

The theoretical framework used in this study is the education production function, which describes how educational outcomes, such as cognitive abilities and knowledge, are generated from "raw inputs." It is a framework for understanding how various education policies can influence student achievement. Children's knowledge and skills are not only "produced" by school inputs and educational policies but also by other factors outside schools (Hanushek, 1979; Lovenheim & Turner, 2018). Hanushek (1979) formulated a model by considering several factors affecting the educational achievement of students as follows:

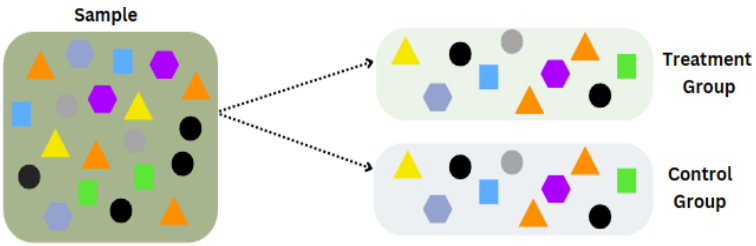
$$A_{it} = f(B_{it}, P_{it}, S_{it}, I_i) \quad (1)$$

A_{it} represents the achievement of student i at a given time, B_{it} is the vector of the family background of student i at a given time, P_{it} is the vector of peer influences of student i at a given time, S_{it} is the vector of school inputs at a given time, and I_i is the vector of student characteristics.

This study employs quantitative analysis using the Propensity Score Matching (PSM) method to mitigate selection bias caused by non-random controls. PSM will find similarities in the characteristics of two populations:

- the treatment group, which is students who received the PIP program;
- the control group, which is students who did not PIP program.

Randomization will be conducted on both populations by PSM by considering the similar characteristics of the two groups and hence allowing for a direct comparison between the groups. The sample in this study is divided into two groups, the treatment group and the control group, which exhibit similar characteristics, as illustrated in Figure 3.



Source: Authors

Figure 3: Design of Propensity Score Matching (PSM) Method

First, the test for differences in mean covariates is conducted to check the imbalances between treatment and control groups. Second, the PSM method will estimate probability scores for PIP acceptance to each individual in the sample based on a logit regression as follows:

$$\ln\left(\frac{P_i}{1-P_i}\right) PIP_i = \alpha + \beta_1 \Sigma H_{ij} + \beta_2 \Sigma X_j + \varepsilon_{ij} \quad (2)$$

where,

$\ln\left(\frac{P_i}{1-P_i}\right)$: Probability of PIP acceptance of the individual *i*

H_{ij} : Confounding variables in the form of household background of the individual *i* in household *j* consisting of household expenditure per capita, head of household education, leading occupation status of head of household, and number of children in the household

X_j : Control variables considered for PIP acceptance in household *j*

Based on the education production function, this study focuses on the household background as the primary factor that might affect students' dropout. Therefore, the variables included in the logit estimations consist of household backgrounds, such as the education level and employment status of the head of the family, per capita household income, and the number of children in the households. In addition to PIP, low-income families also receive other government transfers of *Program Keluarga Harapan* (PKH) and *Kartu Keluarga Sejahtera* (KKS). Hence, other government transfers are also included in the logit estimation. The logit estimation will provide the common characteristics of the recipient of PIP.

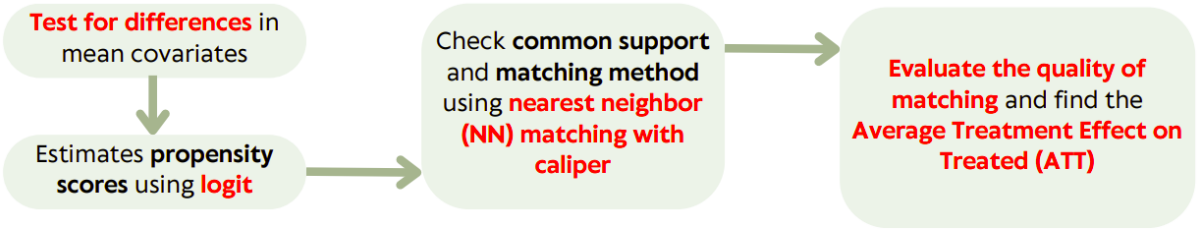
Third, following the logit estimation, the subsequent steps are to verify the presence of common support by implementing the matching method. Common support refers to the overlap in the distribution among treatment and control groups to ensure both have similar propensities for treatment. The matching method using the Nearest Neighbor (NN) with the caliper is applied

because the number of observations for the treatment group was significantly lower than the control group.

Lastly, the outcome of this study is the Average Treatment Effects on Treated (ATT) value as the following equation:

$$ATT = E[E\{Y^T|T = 1, p(X_i)\} - E\{Y^C|T = 0, p(X_i)\}|T = 1] \quad (3)$$

Where ATT is the value of the effect of PIP on the probability of dropping out of school, T=1 represents program participants (recipients of PIP), and Y^T is the outcome of program participants. Meanwhile, T=0 represents non-program participants (non-recipients of PIP), and Y^C is the outcome of those who are not program recipients. Figure 4 summarizes the steps in applying the PSM method in this study.



Source: Authors

Figure 4: Steps in Applying the PSM Method

This study utilizes secondary data from the National Socioeconomic Survey (SUSENAS) of 2019 and 2021 with a cross-sectional approach. The sample consists of school-aged children, 6-21 years old, from poor and vulnerable households based on expenditures per capita. In 2019, 112,004 individuals were identified as the sample, with 63,204 in elementary school, 29,248 in junior high school, and 19,552 in senior high school. Meanwhile, 121,163 individuals were identified as the sample in 2021, with 66,177 in elementary school, 30,458 in junior high school, and 24,528 in senior high school. Summary statistics of the characteristics of the sample are presented in the Appendices.

Results and Discussion

Table 2 presents the dropout status of students from low-income families who were recipients and non-recipients of the PIP program in 2019 based on their education level. In general, the dropout rate was higher among poor and vulnerable students who did not receive PIP. It can be seen that the percentage of students who dropped out in both sample groups (recipients of PIP and non-recipients of PIP) was significantly low. However, the dropout rate of the sample who received PIP is relatively lower (0.61%) compared to the ones who did not receive PIP (0.91%). This trend is consistent in 2021, as depicted in Table 3. The dropout rate of the sample who received PIP is relatively lower (0.71%) compared to the ones who did not receive PIP (1.01%). A summary descriptive of the sample can be seen in the Appendices.

Education Level	Total Sample	2019 Recipients of PIP (Treatment Group)			2019 Non-Recipients of PIP (Control Group)		
		Dropout	Not Dropout	Total	Dropout	Not Dropout	Total
Elementary School	**63,204**	34	17,883	17,917	177	45,110	45,287
		0.19%	99.81%	100%	0.39%	99.61%	100%
Junior High School	**29,248**	78	8,243	8,321	281	20,646	20,927
		0.94%	99.06%	100%	1.34%	98.66%	100%
Senior High School	**19,552**	78	4,636	4,714	281	14,557	14,838
		1.65%	98.35%	100%	1.89%	98.11%	100%
Total	**112,004**	**190**	**30,762**	**30,952**	**739**	**80,313**	**81,052**
		0.61%	**99.39%**	**100%**	**0.91%**	**99.09%**	**100%**

Source: National Socioeconomic Survey 2019 (processed by authors)

Table 2: The Number of Dropouts of Students from Low-Income Families, 2019

Education Level	Total Sample	2019 Recipients of PIP (Treatment Group)			2019 Non-Recipients of PIP (Control Group)		
		Dropout	Not Dropout	Total	Dropout	Not Dropout	Total
Elementary School	**66,177**	32	15,576	15,608	156	50,413	50,569
		0.21%	99.79%	100%	0.31%	99.69%	100%
Junior High School	**30,458**	90	7,885	7,975	360	22,123	22,483
		1.13%	98.87%	100%	1.60%	98.40%	100%
Senior High School	**24,528**	84	5,212	5,296	414	18,818	19,232
		1.59%	98.41%	100%	2.15%	97.85%	100%
Total	**121,163**	**206**	**28,673**	**28,879**	**930**	**91,354**	**92,284**
		0.71%	**99.29%**	**100%**	**1.01%**	**98.99%**	**100%**

Source: National Socioeconomic Survey 2021 (processed by authors)

Table 3: The Number of Dropouts of Students from Low-Income Families, 2021

The subsequent step is to estimate probability scores for PIP by applying the logit regression as outlined in equation (2). The estimation of the PSM model using logit is presented in Table 4, which indicates that, for all education levels, certain characteristics are associated with an increased likelihood of receiving PIP. The characteristics include the low education level of the household head (lower than senior high school level), having a lower number of children, and being recipients of other government transfers of *Program Keluarga Harapan* (PKH) and *Kartu Keluarga Sejahtera* (KKS).

	Elementary School 2019 (1)	Elementary School 2021 (2)	Junior High School 2019 (3)	Junior High School 2021 (4)	Senior High School 2019 (5)	Senior High School 2021 (6)
	PIP	PIP	PIP	PIP	PIP	PIP
cap	-0.099***	0.018	-0.049	-0.015	-0.143**	-0.027
	(0.032)	(0.032)	(0.048)	(0.047)	(0.065)	(0.057)
educ_KRT	-0.265***	-0.104***	-0.22***	-0.087***	-0.237***	-0.133***
	(0.023)	(0.022)	(0.035)	(0.032)	(0.045)	(0.039)
work_KRT	-0.016	0.027	0.002	0.009	0.018	-0.03
	(0.022)	(0.021)	(0.033)	(0.032)	(0.042)	(0.038)
totalchild	-0.076***	-0.093***	-0.035***	-0.05***	-0.066***	-0.023*
	(0.007)	(0.007)	(0.01)	(0.01)	(0.013)	(0.012)
PKH	1.292***	1.055***	1.337***	1.149***	1.352***	1.223***
	(0.023)	(0.024)	(0.033)	(0.033)	(0.043)	(0.039)
KKS	0.827***	0.659***	0.8***	0.701***	0.928***	0.72***
	(0.023)	(0.024)	(0.033)	(0.033)	(0.042)	(0.039)
_cons	-0.106	-1.719***	-1.021	-1.432**	0.037	-1.679**
	(0.422)	(0.433)	(0.637)	(0.636)	(0.868)	(0.77)
Observations	63204	66177	29248	30458	19552	24528
Pseudo R^2	0.135	0.085	0.14	0.103	0.152	0.112

Standard errors are in parentheses
*** *p<.01, ** p<.05, * p<.1*
Source: calculated by authors

Table 4: Results of the Propensity Score Estimation

Finally, the study employs the Nearest Neighbor oversampling (2-NN) matching method to address the imbalance between treatment and control groups. A caliper matching method is combined with NN oversampling as it can decrease the percentage bias by setting a maximum tolerance level for propensity score distance (Gertler et al., 2016). Consequently, for all models of this study, the matching method has small bias percentages of 1% to 3%. The Average Treatment Effect on Treated (ATT) value, as in equation (3), represents the average difference between the treatment and control groups, often called risk difference (Austin & Stuart, 2017). It is expected that there is a significant average difference between the treatment group (receiving the PIP program) and the control group (not receiving the PIP program). The results of ATT are presented in Table 5.

Education Level	***Treatment***	***Mean of Matched Treated***	***Mean of Matched Controls***	**ATT**	***Standard Error***	***t-stat***
Elementary School 2019	PIP	0.002	0.004	-0.002	0.001	**-3.17*** **
Elementary School 2021		0.002	0.003	-0.001	0.001	-1.64
Junior High School 2019		0.009	0.017	-0.007	0.002	**-3.60*** **
Junior High School 2021		0.011	0.02	-0.008	0.002	**-4.09*** **
Senior High School 2019		0.016	0.021	-0.005	0.003	-1.56
Senior High School 2021		0.016	0.022	-0.006	0.003	**-2.13** **

*** *p<0.01* ** *p<0.05, * p<0.1*
Source: calculated by authors

Table 5: Results of the Average Treatment on Treated (ATT)

Table 5 shows that at the elementary school level, the PIP program significantly affected the probability of dropping out in 2019. However, the program did not exert the same effect in 2021. At the junior high school level, the PIP program affected the probability of dropping out both in 2019 and 2021. In contrast, for the senior high school level, the PIP program did not affect the dropout probability in 2019 but significantly affected the dropout probability in 2021. Notably, the PIP program exerted its strongest influence on dropping out at the junior high school level, persisting before and during the pandemic.

The dropout probability varies by student's educational level. One of the main factors influencing dropping out is educational expenses. High educational expenses are associated with an increased likelihood of dropout, particularly at higher educational levels. The lowest educational expenses are observed among elementary students, while the highest are among senior/vocational high school students. In 2019, the estimated personal cost for elementary students in Indonesia was IDR 3,147,000 (approximately USD 197), for junior high students was IDR 4,245,000 (approximately USD 265), and for senior high students was IDR 7,457,000 (approximately USD 466) (Zamjani et al., 2020).

The PIP program is government education assistance from the demand side to lower personal educational expenses. In addition to the PIP program, the government provides educational assistance from the supply side through the School Operational Assistance (BOS). This program provides support to all-level public schools with operational expenses, including maintaining school facilities, purchasing teaching aids, the payment of honorariums for non-permanent teachers and staff, and other school operational expenses. However, according to Zamjani et al. (2020), the allocated operational assistance was insufficient to cover the school's non-personnel operational expenses. For instance, in 2019, the government allocated IDR 800,000 per student (approximately USD 50) for elementary schools. However, the average school non-personnel operational expenses were IDR 996,000 per student (approximately USD 62). A similar discrepancy is observed in the case of junior high schools. While the allocated operational assistance was IDR 1,000,000 per student (approximately USD 63), the average operational expenses were IDR 1,539,000 per student (approximately USD 96). For senior high school, the allocated operational assistance was IDR 1,400,000 per student (approximately USD 88), while the average operational expenses were IDR 1,651,000 per student (approximately USD 197). This suggests that both PIP and BOS may not fully cover the expenses incurred by students.

The PIP program affects differently to the probability of dropout rate at every educational level. At elementary school, the dropout rate was generally relatively low, at 0.37% in 2019 and 0.12% in 2021, due to several reasons (*Direktorat Statistik Kesejahteraan Rakyat*, 2021; *Statistik*, 2019). First, the government has implemented a mandatory education program for children aged 7-12. Second, the number of elementary schools is relatively higher compared to junior and senior high schools, and hence, it is easier to access elementary schools. Third, the personal unit costs for elementary school students are relatively low compared to other educational levels, so there was less barrier for low-income families to send their children to school. According to the Directorate of Population's Welfare Statistics (*Direktorat Statistik Kesejahteraan Rakyat*), there was no significant change in school participation rates at the elementary schools during the pandemic, which indicates the community's awareness that elementary education is fundamental (*Direktorat Statistik Kesejahteraan Rakyat*, 2021). Therefore, the PIP program has no impact on the probability of dropping out of elementary school during the pandemic in 2021.

At the junior high school level, the PIP program affected the probability of dropping out both in 2019 and 2021. In general, students at junior high schools were vulnerable to student dropout, as this is a transition phase to high school education (Cameron, 2009). The dropout rate at the junior high schools was higher compared to the elementary school level, with 1.07% in 2019 and 0.90% in 2021. Access to junior high school is more challenging than elementary school due to the smaller number of junior high schools. Students from low-income families are less likely to continue to high school (*Direktorat Statistik Kesejahteraan Rakyat*, 2021; *Statistik*, 2019). The PIP program can alleviate the school expenses for students from low-income families at the junior high school level, thereby reducing dropouts before and during the pandemic. These findings are consistent with previous studies that found educational assistance significantly affects dropout rates at the junior high school level and has a more significant impact compared to the elementary school level (Cameron, 2009; Yulianti et al., 2015; Listiyanto & Qibthiyyah, 2022).

At the senior high school level, the PIP program did not affect the dropout probability in 2019. However, it significantly affected the dropout probability in 2021. The dropout rate at the high school level was higher than at the elementary and junior high school levels. In 2019, it was 1.76%, while in 2021 it was 1.12% (*Direktorat Statistik Kesejahteraan Rakyat*, 2021; *Statistik*, 2019). It is more challenging to access senior high school education than it is to access elementary and junior high school education. The availability of senior high schools is not uniform across Indonesia. There is an uneven distribution of high schools among regions in Indonesia. The costs associated with attending senior high school extend beyond the purchase of school equipment. Student personal expenses for senior high school are not only for school equipment but also for transportation and boarding costs for students living far from the schools (Baird et al., 2014). The transportation cost tends to increase as students' education level is higher, and the location of schools for higher levels tends to be farther away (Zamjani et al., 2020). The additional educational and transportation expenses costs can cause negative school participation due to financial and non-financial access barriers (Corrales-Herrero et al., 2021).

Although the PIP cash transfer is higher for senior high school students, the amount is insufficient to cover the majority of high school education expenses. Furthermore, the transferred cash for senior high school students does not guarantee that students will remain in school (Churchill et al., 2021). The higher personal educational expenses, the location of the schools, and the limited transferred cash for the PIP program may have resulted in an insignificant influence of the PIP on the dropout probability among poor and vulnerable high school students prior to the pandemic in 2019. However, during the pandemic in 2020, the PIP program was significant in influencing the dropout probability among poor and vulnerable high school students. High school students have a more significant opportunity to attend school during the pandemic because there are no travel constraints compared to before the pandemic in 2019. During the pandemic, students did not need to spend on transportation, practical fees, excursions, and some additional costs related to face-to-face extracurricular activities, thus reducing the financial burdens that students must meet. Consequently, PIP assistance can markedly diminish the probability of students dropping out of high school or vocational high school during a pandemic.

Conclusions

The findings of this study indicate that the PIP program can reduce the probability of school dropout among recipients at each educational level. This study finds that there is a significant negative relationship between the PIP program and the probability of school dropout among

students from low-income families at the elementary school in 2019, junior high school in 2019 and 2021, and senior high school in 2021. However, the results were found to be insignificant at the elementary school in 2021 and at the senior high school in 2019. The impact of PIP on the probability of school dropout among students from low-income families varies across educational levels and periods. PIP has the most significant impact at the junior high school level. The varying significance of results at elementary school may be attributed to the relatively low dropout rates, both before and during the pandemic. In contrast, the differing results at the senior high school level may be attributed to the considerable difficulty in accessing education, higher education costs, and insufficient education assistance to meet the needs of senior high school students, which may lead to a higher likelihood of dropout among students. Consequently, the provision of PIP at the senior high school in 2019 did not result in a significant reduction in the dropout rate.

This study is limited by its cross-sectional design, which precludes direct comparisons with data from the same individuals in 2019 and 2021. A longitudinal analysis would be preferable to determine the extent of the program's impact over a certain period. Furthermore, the PSM method may lack specificity in determining propensity scores, making the resulting ATT values sensitive to the covariates used in score determination. Accordingly, the authors should consider the covariates utilized in the model, ensuring that confounding variables and other controls are more representative. Moreover, this study was unable to encompass variables from the supply side of education because the confounding variables that can link treatment and outcome studied are limited to family background characteristics on the demand side. Future research can combine variables from education's demand and supply sides to obtain a comprehensive analysis.

Appendices

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
2019					
Dropout (1=school dropout)	**63,204**	**0.003**	**0.058**	**0**	**1**
PIP (1=receiving PIP)	**63,204**	**0.283**	**0.451**	**0**	**1**
Cap (per capita expenditure)	63,204	13.116	0.317	11.706	13.572
educ KRT (1=senior high school & college)	63,204	0.291	0.454	0	1
work KRT (1=formal)	63,204	0.297	0.457	0	1
Totalchild	63,204	3.131	1.446	1	18
PKH (1=receiving PKH)	63,204	0.328	0.469	0	1
KKS (1=having KKS)	63,204	0.269	0.444	0	1
2021					
Dropout (1=school dropout)	**66,177**	**0.003**	**0.053**	**0**	**1**
PIP (1=receiving PIP)	**66,177**	**0.236**	**0.425**	**0**	**1**
Cap (per capita expenditure)	66,177	13.201	0.311	11.668	13.65
educ KRT (1=senior high school & college)	66,177	0.325	0.469	0	1
work KRT (1=formal)	66,177	0.313	0.464	0	1
Totalchild	66,177	3.056	1.404	1	15
PKH (1=receiving PKH)	66,177	0.32	0.466	0	1
KKS (1=having KKS)	66,177	0.234	0.423	0	1

Source: National Socioeconomic Survey (SUSENAS) 2019 and 2021, processed by authors

Appendix A: Summary Statistics for Elementary School

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
2019					
Dropout (1=school dropout)	**29,248**	**0.012**	**0.11**	**0**	**1**
PIP (1=receiving PIP)	**29,248**	**0.284**	**0.451**	**0**	**1**
Cap (per capita expenditure)	29,248	13.135	0.306	11.706	13.572
educ KRT (1=senior high school & college)	29,248	0.261	0.439	0	1
work KRT (1=formal)	29,248	0.276	0.447	0	1
Totalchild	29,248	3.184	1.447	1	12
PKH (1=receiving PKH)	29,248	0.372	0.483	0	1
KKS (1=having KKS)	29,248	0.301	0.459	0	1
2021					
Dropout (1=school dropout)	**30,458**	**0.015**	**0.121**	**0**	**1**
PIP (1=receiving PIP)	**30,458**	**0.262**	**0.44**	**0**	**1**
Cap (per capita expenditure)	30,458	13.217	0.303	11.884	13.65
educ KRT (1=senior high school & college)	30,458	0.302	0.459	0	1
work KRT (1=formal)	30,458	0.286	0.452	0	1
Totalchild	30,458	3.181	1.446	1	15
PKH (1=receiving PKH)	30,458	0.384	0.486	0	1
KKS (1=having KKS)	30,458	0.28	0.449	0	1

Source: National Socioeconomic Survey (SUSENAS) 2019 and 2021, processed by authors

Appendix B: Summary Statistics for Junior High School

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
2019					
Dropout (1=school dropout)	**19,552**	**0.018**	**0.134**	**0**	**1**
PIP (1=receiving PIP)	**19,552**	**0.241**	**0.428**	**0**	**1**
Cap (per capita expenditure)	19,552	13.177	0.291	11.787	13.572
educ KRT (1=senior high school & college)	19,552	0.278	0.448	0	1
work KRT (1=formal)	19,552	0.281	0.45	0	1
Totalchild	19,552	3.18	1.437	1	12
PKH (1=receiving PKH)	19,552	0.352	0.478	0	1
KKS (1=having KKS)	19,552	0.291	0.454	0	1
2021					
Dropout (1=school dropout)	**24,528**	**0.02**	**0.141**	**0**	**1**
PIP (1=receiving PIP)	**24,528**	**0.216**	**0.411**	**0**	**1**
Cap (per capita expenditure)	24,528	13.243	0.295	11.846	13.65
educ KRT (1=senior high school & college)	24,528	0.308	0.462	0	1
work KRT (1=formal)	24,528	0.275	0.447	0	1
Totalchild	24,528	3.169	1.441	1	12
PKH (1=receiving PKH)	24,528	0.383	0.486	0	1
KKS (1=having KKS)	24,528	0.285	0.451	0	1

Source: National Socioeconomic Survey (SUSENAS) 2019 and 2021, processed by authors

Appendix C: Summary Statistics for Senior High School

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Profiling At-Risk College Students: Basis for Intervention

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Abstract
The retention rate in Mountain Province State Polytechnic College-Tadian Campus within the past five years is low at 66% while the graduation rate is even lower at 47%. Obviously, these are not encouraging figures but before one can suggest solutions to improve this existing condition, one has to determine the factors causing the prevalence of at-risk students or students likely not to pursue or finish their studies. The following problems were answered in this study: What percentage of students currently enrolled in campus are considered to be at-risk? What are the likely factors that put these students at-risk? What actions may be done to provide support to the students in minimizing or preventing the possibility of their dropping out at the same time raising the retention and graduation rate in the campus? Quantitatively, a descriptive survey using questionnaire, interview, and background investigation on all the currently enrolled students was employed. Eighty-nine point eighty-six (89.86) per cent of the total respondents from the said campus consider themselves at-risk and have a great chance of not finishing their studies due learning challenges caused by insufficient pre-college preparation or slow learning capacity, problematic family situation, unsupportive or discouraging faculty and staff, unpleasant or hostile school environment, and off-campus distractions such as vices and other diversions. Qualitatively through in-depth interviews, majority of the informants recognize the need for counselling, restructuring of school policies, tutoring, and community involvement in order for them to survive college.

Keywords: At-Risk Students, Philippines, Counselling, Surviving College

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Introduction

The excited buzz about Mountain Province State Polytechnic College soon to become a university gives an outward impression that the college is indeed doing an excellent job in terms of providing quality education to the local learners and molding them into valuable members of the society making the institution's contribution to global progress to be supposedly very evident.

But looking closely and probing into the fine prints in the credentials of the institution, there is this flaw in the documents that may not be readily noticeable but impossible to ignore.

Figures on the Retention and Graduation rates particularly in MPSPC Tadian Campus are pointing down south not to mention the equally dismal board performances of the graduates. From that alone, the institution may not be doing well after all, that is, even without using any other yardstick for valuation purposes.

In the middle of this incongruity are the students seriously struggling to finish their courses.

Without the needed external support to these students from either the school, community and their families; they are bound to fail. These are the At-Risk students.

Literature Review

The term 'at-risk' was coined after an article *A Nation at Risk* which was published by National Commission on Excellence in Education in 1983. The article depicted both the economic and social set-up in the United States as endangered due to the failing educational system (Placier, 1993) which is primarily manifested through the learners who fail to complete their courses due to various reasons.

Students who are considered as "at-risk" are the ones who face tough situations that other students do not experience.

According to the study of Smerdon (2002) for the American Institutes for Research, students under the low socioeconomic status manifest isolation and separation in school particularly the male students.

So, what can be the contributing factors in becoming at-risk?

Poverty in the family or within the community is one. Students who come from poor families or communities such as informal settlements are more likely to be branded as at-risk (Knight, Shakeshaft, et.al., 2017).

Impoverished settings can create several risk factors for the young people making them ever more susceptible to risk-behaviors and adversely affect their future as they mature. Growing up in poverty is linked with several risk factors, including being influenced with anti-social behaviors, violent neighborhoods and psychological imbalance (Ridings, 2010).

These poverty-related factors are shown to have damaging connections with educational performance and negative behaviors towards schooling (Obsuth, Watson, & Moretti, 2010).

Young people belonging to families who are struggling economically are those that are most at-risk. (Koball, Heather, et al. 2011).

An unstable family set-up or dysfunctional family can also put a child in a precarious situation as far as education is concerned.

A child who is raised in a stable two-parent home has a better nutrition, school performance, and social skills manifested by positive dealings with peers. Studies show that upsetting the ideal family structure caused by separation of parents, co-habitation, or remarriage have strong harmful effects on multiple adjustments and academic progress. Children who are exposed to domestic violence, criminal activity, or substance abuse have a much higher chance of long-term behavioral problems, such as alcoholism and drug abuse and mental health problems (Koball, Heather, et al. 2011).

The school, which is supposed to be the place where youth will build their dreams can also turn out to be the destroyer of one's tomorrow by leaving them without functional academic readiness. School environments can become trenches for many learners since bullying, peer-pressure or hostile school environment can easily undermine students who cannot cope or do not have social support (Koball, Heather, et al. 2011).

High poverty neighborhoods are often characterized by high crime rates, limited resources, and underperforming schools. Schools with fewer resources are more likely to be associated with poor academic outcomes. Fewer resources mean higher student-to-teacher ratios, lower spending per student, and lower overall academic performance. These neighborhoods often lack the resources needed to help youth overcome risk factors.

Despite their apparent advantages in various aspects, youth from affluent and well-educated families can also be at-risk. These "rich kids" experience elevated rates of depression, substance abuse, anxiety disorders, somatic complaints, and overall unhappiness, as highlighted by Levine (2006). It is essential to recognize that this concern should not diminish the society's attention to other vulnerable groups.

Concept Development

Data from the registrar's office of the Tadian Campus of Mountain Province State Polytechnic College indicates that out of more than a thousand students who enroll per semester, an average of 67 per cent across the three departments finish the semester. Under this retention rate, more than 290 students drop out within the semester. Of the 352 first batch of senior high school graduates who enrolled in the campus during the first semester of SY 2018-2019, only 38 students or 10% of these enrollees graduated within the prescribed period of four years.

Where did the rest go? Twelve per cent (12%) transferred out, seventeen per cent (17%) are continuing their courses while the sixty-one per cent (61%) or a staggering 214 students dropped out of college.

Further enquiry has led to the information that these dropouts have varying reasons. From among the 25 dropouts tracked, the following prevailing reasons came out as their recurring answers: They cannot cope with the academic demands, lack of financial support despite the free tuition fee, got into a relationship and having a child, and neglected the school responsibilities due to frequent night life and drinking or other distractions such as computer

games and other priorities such as accepting jobs in pocket mining or construction and health reasons.

Research by Knight et al. (2017) highlights various systems designed to support at-risk students. Effective interventions should enhance risk behaviors, academic performance, sociability, sexual behavior, and psychological well-being. De Vries et al. (2015) emphasize that these interventions serve as anticipatory measures to prevent risk behaviors among learners.

Donnelly (1987) underscores the importance of early identification of at-risk students. Timely remediation measures, such as tutoring, counseling, awareness programs, multilingual instructions, employment training, truancy follow-up, and mentoring, can have a positive impact.

Notwithstanding the challenging outlook for at-risk students, psychologists are optimistic that many of these concerned young individuals can adapt to the academic environment even amidst their precarious circumstances. With concerted external support, these students' capacity to endure hardships and emerge stronger from them plays a crucial role in developing resilience—their ability to face life's inevitable challenges.

But if left ignored and unchecked, retention and graduation rates in MPSPC Tadian Campus will remain in the red despite the institution's laudable efforts in levelling up to establish a reputable name in the field of higher education. To keep this in check, thorough inspection of the factors that put vulnerable students to be at-risk should be done and strategizing for future actions should be arranged to finally put a plug or minimize this dropout floodgate; thus, this study.

Research Problems

To determine the factors that put the students at-risk and identifying these students in order for the school authorities to devise courses of action in response to this issue, this study aims to find answers the following problems: 1. What percentage of students currently enrolled in MPSPC-Tadian is considered to be at-risk across different categories? 2. What are the factors contributory to putting the students of MPSPC-Tadian at-risk? And, 3. What actions may be employed to provide necessary support to the at-risk students to minimize or prevent their possibility of dropping out at the same time raising the retention and graduation rate in the campus?

Methodology

This study was conducted at the Tadian Campus of Mountain Province State Polytechnic College where there was an observed prevalence of significant drop-outs from among the students.

Every student in the campus enrolled during the first semester of 2023 was asked to answer the validated questionnaire using codes instead of names to identify each respondent.

Using mixed method of research, the quantitative aspect counted and categorized the concerned students according to how they are classified and qualified as at-risk. For the quantitative aspect in the form of a modified grounded theory, an in-depth information gathering through follow-

up interview with each respondent was done. This allowed the researcher to profoundly understand how to recommend an appropriate action for each case.

Under the quantitative part of the study, descriptive statistics was used to determine the size of at-risk students in the campus and categorized them according to the factors that led them into such situation.

The rest of the study employed modified grounded theory analysis wherein the cited theories in the above review of related studies and literatures were connected with the situation of the identified subjects. After such analysis, coding was then applied to determine the factors that are causing the cases. Coding is categorization of data wherein a code will represent a theme or an idea.

Three types of coding were used in this study: Open coding was used initially to create meaning to the gathered data by organizing them first; Axial coding was used to connect the codes and determined the relationship of each case under the same category; and Selective coding was used to connect the categories according to how they were presented, understood and coded previously.

Result and Discussion

All 1,170 students enrolled in MPSPC Tadian Campus in 2023 were given the validated questionnaire to answer. Retrieval rate of the questionnaire is 80.94 per cent which means that 947 students returned the questionnaire. From the 947 respondents whose answers were retrieved, 851 or 89.86 per cent considered themselves to be at-risk. The 851 respondents were therefore considered the informants in this study after they positively answered to the question: *Was there ever an instance when you thought of quitting school?*

Asked how often do they think of quitting school, 19 per cent answered *always*, 17.97 per cent said *a lot of times*, 13.63 per cent said *sometimes*, 33 per cent said *few times* while 15.62 per cent said *very few times*. This question was asked to determine where the group of respondents are actually positioned. With the bulk of the respondents thinking of quitting school few times, while there are more students who are *always* thinking of quitting school than those who think of it *very few times*, this indicates that indeed the scenario should raise concerns.

The qualified respondents were also asked if they feel anxious or uneasy when they think of school. The purpose of this question is to determine if the school is contributory to their difficulties before looking at other factors. 52.76 per cent or majority of the qualified respondents positively answered while remaining 47.23 per cent have other sources of their predicaments affecting their studies which may not directly involve the school itself.

According to the respondents, the following are the possible factors that are triggering or causing them to think of quitting school.

Academic difficulty is the number one factor listed by the respondents. It is either they are not fully prepared or do not have the basic competencies needed for college or, as others simply put it, they are *not that bright enough to get through college*. The school does not have an admission policy that selects academically qualified enrollees. Everyone is allowed to enroll as they have documents to prove that they have finished high school or that they are allowed by the Department of Education through the Alternative Learning System (ALS) certification.

The second factor is poverty which, despite free tuition and the relatively low cost of living in the area, the respondents find it difficult to financially support themselves even with the most basic living expenses and occasional requirements in school such as for projects and even down to the daily transportation expenses to and from school.

Problematic family situation comes third. A considerable number of the respondents belong to a non-traditional family set-up. It is either one of the parents is missing and has another family or some of them are living with relatives. Some students were not aware of the at-risk implication of this situation until the conduct of this study. Most of the respondents do not receive any financial or even moral support from their own homes as many expressed that their own families do not believe that they may even finish their studies and that they are just using school to avoid getting a job.

In relation to this, the fourth factor is job related in connection to financial difficulties. Some respondents sacrifice school and accept jobs where they can be paid for the day. Hauling timber or sand, helping in house construction and occasional pocket mining are the most common activities the male respondents are engaged in. All of the respondents who selected this item are males. While it is commendable that students should seek for jobs to support themselves to college, others are enticed with the feeling of having instant money so they almost always prefer accepting daily paying jobs than going to school.

The next two items involve the school personnel and its environment. According to the respondents, it is their teachers or the school staff who are causing them to lose interest in their studies. Many of the respondents who were asked about this issue claim that they do not fully understand the lessons the teachers give them, others claim that the instructors are not teaching at all because they only provide the information about the lessons but do not bother to explain them properly. Others claim that in one semester, some teachers will only meet them less than five times. All these, the respondents say, are discouraging them to continue their schooling because eventually, they lose interest upon realizing that they are not being taught properly. The students further confirm that they do not feel the presence of a support system where they are given the opportunity to voice their concerns regarding their teachers without fear of being reprimanded by the teachers being complained about. They also claim that even teachers' evaluations are not effective in improving the teachers' performances because the teachers threaten them if the students give them low ratings.

As for the school environment which the students consider as unpleasant or inappropriate, laboratories and laboratory equipment are their primary concern. Most of the college students asked professed not to having seen any science laboratory in the campus, not even a microscope. Poorly ventilated classrooms, unsanitary rest rooms, and even absence sports facilities or gymnasium are the other concerns of the respondents. On top of that, other students complain of very few student organizations and activities where they can be part of to serve as support groups to them.

Like all other college students in such particular age, extra-curricular activities are essential in their social and mental development. Without such, they engage in other activities outside the campus which usually involves alcohol and other vices. Being hooked in such activities is disastrous to one's studies.

Research indicates that students involved in extra-curricular tend to achieve higher academic performance as compared to others who do focus only on academic concerns.

According to an article by Llego (2022) in Teacherph, participating in extracurricular activities have several advantages for learners. These activities allow students to acquire fresh skills, widen their social circle, and engage in new interests. Additionally, engaging in extracurriculars fosters leadership abilities and bolsters self-confidence.

For some students both male and female, they get into romantic relationship with their classmates or board mates. This often results in pregnancies which is a major obstacle in finishing one's studies. During students' orientations every beginning of the semester, a minimum amount of time is being allotted for topics such as teenage pregnancy, alcoholism and other common social problems that usually affect the students. Data from the Student Services and Development Office shows a consistent number of female students getting pregnant in semestral basis.

The least of the factors that cause students to discontinue their students is their personal choice not to pursue studies. No other reasons given except that they just do not feel like continuing their studies.

Conclusion

Mountain Province State Polytechnic College is a rural college that mostly caters to local students mostly who cannot afford to go to big universities in the cities.

One explanation why most of these students are considered at risk and they find the academic endeavor challenging because most of them have not passed the admission tests administered in other universities and colleges while MPSPC has practically an open admission policy.

At-risk students are struggling to build their future through education. It is the moral obligation of the school, the society and most importantly their families to help them through by first understanding them and offering them ways to ease lighten their burdens.

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A Study on Utilizing of Virtual Reality Teaching Materials in Marine Education for Primary School Children in Taiwan

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Abstract
Global awareness of marine education is pivotal, yet Taiwan, as an island nation rich in marine resources, has not garnered the necessary focus in this area. Over the past few years, the COVID-19 pandemic has prompted schoolchildren to gradually adapt to online remote teaching and digital learning tools. Consequently, the importance of designing digital teaching aids and conducting research on teaching sites has become even more pronounced. This study investigates the utilization of virtual reality (VR) teaching materials in marine education for primary school children to address limitations in the learning environment and enhance overall learning motivation. Distilling marine education into five key themes—marine leisure, marine society, marine culture, marine science and technology, and marine resources and sustainability—the study systematically selects video teaching materials tailored for third-grade elementary schools based on these themes. Following a pre-test written assessment, teachers presented both traditional videos and VR headset-enabled videos. Subsequently, a post-test written evaluation and interview were conducted. It is found from written tests, worksheets and interviews that using VR to watch videos significantly improved school children's learning attitudes. At the teaching site, it can also be seen that students use a positive attitude to learn and give back with positive vocabulary. This study highlights the positive impact and promising developmental potential of virtual reality technology in marine education, emphasizing the need for increased attention, further research, and developmental initiatives in this field.

Keywords: Marine Education, Virtual Reality, Digital Learning, Environmental Protection

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Introduction

Researcher grew up in the rural farming and fishing environment of Taoyuan City, Taiwan. Served as a natural and Hakka language teacher at Yong An Elementary School in Taoyuan City and as a full-time counselor for the marine issues group of the Taoyuan City National Education Counseling Corps. Understanding Taiwan's pivotal position in the maritime domain and its abundant marine resources, I advocate for establishing Taiwan as a maritime nation as the foundation for national development. It is crucial to actively engage the populace in comprehending our maritime situation and advantages. With global trends increasingly focusing on maritime issues, nations are actively conducting marine resource surveys, expanding maritime activities, and establishing shared ocean governance. Promoting marine education comprehensively is essential for laying a solid foundation and ensuring its sustainable development.

Literature Review

Marine education is a significant issue of global concern. Taiwan, with its main island and surrounding islands rich in marine resources, should make greater use of its geographical advantages. However, the general understanding of the ocean within Taiwanese society is still notably lacking. The vast ocean holds a wealth of ecological, historical, and environmental knowledge, such as marine geology, sea temperatures, ocean currents, and biodiversity, all of which have significant impacts on human life and the entire planet's ecology. To realize the ideal of Taiwan as a maritime nation, the most fundamental and long-lasting way to protect it is to earnestly implement marine education.

Contemporary education places a strong emphasis on diversity and interdisciplinary development, which implies that educational tools and strategies will also evolve toward greater flexibility and variety. Technology-integrated teaching, which uses technology as a pedagogical tool, can help students gain a deeper understanding of knowledge and assist in problem-solving, thereby fostering higher learning outcomes.

Method

This study explores the use of VR materials to enhance the effectiveness of marine education, while comparing the learning outcomes across five key themes in marine education after using VR materials. It examines the feedback from students following the use of a VR-integrated marine teaching module. Using interviews and questionnaires to collect information and data, followed by qualitative and quantitative research, to obtain detailed and in-depth data for analysis and reflection.

Results

The post-test results showed that in terms of learning outcomes, 85% of the students achieved a certain level of improvement after completing this course module. However, 15% of the students showed no improvement in the test results. The data obtained from this test result may indicate that some students might need additional support strategies in this teaching model, and may require more time to adapt to the diverse module-based learning approach. This situation could be due to individual students not being sufficiently familiar with the teaching module, or it might be a result of differing learning styles, learning needs, or levels of comprehension.

The students' reflections and feedback revealed the positive impact that the teaching activities had on them. Firstly, they became aware of the severity of environmental issues and recognized their responsibility as members of the Earth. This awakening of consciousness is crucial for future environmental protection efforts because only when individuals realize their responsibilities can the accumulation of greater collective power truly drive change. Secondly, they demonstrated a positive attitude and motivation towards learning. Through virtual reality technology and a diverse learning approach, they not only better understood the knowledge but also enhanced their learning capabilities. This positive learning attitude will accompany them throughout their lives, enabling them to continually pursue knowledge and growth. Finally, they expressed hope for the future and a willingness to take action. By understanding the root causes and impacts of environmental issues, they started to consider feasible solutions and indicated their intention to take action to improve the Earth's environment.

Discussion

In lesson planning, teachers need to thoroughly consider the characteristics of different grade levels, students' learning needs and interests, as well as their familiarity with technology, attitude toward new learning methods, and expectations for learning outcomes. Smart mobile devices and VR tools should be integrated into specific teaching scenarios, with corresponding learning activities and tasks designed. For example, one might design or use a marine biology atlas with augmented reality technology, allowing students to use smartphones or tablets to view virtual marine creatures in the real world. This not only satisfies students' curiosity but also sparks interest in learning about marine biology. The technology-based teaching approach using virtual reality has interactive features, and the immersive environment offers a richer sensory experience. This makes learning more enjoyable while effectively conveying educational content. Especially in terms of visual and spatial learning, VR enables more direct participation, which helps increase engagement. Research has revealed the potential of virtual reality technology in education, particularly in improving learning attitudes. This is crucial for promoting innovative teaching methods to enhance student engagement and learning outcomes.

Conclusions

The research results have demonstrated the potential of virtual reality (VR) technology in indoor marine education, with positive impacts on both learning effectiveness and attitudes. Such innovative teaching methods are expected to play an increasingly important role in future education. In the evolving environment of technology-enhanced and gamified teaching, VR technology stands out as a promising choice for instructional design materials. Looking at the long-term effects, the application of VR technology in learning has brought about revolutionary changes in marine education. Of particular interest is the long-term impact of VR education on students—whether it can stimulate students' long-term interest and concern for marine issues, and whether this interest will translate into active environmental conservation actions or further research. Innovative teaching methods not only enrich teaching content and enhance learning outcomes but also cultivate students' autonomy and spirit of inquiry. Therefore, it is foreseeable that with the continuous development of VR technology, it will play an increasingly important role in the field of education, providing students with richer and more immersive learning experiences. VR technology has the potential to transcend geographical and cultural boundaries, even enabling participation in international marine education projects. This helps students to gain a broader understanding

of global marine issues, develop comprehensive perspectives, and interact with students from different cultural backgrounds. It can also cultivate practical marine science and conservation skills in students, which can be applied to real-life marine conservation projects, making them active participants in environmental conservation efforts. With the ongoing advancements in technology, it is anticipated that virtual reality will continue to play a key role in the education sector in the future, particularly in addressing environmental and sustainability-related marine issues.

The study investigates the integration of virtual reality (VR) technology into indoor teaching for marine education and its impact on elementary school students' learning. The pre-test results indicate a relatively limited understanding of marine education among elementary school students. However, after the implementation of lesson plans utilizing smartphones and VR tools, significant improvement is observed in post-test results. This suggests that the use of smartphones and VR tools enhances the effectiveness of marine education for students. Regarding learning attitudes, students provide positive feedback in interviews and worksheets, expressing a desire for more opportunities to utilize such teaching methods for various marine education topics in the future.

Virtual reality headsets provide students with immersive learning experiences, enabling them to understand marine ecology, species, and environments without direct exposure to the ocean. Analysis of the interview transcripts and worksheet contents reveals a notable improvement in students' learning attitudes. Students commonly use positive language to provide feedback on the course, demonstrating the positive impact of VR technology on marine education. Improving learning outcomes and attitudes has always been important educational objectives. The interactive and immersive nature of virtual reality technology contributes to improved learning outcomes, making it easier and more enjoyable for students to understand educational content, thus fostering a positive trend in marine education development. As scientific advancements alter living environments, changes in attention and learning attitudes typically reflect in students' active participation and enjoyment in learning. Such positive attitude changes facilitate deeper student engagement and further enhance their learning outcomes.

The development of marine education may vary regionally, leading to differences in prior knowledge among students from different administrative regions and age groups. When conducting marine education on various marine topics for students in different regions and age groups, it is necessary to allow flexibility in adjusting the difficulty of teaching content to achieve better teaching effectiveness. A preliminary exploration of regional differences in marine education reveals several key factors. Students living in coastal areas have more opportunities to interact with the marine environment, while those in inland areas may have fewer such opportunities. Therefore, curriculum adjustments based on geographical location need to be considered. Students also have varying degrees of prior knowledge about marine ecology or marine science, necessitating flexible adjustments to teaching content or methods. Grouping students for instruction is recommended to ensure that each student can benefit from collaborative and differentiated teaching methods during the teaching process.

Considering the learning objectives of marine education at the elementary school level, educators should not only provide knowledge but also focus on cultivating students' interest in and awareness of marine conservation. However, marine issues emphasized in different regions may vary slightly, such as marine pollution, resource management, or ecological conservation. Therefore, educational content should also reflect local needs and resources.

Regional differences in prior knowledge are a reality that marine education needs to address. Through flexible curriculum design and interdisciplinary teaching methods, marine education can achieve better teaching effectiveness in various regions while also fostering students' autonomous awareness of marine conservation, thereby accomplishing the three learning objectives of experiencing the sea, loving the sea, and understanding the sea.

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Effects of Four-Axis Joystick Device Interactive Technology on Children With Special Needs

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Abstract
In recent studies, employing self-made assistive technology as a resource in special education stands out as a crucial intervention for children with special needs. This study suggests creating an interactive tool intended to serve as an educational interface for children with diverse disabilities. The participants in this study were three children with cerebral palsy, multiple disabilities, and learning disabilities. This study uses a four-axis joystick device with multimedia and programming software to develop an interactive feedback interface to promote movement training and learning motivation of students with special needs. Utilizing this device, which involves a joystick, a self-modeled laser-cut wooden box, and connection to the Printed Circuit Board Assembly for its operation, enables a computer, tablet, or mobile phone connection. Ultimately, using this customized interactive technology involves utilizing multimedia platforms or program software to cater to the specific needs of children with special requirements. This aids in facilitating physical or learning training for children with special needs. Through the case study paradigm, we can understand the training effectiveness of children with different needs, including the effectiveness of the upper limb fine motor training process and learning outcomes. It collects professional advice and feedback from special education teachers and parents, concluding with a discussion of the study's findings.

Keywords: Assistive Technology, Interactive Technology, Children With Special Needs

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Introduction

In the 21st century, we've witnessed a cascade of technological advancements. The user base for assistive technology has been steadily growing, underscoring the heightened significance of selecting and deploying appropriate assistive technology tools and services. It's imperative to consider each user's unique circumstances, encompassing individual traits, preferences, perceptions, and attitudes, to ensure that unsatisfactory outcomes don't lead to the abandonment of assistive technology (Sung et al., 2018). In recent years, Maker has emerged. People who love technology and are keen on practice enjoy sharing technology and exchanging ideas, and have incorporated it into their lives, communities, courses, etc. Of course, assistive technology equipment is no exception.

The capacity to harness do-it-yourself (DIY) techniques and tools for crafting personalized digital assistive technologies (DIY-ATs) has been acknowledged for quite some time (Parry-Hill et al.,2017, Hook et al., 2014). In addition to being able to design and produce according to the individual needs of users, DIY-AT can also reduce manufacturing costs, replicate experience and provide painless learning, helping people with special needs who are in urgent need of assistive devices and have financial burdens to use assistive devices easily and Avoid lengthy time in obtaining assistive devices and reduce the burden of huge amounts of money.

Currently, numerous individuals have utilized the DIY or maker movement to engage in research on assistive technology, yielding positive outcomes. 表單的頂端 an affordable, open-source DIY prototyping platform to fabricate personalized alternative augmentative communication (AAC) devices tailored for nonverbal children and youth in Western Kenya (Hamidi et al., 2022); Additionally, Hamidi (2019) leverages a comparable platform for collaboratively designing interactive audio interfaces to bolster speech-language therapy and music therapy in the United States; Mettler et al. contend that enabling the active participation of the elderly in the planning, design, and utilization of DIY AT can yield satisfactory effectiveness (2023); 3D printing push switches and toy modifications have also achieved good results in mathematical operations and cooperative learning for children with special needs(Sung et al., 2018); Utilizing 3D printing technology, this study creates a multimedia interactive feedback interface designed to train children with learning or physical disabilities in coin insertion, thereby enhancing their learning motivation. The human-machine interface is developed using Microsoft Visual C# (Chen et al., 2018).

Method

A case study methodology was employed to investigate the effectiveness of specially designed teaching activities, which integrate assistive technology with toys and games for both learning and physical training interventions. This approach involved the utilization of a laser-cutting wooden box and a Four-Axis Joystick, in conjunction with a PCBA board, to facilitate the physical training and learning of special needs students in elementary schools. Subsequently, professional suggestions and feedback from the participating special education teachers were collected, summarized, and integrated.

Study Subjects

This study focused on three elementary school students with distinct special needs, including Cerebral Palsy (CP), Learning Disability (LD), and Autism Spectrum Disorder (ASD). The first student diagnosed with CP exhibited high muscle tension, poor hand stability, and limited

fine motor skills in their fingers. The second student, with a learning disability, had transitioned from regular classes to the special education classroom for multiple subjects. The final student, who was diagnosed with Autism Spectrum Disorder (ASD), experienced learning challenges and had been identified by the special education teacher as requiring improvement in interaction skills. Consequently, this student was selected to participate in the study aimed at enhancing their ability to engage with others.

Study Instruments

1. Wooden Box Produced With Laser Cutting

Our team is called Excellent Assistive Technology (AxcellenT for short) (see Fig. 1). We manufacture, modify, and adjust assistive technology devices according to the different special needs of children with disabilities, including 3D printing technology and laser cutting technology equipment (see Fig. 2). In this study, participants had to operate devices to activate modified toys and an online platform to perform tasks. In order to help more children with special needs, AxcellenT makes the production process and results of assistive technology devices available to the public for free (see Figure 3).



Fig. 1 Axcellent Website

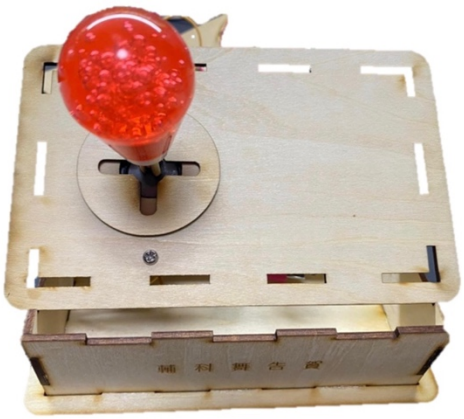


Fig. 2 Wooden Box Produced with Laser Cutting

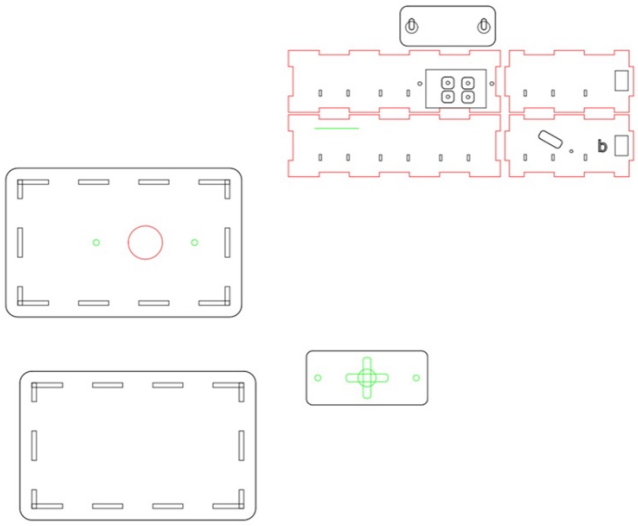


Fig. 3 Public Four-Axis Joystick Device Design

2. Printed Circuit Board Assembly (PCBA) Called "Scratch Board"

The technical key to the integrated design of “toy mechanism” and “program interaction” is to use a Printed Circuit Board Assembly named "Scratch Board" which was developed by Maker Liao, Hong-De (see Figure 4). This board offers several functionalities:

2.1 It utilizes a single chip capable of programming the 41 most commonly used characters in Scratch.

2.2 It can interface with back-end PCs, laptops (NB), tablets, smartphones, and other smart devices via USB connection.

2.3 It supports plug-and-play functionality, allowing for direct control of smart devices without the need for initial driver installation, unlike conventional control panels.

2.4 The Scratch program can be seamlessly utilized for adjustment and trigger control.

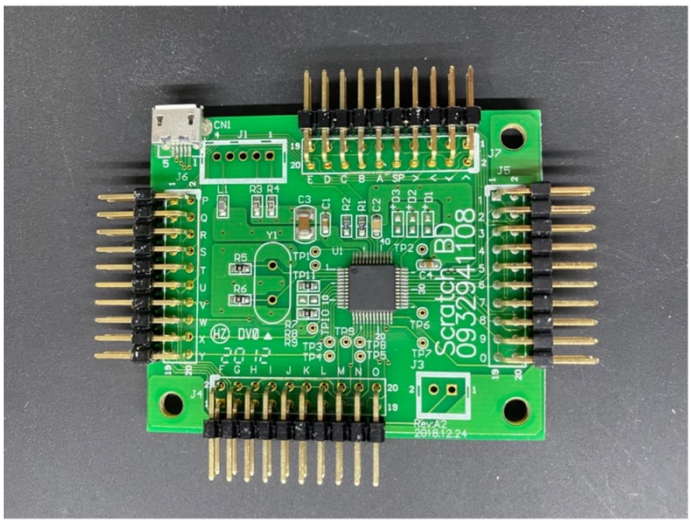


Fig. 4 Scratch Board

3. Four-Axis Joystick

The purpose of choosing a four-axis joystick is to train students in the up, down, left, and right directions and to have a sense of presence on a game console (see Figure 5). In addition, an innovative online platform called Wordwall is also used to gamify the course content, add visual prompts, and reduce the burden on students.

4. Variation Type - Dance Dance Revolution (DDR)

Additionally, various special switches can be employed as substitutes for the four-axis joystick, tailored to the specific requirements of individual students. Furthermore, we have developed a variant wherein the four directional keys are separated (see Figure 6), similar to those found in games like Dance Dance Revolution or the classic game of Snake. Thereby fostering increased opportunities for student interaction and collaboration.

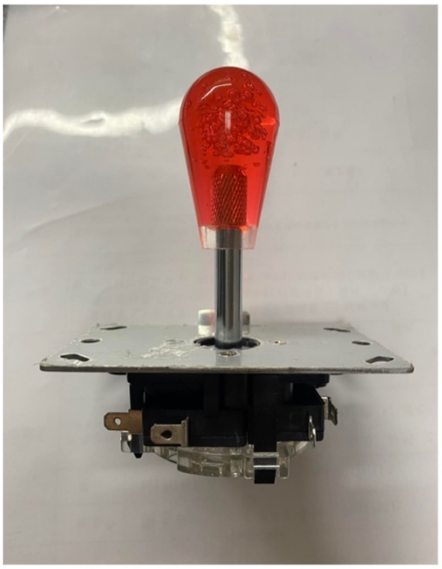


Fig. 5 Four-Axis Joystick

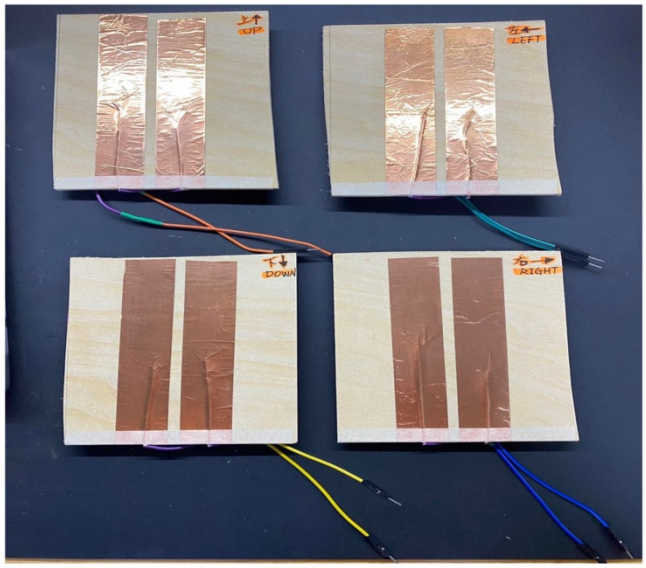


Fig. 6 Variation type of direction

Research Process

Case1. Students With Cerebral Palsy

The initial case involves a student with cerebral palsy, characterized by heightened muscle tension and limited fine motor skills in the hands. Considering the student's anticipated reliance on an electric wheelchair in the future, a four-axis joystick is implemented to enhance directional perception and cultivate operational proficiency. The training regimen comprises several stages:

1. Introduction to Four-Axis Joystick: The student undergoes initial training to familiarize themselves with the operation of the four-axis joystick.
2. Remote Control Car Manipulation: Progressing to the next stage, the student learns to manipulate a remote control car to navigate towards specified target objects.
3. Computer Game Engagement: Subsequently, the student engages in computer game activities, further refining their control and coordination skills.
4. These training stages are recurrent, allowing for repeated practice and skill enhancement (see Figure 7).



Fig. 7 Students with cerebral palsy training process

Case 2. Students With Learning Disability

The second scenario involves a student grappling with learning disabilities, primarily characterized by challenges in comprehension, particularly in Mandarin and mathematics, resulting in persistently subpar academic performance.

To address these issues effectively, we employ a strategic approach: Utilizing the four-axis joystick in tandem with Wordwall, we gamify the learning process. By incorporating game elements, we gradually tailor the difficulty level of course content to suit th e student's learning pace (see Figure 8).



Fig. 8 Students with learning disability learning application process



Fig. 9 Students with ASD learning collaborative engagement process

Case 3. Students With Autism Spectrum Disorder

The third student, diagnosed with autism spectrum disorder (ASD), was identified by the special education teacher as requiring enhancements in interaction abilities. As such, they were selected to participate in this study aimed at fostering improved interpersonal skills.

In our intervention, we introduced a novel approach: We devised a variant that separates the four directional keys independently, drawing inspiration from popular games like Dance Dance Revolution (DDR) and the classic Snake. In this setup, four students were assigned to each direction, with students with ASD actively participating by controlling one of these directions (see Figure 9).

Conclusions and Suggestions

Application of DIY assistive technology devices and interactive technology integrated with games in special education has gradually become a tendency. Drawing from the study process, observations, and feedback provided by the special education teachers of the participants, the authors have formulated the following conclusions and recommendations:

1. DIY assistive technology devices offer the advantage of customizable design, allowing for tailored adjustments to precisely match the unique needs of individual students. By harnessing this flexibility, educators can create solutions that cater specifically to the diverse requirements of each learner, ultimately enhancing their overall educational experience and effectiveness.
2. The integration of interactive technology in student learning environments enhances engagement, personalization, collaboration, feedback, motivation, and accessibility, ultimately contributing to more effective and enriching educational experiences. This dynamic adjustment not only bolsters the student's engagement but also alleviates the sense of academic burden, fostering a more motivated learning environment.
3. When collaboration is emphasized to promote the cooperation of children with special needs, such collaborative learning can enhance the chance and capacity of students with special needs to engage with others.
4. This type of DIY assistive technology devices and interactive technology are not constrained by environmental limitations, providing parents with the flexibility to easily assist their children in using them at home. This not only expands the learning environment but also enhances opportunities for parental involvement in their child's education, fostering a supportive and enriched learning experience outside of traditional classroom settings.

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Using Task-Technology Fit to Analyze the Adoption of Google Workspace for Education in Teaching and Learning Process

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Abstract
In addition to the efficiency of teaching and learning activities, the important point of the development of technology in education is the aspect of collaborative work. Collaboration is crucial, encouraging teachers and students to integrate technology for a more meaningful teaching and learning experience. Google Workspace for Education (GWE) is designed to promote the digital transformation in education and highlights the collaborative functionality in its solution's features. The study aims to explore a comprehensive view of technology adoption and its usage by considering teachers' and students' beliefs, and their behavior towards the development of technology in education. Furthermore, the study aims to identify the factors influencing technology adoption and the effectiveness of its implementation in real-world contexts. The study was conducted by using a qualitative-method approach that involved teachers and students from a private school in West Java, Indonesia. The finding shows a mismatch between teachers' beliefs towards technology's role in education and their knowledge of Google Workspace. This finding is essential to design a method to train teachers and students on how to introduce GWE and familiarize them with working collaboratively to accomplish tasks more efficiently and effectively.

Keywords: Task-Technology Fit, Google Workspace for Education, Teaching Learning Performance

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Introduction

The use of technology in education has grown in recognition, with the goal of promoting collaborative learning as well as improving the effectiveness of teaching and learning activities (Mohammadi, 2018). Collaboration is essential to create an enjoyable educational environment and encourage students and teachers to go beyond monotonous activity (Shin, 2019). Due to this demand, Google Workspace for Education (GWE) provides a collection of resources intended to support digital transformation in classrooms. GWE has a strong focus on collaborative aspects within its features like online classrooms, real-time communication tools, and shared documents.

The implementation of technology in the classroom does not guarantee its efficient adoption and integration. Studies indicate that a more thorough understanding of technology adoption is required, taking into account not just the technology itself but also the attitudes and actions of educators and learners (Liu, S., Wang, F., & Chen, 2020). This entails discovering how they feel about the educational benefits of technology and how comfortable they are utilizing it for group projects.

Teaching and Learning in 21st Century

The 21st century, also known as the digitalization era, is an era where access to information and communication technologies fundamentally change everybody's lives. It influences how people live, work, and learn. Thus, it is necessary for the education system and sector to adapt to this transformation. Traditionally, the teacher-centered learning concept does not fully support the students with the skills that they need to thrive in this digital environment. On the other hand, the 21st century demands a skilled and adaptable next generation prepared to navigate a rapidly evolving technological landscape. Thus, the concept of "21st-century skills" has emerged, encompassing critical thinking, creativity, collaboration, communication, and computational thinking. As technology plays an increasingly important role in education, tools like Google Workspace for Education offer promising possibilities to foster these skills and create a more engaging and effective teaching and learning process.

Collaborative Work for Digital Transformation in Technology

Digital transformation in technology is revolutionizing the way people work and live their lives. It transforms the traditional and non-digital life system into a digitalized system. One of the cores of this transformation is collaborative work. With technology, people can work together easily and seamlessly. It also enhances the togetherness between one individual with another. Moreover, this transformation also indirectly transforms the teaching and learning process between teachers and students. Technology plays a vital role in facilitating collaborative work in the education environment. This collaboration empowers educators and students to achieve higher quality of work.

Google Workspace for Education

Google workspace for education is a set of productivity and collaboration tools to empower educators and students. It offers a variety of features, including Gmail and Chat for communication, Docs, Sheets, and Slides for collaborative document creation, Classroom for managing online courses, Meet for video conferencing, Forms for survey distribution, and Drive for document organizing. This set of tools is beneficial in fostering 21st-century skills in

the educational environment. Thus, to analyze the adoption of Google workspace for education, this paper utilizes task-technology fit framework. Using this framework, researchers may evaluate how well Google Workspace for Education fulfills demands and challenges of teaching in the 21st century, especially in target schools.

Studies elaborate how Google Workspace tools, such as Docs and Classroom, support group projects in the classroom. With these technologies, students can collaborate on documents, homework and projects, encouraging collaboration and communication. Many research works have investigated the application of GWE. According to one study, Google Classroom is a great tool for facilitating collaborative learning, especially in writing (Subandoro & Sulindra, 2019). In addition, case studies of Google Earth and Google Maps-based collaborative learning among Greek primary schools highlight the development of a real environment study (Tsoulis et al., 2013). Similarly, the use of Google Sites in undergraduate schools promotes collaborative learning and shows positive results in students (Roodt, 2017).

Technology offers possibilities for collaborative learning and developing 21st century skills, but successful integration depends on more than the functionality itself. This study takes an in-depth look at the fit between Google Workspace Education and the specific tasks and requirements of 21st century education through the perspective of the task-technology fit model. This study aims to more fully understand the potential of GWE to transform education in the digital age by examining its capabilities and the perceptions and comfort levels of teachers and students.

Literature Review

Task-Technology Fit

Grounded in the task-technology fit (TTF) theory proposed by Goodhue and Thompson (1995), this study investigates the interaction between task characteristics and technology characteristics. The theory suggests that a user's performance and acceptance of a technology depend upon the degree of alignment between the task requirements and the functionalities offered by the technology. The TTF model theorizes a central point: information technology adoption focuses on the alignment between its functionalities and user tasks. This alignment, often termed "fit," is achieved when the technology's features demonstrably facilitate the user's activities. Experienced users, acting logically, prioritize tools and methods that demonstrably enhance task completion speed and overall effectiveness. Therefore, software with functionalities that do not demonstrably align with user needs is less likely to see widespread adoption. (Larsen et al., 2009). Recent studies identified that the TTF model can effectively evaluate how well technology is adopted and integrated in educational settings. This demonstrates the model's usefulness in analyzing a wide range of educational technologies and platforms. Alyoussef's (2021) investigation into TTF within higher education e-learning systems highlighted that a strong fit between the system's features and user tasks leads to increased user satisfaction and a greater likelihood of continued engagement. Yaakop et al. (2020) investigated an integrated model that merges task-technology fit with the technology acceptance model. This approach successfully explains why students in Malaysian higher education maintain their usage of web-based educational tools. According to Yadegaridehkordi et al. (2016), a study investigating cloud-based collaborative learning technologies in educational settings found that a good fit between the learning tasks and the technology's functionalities (task-technology fit) encourages user adoption. Interestingly, the research also revealed that tasks requiring collaboration among learners further strengthen this positive

influence on task-technology fit. Lim and Lee (2021) argued that combining the TAM and TTF models offers a valuable framework for understanding technology acceptance in higher education, particularly regarding the development of 21st-century skills. This study extends this line of inquiry by employing the TTF framework to specifically examine the adoption of Google Workspace for Education, a collaborative suite designed to enhance educational activities.

Integration of Google Workspace for Education in Collaborative Learning

The integration of Google Workspace for Education into collaborative learning and technology in educational settings has been a subject of research across various academic disciplines (Gupta & Pathania, 2021). Oliynyk et. al. (2023) reports that Google Workspace for Education effectively fosters digital competence among teachers in postgraduate education, enhancing collaborative learning and enhancing learning outcomes. Previously, an observational study from Cahill (2014) reported that integrating Google Apps into university classrooms improves students' communication and collaboration skills, and enhances their understanding of technology use in the classroom. Furthermore, Siek & Wijaya (2022) find that adoption of Google Workspace for Education by university students is positively influenced by perceived usefulness, leading to improved learning performance. The study being reported, mostly aim on the subject of higher degree students. Meanwhile, studies that have been conducted in elementary and middle school are rare.

Research Methods

Research Design

This study uses a mixed-methods approach to examine Google Workspace for Education (GWE) use in teaching and learning. Quantitative survey data is combined with qualitative focus group discussions (FGDs).

Participants

This study involved teachers and students from a private school located in West Java, Indonesia. Purposive sampling was employed to select participants who had prior exposure to GWE in their educational activities. The sample comprised 25 teachers and 65 students. Teacher selection focused on those who had participated in GWE-based courses, while students were drawn from various grade levels to ensure a diversity of experiences and perspectives.

Data Collection Methods

Quantitative Questionnaire

A comprehensive survey, utilizing both closed- and open-ended questions, was conducted among teachers and students. This investigation aimed to capture baseline data on their initial attitudes towards educational technology, their familiarity with GWE, and their perceptions of its utility and ease of use.

Focus Group Discussion

Following a preliminary survey, researchers conducted focus group discussions (FGDs) with educators to gain deeper understanding of their practical experiences using Google Workspace for Education (GWE). These discussions aimed to elicit rich insights concerning the challenges and opportunities associated with GWE, its suitability for achieving educational goals, and the perceived benefits and barriers to its successful integration.

Research Framework

By utilizing the Task-Technology Fit (TTF) framework, this study analyzes how well GWE's functionalities align with educational tasks. The analysis focuses on identifying GWE's strengths that benefit learning and any weaknesses that hinder its effective use in educational settings.

Qualitative data from FGDs and open-ended survey responses will be analyzed using thematic analysis. This analysis will identify recurring themes related to the adoption and use of GWE, the challenges encountered by teachers and students, and the strategies employed to overcome these challenges.

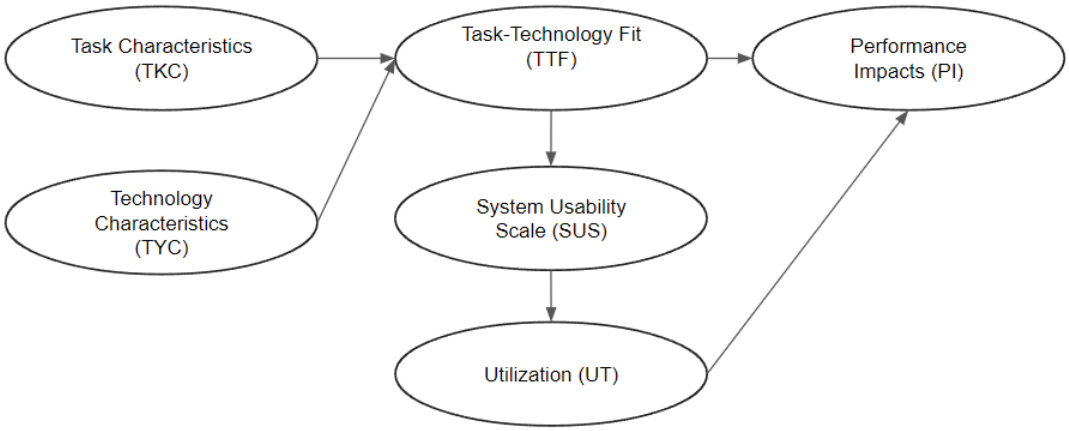


Figure 1: TTF Research Framework

Findings and Discussion

Initial Survey

The initial findings, based on the word cloud obtained from the teachers' lesson plan (Figure 2), reflect that the focus of the current teaching approach is still conventional. It can be seen from the prominence of some keywords such as "peserta" (students), "pembelajaran" (lesson), and "kegiatan" (activity). The "student" keyword indicates that the learning style is still passive, where students are more focused on receiving information and just being a participant and less active participation. Moreover, "lesson" keyword implies a teacher-centered learning style and presentation. However, "activity" mentioned in the word cloud reflects that the current teaching and learning process includes dynamic activities which provoke the emergence of critical thinking among the students.



Figure 2: Word Cloud Analysis on Lecturer's Lesson Plan

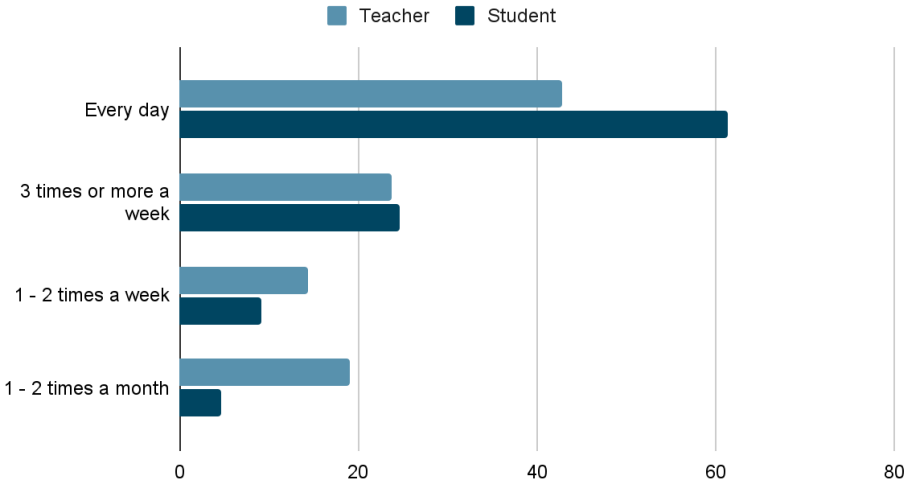


Figure 3: Comparison of the Frequency Using Technology Between Teacher and Student

Figure 3 shows the comparison of how frequent teachers and students are using technology for their operation daily. This figure emphasizes on the information that students are more frequent in using technology than teachers. However, it is not necessary to use educational technology for their learning experience (ex. for gaming and social media).

Through the survey, other findings indicate a positive use of technology adoption for both students and teachers. For instance, students' digital tool adoption has reached a staggering 98% in their day-to-day activities. Furthermore, when specified regarding the academic use of Google Solutions, 80% of the students reported daily usage of the technology. The teachers' survey yielded similar results, where 80% of them declared the adoption of digital tools for their daily teaching and learning process. Additionally, when specified regarding the use of

Google Solutions, 80% of the teachers answered that they have used those tools in the classroom. This indicates a positive use rate of digital devices overall.

However, the same cannot be said regarding the knowledge of Google Chromebooks. Although heralded as a tool for education, students and teachers do not have an awareness of its existence. Before the distribution of the devices, the percentage of students and teachers who knew of the Google Chromebook was 38% and 67%, respectively.

Focus Group Discussion (FGD) With Teachers (NVIVO)

Table 1 summarizes the Focus Group Discussion (FGD) results that describe the adoption and use of GWE based on the TTF framework. The most significant finding is the belief required in teachers when it comes to technology usage, where teachers realize the noticeable impact of technology's benefits after they apply the tools daily. Before any intensive training on Google Solutions was done, teachers were more focused on being the center of instruction and used more conventional teaching methods. On the other hand, students were more enthusiastic when it came to the use of technology. However, after the training, where teachers were given a chance to explicitly learn and explore the tools, they began to believe that there would be a benefit in using digital tools in the classroom. Therefore, upon the utilization of technology in the classroom, the teachers perceived that there was an increase in their performance impact. This particular research emphasizes the benefits teachers encounter when purposely using the tools and features that GWE provides for them. It proves that a mismatch exists in the teachers' belief in technology's role in education and their knowledge of GWE.

Table 1: Summary of findings related to the proposed TTF framework based on FGD results.

Variable	Excerpt
Task Characteristics (TKC)	*Sistem penilaian, supervisi pekerjaan siswa dan mengecheck progress dari siswa, Pencatatan aktivitas harian anak-anak dalam ibadah, seperti shalat.* (Evaluation system, work supervision of students, and checking student progress. Recording daily activities of children, for example prayers.)
Technology Characteristics (TYC)	*Kelebihan Chromebook adalah kemudahan dalam berbagi dan akses berbasis online, menghilangkan kebutuhan untuk menggunakan perangkat tambahan seperti flashdisk.* *Kekurangan Chromebook adalah ketidakfamiliaran pengguna dengan platformnya, yang membutuhkan aktivitas untuk mencoba dan mengembangkan diri.* (The advantage of Chromebook is the ease of sharing and online-based access, eliminating the need for additional devices like flash drives. The drawback of Chromebook is the users' unfamiliarity with its platform, which requires activities to try and develop oneself.)

Task Technology Fit (TTF)	*Memudahkan guru dalam administrasi tugas siswa.* *Memudahkan dalam memberi feedback kepada student.* (Facilitates teachers in student task administration. Facilitates providing feedback to students.)
System Usability Scale (SUS)	*Beberapa merasa nyaman dengan Google Chrome karena lebih simpel, dan meningkatkan kolaborasi namun masih belum terbiasa dengan beberapa fitur.* (Some feel comfortable with Google Chrome because it is simpler and enhances collaboration but are still not familiar with some features.)
Utilization (UT)	*Sudah diintegrasikan ke semua aspek, dari buku digital, penyampaian materi, pengumpulan tugas, dan asesmen.* *Setiap pagi, wali kelas dapat menggunakan Google Chromebook untuk mengaji Al-Quran. Ayat-ayatnya juga dapat ditampilkan di depan.* (It has been integrated into all aspects, from digital books, lesson delivery, task submission, to assessment. Every morning, homeroom teachers can use Google Chromebook to recite the Quran. The verses can also be displayed in front.)
Performance Impacts (PI)	*Komentar langsung pada tugas-tugas siswa melalui Google Chromebook membuat mereka lebih rajin dan cepat mengevaluasi pekerjaan mereka.* *Melalui kolaborasi belajar dengan teknologi Google, perubahan positif dalam karakter siswa menjadi lebih terlihat, terutama dalam motivasi dan kualitas pekerjaan mereka.* (Direct feedback on student assignments through Google Chromebooks makes them more diligent and quicker to evaluate their work. Through collaborative learning with Google technology, positive changes in students' characters become more noticeable, especially in motivation and the quality of their work.)

Conclusion

Although there are benefits of Google Workspace for Education (GWE) to teaching and learning, to make the suite impactful, the teachers must have the intention of using it first. Further studies may show the impact that GWE has on the teachers and students as they continue learning the features and functionality that the suite has. Overall, the benefits of Google Workspace for Education are apparent, and the teachers find its applications beneficial to their performance. The finding shows a mismatch between teachers' beliefs towards technology's role in education and their knowledge of Google Workspace. This finding is essential to design a method to train teachers and students on how to introduce GWE and familiarize them with working collaboratively to accomplish tasks more efficiently and effectively.

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2011–2020 Domestic Retention Intention Journal Paper Content Review: A Case Study of Teachers and Special Education Teachers

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Abstract
This paper applies the content analysis method to evaluate 15 domestic journal papers on teachers and their willingness to stay from 2011 to 2020. The analysis results show that most researchers come from educational backgrounds, followed by management departments. Most existing journal papers use quantitative research designs, but there are differences according to different research topics and objects. At the end of the article, suggestions are also provided for future research directions based on the results of the literature review.
Researcher's professional field: Most are from colleges of education, followed by management. Cross-disciplinary cooperation is recommended.
Research methods: Questionnaire surveys are mostly used. Incorporating qualitative research methods is recommended.
Research objects: More attention is paid to administrative teachers and teachers in remote areas, while research on special education teachers is relatively less. Willingness of special education teachers to stay is also worth paying attention to.
Research results: Most papers believe that the school atmosphere has a positive impact on teachers' willingness to stay.

Keywords: Special Education Teacher, Teacher, Retention Intention

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Introduction

Since the announcement of the Special Education Act in 1984, Taiwan has undergone 8 amendments in hopes of integrating special education resources, implementing assistance and care for disadvantaged groups, improving the quality of special education and related services, realizing equal educational opportunities and the right to appropriate development. The amendments also aim to strengthen contact, counseling and other support services for parents of students with special needs, safeguard the rights and interests of students with special needs, and develop the potential of students with special needs. Among these efforts, special education teachers play an indispensable role in the education environment.

According to the 2022 Education Yearbook, in the 2020-2021 school year, there were a total of 17,668 special education teachers in primary and secondary schools (including special schools and mainstream schools). Among them, 15,293 served students with disabilities (accounting for 86.5%), and 2,375 served gifted students (accounting for 13.4%). Looking at class types, 5,428 disability teachers served self-contained special education classes, 7,673 served resource rooms, and 2,192 served itinerant/consulting services. In addition, of all special education teachers, 13,262 were formally employed (75.1%), while 4,406 were substitute teachers (24.9%). Among formally employed teachers, 11,885 were certified special education teachers (89.6%); among substitute teachers, 2,089 had special education certification (47.4%).

According to 2022 statistics from the Special Education Information Network, in Tainan City where I currently work, there are 38 uncategorized self-contained special education classes, 112 resource rooms, 3 itinerant classes for the visually impaired, 16 uncategorized itinerant classes, 4 itinerant classes for emotional and behavioral disorders, 0 homebound instruction classes, and 5 itinerant/at-home classes, totaling 188 special education classes in elementary schools. There are 658 teachers for students with disabilities in elementary and middle schools, and 4504 students with disabilities, a ratio of about 1:7. Therefore, the various pressures faced by teachers of students with disabilities in educational settings deserve our attention.

According to a 1984 report from the National Conference on Disability Education, the turnover rate for elementary special education teachers was 24.86% (Ministry of Education, 1995), accounting for over 20%. The high turnover rate leads to a growing shortage of personnel, which lowers the quality of curricula for students with special needs who need them most. Given the importance and uniqueness of special education teachers, this paper adopts an educational perspective, taking special education teachers, teachers, and retention intentions as keywords to review domestic literature on retention intentions in the past decade (2011-2020). It is hoped that through a review of existing literature, we can understand the current situation and needs, envision possible future research directions, and provide suggestions and directions for subsequent research and development in the future.

Research Methods

Research Sample

The sample was selected from the literature between 2011 and 2020. The databases searched were Airiti Library (http://www.airitilibrary.com/) and HyRead Taiwan eBook & eJournal Service (http://nutn.ebook.hyread.com.tw/). Online databases were searched using the keywords "special education teacher", "teacher", and "retention intention". Cross-referencing

was also performed. A total of 10 master's theses and 5 journal articles were obtained, comprising 15 journal articles in total.

Content Analysis of Retention Intention Literature

Categorizing by authors' academic disciplines, there were 4 articles from management, 7 from education, and 4 from other disciplines. Content analysis was applied to analyze the findings of each article. The results are compiled in Tables 1 and 2 by author, topic, and methodology and sample, Furthermore, the results of each study will be presented in paragraph form.

Table 1. Retention Intention Related Journal Articles

Author/Year Institution	Topic	Methodology Sample
Po-Hua Hou Hsin-Yi Kung 2019 Professor, Graduate lnstitute of Education, National Changhua University of Education (Corresponding author)	Will You Come Back after Summer Vacation? The Influence Factors of Retention of Rural Area Elementary School Teachers in Taichung, Changhua, and Nantou	The purpose of this study was to explore the influence factors of retention of 326 rural area elementary school teachers in Taichung, using questionnaire.
Hsiu-Yin Lin Yi-Hsing Liao 2014 Master, Department of Public Administration, Chung Hua University	The Work Stress and Desire to Continue in the Position of Information Technology Coordinators at Elementary Schools	Questionnaire with 679 teachers
Chen Shiuan-Kang; Li Chin-Ting; Ho Kao-Chih 2020 Jen-Teh Junior College of Medicine, Nursing and Management	A Study on the Correlation Between Transformational Leadership of Junior High School Principals and Willingness to Stay for Teachers Doubling as School Administrators	Questionnaire with 320 teachers
戰寶華;黃婉禎 2017 Graduate Institute of Educational Administration, NPTU	專業學習社群對偏鄉教師留任意願之影響	Academic discourse
Shu-Yu Chiu · Chia-Hsin Chou · Pei-Chen Wu · Hsiao-Feng Hsia · Shu-Hsien Chen 2017 Nurse of Surgical intensive Unit, Keelung Chang Gung Memorial Hospital	Promoting the Retaining Rate of New Nurses in a District Teaching Hospital	Questionnaire Survey with 15 resigned nursing staff

The study by Po-Hua Hou and Hsin-Yi Kung (2019) investigated the influence factors of retention among 326 rural area elementary school teachers in Taichung, Changhua, and Nantou, employing descriptive statistics, independent sample t-tests, one-way ANOVA, and multiple regression analysis. The findings revealed that teachers perceived a moderate level of retention overall. Concerning voluntary retention, the scores were significantly higher for teachers over 51 years old, married individuals, those in Nantou, those with more than 11 years of teaching experience, those holding administrative positions, and local residents. Regarding

involuntary retention, scores were significantly higher for teachers aged 31 to 40 and those with less than 5 years of experience, as well as for non-resident teachers. Furthermore, marital status, city, and school identification emerged as significant predictors of retention, with school identification being the strongest factor. The authors provided suggestions based on these findings for educational authorities, rural area elementary schools, and future researchers.

The study by Hsiu-Yin Lin and Yi-Hsing Liao (2014) investigated the relationship between work stress and the desire to continue as information technology coordinators in elementary schools. Utilizing a self-developed questionnaire titled "Survey for Information Technology Coordinators at Elementary Schools about the Relationship of Work Stress and the Desire to Continue in the Position," the researchers found that information technology coordinators experienced average to high levels of job stress. Significant correlations were observed between work stress and the desire to remain in the coordinator position, with professional competence and intrinsic conflict exhibiting moderate negative correlations with willingness to stay. Furthermore, the desire to continue as an information technology coordinator was moderate overall. Notably, professional competence and intrinsic conflict, two sources of job stress, emerged as significant predictors of coordinators' willingness to remain in their positions. The study's findings shed light on the interplay between work-related stress factors and retention intentions among elementary school information technology coordinators.

Chen Shiuan-Kang, Li Chin-Ting, and Ho Kao-Chih (2020) explored the correlations between transformational leadership of junior high school principals and the willingness of teachers to remain in administrative roles. Targeting junior high school teachers in Taoyuan, Hsinchu, and Miaoli, the researchers collected 320 valid questionnaires and analyzed the data statistically. The findings revealed that teachers were satisfied with the current transformational leadership and exhibited a willingness to stay in administrative positions. Furthermore, a strong positive correlation was observed between transformational leadership and the willingness of administrative teachers to remain in their roles. Notably, transformational leadership exerted a positive influence on the retention of administrative teachers. Based on these results, the study concluded by offering concrete suggestions for relevant authorities to develop policies and for schools to promote transformational leadership practices.

Zhan Bao-Hua and Huang Wan-Zhen (2017) posited that while enhancing work environments or increasing salaries and benefits may produce short-term results, such measures cannot generate long-term motivational effects for teachers in rural areas. The researchers argued that a comprehensive solution to the shortage of teachers in remote regions necessitates a focus on leveraging intrinsic motivational factors. By considering strategies to tap into intrinsic motivations, educational institutions can foster increased job satisfaction and a sense of accomplishment among teachers in rural settings, ultimately addressing the persistent challenge of teacher shortages in these areas. The study highlighted the importance of examining intrinsic motivational factors as a means to promote long-term teacher retention and commitment in underserved rural communities.

Shu-Yu Chiu, Chia-Hsin Chou, Pei-Chen Wu, Hsiao-Feng Hsia, and Shu-Hsien Chen (2017) investigated the factors contributing to low retention rates of new nurses in 2012, identifying lack of problem understanding, intravenous infection management, consultation resources, support groups, standardized handover modes, and inadequate shuttle bus services as key issues. Aiming to promote new nurse retention, the researchers implemented intervention strategies, including objective structured clinical examination (OSCE) programs, standardized ISBAR handover modes, support groups, senior nurse mentorship through the "Holding

Hands" caring activity, shuttle bus coordination, and regular monitoring of new nurse and clinical teacher schedules. Following the interventions, the new nurse retention rate increased from 69.9% to 84.3%. The study's findings and successful interventions offer valuable insights for other hospitals grappling with nurse retention challenges, highlighting the importance of addressing multifaceted factors through comprehensive strategies.

Analyzing the journal articles in Table 1 and their findings, in terms of authors' academic disciplines, there were two from management, two from education, and one from medicine. Regarding research on teachers in rural areas, there were two articles. The results show that teachers with higher voluntary retention intentions tend to be older and married teachers. This finding resonates with the conclusion of another article which utilized intrinsic motivational factors. There were two articles on concurrent teacher administrators. Both workload and principals' leadership styles influenced the retention intentions of administrator teachers. One article focused on healthcare professionals. The results identified management issues as the main reason for resignation, as well as not knowing how to reflect on or consult about problems. Among the five articles, four used questionnaire surveys for data collection. Regarding retention intentions, two articles found moderate levels, while another two mentioned that improving the internal work environment positively impacted retention intentions.

Table 2. Retention Intention Related Theses

Author/Year Institution	**Topic**	**Methodology Sample**
Ya-Chin Huang 2018 Department of Educational Policy and Administration, College of Education, National Chi Nan University	A Study of the Causes and Strategies of the Loss of Teachers in the Remote Elementary and Junior High Schools in Nantou County	Questionnaire survey of 353 elementary and middle school teachers.
Hao-Lin Yuan 2017 Graduate Institute of Natiional Policy and Public affairs, NCHU	The Willingness of Junior High School Teachers to Retain as Part-Time Administors in Miaoli County	Questionnaire survey of 324 middle school teachers
Che-Hung Chu 2011 Graduate School of Business and Administration Shu-Te University In Partial Fulfillment of the Requirements	The Study of Intention to Stay of the Teacher Charged with Administrative Tasks from the Public Junior High School ─ Example of Kaohsiung City	Questionnaire survey of 336 middle school teachers..
Pei-Tsen Liao 2017 Department of Industrial Design Shu-Te University In Partial Fulfillment of the Requirements	Exploring on Teachers' Intention to Stay in the Decentralized Resource Room of Elementary School	This research used the qualitative research methods.
Ya-Chi Huang 2020 Department of Education and Learning Technology	A Study of the Relationship Between Teacher-Librarians' Job Characteristics and Intention to Stay at Elementary School	This study was conducted adopting questionnaire survey from 298 teacher librarians at elementary schools of school year 107.

Chen, Chang-Ting 2020 Continuing Education Program of School Administration Department of Education College of Education National Taiwan Normal University	A Study on Working Stress and the Willingness of Reappointment as the Section Chief Administrators of Junior High School Teachers in Taipei City	The population was targeted at the section chief administrators of junior high school teachers in Taipei city in the academic year of 2019 and use of Questionnaire survey.
Chang, Chia-Chi 2020 Graduate Institute of Educational Administration and Policy	A Study on the Relationship between School Organizational Climate and Teachers' Retention of Elementary Schools in Rural Areas of Central Taiwan	The study conducted a questionnaire survey on 450 teachers from 200 elementary schools in rural areas of central Taiwan.
Chou, Chih-Ying 2018 Graduate Institute of Educational Administration and Policy	A Study of Relationships among School Climate, Organizational Commitment and Teachers' Retention in Rural Areas of Northern Taiwan	This study conducted a questionnaire survey on 720 teachers from 90 schools in rural areas of northern Taiwan.
Chien-En Huang 2018 Graduate Institute of Natiional Policy and Public affairs, NCHU	A Study of the Relationships among Leadership Styles and Teacher Intent to Stay – The Case of Changhua National High School	The research process is mainly based on literature analysis and questionnaire survey method.
Chiao, Li-Hua 2017 Department or Political Science College of Social Science National Taiwan University	Nursing Staffs' Willingness of Job Retention ─ A Case Study on a Religious Hospital in Taiwan	Maslow Demand theory of the six levels to design the questionnaire, in a religious hospital issued 759 questionnaires.

Ya-Chin Huang (2018) investigated the causes and strategies related to teacher attrition in remote areas. The study found that the primary causes of teacher loss were lack of authorized staffing leading to increased workloads, threats to career advancement, time-consuming commutes for advanced study, inconvenient transportation, and additional administrative responsibilities exacerbating workloads. However, interpersonal relationships among teachers and living expenses were not identified as major factors. To enhance teacher retention in remote regions, the research highlighted the importance of fostering a harmonious school atmosphere, providing a conducive teaching environment, improving salaries and remote area allowances, and ensuring a positive overall school environment. Interestingly, factors such as a sense of accomplishment, utilizing expertise and abilities, and improving overall job satisfaction had relatively little impact on teachers' willingness to remain in remote schools. The study also revealed differences in the causes of teacher attrition based on age, marital status, teaching load, years of service in remote areas, local residency status, and whether teachers had applied for transfers. Additionally, differences emerged in strategies to address attrition between substitute teachers and those who had requested transfers.

Hao-Lin Yuan (2017) explored the degree of attention and satisfaction towards part-time administrative duties among teachers in Miaoli County, Taiwan. Following the enactment of the Teacher Education Act in 1994, which introduced multiple pathways for teacher

recruitment, the study aimed to understand the willingness of teachers to remain in administrative roles. The research findings led to the following recommendations:(1) Enhancing incentives for experienced teachers to undertake part-time administrative duties; (2) Ensuring comprehensive policies and orders are in place before implementation to avoid frequent changes, coupled with strengthening training for part-time administrative teachers; (3) Clearly delineating the distinct roles and responsibilities of government employees and teachers, thereby reducing administrative pressure and financial burdens on teachers.

Che-Hung Chu (2011) investigated the perceptions of role conflict, work stress, and organizational climate among teachers charged with administrative tasks in public junior high schools. The findings revealed moderate degrees of perceived role conflict and work stress, while the organizational climate was close to an open environment. Role conflict exhibited a significant negative influence on teachers' intentions to remain in administrative roles, coupled with a significant positive impact on work stress levels. Furthermore, work stress had a significant negative effect on intentions to stay, with work stress partially mediating the influence of role conflict on retention intentions. Notably, organizational climate did not moderate the relationship between work stress and intentions to remain in administrative positions. Based on these results, the study offered suggestions to address the challenges faced by teachers juggling administrative responsibilities.

Pei-Tsen Liao (2017) investigated the factors influencing the retention of resource room teachers in decentralized settings within Kaohsiung. The study identified three major factors affecting teacher retention: teachers' personal factors, internal school factors, and external school factors. These three factors interacted to shape resource room teachers' willingness to continue in their roles. Among these factors, administrative support, teaching achievement, and classroom management emerged as having the greatest impact on resource room teachers' retention intentions. Liao's findings highlighted the critical importance of providing sufficient administrative support to resource room teachers, enabling them to focus on classroom operations and achieve teaching success. Consequently, the study recommended that relevant authorities at all levels prioritize offering robust administrative backing to resource room teachers, empowering them to concentrate on their instructional responsibilities and experience a sense of teaching achievement, which is crucial for their retention in these specialized roles.

Ya-Chi Huang (2020) examined the job characteristics and intentions to stay among elementary school teacher librarians. The findings revealed a high degree of perceived job characteristics overall and across the four roles analyzed, with skill variety rated highest and task identity and significance lowest. Teacher librarians' intentions to stay were also highly rated, with personal factors scoring highest and organizational environmental factors lowest. Job characteristics differed significantly based on age, marital status, seniority as a teacher librarian, professional background, and school size, but not gender, highest academic degree, or position-in-charge. Intentions to stay varied by age, marital status, and seniority but not gender, education level, background, position, or school size. A significant canonical correlation existed between job characteristics and retention intentions. Task feedback emerged as most influential for job characteristics, while personal factors were key for retention. Regression analyses showed task feedback, autonomy, and significance predicted intentions to stay overall and role-specifically.

Chen, Chang-Ting (2020) investigated the working stress and willingness for reappointment among junior high school teachers with section chief administrative positions in Taipei City. The findings revealed a moderate degree of overall working stress, with workload rated highest and superior pressure lowest. Similarly, the overall willingness for reappointment was

moderate, with organizational identity scoring highest and salary and benefits lowest. Working stress levels varied based on age, educational background, years of service, years in an administrative role, and highest education level attained. Willingness for reappointment differed according to gender, age, educational background, years of service, years in administration, position held, and highest education. Notably, a low negative correlation was observed between working stress and willingness for reappointment among these section chief administrators. The study's findings highlighted factors influencing the work experiences and retention intentions of junior high school teachers juggling instructional and administrative responsibilities. Chen proposed recommendations to address the working stress and reappointment considerations for this crucial segment of the educational workforce.

Chang, Chia-Chi (2020) examined elementary school teachers' perceptions of organizational climate and retention in rural areas of central Taiwan. Employing descriptive statistics, t-tests, ANOVA, correlation, and regression analyses, the study yielded several key findings. Teachers perceived a medium level of organizational climate, with principal supportive behavior rated higher and restrictive behavior lower. Retention levels were also moderate, with voluntary retention higher than involuntary retention. Perceptions of organizational climate differed significantly based on age, teaching experience, educational background, degree level, and remoteness. Similarly, retention varied by age, years of teaching, education, and remoteness. Certain dimensions of organizational climate exhibited significant positive correlations with teacher retention. Furthermore, some background variables and organizational climate dimensions emerged as significant predictors of retention. Based on these findings, Chang proposed suggestions to inform education administration authorities, rural school principals, and future research efforts aimed at fostering favorable organizational climates and promoting teacher retention in rural elementary schools.

Chou, Chih-Ying (2018) investigated teachers' perceptions of school climate, organizational commitment, and retention in rural areas of northern Taiwan. The findings revealed a medium-high level of perceived school climate, with teacher commitment behavior rated highest and principal restrictive behavior lowest. Teachers' organizational commitment was also medium-high, with emotional commitment being strongest and continuance commitment lowest. Retention levels among rural teachers were close to medium-low, with voluntary retention higher than involuntary retention. Perceptions of school climate differed significantly based on gender, age, education level, teaching experience, years at the current school, position, school type, and district. Organizational commitment varied by gender, age, hometown, teaching experience, years at the current school, position, school type, district, and size. Furthermore, retention was influenced by age, hometown, education level, teaching experience, years at the current school, school type, district, and size. Notably, the positive impact of favorable school climate on teacher retention was moderated by high organizational commitment. Chou's study provided insights into the complex interplay between rural school environments, organizational factors, and teacher retention.

Chien-En Huang (2018) investigated the influence of principals' transactional and transformational leadership styles on teacher retention intentions in vocational high schools in Taiwan. Through analysis of questionnaire data, the study concluded that transactional leadership factors affecting teacher retention intentions were ranked from highest to lowest as follows: active management by exception, contingent reward, and passive management by exception. Regarding transformational leadership, the factors impacting retention intentions were ordered from most to least influential: intellectual stimulation, inspirational motivation, individualized consideration, idealized influence, and idealized attributes. Furthermore, the

study found a moderate positive correlation between transactional leadership and teacher retention intentions, as well as a moderate to high positive correlation between transformational leadership and retention intentions. Huang's research highlighted the crucial roles played by principals' leadership approaches, particularly transformational leadership practices, in shaping vocational high school teachers' decisions to remain in their positions. These findings offer valuable insights for educational administrators and policymakers seeking to promote teacher retention through effective leadership strategies.

In the 2017 study by Chiao, Li-Hua, a reevaluation of Maslow's hierarchy of needs within the context of job satisfaction among nursing staff was conducted. Contrary to the traditional placement of physiological needs at the base of Maslow's pyramid, this study identifies self-actualization needs and beyond, such as a sense of accomplishment and a positive working environment, as primary motivators for job retention. The research highlights the effectiveness of medical humanities education in the studied hospital, showcasing how activities like the Newcomer’s Love camp, rural medical care, and volunteer services can invigorate the nursing staff's spirit. The findings recommend several strategies to enhance nursing staff retention, including implementing a regular day shift system, providing foundational education and training, fostering a lifelong learning environment, creating customized promotional pathways, enhancing communication skills among clinical instructors and head nurses, and offering financial support for further education. Additionally, it suggests adjusting medical humanities education to include necessary training during official leave and tailoring programs to meet the specific needs of staff with varying lengths of service, enhancing receptivity among nursing staff.

Analyzing the theses in Table 2 and their findings, in terms of authors' academic disciplines, there were two from management, five from education, two from public affairs, and one from political science. Regarding research on rural elementary and middle school teachers, there were three articles. All three mentioned that the organizational climate within schools impacts teacher retention. There were four articles on concurrent administrator teachers. Among the three focusing on middle school teachers, two found that workload was negatively correlated with retention intentions. One article examined healthcare professionals, finding that family factors were the top reason for resignation, followed by workplace atmosphere. One article looked at vocational high school teachers and found moderately high correlation between principals' leadership styles and teacher retention intentions. One article on special education resource room teachers discovered that administrative support, teaching accomplishment, and class management had the greatest influence on resource room teachers' retention intentions. Additionally, eight out of ten articles used questionnaire surveys for data collection. One resource room teacher study utilized in-depth interviews, while one healthcare worker study used both questionnaires and interviews. Among the ten studies, nine on retention intentions indicated that school leadership styles and organizational climate positively impacted or predicted retention intentions. Only one study, on middle school concurrent administrator teachers, found that organizational climate did not moderate the relationship between workload and retention intentions.

Results and Discussion

Researchers' Academic Disciplines

Reviewing the literature on teacher retention intentions in the past decade, 7 out of the 15 articles were from education-related departments, with 4 from management-related departments ranking second. This shows that in addition to education departments, management departments also pay close attention to teacher retention. Cross-disciplinary collaboration is recommended to enable teachers to serve long-term and utilize their expertise to enhance student abilities.

Research Methodology Analysis

Among the 15 articles, 12 used questionnaire surveys, accounting for 80% of the total. One study on special education resource rooms utilized in-depth interviews, while another on healthcare professionals used both questionnaires and interviews. One article was professional commentary. In summary, studies on retention intentions are mainly concentrated on questionnaire surveys, with questionnaires and interviews being the primary mixed methods. Questionnaire surveys are easy to implement for simultaneously investigating many subjects. Adding qualitative methods like in-depth interviews could provide further insights into teachers' work environments.

Table 3. Research Methodology Analysis

Method	Number of Articles
Questionnaire Surveys	12
In-depth Interviews	1
Mixed (Questionnaires and Interviews)	1
Professional Commentary	1

Table 4. Researchers' Academic Disciplines

Academic Disciplines	Number of Articles
Education	7
Management	4
Others	4

Research Sample Analysis

Among the 15 articles, 6 focused on concurrent administrator teachers, 5 on rural elementary/middle school teachers, 2 on healthcare professionals, 1 on vocational high school teachers, and 1 on special education resource room teachers.

Looking at academic disciplines, among the 6 administrator teacher studies, 3 were from management and 2 from education. Among the 5 rural teacher studies, 4 were from educational administration. Regarding methodology, questionnaires were used in all 6 administrator teacher studies, while 4 out of 5 rural teacher studies used questionnaires.

Research Findings Analysis

Among the 15 journal articles, 7 mentioned correlation between school climate and teacher retention intentions. This indicates that school climate is a major factor influencing retention.

Table 5. Research Findings Analysis

Finding	Number of Articles
School Climate and Retention	7
Special Education Teacher Retention	1
Others	7

In summary, current prominent issues related to teacher retention focus on administrator and rural teachers, aligning with the present education situation. Only 1 study examined special education teacher retention intentions, reflecting not only the small special education teacher population but also lack of attention to relevant issues. Retention intentions of special education teachers deserve more focus in the future.

Suggestions for Future Retention Intention Research Directions

Based on the analysis of domestic journal articles on retention intentions, the author believes that in addition to continuing in-depth research on retention intentions of different teacher types, future research should focus on the following aspects:

Researchers' Academic Disciplines

Reviewing the literature in the past decade, 7 out of 15 articles were from education-related departments, with 4 from management-related departments ranking second. This shows management departments also value teacher retention, in addition to education departments. Cross-disciplinary collaboration is recommended to enable long-term service and enhance student abilities.

Research Methodology

Among the 15 articles, 12 used questionnaire surveys. Questionnaire surveys are easy to implement for large samples. Adding qualitative methods like interviews could provide deeper insights into teachers' work environments.

Research Sample

Among the 15 articles, 6 focused on administrator teachers, 5 on rural teachers, 2 on healthcare professionals, 1 on vocational high school teachers, and 1 on special education teachers. Current prominent retention issues are administrator and rural teachers, aligning with the education situation. Only 1 study examined special education teacher retention, reflecting the small population and lack of attention. Retention intentions of special education teachers deserve more focus.

Conclusion

This paper reviewed domestic journal articles from 2011-2020 on teachers and retention intentions, hoping to envision other potential research directions through literature review. In summary, existing journal articles mainly adopted quantitative research designs, with some minor differences depending on research topics and subjects. Future research should give equal weight to qualitative and quantitative methods, opening another window of knowledge. Most researchers were from education departments, followed by management departments, leading to a focus on general education teachers. However, teachers are not limited to general education, but also include special education, which is an integral part of teacher retention research. Retention intentions of special education teachers warrant more research attention.

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Reading Ability and Academic Achievement

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Abstract
This study aims to respond to the United Nation's sustainable development goal to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all through the development of reading comprehension. This study investigated the significant relationship between reading ability and academic success in English, Math, and Science. Reading ability is identified using Lexile reading scores as measured by ReadTheory.org, a free online software. The 149 participants in an online learning setup were tasked to take the quizzes in ReadTheory.org to find their Lexile reading scores. The academic achievement is measured by the participants' first trimester final grades in English, Science, and Math. This quantitative study used Pearson R correlation coefficient to find the relationship between variables. The results show that reading ability has a significant relationship with academic achievement. When students receive a low Lexile reading score, they seem to get lower grades, but when they receive a high Lexile reading score, they seem to get higher grades in their academics English, Math, and Science. Although there may be other factors that can contribute to obtaining higher grades, this study shows that reading ability may be a contributing element.

Keywords: Reading Ability, Lexile Scores, Academic Achievement, ReadTheory

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Introduction

The Department of Education (DepEd) in the Philippines focuses on addressing the gaps in the reading literacy of students (Hernando-Malipot, 2020) following the report of the 2018 Programme for International Student Assessment (PISA) that the Philippines scored the lowest in reading comprehension among 79 participating countries and economies (San Juan, 2019), and second lowest in both Math and Science literacy (Reysio-Cruz, 2019). Reading Comprehension plays an important role in education (Purvis, 2016). Students need to understand the texts they read to grasp the meaning of what they read. With excellent reading comprehension, students can perform successfully in class (Rutzler, 2020).

Reading programs in schools are established to achieve reading success. There are available reading programs that measure students' reading comprehension or text difficulty in the form of Lexile level (Purvis, 2016; Doman, 2020). ReadTheory.org provides a free assessment to identify students' Lexile scores. Lexile reading measure ranges from below 0L for beginning readers to above 2000L for advanced readers (MetaMetrics, 2020). Lexile text measures are assigned to reading materials such as books and articles measured by Lexile Analyzer developed by MetaMetrics (MetaMetrics, 2020) as shown in the table below.

Grade	Reader Measures 25^{th}-75^{th} Percentile	Text Demand Study 25^{th}-75^{th} Percentile
1	Up to 300L	230-420L
2	140-500L	450-570L
3	330-700L	600-730L
4	445-810L	640-780L
5	565-910L	730-850L
6	665-1000L	860-920L
7	735-1065L	880-960L
8	805-1100L	900-1010L
9	855-1165L	960-1110L
10	905-1195L	920-1120L
11 and 12	940-1210L	1070-1220L

Table 1: Typical Reader and Text Measures

Table 1 shows typical reader measures - grade level and typical Lexile scores, and the typical text measures in which readers and texts are matched appropriately to develop reading comprehension.

The inclusion of the Lexile measure for reading comprehension did not diminish the strong positive relationship between reading fluency and reading comprehension (Purvis, 2016).

Through Lexile measures, teachers can identify their students' reading levels, which can be a tool to predict students' academic achievement.

In PISA results, Filipino participants got low Reading, Science, and Math rankings. This entails the question of the effect of students' reading levels on their performance in English, Math, and Science.

According to a study by Churchwell (2009), there is a significant relationship between reading scores and academic achievement. In addition, the results of Caruthers' (2013)

quantitative data analysis showed moderate positive relationships between reading level and all subdomains of standards-based mathematics achievement, while the qualitative data identified reading ability as a contributing factor to standards-based mathematics achievement. Even pleasure reading has been perceived by educators of teenagers who self-choose their literature to read on their own time to improve academic performance (Whittein, Labby, Sullivan, 2016). In a reading intervention program, Harrel (2014), on the other hand, did not find a significant difference in academic gains in English, Math, Science, and Social Studies. However, students perceived that the reading program impacted them academically and motivationally. This may have been supported by the results presented by Blaabaek (2020), which show that reading scores positively affect reading but not math performance. Moreover, the results point out that reading has a positive effect on skills that principally affect reading performance, but still needs to be determined on the performance on the Math tests.

These studies claim that reading scores affect academic gains in English. However, the contrasting results of the studies above left inconclusive findings on whether reading scores affect academic gains in Math and Science. Hence, additional studies are needed. It is also worth noting that these studies are measured on a large scale and use different tools to identify students' reading scores. There may be other factors that may contribute to the results of these findings. It is of interest that this paper seeks to utilize the Lexile measure in finding the relationship between reading levels and achievement in English, Math, and Science on a small scale, such as at one grade level, to identify somehow its potential effect on reading programs in small schools, and in a classroom setting. There are instances that students get lower Lexile reader scores than their current grade level. In reading programs that use the Lexile reader measures and Lexile text measure, students are tasked to read materials 50-100 Lexile measure lower their current levels and 50-100 Lexile scores above their current levels to ensure the development of reading comprehension. The question now lies if students with high Lexile reading scores get high academic grades, or students with low Lexile reading scores get low academic grades, or Lexile reader scores do not affect their academic achievement. Thus, this paper aimed to determine their relationship.

Theoretical Framework

The framework of this study is based on the information processing theory. It is a theory that views humans as information processing systems in which humans, instead of responding to stimuli, process the information they receive (Oxford Reference, 2020). The principle of Information Processing Theory is that building a long-term memory occurs in stages (Lawless, 2019). The brains filter information, process it in the short-term or working memory, and then store it into the long-term memory (Hatague & Nabua, 2019). According to Miller (2011), information processing theory is a cognitive method learners apply to information and how they convert, employ, and use it. This relates to understanding texts that students read and develop reading comprehension. Reading comprehension is improved through reading strategies teachers and parents may provide at school and home (Scholastic.com, 2020). By providing students with books, other reading materials, and supplementary activities, they acquire knowledge stored in their memory that helps them develop other skills and eventually aids them in performing successfully in class.

Methods

This study utilized ReadTheory.org to identify students' reading Lexile scores. ReadTheory.org is a free online platform focused on reading comprehension activities for K-12 teachers and students. The objective is to increase reading ability and comprehension by reading short passages and taking short quizzes (Tempest, 2018). Users may register, or teachers will register their students. After registration, a pretest of 8 passages with comprehension questions will be taken. The reading level of the passages begins with grade three level, then increases or decreases depending on the takers' answers. After the test, users are assigned an appropriate reading grade and Lexile score based on the result. Users can now start participating in reading passages and taking tests. The length of the reading passages depends on the reading grade level of the participants, which may get higher or lower depending on their performance on each quiz. Pearson R correlation coefficient was used to determine if there was a correlation between the student's Lexile scores and their first-trimester final grades in Math, Science, and English.

Results and Discussions

There were one hundred forty-nine participants in this study. Table 2 shows the mean of the participants' Lexile scores, and their first trimester final grades in English, Math, and Science.

	Lexile Score	English	Math	Science
MEAN	891.95	91.66	90.99	94.41
SD	129.13	4.85	4.14	3.21

Table 2: Mean and Standard Deviation of Lexile Scores and First Trimester Final Grades in English, Math, and Science

The grade 10 participants had a mean Lexile Score of 891.95 with a standard deviation of 129.13. This means that the average reading grade level of the participants is in grades 8 to 9 with a range of Lexile scores of 805-1100L (Grade 8) to 855-1165L (Grade 9). The students' mean grade in English is 91.66, with a standard deviation of 4.85. Their mean grade in Math is 90.99 with a standard deviation of 4.14, and 94.41 mean grade in science with a standard deviation of 3.21.

This paper evaluated the relationship between students' Lexile reading scores as measured by ReadTheory.org and academic achievement in English, Math, and Science as measured by the first trimester final grades of the participants. The hypothesis that there was no statistically significant relationship between Lexile reading scores as measured by ReadTheory.org and achievement scores as measured by final grades in English, Math, and Science in the first trimester was tested using inferential statistics at a .05 level of significance.

If the p-value was greater than the alpha of 0.05, the hypothesis was retained. If the p-value was less than the pre-determined alpha of 0.05 the hypothesis was rejected.

To test this question, participants' Lexile reading scores were the predictor variable while the response variables were the first trimester final grades in English, Math, and Science. Pearson R was used to test the hypothesis.

Table 3 illustrates the results of the relationship between Lexile reading scores and academic achievement in English, Math, and Science. One hundred forty-nine grade 10 students were included as indicated by n. The table presents the degree of relationship with r. A low or weak relationship is designated by 0 to.3, a moderate relationship by .30 to.70, and a strong or high relationship by over 0.70. A result of 0.0 would indicate no significant relationship.

Group	N	R	p
English	149	0.27	0.0005
Math		0.19	0.01
Science		0.27	0.0006

Table 3: Relationship Between Lexile Reading Scores and Academic Achievement in English, Math, and Science

As shown in Table 3, there was a statistically significant relationship between the students' Lexile reading scores and English achievement as shown by r = 0.27, and a p-value of 0.0005. Reading achievement and Mathematics achievement have a significant relationship as shown by r = 0.19 and a p-value of 0.01. Furthermore, there was a statistically significant relationship between reading achievement and science achievement as shown by r = 0.27, and a p-value of 0.0006. The data suggested that there was a low positive relationship between reading achievement and English achievement, reading achievement and Mathematics achievement, and reading achievement and Science achievement having a p-value less than the pre-determined alpha of 0.05, thus, rejecting the hypothesis that they have no significant relationship.

The results showed a low positive relationship between Lexile reading scores, as measured by ReadTheory.org reading tests, and achievement in English, Science, and Math. Other factors may contribute to students' academic achievement; however, the results of this study show that reading ability may be one of the factors. This means that when students receive a higher Lexile reading score, they are more likely to get higher grades in English, Math, and Science, as supported by Churchwell's research findings (2009). Since the response variables are academic achievements in English, Math, and Science, other contributing factors may cause students to receive higher grades because of the components in grading them. These components are not limited to written assessments that may require reading comprehension.

In basic education, there are also graded performance tasks, which may be done individually or by group. However, the importance of getting high scores in reading ability can never be discarded as a substantial factor in receiving higher scores in academics, as shown in this study.

Conclusion

This study concludes that when students receive a low Lexile reading score, they get lower grades, but when they receive a high Lexile reading score, they get higher grades in their academics: English, Math, and Science. Although other factors may contribute to obtaining higher grades, this study shows that reading ability can be a contributing element.

Training may be provided for teachers to promote reading culture in their institutions, which will eventually lead to their students' reading comprehension development. One that educational institutions can use in classrooms is the free online application ReadTheory.org. This may be included in their English class to improve their students' reading ability. Administrators should strengthen their schools' reading programs by exploring innovations that technology can offer and by encouraging research in this field. For future studies, interested researchers may include other grade levels. They may increase the population and correlate to other academic subjects. Researchers can also consider focusing on the achievement in the students' written assessments.

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A Preliminary Evaluation of Secondary School Students' Acceptance Toward Augmented Reality Learning Materials in Genetics

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Abstract
Research literature on augmented reality (AR) in science learning suggests high technology acceptance, citing its immersive nature that enhances students' engagement and understanding. Studies highlighted AR's ability to merge abstract scientific concepts with tangible experiences and to foster positive attitudes and increased acceptance among learners towards technology-infused education. This study aimed to develop an AR mobile application to visualize biological concepts of genetics and then evaluate students' acceptance toward the AR app. This study engaged 47 ninth-grade students from the Northeastern region of Thailand to examine their acceptance of the AR app. It emphasized an interconnection among macroscopic, microscopic, and symbolic representations. Employing pre-experimental research of one-group posttest-only design, they independently interacted with the genetic AR app for 70 minutes, and then a 20-item 5-point Likert scale questionnaire was administered at the end of the session for 10 minutes. The results found that students positively perceived the genetic AR app measuring in four key dimensions: perceived usefulness (PU), perceived ease of use (PEU), attitude toward using (ATT), and behavioral intention to use (BI). The positive acceptance of the AR app suggested its potential as an effective tool for enhancing genetics education, meriting its integration into science curricula to improve learning outcomes.

Keywords: Technology Acceptance, Augmented Reality, Genetics Education, Secondary School Students

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1. Introduction

Rapid technological changes are affecting the pattern of teaching and learning. In addition, technology-enhanced learning is becoming more popular and increasing in research and development for school science (Srisawasdi & Panjaburee, 2015). One such technology is Augmented Reality (AR), which interweaves the real world with a virtual world, presenting graphics, video, image 3D, and animation through mobile devices (Chookaew et al., 2017). The extensive use of AR in education is because it is a technology that capable of interacting with a wide range of learning styles and functions seamlessly on various platforms, such as tablets, smartphones, and notebooks. Furthermore, improving efficiency of AR captivates students' interest and motivates them to learn science. AR enriches the understanding of abstract concepts and strengthens the efficiency of science learning management (Irwanto et al., 2022).

Understanding genetics can pose challenges for students due to the need to assimilate abstract and intricate concepts and master particular terminology (Knippels, 2002). The abstract nature of genetics results in a decline in learners' motivation if they are not in contexts that connect genetics to their daily lives or relevant personal and societal issues (Knippels et al., 2005). Some studies addressed this challenge by designing and testing new teaching and learning activities using the integral technology into science education. (Arslan, 2020). Deep et al. (2020) created Genetics Investigation (GI), a web-based learning environment to support the gradual development of complex understanding in Mendelian genetics. The findings indicated significant improvement in learning following the integration with GI and learners' perceptions that the activities within GI are beneficial for understanding concepts and engaging in inquiry practices. In addition, Arslan et al. (2020) developed a mobile AR for biology. The aim was to enhance students' comprehension of critical and complex topics within the domains of biology, anatomy, physiology, and experimental animals. The findings found that students increased their learning motivation and enhanced their academic achievement in biology. Moreover, Diki et al. (2022) created an AR application to help students understand the DNA replication process. AR enables students to visualize tangible objects. An advantage of applying AR is its capability to facilitate the observation of DNA components integral to the replication process. Hence, previous studies indicated that technology could visualize and simplify complex content. Furthermore, AR can inspire learning motivation.

Consequently, this study aims to develop an augmented reality to encourage students' acceptance of genetic material AR applications in secondary school to address the research question on how students accept using augmented reality after participating in augmented reality activities about genetic material.

2. Literature Review

2.1 Augmented Reality

Augmented reality (AR) is a technology that combines the real and virtual worlds by placing virtual elements in real-world settings to create interactive experiences (Azuma, 1997). It is an application and technology of computer-generated 3D images complemented by audio, video, graphics, and location (GPS) data (Bistaman et al., 2018). Moreover, AR is visible through digital devices such as digital glasses, tablets, smartphones, or other visual display devices (Lertbumrungchai, 2020), and can facilitate interactive learning experiences, improve

knowledge retention and transfer, and enhance students' engagement (Wang et al., 2017). It combines the real and virtual worlds (Chookaew et al., 2017), facilitating the understanding of complex or abstract ideas (Arici et al., 2019). Furthermore, AR dramatically enhances students' motivation, helps them understand abstract content and complex concepts, and fosters a positive attitude toward learning (Weng et al., 2019). Recently, there are four types of AR technology: marker-based AR, markerless AR, projection-based AR, and superimposition-based AR (Filali & Krit, 2019). The study by Yilmaz (2021) utilized marker-based AR, allowing users to interact through mobile devices. The AR process began by employing smartphone apps to scan marked objects and symbols on all prepared items. Once the software system identified and stored the specific symbols on the surface, it proceeded to process the objects, rendering them as 3D images on the smartphone screen.

2.2 Augmented Reality in Science Education

In the contemporary era, internet technologies have revolutionized our daily lives and are regarded as promising tools for enhancing education in the 21st century (Salmi et al., 2017). So, teachers should provide technology-based instructional materials and design learning environments that align with learners' interests and needs are vital aspects to enable them to engage in active learning and gain hands-on experience throughout their science subject. Science subjects often contain numerous abstract concepts that require changing abstract in a concrete form and visualization of these abstract terms to align with learners' perception levels. Therefore, utilizing AR technology in science education can be an encouraging solution to address the challenges posed by abstract and complex science content concepts because integrating AR technology into science affects learners' more precise insights into science-related information (Xu et al., 2022). In previous studies, many researchers provided results that applying AR technology in science education. For example, Costa et al. (2021) developed the Planetary System GO MAR AR game that, as a location-based AR game, focuses on the celestial bodies and planetary systems of the universe to model the Solar System. This AR fosters interactive learning and promotes a deeper understanding of cosmic phenomena. Besides, Ciloglu & Ustun (2023) implemented mobile AR-based biology learning to increase students' motivation, self-efficacy, and attitude toward biology. The findings revealed that students who engaged in biology learning through mobile AR showed significantly higher self-efficacy levels than those who followed traditional methods. However, no notable distinctions between the experimental and control group students regarding motivations and attitudes toward biology learning were observed. Including the study by Diki et al. (2022), which focuses on creating an AR application to aid students in understanding the DNA replication process more effectively. These findings also indicated that mobile AR applications were innovative, non-disruptive, effective for knowledge acquisition, engaging, fascinating, and enjoyable and found to enhance the retention of information, provide a tangible grasp of the subject matter, and ease the learning process.

2.3 Technology Acceptance Model (TAM)

The technology acceptance model (TAM) is used to determine how people view or accept technology (Davis & Venkatesh, 1996) and as an effective behavioral model (Davis, 1985). The TAM model finds application in various research projects centered around new technologies. To explain users' acceptance of novel information systems in computer technology (Oktavendi & Mu'ammal, 2022). According to studies, the elements affected to accept the various technologies of disciplines and users' acceptance. In the previous studied, Kusonyang et al. (2023) investigated Thai context of the AR acceptance for primary school

students on electric circuits used four issues to consider users' acceptance as Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitudes (ATT), and Behavior Intention (BI). The details of each issue are as follows: Perceived usefulness (PU) refers to how individuals perceive the usefulness of information technology systems. Perceived ease of use (PEU) refers to perceived ease of use as defined as the extent to which individuals perceive how user-friendly information technology systems are. Attitude toward using (ATT) pertains to users' positive or negative perceptions of the learning experience with the information technology system, and Behavior Intention to use (BI) refers to the frequency of users using the information technology learning system in the future (Hua Lo al., 2021). Also, in previous studies, several researchers studied the effects of users' acceptance of technology.

Hua Lo et al. (2021) examined the technology acceptance model results in science education. They developed an augmented reality on the ecosystem to enhance students' learning about plants. The findings found that it correlated with higher intentions to use the application among students who exhibited more positive attitudes towards its usage. Furthermore, Panjaburee et al. (2022) studied students' acceptance of personalized e-learning systems. The findings indicated their attitudes and behavioral intentions to use the personalized e-learning system. Personalized e-learning was influenced by their perceived ease of use and usefulness.

Moreover, these factors contributed to the student's perception of the learning guidance the personalized e-learning systems generated as applicable. In addition, Kusonyang et al. (2023) studied students' acceptance of AR on the series circuits. The results discovered that students have a high behavioral intention to use AR in learning. They tend to have high perceived usefulness, ease of use, and enjoyment in AR-based learning, thus demonstrating a relatively high behavioral intention to use AR.

3. Research Methodology

3.1 Participants

The participants were 47 ninth-grade students at the secondary school in the Northeast of Thailand. There were 30 females (63.83%) and 17 males (36.17%). Their ages ranged from 14 to 16 years old, which consisted of 30 individuals aged 14 (63.83%), 16 individuals being 15 years (34.04%), and one individual being 16 years (2.13%). They had not yet experienced using Augmented Reality applications in the context of science learning before.

3.2 Mobile Augmented Reality on Genetics Materials

The study was the development an instructional augmented reality application called “Genetic Material AR.” Figure 1A shows the initial screen app, including scan AR, contact developer (Facebook, website), and how to. The users can interact with both Android and iOS. According to the literature review, it proposed that the development of AR applications should consider five key design elements, including information, interface, interaction, imagination, and immersion (Masmuzidin et al., 2022). There were three sub-issues regarding *information design*: (1) physical content design, which these elements suggested to design with the curriculum. Hence, this AR emphasized on two learning standards and indicators of the national primary education curriculum: (1.1) Explain the relationship between genes, DNA, and chromosomes using a model, and (1.2) Explain how alterations in genes or chromosomes can lead to the development of genetic disorders and provide instances of such

conditions; (2) Virtual content design that refers to multimedia elements such as text, image, audio, video, and animation. Therefore, this AR app comprised text for content explanation and 3D objects; and (3) Marker design that provided image makers. *Interface design*, this issue advises separating into three areas: the display area, main button area, and description area. Accordingly, the AR Genetic Material was categorized into three areas. The display area represented 3D models that appear in the center position of the screen immediately after scanning. The AR Genetic Material app contained various buttons for functions like 'Home,' which facilitated users in returning to the initial screen, 'Capture,' Utilized to capture screenshots; and 'Quiz,' to assess understanding following the study of 3D images, over and above that the AR Genetic Material app provided a description area on the left or right side of the 3D models. The users could get more information about those 3D models, as shown in Figure 1B.

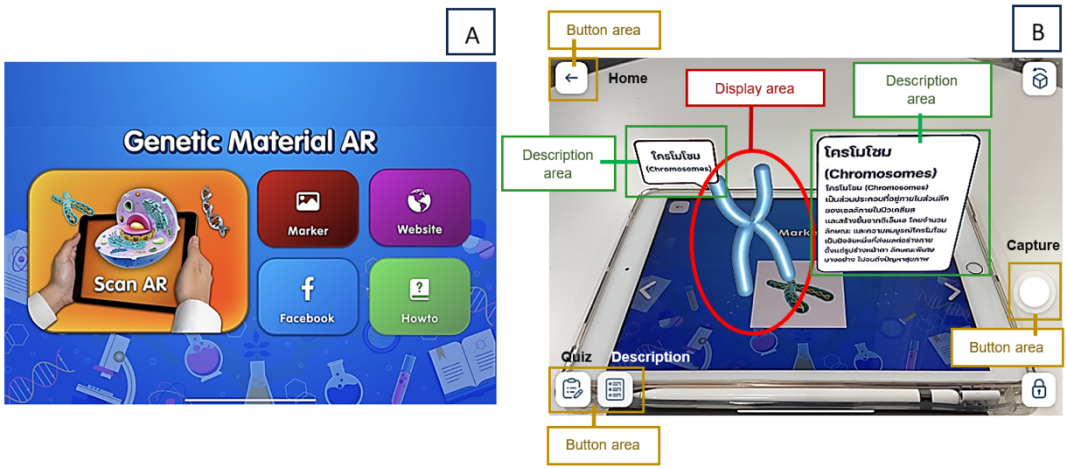


Figure 1: An example screenshot from Genetic Material AR:
A) the initial screen, B) the interface design.

Additionally, the Genetic Material AR followed three levels of representation in biological phenomena: macroscopic, microscopic, and symbolic level. The principle above represented the levels of biological phenomena is consistent with Marbach-Ad & Stavy (2000), which aligned with the suggestions: (1) the macroscopic level, where biological structures are observable to the naked eye, (2) the cellular or subcellular (microscopic) level, where structures become visible only under the light or electron microscopes, (3) the molecular (submicroscopic) level, encompassing DNA, proteins, and diverse biochemicals and (4) the symbolic level offers explanatory methods for phenomena expressed through symbols, equations, chemical formulas, metabolic routes, numerical computations, genotypes, patterns of inheritance, and similar concepts. At macroscopic level referred to visualizing external features; this app created a scenario to engage students to observe the outer structure of the zebra about a banding of two zebras. This marker illustrated how to express zebra's individual characteristics to link an organism's hereditary characteristics. Students scanned through an image-based marker, and then this AR app detected and displayed 3D models, as shown in Figure 2A.

Further, the microscopic level could only be observed under a microscope. Genetic material relates to an organism's components inside an animal cell composed of chromosomes, DNA, and genes. Consequently, this AR app was built to display those components from unobservable to be visualized. The users scanned image-based markers, and 3D objects appeared, as shown in Figure 2B. In addition, structures and types of chromosomes were at

the microscopic level. In this matter, markers were designed with unique features, each of which must be touched. If paired correctly, it will detect and display the 3D model as shown in Figure 2C, and the symbolic level offered explanatory mechanisms for phenomena symbolized by the DNA's base pair structure. The users needed to align the markers of the base pairs by touching them together, and when all four markers were correctly aligned, the AR application would detect and showcased the 3D model, as shown in Figure 2D.

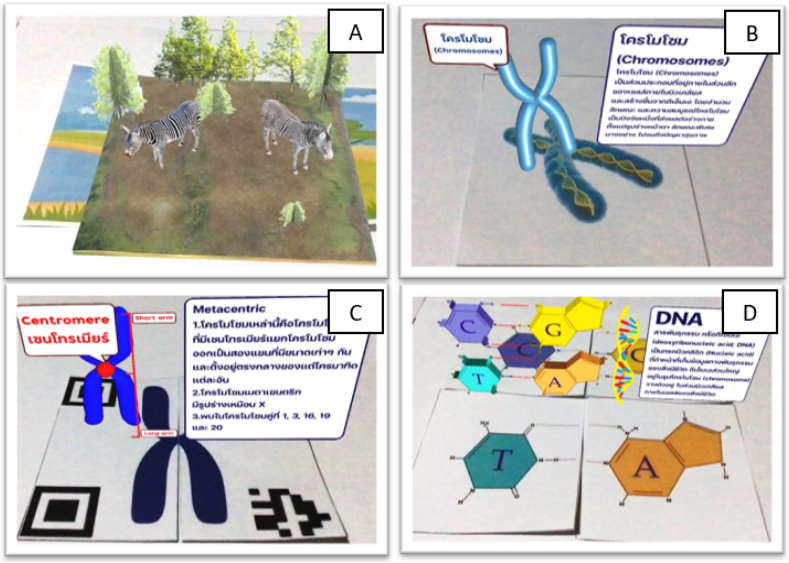


Figure 2: An example screenshot from Genetic Material AR illustrating: (A) Hereditary characteristics, (B) Structure of chromosomes, Types and structure of chromosomes, (D) Base pairs of DNA.

3.3 Data Collection

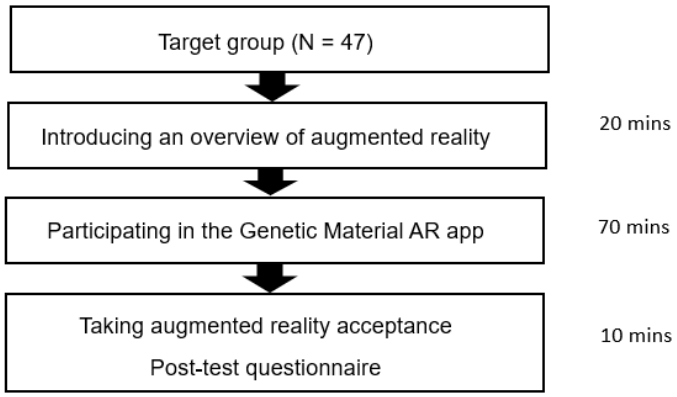


Figure 3: Experimental designs.

This research used a pre-experimental design to conduct one group post-test only design, as shown in Figure 3. A mobile augmented reality was built to develop the genetic material for 9-th grade students. The first author introduced an augmented reality app to participants before interacting for 20 minutes. Then they were assigned to interact with AR through five tasks: (1) observing the zebra streak to clarify differences in the external features between two zebras, (2) solving the puzzle of zebra streaks to link hereditary characteristics, (3) explaining the relationship between genes, DNA, and chromosomes, (4) descripting the inner structure of DNA, and (5) explanation of types of chromosomes. After participating in the augmented reality application, the participants expressed opinions on augmented reality

acceptance through a 5-point Likert scale questionnaire for 10 minutes. The questionnaire focused on the augmented reality acceptance model, to evaluate how the participants perceived the AR. The evaluation included acceptable, reliable, and valid, divided into four dimensions: 1. Perceived Usefulness (PU), 2. Perceived Ease of Use (PEU), 3. Attitudes (ATT), and 4. Behavior Intention (BI), adopted from previous research (Kusonyang et al., 2023; Hua Lo et al., 2021). This instrument consisted of 15 items using a Likert scale ranging from 1 to 5: Strongly disagree = 1, Disagree = 2, Neither agree/ disagree = 3, Agree = 4, and Strongly agree = 5. Descriptive statistics were used to analyze data consisted of mean and standard deviation.

3.4 Data Analysis

This study validates the reliability of the augmented reality acceptance questionnaire by using Cronbach's alpha. In addition, the four dimensions of augmented reality acceptance were analyzed by applying mean and standard deviation.

4. Results and Discussion

The results in Table 1 illustrate the students' acceptance of augmented reality in four dimensions: PU, PEU, ATT, and BI. The overall mean scores of all four dimensions indicated that the mean scores ranged from 4.39 (for attitudes and behavior intention) to 4.50 (for perceived ease of use). These findings specified that the students positively accepted augmented reality in all dimensions, and Cronbach's alpha reliability was above 0.70 for four issues of acceptance.

Table 1. Descriptive data of students' acceptance toward utilizing augmented reality

Dimensions	N	Mean	S.D.	Cronbach Alpha (>.07)
Perceived Usefulness (PU)	47	4.45	0.78	0.89
Perceived Ease of Use (PEU)	47	4.50	0.88	0.74
Attitudes (ATT)	47	4.39	0.83	0.89
Behavior Intention (BI)	47	4.39	0.75	0.76

The findings found that "perceived ease of use" is the highest acceptance because the "Genetic Material AR" is designed based on the principle of AR development for children. This rationale supports students in learning more simply. Furthermore, the app covers two operating systems (iOS and Android) and can easily be downloaded.

In this study, AR learning applications were designed and developed for genetics materials to engage, motivate, and visually represent this content for 9-th grade students. There were various features, for instance, 3D objects and dynamic visuals. The findings correlated with the study of Hua Lo et al. (2021), which developed AR-based learning activities for natural science inquiry. The results indicated that students could gain knowledge about the natural world using AR apps. Furthermore, these apps offered touchable sensations by incorporating videos, special effects, and augmented reality elements, and students demonstrated their favorable reception of using augmented reality for science education. Further, according to Kusonyang et al. (2023), the results of developed mobile augmented reality of series circuits for science learning. The findings found that students had positive views of using augmented reality overall four dimensions: PU, PEU, ATT, and BI.

Conclusions

This research was an AR design and development of learning applications on genetic material to engage secondary school students. This application is compatible with both Android and iOS operating systems. The genetic material AR app is a marker-based augmented reality that uses two types of markers: QR code markers and image-based markers. The application feature involves presenting 3D objects alongside detailed scientific explanations. Consequently, students interacting with the AR app displayed eagerness for hands-on learning participation. Moreover, the students exhibited favorable perspectives regarding the acceptance of augmented reality.

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In-Service Expatriate Teachers' Experiences With Inclusive Education in Chinese Private Schools

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Abstract
The purpose of this qualitative study was to describe the experiences of in-service expatriate teachers who provide differentiated instruction for students with special educational needs (SEN) in regular classrooms at mainland Chinese private schools. The following central research question guided the study: What are the experiences of in-service expatriate teachers who provide differentiated instruction for students with special educational needs in regular classrooms at mainland Chinese private schools? This study used a theoretical framework of Ajzen's theory of planned behavior by examining the planned behavior of in-service expatriate teachers as influenced by the subjective norms of the surrounding culture and their perceived behavior control for providing differentiated instruction for students with special educational needs. Participants were 12 in-service expatriate teachers at a medium-sized Chinese private school. Data collection consisted of physical artifacts, personal interviews, and focus groups. The major theme derived from the data was a disparity between the culture of the participant's home country and the country they resided in which led to lowered self-efficacy for differentiated instruction. The findings of this study are consistent with the research previously conducted on teacher self-efficacy and inclusive education. Interpretations of the themes had significant interpretations of the cultural dissonance among expatriate teachers in Chinese schools.

Keywords: Inclusive Education, Special Educational Needs, Theory of Planned Behavior, China

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Introduction

Despite the widespread global recognition that inclusive education addresses the issues encountered by learners with special educational needs (SEN) and disabilities (United Nations, 2015), students' risk for the marginalization of their academic, social, and emotional needs exists (O'Connor & McNabb, 2021). Children with SEN in mainland China are especially vulnerable as opportunities to study in inclusive educational settings remain extremely limited (Cheng et al., 2021). The purpose of this phenomenological study was to describe the experiences of in-service expatriate teachers who provide differentiated instruction for students with SEN in regular classrooms at mainland Chinese private schools.

Background

With the implementation of the People's Republic of China's 1994 Learning in Regular Classroom (LRC) initiative, the Chinese education system outlined a policy to increase the number of students with special educational needs (SEN) allowed to attend regular classrooms (Wang & Qi, 2020; Zhu & Mu, 2019). This initiative tasked regular classroom teachers with educating learners of mixed abilities, including SEN, within the same classroom (Xie et al., 2021). However, a long history of societal disregard for people with SEN and disabilities, combined with the inconsistent implementation of the LRC legislation, has meant that LRC has had limited success in providing effective inclusive education for students with SEN and disabilities in Chinese classrooms, despite mainland China's attempt to promote inclusive education (Qu, 2022c; Xie et al., 2021; Xu et al., 2018; Yuan et al., 2022).

Contemporary critics (An et al., 2018, Mu, 2021; Qu, 2019) claim that LRC policies hinder governmental support for inclusive education rather than promote it. Many schools that claim to be inclusive offer only tokenistic inclusion for students with SEN, which results in the continued marginalization and stigmatization of learners with minimal academic support or adjustments for learning (Cheng et al., 2021). As a result, little academic accommodations are regularly available for learners with these educational needs. Many authors have concluded that mainland China must address significant challenges in the implementation of inclusive education before an effective inclusive system can be attained (An et al., 2018; Chao et al., 2018; Deng & Manset, 2000; Deng & Poon-McBrayer, 2004; Deng & Poon-McBrayer, 2012; Faragher et al., 2021; Li & Li, 2020; Monteiro et al., 2019; Xie et al., 2021; Xu et al., 2018).

The prevailing negative perceptions of students with SEN in terms of their intelligence, their behavior, and the disruption to classrooms are significant obstacles to total acceptance and adoption of effective inclusive education in China (Jia et al., 2022; Li & Li, 2020). These negative attitudes about inclusion are perhaps the most significant barrier to successful inclusion (Sharma & Sokal, 2016). These societal perceptions also directly influence teachers' treatment of and instruction of students with SEN (Monteiro et al., 2019).

An increasing number of developed countries have embraced inclusive education, and Western countries have provided pre-service and in-service training on special education topics (Lindner & Schwab, 2020). Expatriate teachers who teach in Chinese schools may have had previous experience in differentiated instruction and inclusive education and encounter a social climate and perception of disabilities from the collective Chinese society that may differ from their previous experiences (Jia et al., 2022; Li & Li, 2020). No previous study has examined the impact the societal and cultural context of mainland China has on expatriate teachers who

have been previously trained in their home countries in programs that support inclusive education.

Related Literature

In most school systems worldwide, current expectations are that teachers are required or recommended to differentiate instruction to meet the needs of the learners with SEN in their classrooms (Scarparolo & Subban, 2020; Whitley et al., 2019), rather than sending children who exhibit learning difficulties out of the regular classroom or to a separate school to receive support (Ancil, 2006; Gaitas & Martins, 2017). Educators concur that utilizing best instructional practices such as differentiated instruction to increase the participation of students with SEN improves the quality of instruction for all students (Navarro-Mateu et al., 2019; Strogilos, 2018). Regular classroom teachers are instrumental in creating classrooms where students with SEN feel comfortable and accepted (McGarrigle et al., 2021; Opoku et al., 2021a). Many countries, including the United States and mainland China, have struggled to implement inclusive education practices (Navarro-Mateu et al., 2019; Opoku et al., 2021a; Qu, 2022b).

Even though teachers may recognize the need for learner support and perceive the importance of differentiated instruction, the actual implementation of differentiated instruction does not always occur (Wilson et al., 2016). The use of differentiation as best practice instruction is new to the Chinese educational system as some teachers in mainland China claim to have never heard of differentiation (Li & Li, 2020). Similarly, since only special schools for children with special needs use individualized educational programs (IEPs), some regular classroom teachers in mainland China schools, claiming to provide inclusive education in Chinese regular schools, reported that they are unfamiliar with the concept of IEPs for students with SEN (Fu et al., 2018; Li & Li, 2020). This lack of knowledge for accommodating indicates a need to understand the various perceptions that teachers, who are required to provide inclusive educational experiences for students with SEN, hold for differentiation, especially in mainland China. Teacher attitudes toward SEN and differentiation, combined with the surrounding cultural perceptions, determine how teachers treat students with SEN in their classrooms and how they make decisions to accommodate different student needs (Gaitas & Martins, 2017; Scarparolo & Subban, 2021). Little research has examined expatriate teachers' experiences of the social pressures surrounding the inclusion of students with SEN in regular classrooms in China.

Examination of teachers' perceptions of inclusion and students with SEN is essential because these attitudes impact the effectiveness of inclusive classrooms and often determine whether teachers differentiate in the classroom and how they provide best-practice instruction and lessons for students with SEN (Desombre et al., 2019; Navarro-Mateu et al., 2019; Nichols et al., 2020; Savolainen et al., 2020). When teachers question the appropriateness of inclusive education (Nilhom, 2021) or base their perceptions of inclusive education solely on the type and severity of disability of the students (Yada & Savolainen, 2019), teacher expectations of students can decline, the instructional rigor is weakened, simplistic materials are offered, and teachers' instructional discussion becomes demotivating (Tomlinson, 2014).

Cultural Influences on Attitudes Towards Inclusion

Perceptions of inclusive education often differ by country (McGarrigle et al., 2021; Saloviita, 2020; Yada & Savolainen, 2019). Teachers' perceptions of inclusive education in non-Western,

developing countries are sometimes less accepting than in Western countries with a long history of inclusive education (Faragher et al., 2021; Yada & Savolainen, 2017). The implementation of inclusive policies heavily depends on local values and the surrounding culture's understanding and acceptance of inclusion (Opoku et al., 2021a; Strogilos, 2018; Van Steen & Wilson, 2020). Cross-cultural studies of inclusive education have found that teacher attitudes differ according to the country where teachers work (Van Steen & Wilson, 2020).

Despite challenges still faced with the implementation of inclusive education in many developed countries, studies from developed countries tend to report positive teacher perception and overall acceptance of inclusive education (George et al., 2018; Jia et al., 2022; McGarrigle et al., 2021; O'Connor & McNabb, 2021; Sokal & Sharma, 2017; You et al., 2019). Generally, teachers in Western countries express positive attitudes toward inclusion (Van Steen & Wilson, 2020), yet findings indicate that cultural and demographic factors can influence perceptions of inclusive education. The level of support each country provides for inclusive education tends to influence teachers directly; countries with adequate support for inclusive education are likely to have a much more positive reception from teachers, while countries with less support reported less positive reception of inclusion (Saloviita, 2020; Van Steen & Wilson, 2020).

Comparative studies of teacher perception of inclusive education in Asian countries compared to Western countries are still somewhat limited (Yada & Savolainen, 2019). In 2021 the People's Republic of China participated in an Asian cross-regional review for the first time, although, admittedly, in-country reviews had previously occurred (Faragher et al., 2021). Most of the previous studies of inclusive education were conducted predominately in special administrative regions like Hong Kong and Macau (Chao et al., 2018; Davies et al., 2018; Monteiro et al., 2019) and Taiwan (Yuan et al., 2022) rather than in the mainland.

In the years since mainland China established the LRC policy, students with autism (Mu, 2019; Xie et al., 2022), learning and physical disabilities, such as visual and hearing impairments (Mu, 2019), attention deficit hyperactivity disorder (ADHD), and emotional and behavioral disorders (Xie et al., 2022), have become increasingly visible in regular classrooms in China. The strict social hierarchy supported by Confucianism views learners with SEN or disabilities in lower social positions and unequal social relationships with peers (Qu, 2022b). While it is expected that collectivist cultures might be more inclusive (Van Steen & Wilson, 2020), in actuality, collectivist educational equality exhibited in Chinese schools is viewed as treating all students equally and providing identical support for every student (Qu, 2019; Su et al., 2020). To achieve collective equality, teachers do not view learners as individuals; therefore, they may not provide additional support for learners with SEN nor provide curriculum adjustments and activities that benefit student learning abilities (Qu, 2022b; Su et al., 2020). Teachers in mainland Chinese schools tend to regard inclusion as simply physically allowing learners with SEN in the classroom without extending any special accommodations in terms of the actual teaching or classroom management for these learners to prosper in the classroom (Liu et al., 2020; Qu, 2019). Consequently, the poor academic performance of learners with SEN is attributed to students' ineffective effort and lack of ability rather than poor educational support (Mu, 2021; Qu, 2022b; Xu & Cooper, 2020). The cultural and institutional practice of providing children with one-size-fits-all programs without differentiation or accommodations hinders individual teachers from considering the differing needs of the learners in the classroom, resulting in teachers adapting curriculum on a discretionary basis with little systematic support or ignoring students' differences altogether (Jia et al., 2022; Xu et al., 2018).

Teacher Self-Efficacy for Inclusive Education

Previous research has identified a relationship between teachers' attitudes toward inclusive education and their self-efficacy in teaching students with SEN (Chao et al., 2017; Sokal & Sharma, 2017; Yada & Savolainen, 2017; You et al., 2019). Self-efficacy involves not only belief in oneself but also the perceived behavior control and the ability to organize and take the actions necessary for success (Nichols et al., 2020). Self-efficacy for teaching influences all teacher decisions for planning, organization, adaptability, and performance in the classroom (Davies et al., 2018).

Research Design

This study utilized a qualitative research design to describe the experiences of teachers providing differentiated instruction for students with SEN in regular classrooms at mainland Chinese private schools. In seeking to understand the expatriate teachers' perceptions of differentiated instruction and their perceived behavior control, this qualitative study captured the constructs individuals make about their experiences and perceptions (Patton, 2015) and allowed individuals to describe the shared experience of the phenomenon of teaching students with SEN in mainland China (Moustakas, 1994; Patton, 2015).

Theory of Planned Behavior

This study used Ajzen's (1991, 2002, 2020) theory of planned behavior (TPB) as the theoretical framework for examining general education teachers' perceptions of including students with SEN in regular classrooms and the cultural influences surrounding teachers at Chinese private schools. Ajzen's (1991) TPB found that intentions are influenced by subjective norms that define an individual's evaluation of the importance of the behavior based on their personal beliefs and the perceptions of others (Trafimow, 2009). Ajzen's (1991) TPB allows researchers to understand teacher preconceptions and beliefs about students with SEN in inclusive classrooms, the subjective or societal norms that influence those perceptions, and the confidence teachers feel and exhibit when implementing differentiated instruction (Opoku et al., 2021a).

Research Questions

The goal of this study was to describe teachers' usage of differentiated instruction and the impact of the surrounding subjective norms on the teachers' self-efficacy for providing inclusive education to students with SEN. The central research question: *What are the experiences of in-service expatriate teachers who provide differentiated instruction for students with special educational needs in regular classrooms at mainland Chinese private schools?* and the subquestion *What subjective norms (societal expectations) do in-service expatriate teachers experience in dealing with students who have special educational needs in their regular classrooms?* guided this study.

Participants

The participants for this study came from a well-recognized private school in a large urban city in mainland China. While the school states openly that students with SEN do not receive academic accommodations (X School, 2022), several students with diagnosed and undiagnosed SEN have attended the school, and teacher professional development in the past year has

introduced differentiated instruction (X School, 2022). Like other private schools, the international division of the school employs expatriate teachers from around the world who teach classes in English and local Chinese teachers who teach Chinese language classes (X School, 2022). Expatriate teachers also teach in English for selected classes in the Chinese division.

The participants were selected from a range of nationalities and countries and were teachers with more than two years of experience in classroom teaching. An attempt was made to include participants with a variety of backgrounds and nationalities, a variety of ages, and a variety of teaching experiences with students with SEN. Due to the diversity of expatriate teachers hired at Chinese schools, the participants ranged in age from their mid-twenties to sixty years old, but all participants were fluent in English and all interviews were conducted in English.

Participants in this study were expatriate teachers who held a passport other than from the People's Republic of China, were current in-service teachers at a private school in mainland China, taught in a private school in mainland China, and spoke English proficiently enough to conduct an interview and participate in a focus group. Twelve teachers were recruited for this study. Participants came from three different geographic regions of the world and held passports from six different countries. None of the participants held passports from PR China. The participant pool included seven males (58%) and five females (42%). Three of the participants have bachelor's degrees, eight participants have master's degrees, and one participant has a doctorate. All participants had experience teaching in their home countries and were expected to provide differentiated instruction for students with special educational needs (SEN) who had been admitted into the regular classroom. Five participants also had experience teaching in a country besides China and their home country. All participants currently teach in mainland China. The median teaching experience for participants was 13 years. The median teaching experience in mainland China was six and a half years. The participants teach in different levels of a K-12 school including four high school teachers, six middle school teachers, and two elementary school teachers. Seven participants (58%) taught science, technology, engineering, and mathematics (STEM) subjects, and five participants (42%) taught humanities subjects. Several of the participants have experience working with the International Baccalaureate Diploma Programme (IB) in addition to the American curriculum currently used at the school site. Pseudonyms ensured the confidentiality of the participants, and general geographical regions were used instead of specific home countries to maintain participant confidentiality.

Data Collection

The data collection included written artifacts of teachers' lesson plans or assignment sheets showing their intention to differentiate instruction for students, personal interviews and focus groups. Focus groups were assigned. Three focus groups included four participants each to facilitate discussions of teachers' shared experiences providing differentiated instruction for students with SEN in regular classrooms and grouped participants of diverse backgrounds and disciplines. Data from the physical artifacts, personal interviews, and focus groups were used to cross-validate and triangulate the data (Patton, 2015) and to generate connections between themes or threads of thought from the participants' experiences (Moustakas, 1994).

Discussions

The major theme revealed by the data was a dissonance between their home countries and China in cultural views of SEN and differentiated instruction.

Teacher Participant	Years Taught	Years Taught in China	Home Country Region	Highest Degree Earned	Content Area	Grade Level
Adam	14	9	North America	Doctorate	STEM	High school
Brenda	6.5	6.5	Asia	Masters	STEM	High school
Darrien	3.5	3.5	Asia	Masters	STEM	Middle school
Carla	33	12	Asia	Masters	STEM	Middle school
Deborah	10	7	North America	Masters	Humanities	High school
Robert	12	7	North America	Bachelors	STEM	High school
Franklin	16	6	North America	Masters	STEM	Elementary school
Greg	16	11	North America	Masters	Humanities	Middle school
Jason	5	4	North America	Bachelors	Humanities	Middle school
Edwin	16	9	North America	Masters	Humanities	Middle school
Maria	15	3	Latin America	Masters	STEM	Elementary school
Hillary	9	3	North America	Bachelors	Humanities	Middle school

Table 1: *Teacher Participant Demographics*

Findings

All participants described how their experiences teaching in Chinese schools differed from inclusive education in their home countries. Participants from North and Latin America and one Asian country shared about well-established support systems for inclusive education and modifications for learners with SEN in other countries. In describing their home countries' inclusive education, participants recalled positive experiences with descriptions like "very focused and targeted on individual students" and "super prepared." Participants described their prior experiences as "great," "very rich," and "awesome."

The paradigm difference between cultures in approaching inclusive education and supporting students with SEN was apparent. All of the participants expressed frustration with the cultural environment in Chinese society regarding inclusive education. Robert remarked that the lack of recognizing SEN is "an Asian culture thing. That there's a stigma around special education that is damaging to students." The participants commented on what they viewed as unwillingness in Chinese society to accept or acknowledge SEN. One participant compared the

cultural environment in China to what she had experienced at a school in the Middle East, "just like in China, they [the Middle East] are in denial or they don't actually acknowledge, you know, their kids having special needs problems." Jason remarked "Most of the time, there is no room for special educational needs." Robert explained the surrounding culture by noting the impact of the collective mindset, "I would say that it just kind of the mindset of the individual versus the collective. China is very much - they embrace collectivism." This collectivism, he perceived, led to the unacceptance of individualism and especially individualized instruction in the classroom. While a couple of participants noted China's recent attempt to increase cultural awareness of special needs, overall participants expressed that the cultural environment seemed unwelcoming to students with SEN, all participants remarked on the Chinese stigmatization of SEN that contrasted with the experiences in their home countries or other countries where they had worked.

Because of the cultural stigma of SEN, many participants noted that there was a parental disinclination to seek diagnosis or treatment or to report a diagnosis to the school. Participants shared numerous experiences of parents of past and current students who resisted seeking a diagnosis for their child due to the cultural stigma toward learning disabilities. Participants described experiences of mentioning the possibility of a child having SEN or learning disabilities to parents. Often the parents were unwilling to seek out diagnoses for their child or were unwilling to report a diagnosis to the school, when one had been made, to avoid labeling the child with SEN. The parental refusal to acknowledge SEN frustrated all the participants who shared that this refusal to report special needs created classroom environments where teachers felt they had to guess what the students' needs were and how to support learning.

The cultural impact is apparent in school policy where the participants teach. Robert noted, "I would say that [in] our school currently there's too much of a stigma around special education." Franklin spoke of the school's resistance to officially recognize SEN. One participant from North America bluntly stated, "Our school's not designed for it [inclusion]. They [students with SEN] need to go to a school that is." As expatriate teachers, the participants viewed Chinese attitudes toward inclusion to be non-accepting of inclusive education and averse to accepting SEN. Even though all participants expressed general acceptance of the basic concepts of special needs education and differentiation in the classroom, participants also made isolated negative comments about SEN in the context of talking about students with SEN in Chinese schools.

All participants expressed frustration with their current school's unwillingness to acknowledge that students with SEN are currently enrolled and the school's repeated claims that students with SEN have not been admitted to the school or placed in regular classes. In describing the school's policy for accommodating students with SEN, participants used words like "unarticulated," "vastly underwhelming," "not, not adequate," and "very unprepared." One commented, "It's quite heartbreaking when you see our students [struggle]." The participants spoke of different ways in which they felt the school was unprepared to include students with SEN in regular classrooms. Carla, who has taught at the school the longest of all the participants, commented on the changes she has experienced in the student body, "For the longest time at [school name redacted] we didn't have problems of students like these, but recently for the past two or three years we have an increasing number of students that show this kind of behavior." Adam agreed, "This system that we have here is so unprepared for that [inclusion]." Deborah claimed that the school's lack of acknowledgment of the presence of students with SEN in the classrooms and the need for additional support for these students had caused considerable frustration among the staff. Deborah explained,

> If you have a school that kind of ignores them [students with SEN] like, yeah, we have some kids, but we don't talk or think about it. That can be detrimental if you have a school that doesn't have institutional support. So we know the kids are falling through the cracks, but we can't do anything about it. That creates a lot of cognitive dissonance. That's really tough for teachers.

This type of cultural dissonance was apparent in all participants' responses.

Many participants spoke of the teachers' efforts to help struggling students by tutoring after school, trying to reteach material, and providing scaffolding; however, all of the participants were disheartened at the school's reluctance to recognize or provide a clear policy for providing accommodations for students with SEN. "There are no school policies," commented Adam. Robert remarked that the school needed to think about inclusion more "because it's really easy to brush this stuff under the rug and there's kind of a culture of doing so." The unclear policy at the school of whether teachers can or cannot provide accommodations and what accommodations are acceptable has created tension in the participants. Deborah summarized the frustration expatriate teachers often experience trying to differentiate their classroom instruction in China,

> It's a really hard balance to strike, but I think that is a very important element as well because teachers- like you absorb that stuff [cultural norms] by osmosis. And if you're in a place, if you're in a place that doesn't value that kind of thing, you will over time, find yourself with the best of intentions taking in some of that.

Participants commented on the cultural pressure felt from parents and the school culture which diminishes the importance or even the existence of SEN and expressed their perceptions that societal expectations resulted in demotivation and discouragement in teachers and sometimes increased a sense of apathy when it came to providing differentiated instruction for students with SEN in their classrooms.

Low efficacy for providing differentiated instruction to students in the class was apparent in nearly every participant in this study. Most of the participants had to be encouraged to provide an artifact of differentiated instruction because many claimed that they didn't regularly differentiate lessons for their classes. Despite having attended a variety of professional development sessions provided by the school to train teachers in differentiated instruction, most of the teachers claimed that their ability to implement differentiated instruction into their curriculum and to use differentiated strategies in class was weak. However, throughout the interviews and discussion, participants could all describe times in their classes when they had provided whole-class adjustments for students. Overall, the participants expressed low self-efficacy for using differentiated instruction as individualized instruction for students with SEN. The findings align with current literature on the self-efficacy of teachers who provide inclusive education for students with SEN. Previous research has examined influences on teacher self-efficacy (Chao et al., 2017; George et al., 2018; Monteiro et al., 2019), yet only a few studies (Opoku et al., 2021a; Schwab & Alnahdi, 2020) discussed the impact of the surrounding culture or subjective norms on teacher self-efficacy.

Conclusion

There is a cultural dissonance between expatriate teachers and the surrounding culture encountered while working in mainland China. Many of the participant's home countries had structured educational systems with special education teachers helping regular classroom teachers find resources and supplementing class instruction. Teachers' experiences included co-teaching with special education specialists or resource teachers, which greatly facilitated the implementation of effective differentiated instruction and teacher collaboration.

In contrast, while teaching in China, the participants have encountered negative perceptions of learning disabilities from the collective Chinese society that often continues to stigmatize students with SEN. This subjective norm differs from many of the participants' previous experiences in their home countries. The cultural perception of SEN in China has also been identified by other researchers (Jia et al., 2022; Qu, 2022c; Xu et al., 2018). Students with SEN in Chinese society still face discrimination and marginalization (Alduais & Deng, 2022; Jia et al., 2022; Qu, 2022a, 2022b: Yuan et al., 2022). Learners' unreported learning difficulties and special educational/behavior needs often become apparent after a child has gained admittance to school.

Additionally, this cultural dissonance impacts the instruction in the classroom. Parental refusal to seek a diagnosis for suspected SEN or disclose diagnoses with the school creates undue pressure on the teacher and the school. Teachers feel pressured by parents and the school to provide the same instruction for all students and to keep academics "equal," regardless of the challenges a child with SEN or learning differences might encounter in a regular classroom. The collective attitude in China that all students should be treated equally has even influenced some of the participants who felt that offering accommodations to a student with SEN was "unfair." The societal expectation of having every child learn equally without accommodations or additional support unduly burdens students with SEN who often struggle through classes. The expectation of equality creates a dissonance in teachers between their previous experiences and the surrounding cultural environment in Chinese private schools. The pressure often leads to frustration and sometimes apathy.

This study's findings agree with previous research that the cultural stigma toward SEN has hindered the acceptance and adoption of inclusive education in China (Li et al., 2022; Schalock et al., 2018). This study's findings support a need for greater cultural awareness to improve the general perception of students with SEN in the regular classroom environment (Alduais & Deng, 2022), especially in Chinese private schools, and a need for policy changes in K-12 schools regarding inclusive education.

Unsupportive school culture can lower self-efficacy for inclusive education (Opoku et al., 2021b). The cultural environment in China still shows a hesitancy to embrace inclusive education (Huang et al., 2021; Jia et al., 2022; Mu, 2021; Xie et al., 2022). This cultural disregard for SEN has created a dissonance in participants, many of whom had experienced effective inclusive education in former schools in their home countries. While previous studies have examined the cultural environment surrounding the Chinese acceptance of inclusion and the remaining stigma in receiving a diagnosis of SEN, little research has described the clash of cultures expatriates often feel while teaching in a country unlike their own. Having been conducted in English, this study is unique in that very few international studies have been conducted in English in mainland China to describe the country's implementation of inclusive

education (Faragher et al., 2021; Han & Cumming, 2022) making it accessible to a wider global audience.

This study's limitations should be acknowledged. First, there were only 12 participants, which is a relatively small sample of expatriate teachers in mainland China. This study occurred at a single K-12 school in one urban city in mainland China. Secondly, many factors and variables, such as the teachers' prior experiences and education level, can influence teacher self-efficacy for differentiated instruction in inclusive environments. Participants were limited to English-speaking teachers because of the researcher's language abilities. The participation of Chinese-speaking teachers might have given more variety of responses.

Further research is suggested to discover the experiences of a more diverse group of educators. Research that includes more teachers and additional locations would be advisable to generate more representative findings. Most of the participants in this study were experienced teachers who had taught for more than five years and lived in China for several years. Further studies to describe the experiences of teachers, perhaps in their first or second year of teaching in China, would broaden the perspective of the experiences of expatriate teachers. The examination of school systems in more rural areas and smaller cities is needed to gather more comprehensive data, especially in schools that employ expatriate teachers. Further research could include Chinese-speaking teachers to compare their experiences and perceptions with the experiences of the expatriate teachers. Examining the attitudes of administrators, supervising teachers, and school management would also generate research on school-wide impressions of SEN and inclusive education.

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Mobile Augmented Reality on Electric Circuits for Science Learning in Primary School Students: The User Experience Evaluation

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Abstract
The adoption of mobile augmented reality (AR) technology has expanded in various ways. It can be utilized, especially in education, which is a crucial instrument used in the learning management process and helps change the perspective about education, including activities in the laboratory. This research aimed to evaluate the level of user experience among 6th-grade students toward augmented reality on electric circuits for science learning. The participants were 28 6th-grade students in the Northeastern region of Thailand. This study used a pre-experimental design involving a single-group post-test-only design. An AR app was developed based on the misconceptions and provided features related to learning standards and indicators of the national curriculum; moreover, AR app showed things that the naked eye cannot see, making them visible. The participants evaluated their user experience through twenty-six items of the user experience questionnaire. The finding found that attractiveness, dependability, and novelty dimension rated at an “excellent” level. In addition, perspicuity and stimulation were above average, demonstrating that our AR app performed well and received favorable responses.

Keywords: Mobile Augmented Reality, Electric Circuits, User Experience, Primary School Students

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1. Introduction

The current technological advances are always creating chances for new strategies to promote creative methods to facilitate learning (Omair et al., 2022). One popular digital technology is augmented reality (AR), a rapidly evolving state-of-the-art. Can seamlessly integrate virtual objects into the real world, creating a truly immersive experience (Akçayır & Akçayır, 2017). AR displays animation, three-dimensional (3-D) graphics, and video through handheld devices. Furthermore, AR users expressed high levels of motivation and satisfaction while interacting with the technology due to AR as a practical learning tool being easily accessible, portable, and affordable, allowing users to access models from any device at any time, and it promoted curiosity and engagement in the learning process (Chookaew et al., 2018). Nowadays, AR is used widely in learning science. As abstract concepts frequently explain natural phenomena in science courses, incorporating technology has become essential to support these subjects. To enrich students' learning environments, especially when dealing with complex and abstract concepts (Anil & Batdi, 2023). Sahin and Yilmaz (2020) explored the influence of AR in science learning on students' attitudes and academic achievements. The findings indicated that using this technology positively affected students' attitudes and contributed to enhance academic performance. It suggested that pupils preferred using AR in the science learning because AR helped them see the concept more concretely.

Many students frequently see physics as a complicated and uninteresting subject because of its complex and highly abstract concepts (Mbonyiryivuze et al., 2022). Past studies found that students frequently have misconceptions about a current running through the circuit when the switch shuts and the resistance magnitude based on the electric current (Nugraha et al., 2018). These concepts related to the knowledge of voltage, current, and resistance due to their abstract nature and difficulty explaining. Understanding how these three variables interact within a circuit is consistently tricky and challenging for experiments in a natural laboratory (Avilés & Cruz, 2017). Moreover, while performing electrical circuit experiments in schools, teachers must supervise students to construct accurate circuits and avoid hazardous ones like short circuits. However, it was unfeasible to thoroughly monitor each student's circuit in larger classes, which may cause harm. It required substantial time and effort to maintain experiment equipment and prepared equipment for potential fallibility during experiments in a laboratory (Kuriki et al., 2021).

The study emphasized a mobile augmented reality of electric circuits for primary school students. This AR app allowed students to experience and interact with 3D virtual objects of the abstract topic. This research aimed to evaluate the level of user experience among primary school students towards augmented reality.

2. Literature Review

2.1 The Concept of Augmented Reality (AR)

AR technology creates an interactive experience by merging the real and virtual worlds (Marini et al., 2022). This technology allows the visualization of the actual environment through the application implemented by computer-generated such as pictures, videos, sound, or various parameters that can be added to our real-world environs with overlay physical objects in real-time. Users can become fully immersed in a generated virtual environment. Moreover, it enables users to interact with and observe 2-D or 3-D data in the real world (Suhaimi et al., 2022). However, AR cannot replace physical reality. On the other hand, they

can add new experiences and layers on top of the reality world, which is confirmed by utilizing mobile devices and cameras to broaden the reach of the natural world (Mukhtarkyzy et al., 2022). Therefore, AR technology is suitable for younger age groups as it does not rely on a mouse and keyboard to reach the generated virtual environment (Esmaeil et al., 2023).

2.2 Augmented Reality in Science Education

AR technology provides numerous chances to develop instruction and learning encounters (Mukhtarkyzy et al., 2022). In a past study, Irwanto et al. (2022) addressed trends in the use of AR in science learning reported from the Scopus database for the last 15 years (2007-2022) that AR has been used widely at all levels of education. Because it is a technology that can interact with various learning styles, it can operate on multiple devices, including tablets, smartphones, and laptops. It also can stimulate interest, increase motivation to learn, increase understanding of abstract concepts and help strengthen the efficiency of learning science management. It supports students to have a positive attitude toward learning good science, enhancing students' learning experience and encouraging a creative new learning environment (Yilmaz, 2021).

Furthermore, researchers also mentioned the use of AR in elementary students. From the previous study, Volioti et al. (2022) developed an augmented reality application system for teaching physics for grades K–12 in schools. The study revealed positive results, indicating user-friendliness; additionally, it was a system that helped to enhance learning and to achieve intended learning objectives.

One of the benefits of utilizing AR in learning about electrical circuits for elementary students was an interest-generating tool which motivated participation in learning. It was also a dynamic technology that helped to transform abstract concepts into concrete that is impossible through laboratory equipment. It assisted students to learn individually and freely through the interaction with technology media. It helped them learn and surpass the limitations of lacking laboratory equipment (Baran et al., 2020).

2.3 Usability Testing

Usability Testing is a crucial factor in assessing the quality of mobile applications, measuring both the ease of use and user satisfaction with their functionality, which will help applications function efficiently and offer a pleasant experience (Szekely et al., 2023). Furthermore, the User Experience (UE) connects with the method the user perceives when interacting with the system, a crucial element in the system's development (Ramli et al., 2023).

Users can evaluate the usability testing of mobile applications through the User Experience Questionnaire (UEQ) for the development of an efficient system.

The UEQ is an efficient instrument or questionnaire used to assess the UE designed for immediate, spontaneous responses, given the importance of swift evaluation (Silva et al., 2023). Laugwitz et al. (2008) developed UEQ that the UEQ scale structure includes six scales containing 26 pairs of opposite adjectives about the application's characteristics, namely Attractiveness (enjoyable, good, pleasing, pleasant, attractive, and friendly), Efficiency (fast, efficient, practical, and organized), Perspicuity (understandable, easy to learn, easy, and straightforward), Dependability (predictable, supportive, secure, and meets expectations), Stimulation (valuable, exciting, engaging, and motivating), and Novelty (creative, inventive,

leading edge, and innovation). These questions could be scored on a 7-scale, ranging from -3 (worst) to +3 (very good).

3. Methodology

3.1 Study Participants

The participants in this research were twenty-eight sixth-grade students from the Northeastern part of Thailand. here were 14 females (50%) and 14 males (50%) aged 12. They needed to gain experience in utilizing augmented reality for science learning.

3.2 Learning Materials

We developed mobile augmented reality and designated “Bright Circuits AR” for primary school students. The AR app was built for science learning of electric circuits, which followed the learning standards and indicators of the national curriculum as follows: 1) to identify the components and describe the functions of each component of a simple electrical circuit from empirical evidence, 2) to create a diagram and assemble a simple electrical circuit and 3) to design an experiment and conduct it using an appropriate method to explain the procedure and results of connecting electric cells in series and parallel.

The Bright Circuits AR app, developed as marker-based AR, was categorized into three sections: electric devices, series electric circuits, and parallel electric circuits.



Figure 1: An example screenshot from the Bright Circuits AR app: A) the initial screen, B) the interaction topics screen.

The initial screen on the Bright Circuits AR application as shown in Figure 1A, consisted of four sections: (i) Scan AR area, (ii) Marker for scan AR, (iii) Contact information for assistance (Facebook, Line, Phone, and E-Mail), and (iv) The instructions of the Bright Circuits AR application after selecting components of Scan AR. The screen displays three topics to interact with AR: electric devices, series electric circuits, and parallel electric circuits, as shown in Figure 1B.

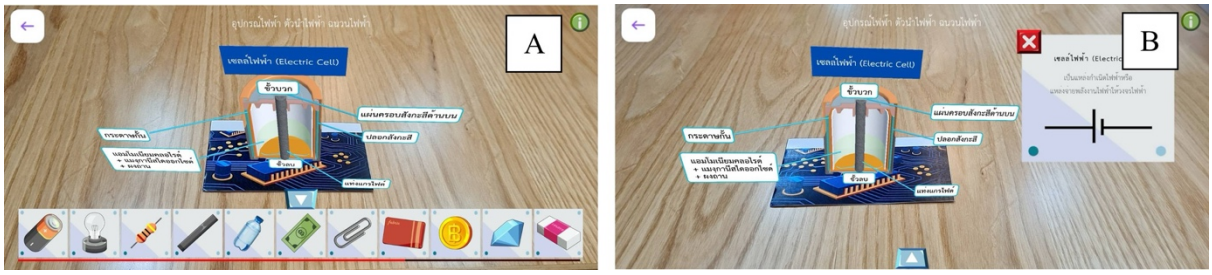


Figure 2: An example screenshot from the Bright Circuits AR app on the electric devices section: A) 3D displaying results, where students were able to select and study one electrical component of their interest at a time, B) displaying the results of function "i" icon will which presenting additional data for that electrical device.

The participants used their mobile devices to scan the electric device marker, which is the first topic. They can select each type of electric device, including insulators and conductors. Who are interested in studying information, as depicted in Figure 2A. Furthermore, various devices showed the information about names, duties, electrical symbols, and components by displaying results in 3D, as in Figure 2B, before moving to the next topic.

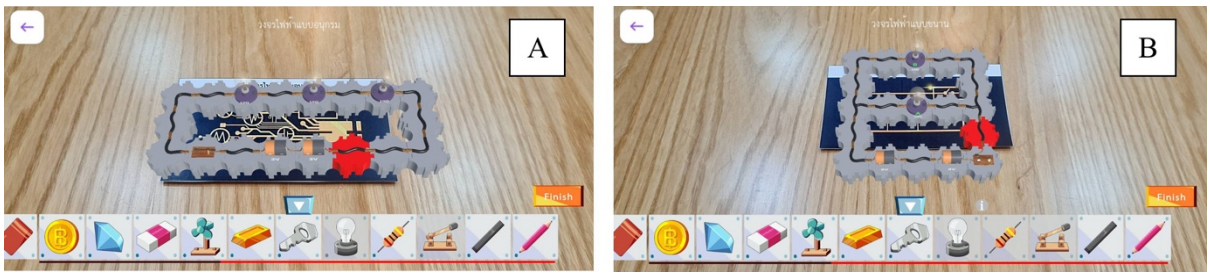


Figure 3: An example screenshot from the Bright Circuits AR app on the series electric circuits and parallel electric circuits section: A) presenting 3D visuals in the section on connecting electrical circuits in series, B) presenting 3D visuals in the section on connecting electrical circuits in parallel.

In the next topic, the tasks were connecting series electric circuits and parallel electric circuits. In the first step, the participants used their mobile devices to scan the series electric circuits marker or parallel electric circuits marker to interact with AR. When the scan succeeded, the system displayed 3D jigsaw puzzles, in which the users could choose a jigsaw to place electric devices to build the correctness of electric circuits. Users could select the finish button if they were confident in creating an electric circuit, as shown in Figure 3A and Figure 3B. After that, the user could use the edit button when to update an electric circuit. The application displayed the outcomes after choosing the finish button.

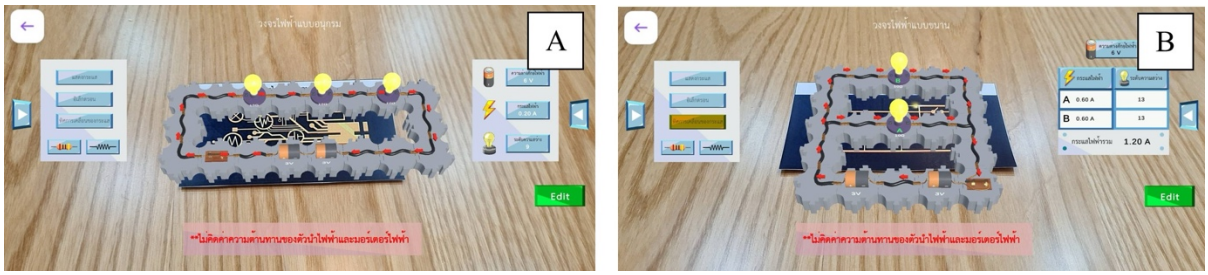


Figure 4: An accurate and complete of 3D display representation:
A) The complete results of connecting electrical circuits in series and
B) The complete results of connecting electrical circuits in parallel.

When choosing the finish button, the system displayed accurate outcomes by presenting voltage, current, and brightness levels on the right side of the screen. Additionally, on the left side of the screen, there was a button display to visualize the direction of current flow and electron flow. Also, there was an electrical symbol button to display the circuit as an electrical symbol, as shown in Figure 4A and Figure 4B.

3.3 Data Collection

This study employed a pre-experimental design involving a single-group post-test-only design. Figure 5 presented experimental procedures; the participants were 28 6th-grade students in the Northeast, Thailand. Before interacting with the Bright Circuits AR, the first author briefly introduced this AR app for 20 minutes in the following manner: What is the Bright Circuits AR app? How does it work? Then, the participants were assigned to interact through three tasks according to three sections of the AR app for 120 minutes as follows:

1) Do you know about electric devices, conductors, and electrical insulators? To learn to get this information to apply to connect electrical circuits.
2) How can you connect electrical circuits in series to make the light bulb shine the brightest? To design and choose electrical devices, conductors, or electrical insulators to connect to succeed the mission.
3) How can you connect electrical circuits in parallel to make both light bulbs light up simultaneously, and with the condition that if one bulb removed from the circuit, the other bulb must remain lit?

For the accomplishment of the mission, it involved designing and selecting electrical components, conductors, or insulators for connection. After completing the mission, students would complete questionnaires regarding their proficiency in utilizing augmented reality technology for 10 minutes.

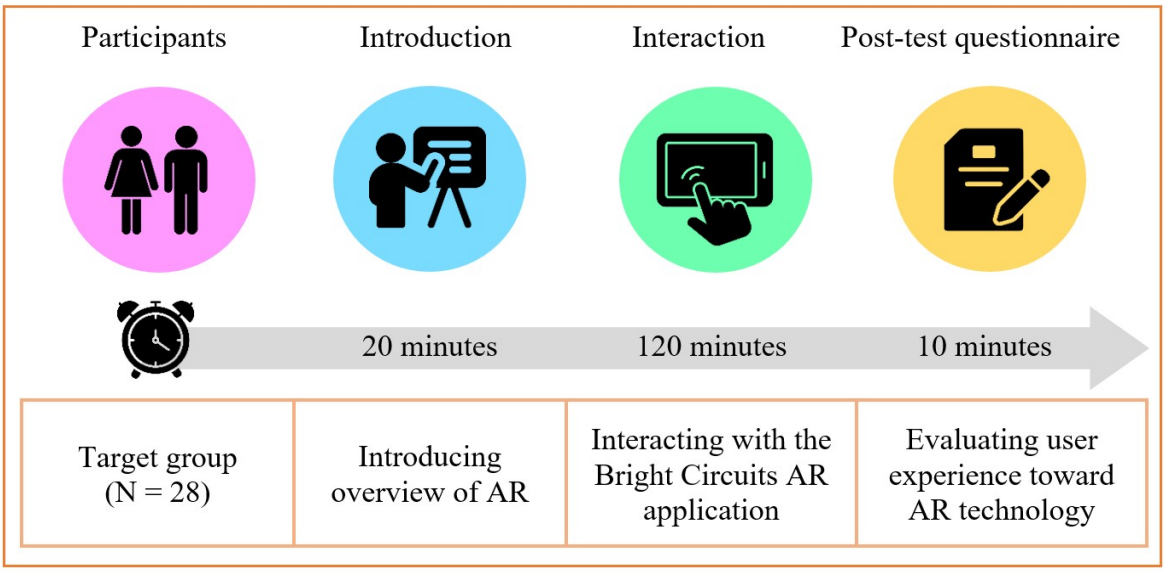


Figure 5: Experimental design.

3.4 Data Analysis

This study used Use Experience Questionnaire (UEQ) questionnaires adopted from Kusumaningshi et al. (2022). The UEQ was reliable and valid (Laugwitz et al., 2008) to measure the quality of the interactive AR app that had twenty-six items and consisted of six

scales: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty with the positive term and the negative term. There was a 7-stage scale from –3 to +3: -3 was the most negative answer, 0 was the neutral answer, and +3 was the most positive answer. Mean was used to analyze the UEQ to compare with benchmarks that classified into five categories per scale: excellent, good, above average, below average, and bad.

4. Results and Discussion

4.1 Results

Figure 6 displays the mean outcomes for every UEQ evaluation scale (depicted in vertical bars) and their variability (represented in black lines atop the vertical bars). Perspicuity and stimulation yielded the least favorable outcomes. Most participants declared that there was some confusion in downloading the app. In addition, some students needed clarification of the app instructions.

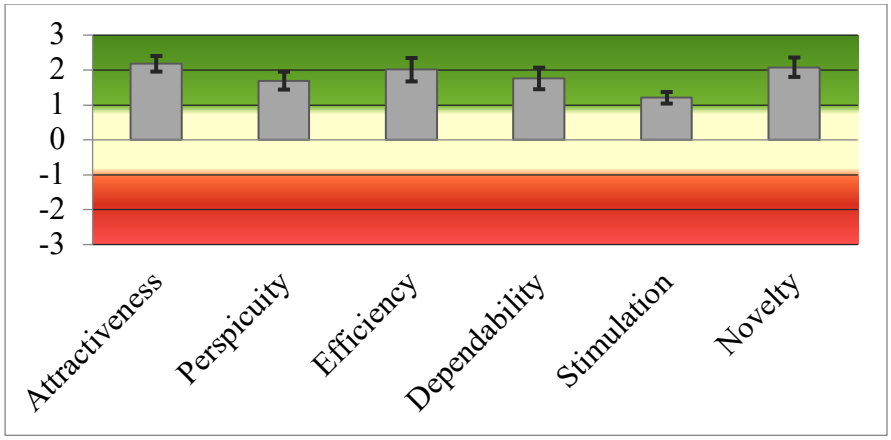


Figure 6: Mean and variance of each scale.

The findings from AR app assessment compared with the benchmark data provided in the Data Analysis Tool from the website (www.ueq-online.org). Figure 7 illustrates that four scales which were excellent comprised of attractiveness (M = 2.18, SD = 0.61), efficiency (M = 2.01, 0.91), dependability (M = 1.76, SD = 0.84), and novelty (M = 2.08, SD = 0.75). However, perspicuity (M = 1.70, SD = 0.69) and stimulation (M = 1.21, SD = 0.45) were above average.

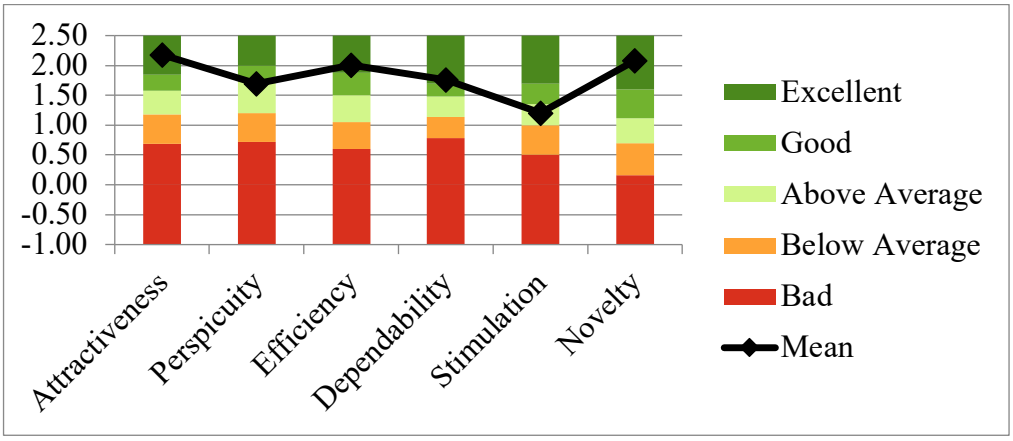


Figure 7: Comparison of the data with the benchmark.

4.2 Discussion

The research findings correlated with Mercier et al. (2023) on the web AR application for evaluating the impact of geolocation data on usability through UEQ. Their findings found that the overall usability of their system was excellent. Moreover, our results related to the work of Kusumaningsih et al. (2022) on the AR development for solar system application for elementary school students and the application evaluation. They used UEQ to measure students' experience towards AR, to which students responded positively as the overall resutls of the Bright Circuits AR. These intriguing findings closely aligned with previous studies that conducted a user experience of VR through the UEQ, in which the attractiveness, dependability, and novelty dimensions were rated at an "excellent" level (Borgnis et al., 2021). This AR app was enjoyable, creative, predictable, fast processing, efficient, practical, attractive, and friendly. On the other hand, perspicuity and stimulation dimensions need to be improved in AR apps to simplify usage and encourage users to use AR apps.

5. Conclusions and Suggestions

The outcomes of this study are highly encouraging and captivating in terms of user engagement with Bright Circuits AR. Most students felt the enjoyment. Moreover, they expressed that AR was practical, implemented, and contemporary. In our future work, we will improve the system for more user-responsive learning experiences, streamlined functionality, increased engagement, and adaptation for Android and iOS operating systems.

Acknowledgements

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Assessment of Crisis Management in Higher Education Institutions Towards Academic Quality and Impacts on Students

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Abstract
In response to the Covid-19 pandemic, the Ministry of Higher Education in Malaysia issued various directives for higher education institutions (HEIs) to follow. These directives are mostly general and therefore lead to differences in Covid-19 crisis management plan. The importance of a well-designed and properly implemented crisis management plan is highlighted as it minimises disruption to service delivery, which affects academic quality and perception of students, especially regarding their motivation and experience as a student. This paper investigates how academic quality and students' perception are affected by the implementation of crisis management plans in HEIs. Using a structural equation modelling approach, data from students in various HEIs in Malaysia are analysed to explore the relationship between crisis management plan implementation and student constructs. Based on the findings of these analyses, this paper aims to contribute by providing a suggestion of possible improvement on the existing system on the design and implementation of a crisis management plan that is beneficial for students in the event of a crisis and enhancing the resilience and adaptability of the higher education system in the face of unforeseen challenges.

Keywords: Academic Quality, Crisis Management Plan, Higher Education Institutions

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Introduction

The Covid-19 pandemic in Malaysia was a part of the worldwide pandemic of coronavirus disease started in 2019. Turgut (2021) stressed that the pandemic has revealed the biggest education crisis in human history. On 18th March 2020, the Movement Control Order (MCO) was implemented in Malaysia (Tang, 2022). One of the restrictions was to close all the higher education institutions (HEIs) nationwide. It affected thousands of students (Daim, 2020). HEIs have been forced to close their physical classes to the growing coronavirus outbreak, and switched classes to online classes (Ali et al., 2020). Daniel (2020) added that, Covid-19 disease has had a devastating effect on the educational activity that could have very harmful consequences for future generations.

The academic quality advocated in HEIs is to ensure that students have a good experience and learning opportunities and hence, HEIs should provide a conducive learning environment, promote effective teaching, enhance student support, and design appropriate assessment systems. In Malaysia, public and private HEIs have their own specific unit or department to uphold the academic quality. These units and departments have clear quality vision, mission, and objectives that contribute to manage, facilitate, and conduct activities towards quality assurance and enhancement of core processes based on the Malaysian Qualification Framework (MQF). The academic quality assurance should align and comply with Malaysian Qualifications Agency (MQA) standard by demonstrating that a desired level of quality of an academic activity has been attained, at any situation including the Covid-19 outbreak. Covid-19 crisis management comprising of Covid-19 Standard Operating Procedure (SOP) on resources allocation, teaching and learning activities, workplace, classroom, laboratory, instrument, and equipment. Immediate response and proper Covid-19 crisis management plan is the key to secure academic quality.

Impact of Covid on Students in HEIs

According to Schleicher (2020), the crisis has exposed many shortcomings and inequities in the education system stemming from online education accessibility, and the issue of supportive environments needed for learning, up to the misalignment between resources and needs. Baik et al. (2019) argued that student well-being was affected in HEIs during Covid pandemic. This was supported by Auerbach et al. (2018) that undergraduate students are particularly prone to mental distress during the pandemic. According to Dodd et al. (2021), only 35% of students reported a ‘sufficient level of well-being’ during the first months of the pandemic, and 32% reported very low well-being’. This was supported by Lize et. al., (2023) that, when arriving at university, students’ well-being is positively correlated to their academic confidence. Fodjo et al. (2021) reported a negative impact of Covid-19 on the well-being of students. This was further supported that self-efficacy is significantly correlated with well-being and academic confidence, as expected based on Gutierrez and Tomas (2019) and St Clair-Thompson et al. (2017).

Ruth et al. (2021) highlighted that there is expanding evidence of the HEI students distress associated with facing multiple abrupt changes and the need for rapid adaptation to a variety of academic, social, and financial challenges. According to Nutifafa et al. (2022), academic stress and future anxiety independently and serially mediated the relationship between fear of Covid-19 and psychological distress. Covid-19 related changes has evoked academic stress in American undergraduate and graduate students as reported in Scheffert et al. (2021). Nutifafa et al. (2022) also stressed that efforts should be made at assessing the source of students' distress

in relation to the fear of Covid-19, to enable professionals to design and develop holistic intervention strategies that best suit the needs of students as they navigate the ravages of the pandemic.

Problem Statement

During the Covid-19 crisis, HEIs in Malaysia were given flexibility in formulating their strategies related to teaching and learning. This has led to differences in the Covid-19 management strategies related to teaching and learning between HEIs (Ho & Wearn, 1996; Prasad & Jha, 2013; Teeroovengadum et al., 2016). Most of the HEIs literature have characterised universities as heavily coupled organizations with multiple decision-makers, unclear technology, and competing goals that impede far-reaching solutions (Fernandez & Shaw, 2020). According to Lim (2022), private HEIs institutions faced financial challenges due to students' decisions to defer and/or delay their studies following the Covid-19 pandemic. He added that HEIs also encountered challenges in the disruptions of their teaching and learning activities. Many HEIs were forced to shut down temporarily and switch their conventional physical activities to online activities, as instructed by MOHE. Without regards to their familiarity of e-learning platforms or their ability to use these information technologies in their education, the Covid-19 pandemic has tested the extent to which both academic staff and students are prepared to adopt and use these technologies in their online learning activities (Allam et al., 2020). The lockdown forced HEI curricula online, leading to great challenges for those involved in the delivery and receipt of learning and teaching (Almazova et al., 2020). Consequently, many students were forced to deal with advanced online information and communication technologies (ICTs) to accomplish their learning activities and follow up with their instructors in a safer manner to ensure social distancing was maintained during the Covid-19 period (Kurilovas & Kubilinskiene, 2020). Nevertheless, the sudden adoption of these online services during the pandemic may have negative effects on academic staff and students' lives, as there are several issues that may hamper and demotivate them during their teaching and learning process (Al-Kumaim et al., 2021). According to Oleksiyenko et al. (2023), HEIs lacked knowledge on handling the treacherous global pandemic and took cautious steps to implement partial or full closures and openings. In the tightly regulated policy environments, academic executives made quick decisions on lockdowns, e-learning, space regulations, and sanitization procedures. The lockdowns impeded students' study progress. Graduation ceremonies were cancelled or delayed. International students became stranded. The processes of teaching and examination became more complicated, as online testing was neither fully trusted, nor always efficiently managed.

Awareness and crisis management-based programs can be developed to help enhance crisis awareness and build the knowledge base of crisis management among organizational leaders, members, and stakeholders. Preparing an organization, in advance, by training on crisis management is better than paying a high cost in the future. Furthermore, training can speed up an organization's recovery from crisis events (Carroll & Buchholtz, 2003). This paper investigates how students' perceptions are affected by implementation of crisis management plans in HEIs. The importance of a well-designed and properly implemented crisis management plan is highlighted as it minimises disruption to service delivery, which affects academic quality and perception of students, especially regarding their motivation and experience as a student. Many HEIs in Malaysia have adapted Covid-19 related SOPs suggested by the government to deal with this new arrangement, and a few are establishing their own Covid-19 crisis management plan as a more comprehensive solution to attain the operation in their institution and aimed to attain academic quality during this pandemic phase.

Crisis Management

Crisis management is a research ground in the field of human resource development. Fener and Cevik (2015) defined crisis as a sudden event that reduces the chances of progress of the organization and achieving outstanding performance and may lead to the collapse and demise of the entire organization. Alves et al. (2020) added that with crises, officials and decision-makers in the organization lose their ability to control it or its future directions. Crisis are also interpreted as an event that would have negative implications on the organisation or company (Fajar, 2011). Since the number of crisis events happening in HEIs in current years keep increasing, crisis management has increasingly discussed among the people in HEIs. Despite the increasing level of risks HEIs are facing today related to the complexity of institutional operations, technology, and infrastructure there is a lack of overall crisis management plans at the institutional level. Crisis management refers to the organization's ability to deal quickly and efficiently with the ongoing crises, with the aim of reducing or preventing the risks and negative effects of the crisis, through identification, diagnosis, planning and confronting the crisis (Taneja et al., 2014). Smith (2017) added crisis management as a treatment that must be done given the issues outside the control of the institution or company. According to Jia and Holly (2010), prior to any disaster, a successful crisis management plan exposes weaknesses within the current system and develops facilities to handle the issues. So, the crisis management team can portray these capabilities with speed and efficiency during a crisis and can learn from the experience to further improve the program.

Crisis events could cause panic within the campus community and raise questions regarding colleges and universities' abilities to timely prepare and respond to crisis events while maintaining a culture of inclusivity and open access. Shamsir et al. (2021) highlighted that, "The lack of clear planning frameworks and strategies for pandemic preparedness by HEIs has been exposed as a result of the Covid-19 pandemic". Thus, for administrators of educational institutions, it is crucial to develop an effective strategic plan that would likely prevent the occurrence of a crisis event or minimize the impact if one occurs (Wang & Hutchins, 2010). As Covid-19 became a global issue and was declared a pandemic, it led to lockdowns across the world. These lockdowns have created ample impacts and challenges for those involved in the teaching and learning, especially crisis management in HEIs (Almazova et al., 2020). Effective campus crisis management depends on the capacities of institutions and administrators to under-stand and resolve problems and their causes.

Exploratory Structural Equation Modelling

Factor analysis is a statistical analysis method used to investigate latent factors that are not directly observable through the combination of manifest variables that are directly observable. Based on how it is used, and the restrictions applied, factor analysis can be used to explore and summarise a dataset (exploratory) or to confirm the fit of a model (confirmatory). Marsh et. al. (2014) proposed exploratory structural equation modelling (ESEM) as an extension for exploratory and confirmatory factor analysis as it allows investigation of the causal relations between the latent factors and the strength of these relations. Furthermore, ESEM is proposed instead of conventional SEM as it will allow the models to be more flexible and better reflect real-life circumstances. ESEM combines the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Instead of using pre-determined models, ESEM uses EFA to extract a model that fits the analysed dataset. ESEM then uses CFA to investigate the goodness-of-fit of this model and investigate the causal relations between latent factors present in the model.

Materials and Methods

The questionnaire was crafted to gauge students' perceptions resulting from the implementation of Covid-19 crisis management plans in their respective institution, particularly focusing on teaching and learning activities. Its primary aim is to investigate various aspects of the Covid-19 crisis management plan within HEIs, including its availability, proper implementation, accessibility to all students, and the integration of key SOPs such as hardware and software improvements. These questionnaire items were adapted for the HEI context from instruments developed by Adamu and Mohamad (2019). Based on the works of Alem et al. (2016) and Yang et al. (2021), another section of the questionnaire delves into students' perceptions regarding both the negative impacts and benefits of the implemented Covid-19 crisis management plans. This section specifically examines the effects on their teaching and learning experiences, motivation levels, and academic quality. Each perception is evaluated using a minimum of three measurement items, employing a 5-point Likert scale, namely, 1(strongly disagree), 2(disagree), 3(neutral), 4 (agree), and 5 (strongly agree). Before dissemination, the questionnaire underwent a revision process following a pilot study. Surveys were conducted using the online survey platform Qualtrics for ease of administration and data collection.

Participants and Setting

The target population comprises students enrolled in Malaysian HEIs during the period of 2020 to 2021, coinciding with the implementation of the MCO in Malaysia. Student volunteers stationed across various states in Malaysia were enlisted to assist in conducting surveys within the vicinity of their respective universities or through their contacts. A dataset containing 225 responses was collected from December 2023 to March 2024. Following a cleaning process, a cleaned dataset consisted of 205 valid responses were extracted. In addition, an item was scored with a reversed ranking and was reversed before analysis. Table 1 provides an overview of the demographic profile of the respondents participating in the study.

Table 1: Demographic characteristics of respondents (N = 205)

Characteristics	Category	Frequency	Percentage (%)
Academic Discipline	Physical Sciences, Engineering and Medical	88	42.9
	Arts, Business, and Social Sciences	79	38.6
	IT, Computer Science and Mathematics	38	18.5
Year of Study in 2021	1st Year	98	47.8
	2nd Year	65	31.7
	3rd Year	13	6.4
	4th Year	29	14.1
Public / Private	Public Institution	144	70.2
	Private Institution	61	29.8
Diploma / UG	Undergraduate Student	186	90.7
	Diploma Student	19	9.3
>20% hands-on classes	Yes	158	77.1
	No	47	22.9

To investigate the complex interplay of factors influencing academic quality, we employ factor analysis. Exploratory Factor Analysis (EFA) uncovers potential latent factors within a dataset, while Confirmatory Factor Analysis (CFA) assesses causal relationships among these factors.

Each method has distinct advantages and limitations, detailed in Asparouhov and Muthen (2009). A relatively new approach, Exploratory Structural Equation Modelling (ESEM), extends CFA, accommodating fewer rigid models and offering a broader array of potential structures. Our study implements ESEM on R 4.2.1 utilizing the packages *psych* and *lavaan*.

Results

As the first step of ESEM, EFA with 4 factors was performed on the data to obtain a model that best fits the data. The model obtained from EFA is not bounded to follow pre-existing theories that was used in developing the questionnaire due to its exploratory nature. Consequently, the factors from the EFA model are interpreted differently compared to the theoretical factors. In the theoretical model with four factors, these factors are interpreted as implementation of crisis management plan (CMP), students' motivation, academic quality, and students' social experience. In comparison, our ESEM model merges academic quality and students' social experience into overall quality of academic and student experience, whereas the implementation of CMP factor is separated into two factors in our ESEM model.

Table 2 provides an overview of the factors of the ESEM model with the items which highly affects or defines each factor. Quality of student experience refers to both the academic and social aspects of students' experience in their institution. As shown in Table 2, quality of student experience is affected by whether the implemented SOPs under the CMP allow seamless transition from physical learning experience to online learning, such as online lectures and tutorials, online interaction with friends and colleagues, and extracurricular activities.

Table 2: Examples of Items in Each Factors

Factor	Items	Mean	Standard Deviation	Proportion of Variations (%)
Quality of Student Experience (17 items)	Covid-19 SOPs in my institution have			12.0
	• made it easy to conduct discussions during online tutorials.	3.86	1.09	
	• made it easy to access and obtain materials used in online lectures.	4.07	0.96	
	• allows me to safely interact with my friends and colleagues.	3.71	1.13	
	• effectively minimised the impact on academic quality.	3.68	1.01	
	• effectively minimised the impact on my experience as a student.	3.78	1.06	
Motivation (5 items)	Covid-19 SOPs in my institution have			9.8
	• motivated me to complete my study objectives.	3.62	1.11	
	• motivated to join online lectures and tutorials.	3.56	1.21	
	• helped me to focus on my study.	3.46	1.21	
SOPs under CMP (9 items)	My institution			11.8
	• properly prepares and informs me of actions to be taken when a crisis occurs.	3.99	1.05	
	• informed me on where I can find information regarding crisis management.	3.93	1.03	
	• often circulates information concerning crisis management through internal communication.	3.92	1.00	
Impact of CMP (5 items)	During Covid-19, my institution			6.4
	• installed and upgraded the hardware used.	3.65	1.16	
	• made improvements to the software used.	3.85	1.05	
	• provided training on the usage of software that is useful to me.	3.61	1.13	

The first factor, quality of student experience, can be summarised as whether the SOPs implemented effectively minimised the interruptions from crises onto academic and social aspects of students' experience. The second factor, motivation, includes items that measure whether the implemented SOPs motivated students to complete their study objectives, join online lectures and tutorials, and focus on their self-study. In addition, students' motivation is affected by whether they often feel anxious with the implemented SOPs. The third factor mostly measures whether HEIs communicate effectively and provide clarity on information regarding CMP onto students. This factor includes measurements of communication and clarity of information pre-COVID-19 and during the COVID-19 period. Meanwhile, the fourth factor measures the impact of actions taken by HEIs are noticed by students. This factor measures whether actions taken by the HEIs reduce the anxiety of students and protected their interests. Furthermore, this factor also measures whether HEIs made improvements onto the hardware and software used by students.

Table 3: Comparative Statistics of ESEM Model

Statistics of ESEM Model	
Comparative Fit Index (CFI)	0.901
Tucker-Lewis Index (TLI)	0.873
Root Mean Square Error of Approximation (RMSEA)	0.063 (Lower) 0.070 0.076 (Upper)

Next, ESEM was conducted on the data using the model and factors extracted with EFA. Table 3 presents some goodness-of-fit statistics of the model fitted. It is important to note that for Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), values greater than 0.90 indicates that the model is a good fit for the data. Meanwhile, values less than 0.08 for RMSEA is suggested for a model to be a good fit for the data. Based on Table 3, the CFI for the model is 0.901, higher than the suggested value, while the TLI is 0.873, barely not reaching the suggested value for TLI. Meanwhile, the RMSEA for the model is 0.070. Hence, we can conclude that the ESEM model is an acceptable fit for the data.

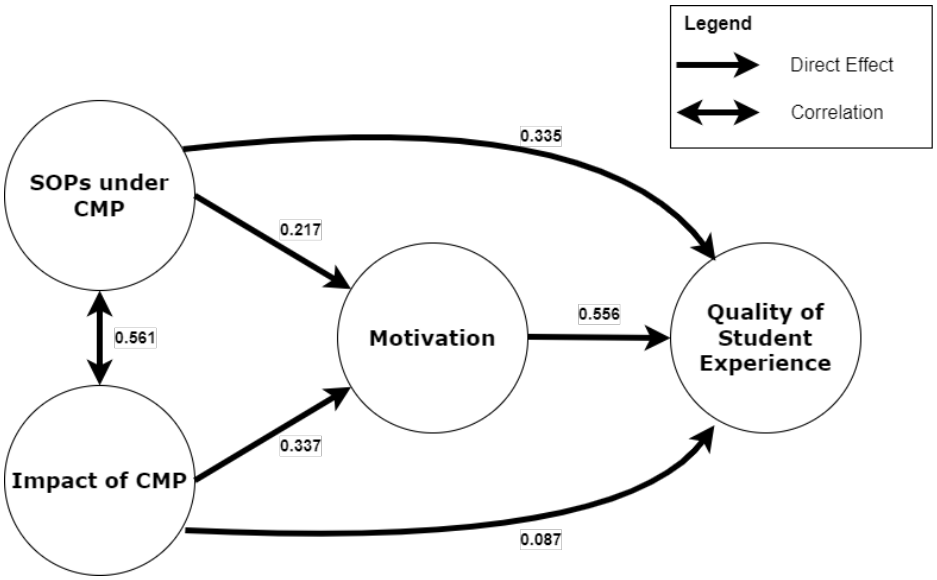


Figure 1: Path Diagram of ESEM Model

From Figure 1, a positive direct effect (one-way effect) is observed from motivation onto the quality of student experience. This suggests that a high score in motivation would generally associate to a high score in the quality of student experience, but the reverse is not necessarily true. The same can be said regarding the SOPs under CMP onto quality of student experience. In addition, students' motivation is directly affected by SOPs under CMP and the impact of CMP. The coefficients for the direct effects could then be used to compare the effects of various factors onto another factor. A positive correlation (two-way effect) between implementation of SOPs and impact of crisis management plan noticeable by students is also observed in the model. As SOPs under CMP and impact of CMP are correlated to each other, a high score in either factor would likely to associate with high score on the other factor. Additionally, the indirect effect of SOPs under CMP and impact of CMP onto quality of student experience could be investigated by multiplying the direct effect of either factor onto motivation by the direct effect of motivation onto quality of student experience. Based on Figure 1, we could investigate the total effects of each factor onto quality of student experience by adding the direct effects

with the indirect effects. It is shown that motivation (0.556) plays the biggest role onto quality of student experience, followed by the SOPs under CMP (0.456) and impact of CMP (0.274).

Conclusion

Based on the results of the factor analysis provided in Table 2, policymakers could improve quality of student experience by implementing SOPs that allows students to transition from physical learning activities easily and seamlessly onto online learning activities, including online lectures and tutorials, online interactions with colleagues, and extracurricular activities. Realistically, this can be done by integrating aspects of online learning into the curriculum and providing training to students on platforms used in online learning. In turn, this would minimise disruption onto learning activities as students are previously acquainted with SOPs that are implemented in the event of a crisis. In addition, HEIs need to implement effective communication and ensure clarity of information regarding CMP. As a preventive measure, HEIs could provide easily accessible resources containing information on actions to be taken in a crisis and notify students of the availability of such resources. Additionally, HEIs could provide trainings and simulations for students to experience some emergency events. During crises, HEIs should establish regular communication with weekly newsletters and discussion forums to provide information and ensure students of actions taken. Furthermore, HEIs should continuously make improvements onto the hardware and software used to further reduce the possibility of technical disruptions.

As motivations affects quality of student experience, HEIs need to improve students' morale and motivate students to continue performing their learning activities. As an example, HEIs could make attending lectures and tutorials more interesting by integrating advanced learning technologies to allow interactive and fun learning activities. As most learning activities are conducted online, further emphasis on self-study and own revision should be given to ensure reception of learning materials. In addition, crisis events might apply additional mental pressure on students, hence it is important for HEIs to provide counselling services for students to express their concerns. In turn, this would help in improving students' mental health, which could improve students' motivation. The authors also acknowledge a deficiency in the research. Given that nearly two years have elapsed since the pandemic, students' recollection of their experiences during that period has naturally waned, thus limiting the study's capacity to capture their immediate reactions to the crisis management plan. Nevertheless, the study does give us some direction on how a crisis management plan in HEIs should be implemented to uphold the academic quality.

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Challenges and Needs for Primary Rural Schools to Develop Computing Science Teaching in Thailand

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Abstract
The teaching of computing science in a rural area is challenged by various limited resources and supports. This study aims to explore challenges and needs in computing science teaching in primary rural school, Thailand. Qualitative data were collected through interviews with six participants who teach computing science in a primary rural district. The findings show that there are teachers from diverse backgrounds, including education, social sciences, science, and computer. They teach computing science based on their own experiences using different approaches in classes. Most teachers suggest the requirement for training to gain more teaching experience, especially those who background not in the computer field. Furthermore, more learning tools should be provided in this area, as only a few schools have accessed to standard learning equipment. Activities such as games and active constructions are integrated into their classes to promote an understanding of computational thinking among students. However, teachers required intense supervision from the regional education office to ensure effective implementation and improvement.

Keywords: Teaching, Computing Science, Primary School

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Introduction

The Institute for the Promotion of Teaching Science and Technology in collaboration with the Ministry of Education (MOE) has improved learning standards and indicators for science learning subjects in the core curriculum (revised edition 2018) and added technology content which includes Technology and Computing Science (CS) for schools to provide basic education that is consistent with economic and social changes according to the government's national development policy. The basic education curriculum in Thailand is a 12-year core curriculum including a 9-year compulsory curriculum. Core content and indicators of CS for each grade level were provided to help develop students to have knowledge, understanding and skills in logical thinking, analytical thinking, and problem solving were recognized as a key stimulus in the development of a country's human resources. To drive the implementation of CS in the classroom, the first academic semester started from 2017 to this date the CS is in science and technology content (IPST & MOE, 2018).

In the context of primary rural school districts, Ratchaburi, Thailand, primary teachers encounter specific obstacles, notably a substantial presence of students from low socioeconomic backgrounds inhabiting small, often isolated communities. Moreover, resource allocation is limited. There are more than 200 primary schools across Ratchaburi Province, and they are unique depending on each educational area. In rural schools, it's common to find smaller class sizes and multi-grade classrooms. Teacher is a key driver of the rural area's development. A comprehensive understanding of the strengths, challenges, and opportunities associated with primary education in rural areas is significant for policy decisions and interventions aimed at improving educational outcomes for rural students to drive Thailand into a digital economy and a tech-rich society (OECD, 2019). The research designed as a case study in which schools are in a context of high marginality and diversity. The study aims to explore teachers' challenges and needs in teaching computing science in primary schools near the western border of Ratchaburi, Thailand.

Methodology

A Qualitative method was used as the main objective of the study was to explore the challenges teachers faced in teaching computing science and what could be done to improve this situation. It was considered important to reflect and interpret the reality to reach the understanding of teaching computing science in rural primary school districts. Six participants were asked about teaching computing science they were currently doing and their background and the following questions: 1) "What challenges, if any, have you encountered teaching computing Science"; 2) "What suggestions do you think work well for helping students understand computing Science?" The length of each interview ranged from one to two hours. Since each participant works as a teacher from a different school in a primary school near the western border of Ratchaburi, Thailand, the location of the interview varied. The recording of the data was done through Zoom VDO recording, face-to-face interviews, and taking notes, always with the consent of the participants of this study, their rights not to participate, and the commitment to protect confidentiality and anonymity. The analysis of results was carried out via content analysis to determine the challenges and needs of primary school teachers.

No.	Name	Gender	Teaching Experience in CS (years)	Background	No. of Students in CS class	Class level Responsibility (k)
1	A	F	0.5-1	Science	~75	1-3
2	B	F	2-2.5	Business	~90	1-3
3	C	F	2-3	Computer	~200	1-6
4	D	M	4-5	Computer	~150	4-6
5	E	M	5-6	Computer	~300	1-6
6	F	F	6-6.5	Biology	~100	1-6

Table 1: Characteristics of Study Participants

Findings

The General Data of Participants

Three males and four females were interviewed. Most participants have a 1-5 years difference in teaching experience computing science of primary school. Participants 's backgrounds are in computer, followed by science and business. In terms of class size, most of them teach computing science in medium-large classes from the k1-6 class level.

Participant Experiences in Computing Science Teaching

The challenges identified by the participants refer to student, teacher, and resource. Below are some quotes as evidence of such experiences.

Student Challenges

Large number of students in the class:

> "… due to the large number of students. If you have enough teaching materials, you can manage it - there is not enough for unplugged media, leading to competition among students. Sometimes we evaluate students in pairs and don't know who they are. For younger students, we prepare more. As for the plug-game materials for 24 students, I allocate materials initially and then rotate them around …" (C, 3 Y, Computer).

Different levels of basic knowledge:

> "… content for prathom 1 should focus on systematic practices like brushing teeth and washing clothes. Reading is still difficult for many, and some children begin to tell the process in the middle of washing. When asked how they wash, some simply respond by using just water not adding detergent. For dental hygiene, they tend to forget about to gargle with water after brushing their tongues …" (A, 1 Y, Science Teaching).

> "… When playing games there's been confusion when a picture of a mouse appears. as some children incorrectly identify it as a keyboard. Additionally, the screen and computer still have incorrect answers ..." (A, 1 Y, Science Teaching).

Multi-grade classroom:

> "… in terms of reading and language comprehension, it's essential to make sure everyone's on the same page and understands each other well …." (B, 2Y, Business).

> " … most of our students belong to the Karen ethnic group, accounting for about 90% of the total. Teaching Prathom 6 tends to focus on basic and easy, not detailed …" (C, 3 Y, Computer).

Teacher Challenges

Less confident in subject knowledge:

> "… my favorite learning media includes coding and building with Lego. There is a lot of equipment, some of which is necessary, and I'd like to try out and incorporate it. What do I want to develop further? As a beginner, I'm unsure about what's right or wrong, so I rely on those with expertise in the field …" (A, 1 Y, Science Teaching).

Self-doubt in using the program:

> "… I like keeping it simple with fewer gadgets, like non-computer devices such as cards. These items tend to only be used once a year, which means a lot of preparation time for minimal usage. Instead, it would be better to have stuff I can use all the time, like things that stay useful, or computer programs would be more practical ..." (E, 5 Y, Computer).

Resource Challenges

Technical problems in school:

> "… at present, students come to study in the science room. The science room does not have any technological equipment except the teacher's notebook …" (F, 6Y, Science and Technology).

> "… right now, we're facing a situation where three students are sharing one computer, or they're taking turns using the same machine. This makes it difficult for them to get practice …" (D, 4Y, Computer).

According to the previous challenges, the needs identified by the participants refer to student, teacher, and resource, respectively as in Table 2. Some quotes are described as follows:

Student Needs

Effective classroom management:

> "… students do not yet possess sequential thinking in computational science. It's essential to focus on teaching how to think systematically, and the technology foundational skills for them to build on …" (A, 1 Y, Science Teaching).

> "… printing pictures and playing games with Post-it notes works well, especially for dealing with English consonants. Sometimes, certain letters don't quite fit. I've found that playing a game each evening, where kids take turns answering questions, is effective. Additionally, using identical plates to teach the ABCs has been a hit too …" (A, 1 Y, Science Teaching).

Teacher Needs

Reflect on performance, set personal goals & explore new techniques:

> "… I'm eager to develop my proficiency in teaching Scratch and Python programming …" (B, 2Y, Business).

> "… it would be great to receive a certificate of honor for attending training as recognition of self-improvement …" (A, 1 Y, Science Teaching).

Resource Needs

Onsite and online training:

> "… I normally travel to training workshops using my car. If there are students along, they should be notified in advance so that the school can allocate a budget in case…" (A, 1 Y, Science Teaching).

> "… when organizing training, it's important to consider the level of teaching, the specific aspects to cover, and the equipment used ..." (A, 1 Y, Science Teaching).

> "… if it's a program teaching course, I want it to be on-site because training is all about practice. If it's online, sometimes we have questions. But the speaker is still not convenient to answer us. Like step 1, if you don't get the next step, you can't do it. So, we thought about what on-site was the most answerable. If training is required on using the program …" (F, 6 Y, Science and Technology).

Point	Challenges	Needs
Student	Large number	Effective classroom management
	Different levels of basic knowledge	
	Multi-grad classroom	
Teacher	Less confident in subject knowledge	Set personal goals & explore new techniques
		Reflect on performance
	Self-doubt in using the program	Onsite and online training
Resource	Technical problems in school	Future curriculum development
		Improving class hour

Table 2: Challenges and Needs

The findings indicate major challenges related to students, teachers, and material resources. In terms of students point, they have different basic knowledge and multi-grade students in the same class. Teachers want to have more time to understand core content, and strategies for their students to achieve learning outcomes of this subject and how to manage classroom

effectively. As to the point of teacher, they have less confidence in subject knowledge and self-doubt in using the program in teaching. Exploring new techniques, reflecting on performance, and training can be the direction for teachers to get more confident in their teaching. As for resources, some technical problems in local schools are the barriers to teaching computing science. This study illustrates the challenges faced by teachers in primary rural schools. There are previous studies that can give guidelines to build an environment for primary and secondary school students in the class and to embed computational thinking skill, logical thinking, and problem-solving skill (Surakiart Y. & Surachai S., 2020; Siririat W. & Wichai S., 2021), however, there is an obvious struggle in practice and continuous improvement in the condition of the rural area. The findings of this study can provide some useful implications. The management is demanding the training and necessary material and human resources that could allow the optimal operation of the school and overcome these challenges of schools are the teachers' initiative, the person in charge, and the teamwork with community authorities and stakeholders (Cristóbal C., Rubí S. & Edith C., 2019).

Conclusion

The exploration of challenges and needs can point out school issues in three levels: student, teacher, and resource in current situations and context conditions that schoolteachers need to be accompanied by necessary resources and the effectiveness in programs implementation derived from educational policies, linked to educational reforms.

Acknowledgments

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Errors in L2-Chinese Orthography for L1-Japanese and L1-Korean Learners: A Corpus Study

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Abstract
Both Korea and Japan are countries within the Sinosphere. Nowadays, the use of sinograms in Korean has become increasingly rare, while they are still retained in Japanese. While previous studies have investigated L2-Chinese character errors separately for L1-Japanese and L1-Korean students at different levels of L2-Chinese proficiency, a direct comparison is needed to find out L1-specific differences given their differential preference in the use of sinograms. This study focuses on L1-Japanese and L1-Korean students at the intermediate level of Chinese language proficiency, which is considered the stage where the writing ability of international students is relatively stable. Individual Chinese characters were randomly selected and grouped into pre-established frequency bands A and B, with 60 characters in each band. Sentences containing target characters were extracted from Chinese continuous interlanguage corpus. Errors were classified into two types: orthographic errors (writing the wrong character), and substitution errors (writing a different character than intended). A total of 5007 sentences were analyzed. Results show that L1-Japanese learners tend to make more substitution errors for low-frequency words, indicating a potential influence of confusability from their larger inventory of sinograms.

Keywords: Chinese Orthography, Word Frequency, L2 Acquisition, Cross-Linguistic Comparison

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Introduction

Chinese characters are symbols used to record and write the Chinese language, and are the oldest writing system still in use today. In history, Chinese characters were the only international communication system in East Asia, and were even the official written language of countries like Japan, Korea until the 20th century. Japan has established the "List of Commonly Used Chinese Characters," while Korea has established the "Basic Chinese Characters for Education." Today, we can still see the influence of Chinese characters in the written language and daily life of Japan and Korea.

Chinese characters are known as kanji in Japan and hanja in Korea. In Japan, instruction of 996 kanji begins in the 1st grade of elementary school and is officially completed by the end of the 6th grade. Another 949 characters are covered in grades 7-9, and collectively, these 1945 characters are labelled jooyoo kanji. In Korea, formal hanja instruction begins in the 7th grade and continues through the subsequent five years of secondary schooling. According to the Korean Ministry of Education, 900 characters are taught in middle school, and another 900 in high school (Brown, 1990).

Chinese Character Acquisition in Korean and Japanese

Because of this connection between Chinese and Korean/Japanese writing systems, it has been proposed that Chinese characters are easily learned by Korean/Japanese speakers by means of positive transfer. For example, China and Japan share some Chinese characters with identical shapes that have remained unchanged since their inclusion in the Japanese language system, despite changes in pronunciation and meaning. Second, while most Chinese characters used in Japan have undergone changes in pronunciation, some still have similar or nearly identical pronunciations to their Chinese counterparts. The only difference is whether they are pronounced with tones or not. Third, most characters shared by China and Japan have consistent meanings without any obvious difference (Hu, 2012).

However, literature has identified potential difficulties by Japanese/Korean speaker despite this connection. For example, a recent study by Liu (2020) compared Japanese and Korean students studying abroad, and found that both Japanese and Korean students made a large number of common or similar mistakes. Stroke deformation, stroke spatial position, and stroke deficiency are among the most common errors made by both groups of students.

At the same time, some potential group differences have been found as well. For example, it has been identified that Korean students make more stroke deformation and homophonic wrong characters than Japanese students. Liu (2020) further stated that the Chinese proficiency of Japanese students studying abroad seems to be higher than that of Korean students on 2 bases: first, the proportion of Japanese students who obtain Chinese language certificates is higher than that of Korean students; second, the average scores of Japanese students in HSK essays were higher than Korean students. This provided anecdotal evidence that Chinese character learning may be easier for Japanese students than Korean students.

One possible reason for the apparent higher difficulty of Chinese orthography acquisition by Korean speakers may be the increasingly rare usage of hanja in Korea. After the Korean language was reformed in the 1940s and 1950s, the use of Hanja was gradually reduced, and today, it is not commonly used in everyday communication. While Hanja is still taught in

schools as a part of Korean language education, its usage is limited to academic, legal, and historical contexts.

Despite empirical evidence, some scholars have maintained that learning characters may be simpler in Korea than in Japan on the basis of linguistic comparison. In Korea, characters have only one pronunciation, i.e. single syllable approximations to the original Chinese. On the other hand, in Japan, 60 percent of the jooyoo kanji have both 'Chinese' as well as native Japanese pronunciations, often several of each. Moreover, the Korean system is less complicated than the Japanese system, with Korean hanja only used to write nouns of Chinese or Sino-Korean origin (Brown, 1990). Given this divergence in predictions, more evidence is needed to establish the relative difficulty of Chinese character acquisition in Korean and Japanese speakers. This will be one of the aims of the current study.

Finally, Liu (2020) also investigated character errors made by students of different L2 proficiencies. It was found that the number of different types of errors decreases significantly as students' Chinese proficiency level increases. This gives some insight into the individual differences underlying Chinese character acquisition (i.e. target L2 proficiency being a factor). Since L2 proficiency may be an index of how familiar the learners are with Chinese characters, the current study investigates whether another proxy of familiarity – frequency of target character – may also be predictive of Chinese character acquisition in Japanese and Korean speakers. This is the second aim of the current study.

We conclude by explicitly stating our two research questions: (1) Are there differential character error rates of Chinese characters by L1-Korean and L1-Japanese speakers? (2) Are any differences further modulated by word frequency of the characters?

Methods

Chinese characters were selected and categorized into pre-established frequency bands A to B in descending order of word frequency (Ministry of Education, 2010), resulting in a total of 60 characters in each band. Example characters for each Band are listed in Table 1 below.

Band A	Band B
百 [hundred]	伴 [companion]
饱 [full]	辈 [generation]
比 [compare]	波 [wave]
布 [cloth]	灿 [bright]
草 [grass]	潮 [tide]

Table 1: Example Chinese characters from each frequency band

Learner data was extracted from the Chinese Continuous Interlanguage Corpus, which contains written data by foreign learners of Chinese in more than 110 different countries and regions that total more than 5 million words.

Sentences containing the target characters written by L1-Japanese and L1-Korean learners were analyzed. Data was filtered so that learners were at the intermediate level of Chinese language proficiency (equiv. HSK Level 4-5), which is considered the stage where the writing ability of international students is relatively stable (Zhu, 2021). This yielded a total of 5007 target sentences. Character errors were classified into two types: orthographic errors (writing a

character wrong), and substitution errors (writing a different character than intended). For each error type, accuracy was binary-coded (1 for correct, 0 for incorrect).

Results and Discussion

Figure 1 shows the results for orthographic errors. General observations reveal a global higher rate of error for low-frequency words than high-frequency words.

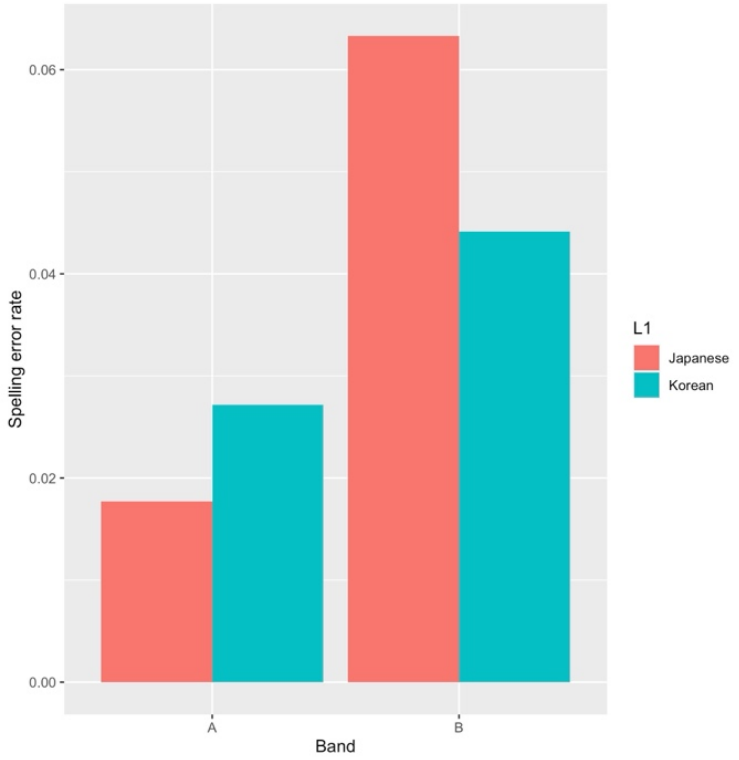


Figure 1: Proportion of orthographic errors by L1-Japanese and L1-Korean learners

A 2 (L1: Korean vs. Japanese) x 2 (Band: A vs. B) independent-measures ANOVA was performed on the orthographic error rate. We found a significant main effect of Band ($F(1,5003)=8.49$, $p=0.004$), confirming that both L1 groups exhibit higher error rates for low-frequency words than high-frequency words. This is expected because less exposure to target characters elicited more errors in general for both groups. However, neither the main effect of L1 nor the interaction between L1 and Frequency band reached significance, indicating no statistical evidence that Japanese and Korean speakers differed in terms of orthographic errors, or any further modulating effect of character frequency.

Figure 2 shows the results for substitution errors. General observations again reveal a global higher rate of error for low-frequency words than high-frequency words, and may also suggest a potential differential influence where Japanese speakers are disproportionately affected by low-frequency characters than Korean speakers.

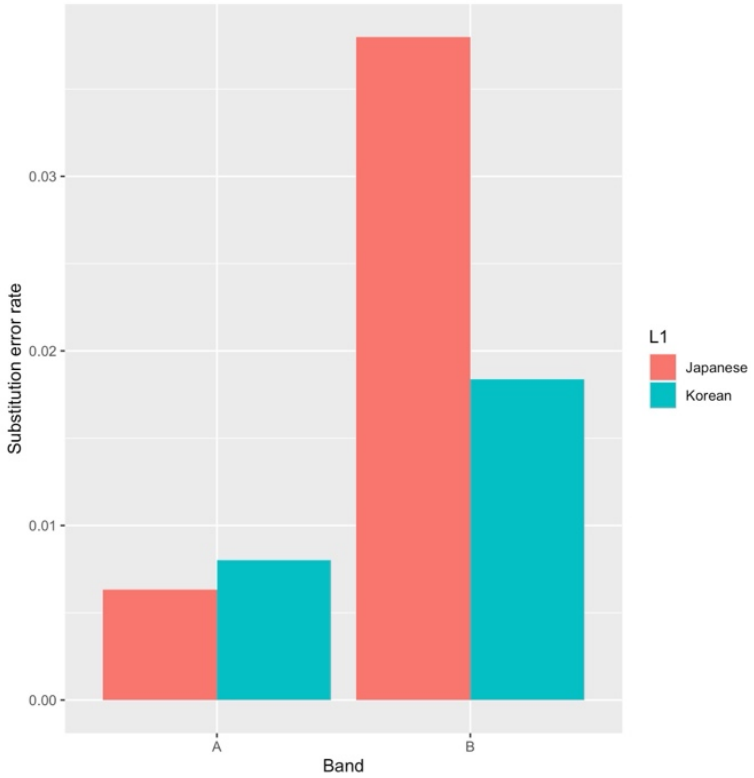


Figure 2: Proportion of substitution errors by L1-Japanese and L1-Korean learners

A 2 (L1: Korean vs. Japanese) x 2 (Band: A vs. B) independent-measures ANOVA was performed on the substitution error rate which partially confirmed the observations. We found a significant main effect of Band ($F(1,5003)=6.68$, $p=0.010$), confirming that both L1 groups exhibit higher substitution error rates for low-frequency words than high-frequency words. Crucially, the interaction between L1 and Band was marginally significant ($F1,5003)=2.92$, $p=0.088$). Combined with the numerical trend of interaction for orthographic errors (albeit not reaching even marginal significance), this may provide some initial evidence that L1-Japanese learners indeed tend to make more substitution errors for low-frequency words than Korean speakers.

Conclusion

The current results have provided initial evidence of differential difficulty experienced by L1-Japanese and L1-Korean speakers in writing Chinese characters, a difficulty which is modulated by character frequency. In particular, Japanese speakers seem to be especially affected by low-frequency characters, exhibiting a disproportionately higher error rate than Korean speakers. This may indicate a potential influence from the larger inventory of sinograms in Japanese. Namely, the more frequent use of sinograms played a negative role for Japanese speakers. Thus, due to negative transfer of similarly-written L1 and L2, L1-Japanese learners may have shown higher error rate because of easily confusable sinograms between Chinese and Japanese (example: 広 vs 广, both meaning spacious).

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Research on the Effectiveness of Reflective Practice Applied to College Students'Service Learning: Taking Advertising Design Courses as an Example

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Abstract
Students' service learning process will be integrated into reflective practice teaching, integrating flipped teaching, experiential learning and workplace experience of social service. Use individual and team reflection training to form a review mechanism of large and small circles. The superposition of each other's experiences forms the basis for new experiences, and repeated accumulation builds the habit of reflection, allowing students to take the lead in answering questions and answers. At each learning stage, students can observe and reflect on their own learning gaps through specific workplace experiences. Teacher support or dialogue with industry experts will form an understanding of the social workplace, and then the application and verification of the design work will be carried out in the next stage. This study is a service learning activity planned in the advertising design course. It uses the teaching operation of reflective practice to test the learning effectiveness of students' creativity, execution and reflection on new products in the three stages of creative ideation, design execution and self-evaluation. . The research results show that circular reflection has an impact on students' creative thinking and self-evaluation, but has no significant impact on execution effectiveness.

Keywords: College Students, Service Learning, Reflective Practice, Design Education

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Introduction

General education in college leads to the exploration of majors. The academic system in Taiwan is different from that in the West. Most design education begins with entering a four-year college. Students are limited by course hours and low graduation credits. In recent years, there has been a trend of weakening professional skills, resulting in a decrease in students' quality and professional training. More importantly, they lack the attitude and strength to be in line with the workplace.

There is a gap in functional learning and application, and there is a lack of practical design capabilities. The goal of the commercial design course is to cultivate talents that are in demand in the workplace and to be able to face the competition in the workplace with close to practical experience. However, students learn specific majors and skills but do not know how to apply them in practice. There is a lack of integration in the workplace and they will spend more time exploring career options. The learning-application gap in higher education in Taiwan is the most important issue.

Students' independent learning and teamwork abilities decline. Currently, college students are experiencing high school life through the Covid-19 epidemic and studying remotely. Distance learning results in the lack of real communication among peers, the loss of physical cooperation and insufficient interactive communication in learning, and the loss of the positive significance and influence of peer learning.

Research Purpose

Traditional design teaching is based on competitive learning that evaluates students' classroom performance, while Project Based Learning (PBL) experiential learning is based on the achievement of common goals and the effectiveness of action implementation. Allow students to fully express their opinions, concepts and ideas, while listening and thinking about other people's opinions, and then integrating them into new ideas.

Concept: The design course combines reflective practice, emphasizing the exploration and self-practice of experiential learning, allowing learners to move from abstract thinking to concrete execution through the execution of project design. Students constantly challenge, criticize, evaluate and revise themselves during the execution process. There are three stages of the reflection cycle in design activities, including thinking, reflection and execution. It can train students to find better methods in tasks, change the way they look at themselves, and understand the content and goals of work.

Execution: Students form a supportive task team and go through three spiral cycles. Students can lead meaningful action plans, stimulate discussions, reflect on mistakes, revise designs, and build team cohesion and a sense of belonging.

Literature Review

College Service Learning

Education in Taiwan is compulsory education for twelve years. Functional development begins with college education. Due to lack of practical experience, students are unable to understand the practical significance behind learning. Therefore, students use service learning to obtain

practical work in simulation design services. In addition to changing "teaching and learning", students can also better understand the professional and practical experience in the workplace.

This course combines service learning and reflective practice operations to acquire functional-related experience and skills, improve students' learning motivation and exploration ability, and guide students to achieve in-depth learning. Students not only acquire core skills needed in the future, but also develop the influence of independent learning and thinking (Huang, Malicky, & Lord, 2006). The focus is on the project execution process, where students can challenge themselves, continue exploration, target tasks, communication and cooperation, reflection and correction, and peer criticism as standards for verification. Students can verify their learning performance and improve their sense of academic achievement.

Reflective Practice

Schön (1983) proposed the concept of "reflective practice", defined the relationship between reflection and action, and explained how to use reflection to improve professional capabilities. He proposed two different types of reflection: "Reflection-in-action" and "Reflection-on-action". Reflection-in-action refers to the act of reflection in action, by constantly reviewing one's own status and performance, correcting behavior in real time, and learning how to achieve goals and solve problems. Reflection-on-action refers to the reflection behavior after action, by reconstructing past experiences, reflecting on the performance of past actions, formulating plans for the parts that need improvement, and improving the entire learning process. Scholars Boud et al., (1985) embedded "personal emotions and feelings" into the three-step reflection model, which are **Returning to the experience**: Reconstructing important events that occurred; **Attending to feelings** : Pay attention to the emotions and feelings of the participants, check whether the emotions are positive or negative, and avoid ignoring the events and key reasons that cause negative emotions; **Evaluating the experience:** Re-examine the problems and events that have been understood, and integrate new ones learning experience.

Reflective Practice Applied to Design Education

Reflective practice is an active and dynamic process that requires repeated practice and internalization to become a part of learning behavior. Reflective students will be more capable and effective in external dialogue and self-communication (Tennyson, 2008). Reflective practice operations are simple and easy, but they need to be done deliberately, thereby forming a habit of thinking, or improving experience and implementation problems. The key is for students to grasp the key points, question content, feedback skills, behavior modification, promotion of cooperative learning, etc. Connecting one experience to another ensures students can perform better at the next level.

In order to get rid of the limitations of classroom teaching, advertising design is based on the "action-reflection" teaching model. Revised Gibbs (1988) proposed the famous reflective cycle theory as a continuous improvement cycle of repeated experiences, including six stages of description, feeling, inspection, analysis, conclusion and action plan. Reflective training on a team basis forms a review mechanism of large and small circles (Figure 1). The superposition of each other's experiences forms the basis for new experiences, and repeated accumulation builds the habit of reflection, allowing students to take the lead in answering questions and answers. At each learning stage, students can observe and reflect on their own learning gaps through specific workplace experiences. Teachers and industry experts provide support to form

an understanding of the social workplace, and then implement the application and verification of design work in the next stage.

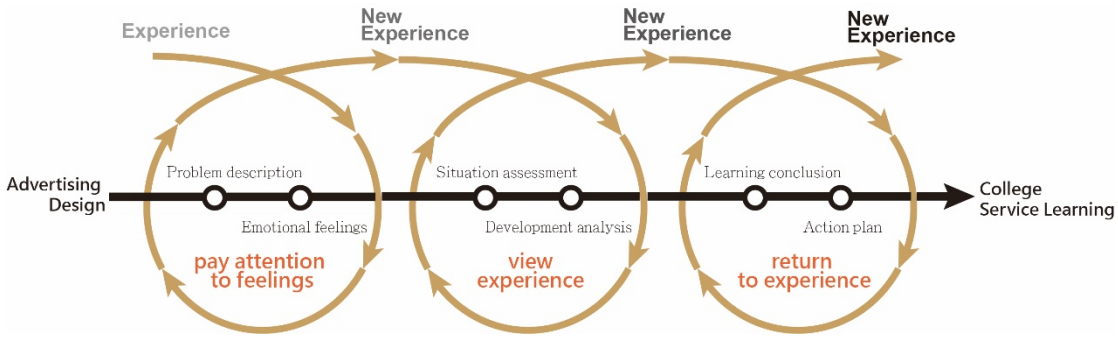


Figure 1. Reflective cycle training for college service learning

The effectiveness survey of reflective practice uses a scale survey, and its items include reflection-in-action, reflection-on-action, reflection with others, self-evaluation, desire to improve, general confidence, communication confidence, uncertainty, pressure, interaction with students, and learning satisfaction.

Cooperative Learning

Cooperative learning is a creative and effective teaching theory and strategy that can improve the atmosphere in the classroom, improve students' academic performance, and promote students to achieve good results. Cooperative learning is also a systematic learning strategy. Six students with different abilities form a group to engage in learning activities in a cooperative manner to jointly complete the team learning goals and improve the team learning level. Cooperative learning starts from the perspective of motivation, emphasizing the incentive effect of cooperative learning on students to engage in tasks. From the perspective of cognition, it emphasizes the impact of cooperative learning on the effect of completing tasks. Students experience collaborative abilities, engagement, collaboration skills and interaction in service-learning tasks.

Educational Practice

The implementation of teaching activities is evaluated through students' participation in the activities to confirm whether they are effective. Students can understand the implementation goals or make students more confident, and evaluate the integration of theory and practice. The questionnaire survey is the Educational Practices Questionnaire (EPQ) developed by Jeffries & Rizzolo (2006), and was later verified by Unver and other scholars for reliability and validity (Unver et al., 2017). This plan will revise the questionnaire to design teaching practice content, including active learning (discussion of ideas, active discussion, timely feedback of opinions and satisfaction of learning time), collaborative learning, and diverse learning methods (the use of different learning methods, evaluation), high expectations (understandable and attainable goals).

Learning Engagement

Traditional studies on learning engagement mostly focus on behavioral aspects (such as classroom speeches, good scores), but pay less attention to the intrinsic motivation of learning. Research on action learning focuses on students' practical learning processes and experiences, so surveys of learning participation will focus on students' recognition of classroom teaching. Learning engagement refers to students' level of effort and quality of involvement when performing learning activities. Participation is closely related to students' enthusiasm for learning, learning knowledge and time investment, and will also be greatly affected by classroom participation and interactive communication. The learning participation questionnaire includes "classroom teaching" which refers to students' classroom discussions, peer knowledge sharing, and willingness to collaborate in classroom operations; "online activities" refers to online learning attitudes and participation, including the ability to actively offer assistance, actively share or participate, etc.; "action implementation" means actively participating in the offline implementation process, assisting others.

Methods

Research Design

The research subjects are 69 third-year students in the advertising design course. They have similar learning experiences and are at the stage of career exploration. The client of the service learning is a technology start-up team that specializes in developing motorcycle safety lights to avoid traffic accidents. The student execution goal is to propose marketing plans and advertising designs based on product needs.

Service learning in design courses can make students more familiar with professional content in the future workplace, and communication and interaction among peers will be better. The process of student service learning will consider the improvement and implementation effects of learning methods. Entering the design implementation stage, there is significant learning participation and experience. The research is based on the grouping of cooperative learning teams, which undergoes design execution, communication and review, reflection and feedback, and then the next round of team grouping, and so on, as shown in Figure 2, through three processes of creative thinking, reflection and evaluation, and design execution. A scale survey on cooperative learning, educational practice and learning engagement was conducted after reflection.

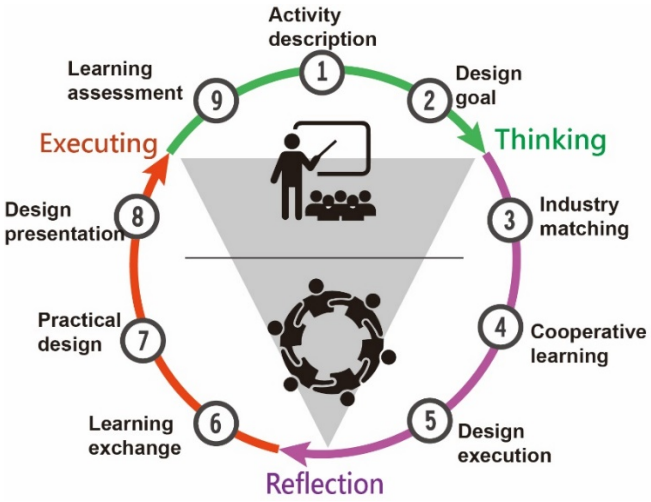


Figure 2. Activity flow of the reflection cycle

Research Method

Students form new cognitive concepts through practical experience and reflective observation in classroom reviews, which are then applied and verified in the next stage of practical design. The reflective observation of service learning will take nine steps (same as Figure 2), including activity description, design goal, service matching, cooperative learning, design execution, learning exchange, practical design, design presentation, and learning assessment, forming an infinite cycle process. Phased task execution incorporates feedback from reflective practice to achieve the application of new learning experiences. The research method is to use the computer software SPSS for data analysis, narrative statistics and t-test and variation analysis in inferential statistics. The scale adopts a Likert-type five-point scale.

The service learning process will go through three reflection cycles, and three scores will be obtained in sequence: creative thinking (**Thinking**), reflection and evaluation (**Reflection**), and design execution (**Execution**). The four-item learning scale was tested after the service was completed. The differences in the performance of the four learning assessments of "Cooperative Learning", "Educational Practice", "Learning Participation" and "Reflective Practice" will be analyzed using internal consistency and related analysis as item identification and homogeneity. Factor analysis uses principal component analysis to extract factors, and questions with factor loadings less than .45 are deleted. In terms of reliability analysis, the reliability of each level must be above 0.7. One-way analysis of variance tests whether there are differences in the scores of the data. Product-difference correlation explores the correlation between aspects to understand the linear relationship between variables.

Data Analysis

First of all, the four-item learning evaluation questionnaire scale in the study is based on the results of reliability analysis. The Cronbach Alpha value of the cooperative learning scale is between .949-.954, and the reliability coefficient is .953; the educational practice scale is between. Between 940-.945, the reliability coefficient is .946; the learning participation scale is between .954-.959, the total reliability coefficient is .958; the reflective practice scale is between .909-.919, The overall reliability coefficient is .914. All four learning scales have high reliability, indicating that the internal consistency of the scale questionnaire is extremely high.

Table 1. Single sample K-S fitness test

		Creativity	Reflection	Execution	Cooperative learning	Educational practice	Learning engagement	Reflective practice
N		69	69	69	69	69	69	69
Normal parameter	Mean	85.579	87.333	87.637	4.146	4.213	4.032	3.993
	Std. Deviation	3.923	2.553	3.959	.569	.538	.635	.397
Most extreme difference	Absolute	.170	.264	.174	.078	.081	.085	.064
	Postive	.153	.264	.174	.067	.072	.064	.054
	Negative	-.170	-.180	-.120	-.078	-.081	-.085	-.064
K-S Z value		.170	.264	.174	.264	.081	.085	.064
Asymp. Sig.		.000	.000	.000	.200	.200	.200	.200
Result		Abnormal	Abnormal	Abnormal	Normal	Normal	Normal	Normal

The three-stage scores of the students' reflection cycle and the four learning assessments after service learning are tested by K-S fitness test (Table 1). Among them, the significant values of the three scores are all .000, which is less than the significance level of .05, indicating that are assigned abnormally. The significant values of the four learning scales are all .200, which is

more than the significance level of .05, indicating that the four assessments are all normally distributed.

Table 2a. Descriptive Statistics of three stage scores

Three-stages	N	Mean	Std. Deviation	Mix	Max
Creativity	69	85.579	3.923	79.00	93.00
Reflection	69	87.333	2.553	85.00	94.00
Execution	69	87.637	3.959	80.00	95.00

Table 2b. Wilcoxon sign rank test of students' scores in three-stages

	Creativity - Reflection	Creativity - Execution	Reflection - Execution
Z	-3.202	-2.634	-.079
sig	.001	.008	.937

According to the Z statistic (positive level) of the Wilcoxon Sign Rank test (table 2a, 2b), the observed value of creativity-reflection is -3.202, with a significant value of .001 (<.05); the observed value of creativity-execution is -2.634, with a significant value of .008 (<.05); the observed value of reflection-execution is -.079, and the significant value is .937 (>.05). The results show that there is a significant difference between the creativity score and reflection and execution scores. However, there is no significant difference between reflection and execution. Among them, the Z value is negative, indicating that the performance of the three stages of reflective cycle teaching has improved significantly.

Table 3. One-sample test of learning assessments

items	T	df	Sig.	average difference	95% confidence interval	
					lower	upper
Cooperative learning	16.730	68	.000	1.146	1.009	1.283
Educational practice	18.722	68	.000	1.213	1.083	1.342
Learning engagement	13.488	68	.000	1.032	.879	1.185
Reflective practice	20.780	68	.000	.993	.898	1.088

Table 4. Pearson correlation analysis of learning assessments

Variances	Cooperative learning	Educational practice	Learning engagement
Educational practice	.855 .000		
Learning engagement	.810 .000	.722 .000	
Reflective practice	.643 .000	.636 .000	.637 .000

According to the results of one-sample test in Table 3, students' cooperative learning (t=16.730, P=.000), educational practice (t=18.722, P=.000), learning engagement (t=13.488, P=.000)and reflective practice (t=20.780, P=.000). all four learning assessments reached the significant level (<.05). It means that there are significant differences in the cooperative learning, educational practice, learning engagement, reflective practice of the students. It means that after students have gone through the reflection cycle, there are significant differences in all four learning assessments.

The process of the reflection cycle of service learning is different among the four learning assessments. Students' cooperative learning, educational practice and learning engagement have a significant impact on the effectiveness of reflective practice. Comparing the four learning assessments, there are means of some questions, including learning engagement in online and extracurricular activities, confidence in reflective practice, interaction and learning satisfaction.

According to the Pearson correlation sample test of the four learning assessments (Table 4), all correlation coefficient r values ranged from .636 to .855, and the significant values were all .000 (<.05), reaching the significant level. It means that the student reflection cycle is positively correlated with the four learning assessments and is highly correlated (.6<r<.9).

Table 5. Pearson correlation analysis of sub-variables of reflective practice

	1	2	3	4	5	6	7	8	9
reflection-in-action[1]	1								
reflection-on-action[2]	.666** .000	1							
reflection with others[3]	.673** .000	.674** .000	1						
self-evaluation[4]	.590** .000	.785** .000	.591** .000	1					
desire to improve[5]	.554** .000	.586** .000	.635** .000	.566** .000	1				
general confidence[6]	.329** .006	.455** .000	.340** .004	.494** .000	***.237*** ***.050***	1			
communication confidence[7]	.466** .000	.457** .000	.381** .001	.595** .000	.342** .004	.747** .000	1		
uncertainty[8]	.500** .000	.355** .003	.390** .001	***.207*** ***.089***	.419** .000	***-.076*** ***.533***	***-.017*** ***.887***	1	
stress and interaction[9]	***.129*** ***.292***	***.008*** ***.950***	***-.205*** ***.091***	***-.052*** ***.673***	***-.013*** ***.918***	***-.106*** ***.384***	***-.165*** ***.176***	.430** .000	1
learning satisfaction[10]	.539** .000	.503** .000	.640** .000	.567** .000	.596** .000	.381** .001	.359** .002	.248* .040	***-.181*** ***.136***

** Indicates that the P value is less than the significant level .05

Cooperative learning, educational practice, and learning engagement are highly correlated. Reflective practice also has a medium to high correlation (Table 4). The action scale of reflective practice for service design is to evaluate the thinking, action, evaluation, pressure and satisfaction of the service design process, and contains ten sub-variables. There are reflection-in-action, reflection-on-action, reflection with others, self-evaluation, desire to improve, general confidence, communication confidence, uncertainty, pressure, interaction with students, and learning satisfaction. According to Pearson correlation analysis (Table 5), service pressure and interactive communication have no significant correlation with other variables. Design processing correctness was also not significantly related to students' execution and communication confidence.

Findings

There is no significant interaction between scores of students' reflection cycles and learning assessments. It means that the performance of service learning has no direct impact on the learning effectiveness of the entire design activity, but there is a significant improvement in the three scores, and there is an interactive impact on cooperation, practice, participation and reflective practice.

According to the mean of the questionnaires on cooperative learning, educational practice, learning engagement and reflective practice, students participate less in online activities, are more difficult to discuss or share, and are less likely to be motivated to participate in extracurricular or online activities.

The results of the reflective practice scale showed lack of confidence and interaction, low self-confidence, feeling stressed about communication and communication, and affecting learning satisfaction. Among them, "uncertainty", "general confidence" and "communication confidence" did not reach significance, and showed reverse negative values. It means that when students' "uncertainty" is high, learning actions, problem-solving abilities, self-confidence and improvement abilities are also relatively reduced, which in turn affects "learning satisfaction". It shows that students' hesitance about the design service process, methods, or lack of understanding of peers and service needs all indirectly affect the performance of design execution, as well as academic scores, achievements, and satisfaction.

Therefore, the application of reflective practice focuses on students understanding learning objectives, as well as service design needs. They can make good use of their knowledge and skills to share and provide information more effectively. They can also interact with each other with the necessary experience, and listen to their classmates' thoughts and opinions, thereby enhancing their self-confidence in the collaborative process. This can reduce learning pressure and improve communication effects and learning satisfaction.

Discussion and Conclusion

In the reflective practice process of service learning, students constantly re-evaluate their experiences, learn lessons and improve them as a basis for the next experience. That is, students develop a work attitude that can connect to the workplace by discovering mistakes and reviewing and evaluating better ways to perform tasks. Such training can help students improve their self-reflective abilities in response to problems that students lack practical experience but are not good at thinking about. The role of teachers is relegated to the role of learning supporter, challenging students to think about workplace coping, professional needs, lack of customer communication and implementation, etc., things that cannot be experienced in classroom teaching, and becoming a supporter of students' independent learning.

Students improve their understanding through their own in-depth thinking. Peers provide challenging problems to stimulate students' existing concepts and thoughts and stimulate new solutions. Reflective practical operations also provide students with a learning experience of "trust" and "communication", and achieve mutual support and learning and growth through peer sharing and feedback. Students also gain different experiences from the process of expressing communication and listening to other people's opinions.

In addition, through the course's reflective practice training, students and teachers can not only reflect on the performance in project design, but also exchange opinions and see the diversity and personality of students. Students can conduct learning and communication in the way they like, and decide reflective expressions or tools to support the reflective process, which is in line with students' tendency to think independently. This kind of experiential learning is transformed from a teacher-led classroom to a situation where students independently seek answers and verify results, solving the problem of students' learning-application gap and enthusiasm for learning.

Implications

Advertising design is different from knowledge-based courses. In addition to changing classroom teaching operations, it must also play a role in workplace classrooms. Combining "service learning" and "reflective practice", the traditional design learning process is reversed, and the teacher's role in the course is changed from a leader to a counselor or supporter. Critical reflection has excellent feedback effects when applied to design teaching. Students take the lead in learning goals and progress, providing workplace experience that cannot be learned in college courses. The learning process undergoes multiple cycles of reflection to master the modification of learning tasks and achieve design education goals. However, the depth of reflective practice requires practice, especially in the learning stage. If students can internalize reflection as a learning habit, they will be able to deal with workplace pressure and setbacks more effectively, and they will be able to accept criticism, challenges and suggestions more calmly.

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Development of Massive Open Online Course for Sports Tourism Course of Undergraduate Students in Physical Education Program

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Abstract
The current study aimed at 1) developing the Massive Open Online Course (MOOC) for sports tourism course provided to undergraduate students in Physical Education program, and 2) investigating learning outcomes of the undergraduate students in Physical Education program after learning with MOOC for sports tourism course. The samples consisted of 30 undergraduates studying in Physical Education program at the faculty of Education, Phuket Rajabhat University. They were studying in an academic year 2023 and enrolling in the online sport tourism course provided on the MOOC. The research instruments comprised of the MOOC for sports tourism course for undergraduate students in Physical Education program and a learning achievement test of sports tourism course for undergraduate students in Physical Education program. The data were analyzed using mean ($\bar{x}$), standard deviation (S.D), and t-test at .05 level. The results have revealed that the MOOC for sports tourism course provided to the undergraduate students in Physical Education program was appropriate to use at the highest level and 2) the average score of students' learning achievement after studying with the MOOC was significantly higher at the value of .05 level.

Keywords: Massive Open Online Course, Sports Tourism, Physical Education Program

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Introduction

A massive open online course (MOOC) is an evolved version of distance and online education, both of which have been around in various forms for decades. Correspondence education dates back as far as the late nineteenth century, while computers and the Internet have been used in education since their earliest stages. As early as 1972, Athabasca University in Alberta, Canada was delivering distance education using print, television, and eventually online content to teach courses to national and international students. MOOCs promote independent learning by exploring a variety of learning possibilities in the digitally connected world. They enable access to a collective space where knowledge is constructed in a participatory, interactive, contextualized, and creative framework, made possible by free-of-charge, web-based, open-access online courses (Kady & Vadeboncoeur, 2022).

The continuous demand of the 21st-century learners opens the door for Massive Open Online Course in different universities abroad. The University of Melbourne's Graduate School of Education (MGSE) has launched a MOOC on how to give school children the skills to survive in a world of ever-changing technology. In Dublin, the Minister and Education and Skills launched a new Massive Open Online Course called "21st Century Learning Design" which will be used by teachers across the globe to help support the objective of bringing more technological skills into the classroom. It became one of the newest ideas of education designed for extended learning and career development. MOOC is an interactive step-by-step course aimed at reaching an unlimited number of participants worldwide to create a community of lifelong learners. It allows people from different regions to access and study courses at their preferred universities (Angeles, Creus, & Antonio, 2016). It is also a means of empowering the learning community and exchanging culture because the learners are capable of interacting with other people using different platforms like edX, moodle, course sites by blackboard, udemy, versal and etc.

For this research, the researcher has opted to utilize moodle for developing the MOOC for sports tourism course provided to undergraduate students in Physical Education program to consider with details as follows:



Figure 1: MOOC PKRU

In 2023, global economic slowdown, high product prices, increasing interest rates, and the tendency of robust performance of the baht are all risk factors for both global and Thai economy. Meanwhile, the Thai economy relies heavily on tourism and foreign investment. There is an estimation that the Thai economy this year will grow slightly higher than that of last year. Thailand Development Research Institute (TDRI) had estimated that the Thai

economy in the past years may have expanded by 3.2%, whereas this year it is projected to grow by 3.5%, slightly higher than last year. The main factor is the highly like recovery of tourism. Last year there were about 11 million tourists, while this year, when combined with Chinese tourists, it could reach 25 million. Therefore, the tourism revenue will definitely increase, which will propel the growth of the Thai economy (Phuket Provincial Office, 2023; The Stock Exchange of Thailand, 2023).

Regarding the intensive promotion and stimulation of tourism industry with an attempt to revitalize the economy of tourism, the overall goal is to reach at least 80 percent of the year 2019 income. The Tourism Authority of Thailand has continuously promoted the Thai Tourism Year 2023 for domestic markets and Visit Thailand Year 2023: Amazing New Chapters for foreign markets since 2022. This is significant driving mechanism to ensure that Thai tourism industry will recover both income and qualitative changes, moving towards being high value and sustainable tourism. In terms of income from tourism, Phuket has the second highest income in the country after Bangkok. The objcctive is to make Phuket province the hub of international standards for sustainable development of tourism, education, and innovation in service providing. Based on Phuket's tourism statistics, the number of tourists in 2022 was 38.61% (5,628,483 tourists in 2022, compared to 14,576,466 in 2019), while tourism income was 43.71% (193,636.78 million baht in 2022, compared to 442,980.67 million baht in 2019). In the first quarter of 2023 (January-March), the number of tourists was 57.24% (2,781,529 people, compared to 4,859,388 people in 2019), whereas for the income from tourism was 58.18% (88,108.08 million baht in 2023, compared to 151,429.37 million baht in 2019) (Ministry of Tourism and Sports, 2023; Phuket Provincial Office, 2023).

Organizing sports activities to promote tourism in Phuket (Phuket Sports City and Phuket Sand Box) in 2021 and 2022 could boost up Phuket economy to 2,170,062,850 baht. In 2021, there were 26 sport events, which were divided into 16 domestic events and 10 international events. The total number of competitors were 42,650; among these 28,050 were Thais, and 14,600 were foreigners. The total economic value that stemmed from these events was 547,990,750 baht. In 2022, there were 26 sport events, which comprised of 13 domestic events and 13 International events. the total participants were 116,000; among these 86,900 were Thais and 29,100 were foreigners. The total economic value earned from these events was 1,622,072,100 baht (Phuket Provincial Office, 2023; TAT Academy, 2023).

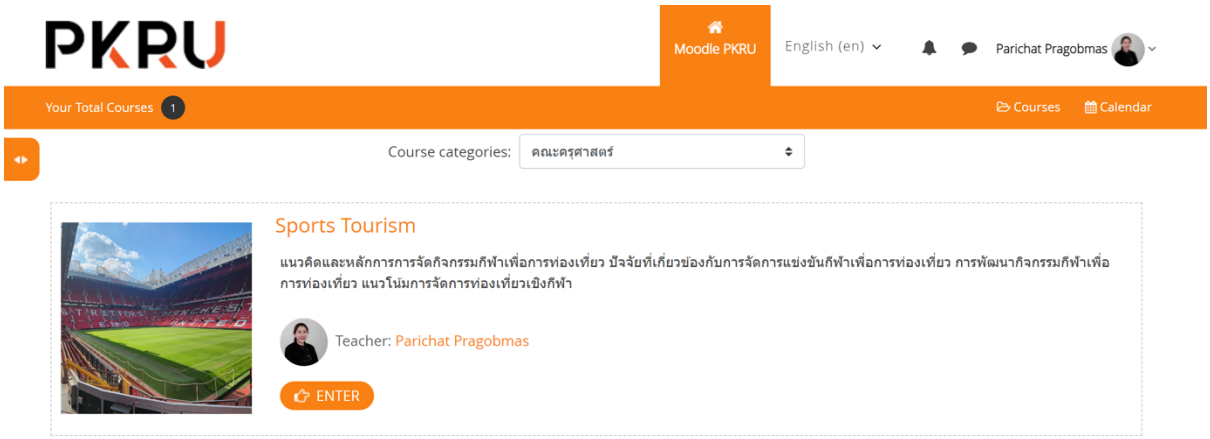


Figure 2: Sports tourism course

The substantial advancements in information and communication technology, educational institutions worldwide have developed online learning systems by applying the internet to teaching and learning. This approach aims to cultivate systematic thinking skills, analytical thinking, and creative thinking among learners. Online classrooms help expand the scope of traditional classrooms to reach diverse groups of learners through a system that facilitates various processes, including course registration, learner data management, content management, and learner assessment. Learners can study anytime and anywhere, which motivates them to engage in lifelong learning.

Consequently, MOOC is an open education innovation that plays a crucial role in developing online teaching and learning methods. It provides opportunities for interested learners from around the world to enroll in courses they are passionate about without any cost. The development of MOOC responds to the ideology of open education, stemming from the concept that knowledge should be shared and learners' desire to learn should be fulfilled without limitations. This fosters a learning society, a society that shares knowledge, leading to lifelong learning for the global community in the 21st century.

Objectives of Study

1. To study developing the MOOC for sports tourism course provided to undergraduate students in Physical Education program.
2. To study investigating learning outcomes of the undergraduate students in Physical Education program after learning with MOOC for sports tourism course.

Methodology

Section 1: Developing the MOOC for Sports Tourism Course Provided to Undergraduate Students in Physical Education Program

To assess the suitability of the MOOC for the sports tourism course provided to undergraduate students in the Physical Education program prior to its implementation, an evaluation process was conducted by subject matter experts, divided into two distinct groups. Group 1: Learning Content Evaluation, this group consisted of three experts tasked with evaluating the appropriateness of the learning content. The experts were required to possess extensive knowledge and expertise in sports tourism or related disciplines, as well as a minimum academic qualification of a master's degree. Group 2: Online Course Evaluation, this group comprised three experts responsible for evaluating the appropriateness of the online course delivery. The experts were required to have comprehensive knowledge and expertise in information technology or relevant fields, and a minimum academic qualification of a master's degree.

The evaluation of the online course's appropriateness was conducted using a 5-point Likert scale, with the following rating system: 5 - highest, 4 - high, 3 - moderate, 2 - low, 1 - least. The interpretation of the mean appropriateness scores was as follows: mean score ≥ 4.20: highest, mean score between 3.40 - 4.19: high, mean score between 2.60 - 3.39: moderate, mean score between 1.80 - 2.59: low, mean score < 1.80: least.

Section 2: Investigating Learning Outcomes of the Undergraduate Students in Physical Education Program After Learning With MOOC for Sports Tourism Course

The samples consisted of 30 undergraduates studying in Physical Education program at the faculty of Education, Phuket Rajabhat University. They were studying in an academic year 2023 and enrolling in the online sport tourism course provided on the MOOC. The research instruments comprised of the MOOC for sports tourism course for undergraduate students in Physical Education program and a learning achievement test of sports tourism course for undergraduate students in Physical Education program. The data were analyzed using mean ($\bar{x}$), standard deviation (S.D), and t-test at .05 level.

Conclusion

This research presented the findings in two sections: 1) developing the MOOC for sports tourism course provided to undergraduate students in Physical Education program, and 2) investigating learning outcomes of the undergraduate students in Physical Education program after learning with MOOC for sports tourism course. Detail as follows:

Section 1: Developing the MOOC for Sports Tourism Course Provided to Undergraduate Students in Physical Education Program

Table 1: Learning content and online course evaluation

		Mean	Level
	Learning Content Evaluation		
1	There was a clear statement of objectives	4.67	highest
2	The learning objectives were appropriate and relevant to the content within the lessons	4.33	highest
3	The language used was accurate, appropriate, and conveyed meaning clearly	4.33	highest
4	The lessons had an appropriate level of difficulty and content volume for the learners	4.67	highest
5	The content was accurate, and there was clarity in explaining the subject matter	4.33	highest
6	The content was interesting and engaging, encouraging learners to follow along and learn continuously	4.33	highest
7	The appropriateness of images in relation to the content	4.67	highest
8	The sequence of presenting the content was appropriate	4.33	highest
	Overall Mean	4.46	highest
	Online Course Evaluation		
1	The format/design of the lessons stimulated interest	4.67	highest
2	The layout and arrangement of elements was appropriate and visually appealing	4.33	highest
3	The continuity in content presentation within the lessons	4.33	highest
4	The fonts used were appropriate and clear	4.33	highest
5	The appropriateness of the size and color of the fonts used	4.00	high
6	The appropriateness of the colors in graphic images	4.33	highest
7	The consistency between images and captions	4.67	highest
8	The sounds and music used to accompany lessons	4.00	high
	Overall Mean	4.33	highest

The researcher developed the MOOC for sports tourism course provided to undergraduate students in Physical Education program, consisting of the following components: course content, learning media and resources, end-of-chapter exercises and learning assessment. The results have revealed that the MOOC for sports tourism course provided to the undergraduate students in Physical Education program was appropriate to use at the highest level.

Section 2: Investigating Learning Outcomes of the Undergraduate Students in Physical Education Program After Learning With MOOC for Sports Tourism Course

The average score of students' learning achievement after studying with the MOOC was significantly higher at the value of .05 level.

Table 2: Learning achievement

	Pre-Test		Post-Test		t	p
	Mean	SD	Mean	SD		
Learning achievement	27.50	2.65	51.17	2.26	33.27	0.00*

The observed improvement in learning outcomes can be ascribed to the inherent self-directed nature of online education. In this paradigm, learners are empowered to select and engage with individual modules or units that align with their personal interests and educational requirements. The accessibility of online lessons is not constrained by temporal limitations, granting learners the flexibility to access the content at their convenience and without restrictions on the frequency of their engagement.

Moreover, the integration of assessments and evaluations is a crucial component in monitoring the learners' progress throughout their educational journey. Prior to embarking on the course, the learners' baseline knowledge is gauged to establish a foundation for their learning trajectory. As they navigate through each lesson within the curriculum, strategically placed end-of-chapter quizzes and comprehensive examinations serve as valuable tools for learners to reinforce their understanding of the material and self-assess their mastery of the subject matter. This meticulous approach to learning ensures that the educational process is both efficient and effective, maximizing the learners' potential for academic growth and success.

A key suggestion in this research is that the content in online lessons must be connected to current teaching and learning practices. The developed online lessons, particularly those based on electronic databases or research support tools introduced in this section, may not be usable in another period because teaching and learning methods change with the times. Therefore, it is advisable to select electronic databases or research support tools that are likely to remain relevant in the future. Moreover, the content should be designed in a format that emphasizes the learners' ability to apply it in conjunction with other databases or research support tools.

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The BETA Module in Action: An Empirical Study on Enhancing Entrepreneurial Skills Through Kearney's and Bloom's Guiding Principles

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Abstract
This study investigates the efficacy of integrating Kearney's "4 Principles of Entrepreneurial Pedagogy" and Bloom's "Three Domains of Learning" in entrepreneurial education, using the Business Essentials through Action (BETA) module at Singapore Polytechnic as a case study. The BETA module, a novel approach to business education, combines venture creation with foundational business courses, emphasizing experiential learning and practical application of theoretical concepts. We assessed the impact of this module on students' entrepreneurial competencies using the Personal Entrepreneurial Competencies (PEC) questionnaire, comparing outcomes between participants in the BETA module and those following a traditional curriculum. Our findings indicate that students involved in the BETA module exhibited significant improvement in key entrepreneurial competencies such as "Opportunity Seeking and Initiative" and "Persistence," compared to their counterparts in the traditional curriculum. Furthermore, the study explores the correlation patterns among various entrepreneurial competencies within both groups, revealing how the BETA module fosters a synergistic development of skills, distinguishing it from conventional educational approaches. The research contributes to the broader academic discussion by providing empirical evidence of the effectiveness of integrating Kearney's and Bloom's frameworks in entrepreneurial education. It highlights the BETA module's potential to enhance entrepreneurial competencies, suggesting that such pedagogical innovations could play a crucial role in preparing future entrepreneurs to navigate the complexities of the global business landscape. The study also identifies areas for further curriculum refinement, particularly in competencies like "Risk Taking" and "Persuasion and Networking," to bolster the module's comprehensive skill-building approach. This study not only reinforces the value of innovative educational models in entrepreneurial education but also opens new avenues for future research in optimizing pedagogical strategies for nurturing entrepreneurial talent.

Keywords: Entrepreneurial Education, Entrepreneurial Mindset, Entrepreneurial Pedagogy, Business Essentials through Action (BETA) Module

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Introduction

Entrepreneurial education is increasingly recognized for its critical contribution to equipping emerging generations with the capabilities required to lead and innovate in a dynamic global context (Porfírio et.al, 2022). This study focuses on the application of Kearney's "4 Principles of Entrepreneurial Pedagogy" (Kearney, 2010) and Bloom's "Three Domains of Learning" (Bloom, 1956) within this educational sphere, proposing a structured approach to developing essential entrepreneurial skills through engagement and critical analysis. Kearney's framework, centred on experiential learning, emphasizes the importance of creating real-world, learner-centred experiences (Kearney, 2010). Bloom's taxonomy complements this by categorizing learning objectives across cognitive, affective, and psychomotor domains (Anderson & Krathwohl, 2001), thus advocating for a comprehensive learning experience beyond mere knowledge acquisition to include the development of values and practical skills. The relevance of these frameworks to entrepreneurial education lies in their shared emphasis on a dynamic, application-oriented approach to learning, which is crucial in entrepreneurship (Lackéu,2020). However, despite the theoretical prominence of these models, there remains a notable gap in the literature regarding their empirical application within entrepreneurial education, particularly in environments focused on the practical development of entrepreneurial skills and mindsets (Banha et al., 2022). Addressing this gap, the present study examines the Business Essentials through Action (BETA) module implemented at the Singapore Polytechnic School of Business (Lynn, 2021). This module, which integrates venture creation with foundational business education, provides a practical case for exploring the effectiveness of Kearney's and Bloom's frameworks in fostering entrepreneurial competencies. The aim is to conduct an empirical assessment of the BETA module's impact on students' entrepreneurial skills (Chen, 2021), thereby offering insights into the practical application of these educational frameworks in nurturing future entrepreneurs and leaders. This research contributes to the existing body of knowledge by detailing the application of Kearney's and Bloom's models in a real-world educational setting, highlighting the potential for these frameworks to enhance entrepreneurial education in response to the evolving challenges of the 21st-century entrepreneurial landscape (Porfírio et, al 2022; Lackéus, 2020).

Literature Review

Overview of the BETA Program at Singapore Polytechnic School of Business

The Business Essentials Through Action (BETA) is a year-long program offered to first-year students at the Singapore Polytechnic School of Business (Singapore Polytechnic, 2024). It integrates foundational business courses such as Marketing Fundamentals, Management and Human Resource Practices, and Business Negotiation Skills with the practical experience of starting a venture. The program emphasizes learning through action, where students apply theoretical knowledge in real-world contexts by working in teams to develop and prototype business ideas. A key component of BETA is the incorporation of Design Thinking principles and marketing strategies, which guide students in understanding market needs and crafting effective value propositions for their products or services. This process culminates in presentations to a panel of judges, allowing students to hone their presentation skills and gain confidence in public speaking. The program is structured around experiential learning, moving away from the traditional lecture-tutorial format. Instead, students are engaged in hands-on activities that encourage the application of business concepts to their projects. This approach aims to enhance the retention of knowledge and the development of practical skills. Classes are conducted with a focus on personalized learning, facilitated by a low student-to-teacher

ratio. Two classes are combined for BETA sessions, with two experienced lecturers guiding the larger group, which fosters a collaborative learning environment and exposes students to a variety of perspectives. Students in the BETA program have the opportunity to create a diverse range of businesses, from artisanal crafts to digital services. The program includes activities such as organizing events to showcase these businesses on campus and participating in pop-up sales, providing students with firsthand experience in decision-making and business operations. The BETA program represents an innovative approach to business education at Singapore Polytechnic, aiming to equip students with both the theoretical knowledge and practical skills necessary for entrepreneurial success. This initiative is part of the institution's broader effort to adapt its curriculum to the evolving needs of the business landscape.

Kearney's Experiential Learning Framework in Entrepreneurial Education

Kearney's (2010) "4 Principles of Entrepreneurial Pedagogy" pivot around the core idea of experiential learning, where the educational process is structured to simulate the complexities and unpredictability of the entrepreneurial world. These principles underscore the importance of engaging students in problem-solving tasks, collaborative projects, and reflective practices that mimic the decision-making processes and challenges faced by entrepreneurs. By doing so, Kearney's approach seeks to cultivate a mindset that is adaptable, creative, and resilient to the uncertainties inherent in entrepreneurial ventures. This pedagogical framework resonates with the constructivist theory of learning, which posits that learners construct knowledge through experiences and interactions with their environment (Piaget, 2013). Kearney's emphasis on experiential learning aligns with this theory by advocating for an educational setting where students are active participants, not mere recipients of information. This approach encourages learners to engage deeply with the material, fostering a deeper understanding and retention of entrepreneurial concepts and practices.

Integrating Bloom's Taxonomy for Holistic Entrepreneurial Learning

Bloom's taxonomy, a foundational educational framework, extends beyond the mere classification of learning objectives; it serves as a multidimensional tool that guides the creation of a holistic educational experience. Initially conceptualized by Bloom in 1956 and later refined by Anderson and Krathwohl in 2001, the taxonomy delineates learning into three distinct domains: cognitive (mental skills or knowledge), affective (growth in feelings or emotional areas), and psychomotor (manual or physical skills). This tripartite division facilitates a structured approach to curriculum development, ensuring that educational programs are comprehensive and cater to the multifaceted nature of learning. In the realm of entrepreneurial education, the application of Bloom's taxonomy is particularly pertinent. The cognitive domain encompasses the theoretical and analytical skills required for entrepreneurship, such as understanding business concepts, analyzing market trends, and applying strategic thinking. By systematically structuring learning objectives within this domain, educators can scaffold students' knowledge from basic recall of facts to complex analysis and evaluation, laying a solid foundation for entrepreneurial expertise.

Entrepreneurial Competencies

The Personal Entrepreneurial Competencies (PEC) framework, as conceptualized by McClelland (1961) and further refined by Boyatzis (1982), is instrumental in evaluating the traits and capabilities essential for entrepreneurial success. This framework distinguishes itself by identifying specific competencies that are closely associated with entrepreneurial

performance and potential, making it a valuable tool in both educational and professional development contexts. The 10 PEC Competencies:

1. Opportunity Seeking and Initiative: Entrepreneurs are distinguished by their proactive nature in identifying and pursuing new business opportunities.
2. Persistence: This trait involves the entrepreneur's relentless drive to overcome obstacles and challenges.
3. Fulfilling Commitments: Demonstrating reliability and a strong sense of responsibility towards commitments is crucial.
4. Demand for Efficiency and Quality: Entrepreneurs strive for high standards in efficiency and quality, seeking continuous improvement.
5. Taking Calculated Risks: The ability to evaluate and take strategic risks is a key entrepreneurial trait.
6. Goal Setting: Effective entrepreneurs are adept at setting clear, achievable goals and working towards them.
7. Information Seeking: An entrepreneurial mindset includes a keenness to seek relevant information for decision-making.
8. Systematic Planning and Monitoring: Planning and monitoring systematically are essential for navigating the entrepreneurial journey.
9. Persuasion and Networking: Building and leveraging networks, along with persuasive communication, are critical.
10. Independence and Self-Confidence: Independence and a strong belief in one's abilities underpin entrepreneurial actions.

The inclusion of the PEC framework in this study leverages its comprehensive approach to assessing entrepreneurial readiness and potential (McClelland, 1961; Boyatzis, 1982). The framework's balance of personal attributes and skills provides a holistic view of what constitutes entrepreneurial competence. In the context of entrepreneurship education, specifically, the PEC framework aids in the evaluation of how pedagogical strategies impact the development of essential entrepreneurial competencies. This study aims to empirically assess the effectiveness of the Business Essentials through Action (BETA) module in fostering these competencies, contributing insights into the optimization of entrepreneurship education programs. The adoption of the PEC framework is substantiated by its validation and widespread acceptance within the entrepreneurial research community, affirming its relevance and reliability for this research.

Empirical Application and Pedagogical Innovation

Despite the rich theoretical foundations provided by Kearney and Bloom, there exists a notable gap in the literature concerning the empirical application of these frameworks in entrepreneurial education. The BETA module offers an innovative case study in this regard, integrating venture creation with foundational business education in a manner that embodies Kearney's experiential learning principles and Bloom's taxonomy (Lynn, 2022). This integration represents a novel approach to entrepreneurship education, one that emphasizes the practical development of entrepreneurial skills and mindsets within an academic setting. The need for empirical evidence supporting the effectiveness of such pedagogical innovations is critical, particularly as the field of entrepreneurial education continues to evolve (Lackéus, 2020). By exploring the impact of the BETA module on student competencies, this study contributes valuable insights into the practical application of Kearney's and Bloom's educational theories, offering potential pathways for the enhancement of entrepreneurial education programs globally.

Methods

In this study, we explored the effectiveness of the Business Essentials through Action (BETA) module in enhancing entrepreneurial competencies among students at Singapore Polytechnic. Utilizing the Personal Entrepreneurial Competencies (PEC) questionnaire, a tool validated by prior research (McClelland, 1987; Spencer, 2008), we gauged entrepreneurial skills in students before and after their engagement with the BETA module or a traditional curriculum. The study involved 141 participants in the BETA module and 119 in the control group, with data analysis performed using descriptive and inferential statistics in SPSS to assess changes and correlations in competencies. Guided by our research questions, we aimed to uncover:

Competency Changes: We sought to identify which entrepreneurial competencies underwent significant changes from the pre-test to the post-test phase within both the Beta and Non-Beta groups. This analysis was intended to illuminate how the BETA module and traditional curriculum each contribute to the development of these competencies, thereby addressing our second research question.

Correlation Patterns: Our investigation also focused on discerning patterns of correlation among entrepreneurial competencies within both groups at the post-test stage. By examining how these patterns vary between the Beta and Non-Beta groups, we aimed to shed light on the distinct impacts of the educational experiences provided by the BETA module and the conventional curriculum, as per our fourth research question.

This structured approach allowed us to systematically evaluate the influence of the BETA module in fostering entrepreneurial skills, comparing it against traditional educational methods to draw insights into the most effective pedagogical practices for nurturing future entrepreneurs.

Analysis & Results

Comparison of Entrepreneurial Competencies

In evaluating the Non-Beta group's performance through a pre-post assessment (Table 1), significant developments were noted in two key entrepreneurial competencies. The "Opportunity Seeking and Initiative" competency exhibited marked improvement, with a notable mean difference of -.731, supported by a t-value of -2.171 and a statistically significant p-value of .031. This enhancement suggests that the conventional curriculum effectively bolstered the participants' propensity to identify and act on opportunities. Similarly, the "Risk-taking" competency also showed a positive shift, evidenced by a mean difference of -.562, a t-value of -1.994, and a p-value of .047. This indicates an increased willingness among participants to undertake calculated risks, pointing to the traditional educational approach's role in fostering a more entrepreneurial risk-taking disposition.

Table 1: *Pre-Post Test Comparison of Entrepreneurial Competencies for Non-Beta Group*

Competency	Levene's Test F	Sig.	t(DF)	Sig. (2-tailed)	Mean Difference	95% CI Lower	95% CI Upper	Cohen's d
Opportunity Seeking and Initiative	2.963	.087	-2.171 (234)	.031	-.731	-1.395	-.068	2.587
Risk Taking	.171	.679	-1.994 (234)	.047	-.562	-1.117	-.007	2.164
Demand for Efficiency and Quality	1.018	.314	-1.772 (234)	.078	-.658	-1.390	.074	2.853
Persistence	.035	.852	-1.572 (234)	.117	-.509	-1.147	.129	2.488
Commitment to The Work Contract	.127	.722	-1.375 (234)	.171	-.425	-1.035	.184	2.377
Information Seeking	.820	.366	-.350 (234)	.726	-.113	-.750	.524	2.483
Goal Setting	.492	.484	-.428 (234)	.669	-.166	-.931	.599	2.981
Systematic Planning and Monitoring	.948	.331	-.667 (234)	.505	-.227	-.897	.443	2.612
Persuasion and Networking	1.957	.163	-1.834 (234)	.064	-.650	-1.348	.048	2.722
Independence & Self Confidence	1.176	.279	-.789 (234)	.431	-.306	-1.070	.458	2.979

CI = Confidence Interval, DF = Degrees of Freedom

Table 2 presents a comprehensive comparison of entrepreneurial competencies before and after participation in the BETA module for the Beta group. The analysis indicates significant improvements in several competencies. Notably, "Opportunity Seeking and Initiative" saw a significant uplift with a mean difference of -.850 and a p-value of .006, suggesting an enhanced capability in identifying and capitalizing on opportunities. Although "Risk Taking" showed improvement with a mean difference of -.501, it did not achieve statistical significance ($p = .060$). Further, substantial enhancements were recorded in "Demand for Efficiency and Quality" (mean difference: -.655, $p = .047$), "Persistence" (mean difference: -.916, $p = .003$), and "Commitment to The Work Contract" (mean difference: -.698, $p = .020$), among others. The most pronounced progress was observed in "Systematic Planning and Monitoring" with a mean difference of -.915 ($p < .001$), highlighting the BETA module's strong influence on

students' strategic planning capabilities. Improvements in "Persuasion and Networking" and "Independence & Self Confidence" were also noted, with mean differences of -.372 and -.699 respectively, although the former did not reach statistical significance (p = .276). These findings underscore the BETA module's effectiveness in cultivating a broad spectrum of entrepreneurial skills among participants.

Table 2: *Pre-Post Test Comparison of Entrepreneurial Competencies for Beta Group*

Competency	Levene's Test F	Sig.	t(DF)	Sig. (2-tailed)	Mean Difference	95% CI Lower	95% CI Upper	Cohen's d
Opportunity Seeking and Initiative	1.437	.232	-2.783 (245)	.006	-.850	-1.452	-.249	2.377
Risk Taking	3.299	.071	-1.888 (245)	.060	-.501	-1.024	.022	2.064
Demand for Efficiency and Quality	1.224	.270	-1.998 (245)	.047	-.655	-1.302	-.009	2.553
Persistence	.769	.381	-2.971 (245)	.003	-.916	-1.523	-.309	2.398
Commitment to The Work Contract	1.228	.269	-2.348 (245)	.020	-.698	-1.284	-.113	2.313
Information Seeking	.001	.980	-2.396 (245)	.017	-.701	-1.278	-.125	2.277
Goal Setting	.057	.811	-1.427 (245)	.035	-.552	-1.314	.210	3.009
Systematic Planning and Monitoring	.513	.474	-3.335 (245)	< .001	-.915	-1.456	-.375	2.135
Persuasion and Networking	.587	.444	-1.091 (245)	.276	-.372	-1.043	.299	2.650
Independence & Self Confidence	.634	.427	-1.877 (245)	.022	-.699	-1.432	.034	2.895

CI = Confidence Interval, DF = Degrees of Freedom

Correlation Among Entrepreneurial Competencies

The examination of correlation patterns between entrepreneurial competencies in the Beta and Non-Beta groups, detailed in Tables 3 and 4, sheds light on the nuanced effects of different educational methodologies. These patterns reveal the interconnectedness of competencies within each group, offering insights into the unique impacts of the BETA module versus conventional education methods. In the Non-Beta group, as depicted in Table 3, there's a pronounced correlation between "Opportunity Seeking" and "Persistence" (.673**), suggesting that traditional education may reinforce the idea that recognizing opportunities is closely linked with persistent effort. Additionally, the correlation between "Efficiency and Quality" and "Risk Taking" (.594**) indicates that in conventional settings, a focus on high standards is often associated with an openness to risk-taking. The relationship between "Systematic Planning and Monitoring" and "Information Seeking" (.524**) further illustrates the emphasis traditional education places on comprehensive planning and diligent information gathering.

Table 3: *Pearson Correlation on Entrepreneurial Competencies for Non-Beta Group (Post-Test)*

	Opportunity Seeking	Risk Taking	Efficiency and Quality	Persistence	Commitment
Opportunity Seeking	-	.253**	.438**	.673**	.488**
Risk Taking	.253**	-	.594**	.327**	.178
Efficiency and Quality	.438**	.594**	-	.453**	.385**
Persistence	.673**	.327**	.453**	-	.399**
Commitment	.488**	.178	.385**	.399**	-
	Information Seeking	Goal Setting	Systematic Planning and Monitoring	Persuasion and Networking	Independence & Self Confidence
Information Seeking	-	.441**	.524**	.332**	.164
Goal Setting	.441**	-	.409**	.397**	.216
Systematic Planning and Monitoring	.524**	.409**	-	.435**	.406**
Persuasion and Networking	.332**	.397	.435	-	.341**
Independence & Self Confidence	.164	.216	.226	.341**	-

*N = 117 for all correlations. **Correlation is significant at the 0.01 level (2-tailed)*

Conversely, the Beta group's correlation patterns, as presented in Table 4, highlight different emphases. The strong connection between "Persistence" and "Efficiency and Quality" (.644**) may reflect the BETA module's success in embedding the principle that consistent effort is key to achieving excellence. The link between "Systematic Planning and Monitoring" and "Goal Setting" (.494**) suggests the module's effective focus on strategic alignment between planning and goal achievement. Significantly, the correlation between "Persuasion and Networking" and "Independence & Self Confidence" (.460**) implies the module's role in bolstering self-assurance, thereby enhancing students' networking and persuasive skills, an area less emphasized by traditional educational approaches.

Table 4: *Pearson Correlation on Entrepreneurial Competencies for Beta Group (Post-Test)*

	Opportunity Seeking	Risk Taking	Efficiency and Quality	Persistence	Commitment
Opportunity Seeking	-	.196	.494**	.599**	.464**
Risk Taking	.196	-	.438**	.493**	.189
Efficiency and Quality	.494**	.438**	-	.644**	.472**
Persistence	.599**	.493**	.644**	-	.500**
Commitment	.464**	.189	.472**	.500**	-
	Information Seeking	Goal Setting	Systematic Planning and Monitoring	Persuasion and Networking	Independence & Self Confidence
Information Seeking	-	.329**	.449**	.306**	.170
Goal Setting	.329**	-	.494**	.390**	.186
Systematic Planning and Monitoring	.449**	.494**	-	.396**	.275**
Persuasion and Networking	.306**	.390**	.396**	-	.460**
Independence & Self Confidence	.170	.186	.275**	.460**	-

*N = 106 for all correlations. **Correlation is significant at the 0.01 level (2-tailed)*

Discussions

Comparison of Entrepreneurial Competencies

The comparative analysis between the Non-Beta and Beta groups, utilizing pre-post test measures, yielded valuable insights into the evolution of entrepreneurial competencies, pivotal for refining entrepreneurship education strategies. In the Non-Beta group, notable progress was recorded in "Opportunity Seeking and Initiative" and "Risk Taking," underscoring the capacity of conventional educational frameworks to nurture foundational entrepreneurial qualities, such as proactive opportunity identification and calculated risk engagement. This aligns with existing scholarship that underscores the critical nature of these competencies for entrepreneurial efficacy (Lumpkin & Dess, 1996). Conversely, participants in the Beta group, engaged with the BETA module, demonstrated substantial growth across a broader range of entrepreneurial competencies. Enhancements were particularly significant in areas like "Persistence," "Demand for Efficiency and Quality," and "Systematic Planning and Monitoring," among others. These findings lend support to the comprehensive skill-building approach of the BETA module, resonating with the holistic educational paradigms advocated by scholars such as Neck and Greene (2011). However, the lack of marked improvement in "Risk Taking" and "Persuasion and Networking" within the Beta group warrants a reevaluation of the BETA curriculum. This suggests an opportunity to further tailor the module's content to address these essential elements explicitly, enhancing its capacity to cultivate versatile entrepreneurs adept at managing risks and forging robust networks, as emphasized by Morris (1991). Optimizing the curriculum in these respects could significantly elevate the module's effectiveness in preparing students to adeptly navigate the entrepreneurial domain.

Correlation Among Entrepreneurial Competencies

Analyzing the correlation patterns between entrepreneurial competencies in both Beta and Non-Beta groups sheds light on the subtle impacts of diverse educational frameworks on skill development. These correlations reveal how different competencies are interlinked and how varied educational experiences might shape these connections. In the Non-Beta group, traditional educational approaches appear to reinforce a significant relationship between "Opportunity Seeking" and "Persistence" (correlation coefficient: .673**), suggesting that within conventional settings, the knack for spotting opportunities is closely tied to the perseverance to chase them. This finding aligns with the entrepreneurial literature that considers persistence a key enabler for leveraging opportunities (Shane & Venkataraman, 2000). Moreover, the link between "Efficiency and Quality" and "Risk Taking" (correlation coefficient: .594**) may reflect the traditional pedagogical belief that high standards and efficiency necessitate a readiness to embrace calculated risks, resonating with the notion that adept risk management underpins quality entrepreneurial outcomes (Knight, 1921). The notable correlation between "Systematic Planning and Monitoring" and "Information Seeking" (correlation coefficient: .524**) emphasizes the value placed on meticulous planning and informed decision-making within traditional educational paradigms. Conversely, the Beta group's correlations provide a nuanced view of the experiential BETA module's influence on entrepreneurial competencies. The strong association between "Persistence" and "Efficiency and Quality" (correlation coefficient: .644**) implies the module's success in embedding the ethos that consistent, diligent efforts yield superior results, echoing the deliberate practice principles where ongoing, focused endeavors are crucial for skill mastery (Ericsson et al., 1993). The linkage between "Systematic Planning and Monitoring" and "Goal Setting" (correlation coefficient: .494**) suggests the module's emphasis on aligning detailed planning

with clear goal orientation, a critical success factor in entrepreneurship as per goal-setting theory (Locke & Latham, 2002). This approach equips participants with strategic planning capabilities, crucial for navigating the entrepreneurial landscape. Furthermore, the correlation between "Persuasion and Networking" and "Independence & Self-Confidence" (correlation coefficient: .460**) highlights the module's role in enhancing self-efficacy and social skills, essential for stakeholder engagement and resource mobilization in entrepreneurial ventures, as suggested by Bandura's (1977) social learning theory. These findings articulate the comprehensive and synergistic nature of the skill set fostered by the BETA module, underscoring its potential to prepare students for the multifaceted challenges of entrepreneurship with a strategic, confident approach.

Conclusion

The study's exploration into the efficacy of the Business Essentials through Action (BETA) module, underpinned by Kearney's and Bloom's educational principles, has yielded significant insights pertinent to entrepreneurial education. Conducted within the vibrant academic milieu of Singapore Polytechnic and engaging a diverse student cohort, the research methodically assessed the module's impact on key entrepreneurial competencies using the Personal Entrepreneurial Competencies (PEC) questionnaire. The findings reveal a pronounced enhancement in competencies such as "Opportunity Seeking and Initiative" and "Persistence" among students engaged with the BETA module, underscoring the module's robustness in nurturing essential entrepreneurial traits. These improvements were notably more substantial than those observed in the control group, which followed a conventional curriculum, suggesting the unique value the BETA module brings to entrepreneurial education. However, the research also identified areas within the BETA curriculum, such as "Risk Taking" and "Persuasion and Networking," where enhancements were not as significant. This insight opens avenues for further refinement of the module, potentially incorporating more targeted strategies to bolster these competencies. In delving into the correlation patterns among various entrepreneurial competencies, the study highlighted how the BETA module fosters a synergetic development of skills, distinguishing it from traditional educational approaches. The significant correlations observed within the Beta group between competencies like "Persistence" "Efficiency and Quality," "Systematic Planning and Monitoring" and "Goal Setting," reflect the holistic and strategic focus of the BETA module. These correlations not only illuminate the interconnected nature of entrepreneurial skills but also the module's capacity to cultivate a comprehensive skill set essential for navigating the complexities of the entrepreneurial landscape.

In conclusion, this study contributes to the discourse on entrepreneurial education by providing empirical evidence of the BETA module's effectiveness in enhancing entrepreneurial competencies through an integrated application of Kearney's and Bloom's educational frameworks. The insights gleaned from this research underscore the potential of such innovative pedagogical approaches in preparing future entrepreneurs to meet the challenges of the 21st-century business world. The findings also highlight the need for continuous curriculum evaluation and adaptation to ensure that entrepreneurial education remains responsive to the evolving demands of the global market. As this study opens new pathways for academic inquiry, it invites further exploration into optimizing educational strategies to nurture the next generation of entrepreneurial leaders.

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Artificial Intelligence in Education: A Threat or a Tool for Teaching

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Abstract
The exponential rise in the use of artificial intelligence in instructional delivery has challenged the academic landscape and provided implications for teaching and learning. Artificial intelligence (AI) becomes one of the emerging issues in higher education. This paper looked into the state university teachers' views and usage of artificial intelligence in the classroom. Using mixed-method research design, a researcher-made survey questionnaire solicited the teachers' experiences with the use and non-use of artificial intelligence in their teaching practice. A purposive random sampling technique was used in choosing the thirty university teachers as the research respondents. As such, in the quantitative data, the teachers' use of AI-powered educational technology in the classroom was identified. For the qualitative data, advantages and disadvantages of the use of AI based on the teachers' experiences were analyzed using Braun and Clarke's six-step data analysis. The study found that teachers use canva, chatGPT, educational games, educational chatbots, grammarly, quillbot, and YouTube videos in their classes. The advantages of using AI include personalized learning, having virtual assistants, and streamlining teaching and learning. However, AI also has its disadvantages, as it limits human interaction and empathy, which are essential in the teaching and learning process. The findings offer pedagogical implications and recommendations on how artificial intelligence can help teachers provide personalized learning experiences for their students. AI has been used as a tool in teaching but it can also imply some threats if not properly managed or regulated as it poses ethical challenges in academic work.

Keywords: Artificial Intelligence, Education, Instructional Delivery, Threat or Tool in Teaching

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Introduction

In the age of information, expanding the amount of information taught in the classroom, implementing high-quality instruction, and enhancing both are the key components of teaching. When information technology is used in the classroom, it can significantly alter the amount of knowledge that students learn. According to research by credible experts, "sight and hearing are the main organs of student learning." Information technology will therefore become a more comprehensive and richer tool library for our study once it is used as a teaching method. In a traditional classroom, teaching quality can only be improved based on the students' needs and areas of difficulty. Numerous real-world examples demonstrate how information technology can be used to overcome the main obstacles and challenges in the teaching and learning process.

Artificial Intelligence (AI) has the potential to address some of the biggest challenges in education today, to innovate teaching and learning practices, and to accelerate progress towards quality education (UNESCO, 2023). However, rapid technological developments inevitably bring multiple risks and challenges, which have so far outpaced policy debates and regulatory frameworks. UNESCO is committed to supporting Member States to harness the potential of AI technologies for achieving the Education 2030 Agenda, while ensuring that its application in educational contexts is guided by the core principles of inclusion and equity.

Artificial Intelligence (AI) has the potential to significantly impact higher education in various ways. The potential of using artificial intelligence in education to enhance learning, assist teachers and fuel more effective individualized learning is exciting, but also a bit daunting. Thus, ethical considerations must be in place in order not to abuse and misuse this technological means of facilitating teaching and learning. In order to determine the effects of using Ai in education, this study explores the use of artificial intelligence among higher education teachers and identifying the pros and cons of integrating AI-generated technology into the tertiary classroom.

Higher education could be greatly impacted by artificial intelligence (AI) in a number of ways. It's fascinating, but also a little scary, to think about how artificial intelligence might improve education, help instructors, and support more successful tailored learning. Therefore, in order to avoid abusing and misusing this technical tool that makes teaching and learning easier, ethical concerns must be in place. This study explored the use of artificial intelligence among higher education teachers and identifies the benefits and drawbacks of incorporating AI-generated technology into tertiary classrooms in order to ascertain the effects of employing AI in education.

Review of Related Literature

The development of artificial intelligence has had a profound impact on education and teaching practice. It is changing the teaching methods of teachers and the learning methods of students (Xue and Wang, 2022). The generative AI tool – ChatGPT remarkably perform complex tasks within the field of education has caused mixed feelings among educators, as this advancement in AI seems to revolutionize existing educational praxis. Benefits of ChatGPT include but are not limited to promotion of personalized and interactive learning, generating prompts for formative assessment activities that provide ongoing feedback to inform teaching and learning (Baidoo-Anu and Ansah, 2023). Their study offers recommendations on how ChatGPT could be leveraged to maximize teaching and learning. Policy makers, researchers, educators and

technology experts could work together and start conversations on how these evolving generative AI tools could be used safely and constructively to improve education and support students' learning.

The rapid advancement of artificial intelligence (AI) has significantly influenced education. Its application, including adaptive learning, teaching evaluation, and virtual classrooms, has positively impacted teaching and learning, enhancing both educators' teaching capabilities and students' learning outcomes. However, challenges for AI in education are also anticipated in the future. Addressing these challenges will contribute to leveraging AI for education reform (J Huang, S Saleh, Y Liu, 2021). The integration of artificial intelligence (AI) in education has introduced new prospects and challenges. This position paper outlines three paradigms of AI in education: AI-directed, AI-supported, and AI-empowered, each involving distinct roles for AI and learners. These paradigms reflect AI's evolution from directing cognitive learning to empowering learners as leaders. The trend in AIEd emphasizes leaner agency, personalization, and iterative development of learner-centered, data-driven, personalized learning (Ouyang & Jiao, 2021).

The educational effects of emerging technologies on how educational institutions teach and how students learn were investigated in the conceptual review that looks into the advent of using artificial intelligence in teaching and learning in education. The goal of this study is to forecast how artificial intelligence will affect education in the future. It is thought that using artificial intelligence techniques well can raise the standard of instruction and learning. Nonetheless, the difficulties associated with incorporating AI in educational settings are discussed. Additionally, the difficulties that students encounter in using artificial intelligence with regard to administration, instruction, learning, and student support (Fahimirad & Kotamjani, 2018).

In a quantitative study, teachers' opinions about GAI and its possible application in the classroom were investigated (Kaplan-Rakowski, 2023). In a validated survey, a representative sample of 147 teachers expressed their opinions about GAI technology, including its potential, integration, use, and drawbacks. Generally speaking, regardless of their method of instruction, the teachers have positive opinions on GAI. The study's conclusions imply that instructors' viewpoints got more optimistic the more GAI they employed. Teachers said GAI may be a useful tool for pupils and improve their professional growth.

Another study evaluated AI's impact on education, focusing on administration, instruction, and learning (Gwo-Jen Hwang, et al., 2020). The findings indicated extensive AI adoption in education, evolving from computer-based technologies to web-based intelligent education systems and humanoid robots. AI has enabled efficient administrative tasks like grading, improved teaching quality, and personalized learning content, enhancing the overall learning experience (Chen et al., 2020). A study conducted a comprehensive review of influential Artificial Intelligence in Education (AEId) studies by analyzing 45 articles. Findings revealed a growing interest and impact of AIEd research, a lack of deep learning technologies in educational contexts, and a need for deeper engagement with educational theories. Recommendations included exploring AI in physical classroom settings, employing advanced deep learning algorithms, utilizing NLP for personalized education, integrating biomedical detection and imaging technologies, and closely combining AI technologies with educational theories (Chen et al., 2020). In another study, (AIED) applications were focused which involve using AI technologies in educational settings to enhance teaching, learning, and decision-making processes. It addresses the interdisciplinary nature od AIED, proposing a framework

to guide researchers with diverse backgrounds in conducting AIED studies. The paper also outlines 10 potential research topics in AIED and describes the preferred article types for submissions.

This study delves into the impact of AI systems on learner-instructor interaction in online learning. Through Speed Dating with storyboards, the voices of 12 students and 11 instructors were analyzed, revealing that while AI systems can enhance personalized interactions at scale, concerns exist regarding social boundaries, responsibility, agency and surveillance. The study emphasizes the need for AI systems to prioritize explainability, human-in-the-loop process, and careful data handling. The findings also contribute to the design of AI system storyboards. And offer practical implications for maximizing positive impacts while minimizing negative ones (K Seo, J Tang, I Roll, S Fels, & D Yoon, 2021).

The U.S. Department of Education Office of Education Technology's new policy report, Artificial Intelligence and the Future of Teaching and Learning: Insights and Recommendations, addresses the clear need for sharing knowledge, engaging educators, and refining technology plans and policies for artificial intelligence (AI) use in education. The report describes AI as a rapidly-advancing set of technologies for recognizing patterns in data and automating actions, and guides educators in understanding what these emerging technologies can do to advance educational goals – while evaluating and limiting key risks (U.S. Department of Education – Office of Educational Technology, 2023).

This article provides a comprehensive review of empirical studies on artificial intelligence in education (AIEd) from 1993 to 2020. A total of 40 empirical studies were thoroughly reviewed, employing bibliometrics, content analysis, and categorical meta-trends analysis. The review highlights AIEd technologies and applications, their prove and potential benefits for education, and bridges the gap between AI technological innovations and educational applications. The article offers practical examples and insights for both technological experts and educators, along with rich discussions on practical implications and future AIEd necessitates addressing AI ethics and privacy concerns, emphasizing interdisciplinary and transdisciplinary collaborations for large-scale, longitudinal research and development efforts (Zhang & Aslan, 2021).

This paper examines the use of AI in education across the globe with an emphasis on its possible effects in developing nations. Examples of AI's application in education are provided, and the pressing need to close the digital and social divide is discussed. In the first section, cases from different nations are examined to show how AI can enhance learning outcomes. In the second section, learners are better prepared for a future driven by AI through a new curriculum and the development of AI capabilities through training and education. The document highlights the need for comprehensive public policy, inclusion and equity, teacher preparation, high-quality data systems, meaningful research, ethics, and transparency in data use, as well as the challenges and policy implications associated with AI in education. It ends by urging more conversations about the applications, opportunities, and dangers (Pedro et al., 2019).

Another article explores the applications of artificial intelligence (AI) in education and the associated ethical challenges. It defines AI, introduces its educational applications and benefits, outlines ethical dilemmas, and provides recommended instructional resources from MIT Media Lab and Code.org. The aim is to help practitioners leverage the benefits of AI in K-12

classrooms while addressing ethical challenges and advancing students' understanding of AI and ethics (Akgun & Greenhow, 2022).

This paper speculates on future of research in Artificial Intelligence and Education (AIED) based on three uses of models of educational processes: as scientific tools, as components of educational artifacts, and as bases for the design of educational artifacts. It emphasizes the need for an evolution of theories and models to study collaborative learning situations, integration of computer-based learning systems into schools, and the utilization of models as bases for design of educational technologies. The conclusion highlights the importance of AIED research being concerned with all three roles of models to varying extents in each case (Michael Baker 2000).

The paper provides an in-depth analysis of global research developments in applying artificial intelligence techniques to the education sector, highlighting AI's role in teaching and student evaluation. It emphasizes that AI is fundamental in NLP – enabled intelligent tutors' system, fostering skills such as self-reflection, addressing complex questions, resolving conflicting statements, generating creative queries, and decision-making abilities (G Malik, DK Tayal, & S Vij, 2019).

In a study that examined the integration of AI technologies into key educational domains of learning, teaching, assessment, and administration, the results identify 13 roles of AI technologies in education domains, 7 learning outcomes of AIED, and 10 major challenges, shedding light on the current focus of AIEd research and offering suggestion for future directions (Chiu et al., 2023). Likewise, another paper delves into ethical considerations surrounding Artificial Intelligence in Education (AIED) by analyzing international organizations' policies and guidelines. It explores the potential ethical issues arising from the adoption of AIED and aims to establish a set of ethical principles through thematic analysis. The proposed ethical principles are intended to guide educational stakeholders in developing and deploying ethical and trustworthy AIED, offering implications for students, teachers, technology developers, policymakers, and institutional decision-makers. The paper serves as a framework to inform ethical AIED and encourage future impact studies in the field (Nguyen et. al., 2022).

This paper addresses the emerging concerns about Fairness, accountability, Transparency, and Ethics (FATE) in AI-supported educational interventions. It argues that explainable AI (XAI) is crucial in education but requires a distinctive approach. The paper introduces the XIA-ED framework, which encompasses six key aspects related to explainability in educational AI tools. It presents four case studies illustrating the application of XAI-ED in different AI tools and concludes by discussing opportunities, challenges, and future research needs for the effective incorporation of XAI in education (Hassan Khosravi, et.al., 2022).

In a similar study that examined the potential scenarios and implications of the arrival of AI in education, it aimed to shed light on the future of schools. Conducted as a phenomenological, qualitative research, the study gathers opinions from participants across different sectors. The results indicate that the introduction of AI in education will bring both new benefits and drawbacks for schools and teachers. While participants generally express positive perceptions towards AI, some concerns, particularly from teachers and academicians, are highlighted regarding the future of teaching. Additionally, the study reveals that lawyers and jurists focus on the legal aspects of AI in education, foreseeing potential future problems, while engineers

view AI as a tool to enhance the quality and benefit of education for all (Gocen & Aydemir, 2020).

Over the past decade, a collaborative effort between educators and computer scientists at the University of Illinois has focused on envisioning the future of education within the realm of "artificial intelligence". Dissatisfied with initial digital learning environments, the agenda has been to design alternatives and study their implementation. The central inquiry revolves around the nature of machine intelligence, its constraints, and its potential in education. The paper offers conceptual insights and outlines results from experimental implementations. A key finding suggests that while artificial intelligence will not replace the role of a teacher due to fundamental differences between machine and human intelligence, it has the potential to transform education in ways that paradoxically make it more human, not less (Cope et al, 2020).

Methodology

A mixed-method research design involving purposive random sampling was employed as an effective approach in this study in the use of various artificial intelligence teaching and learning practices among State University teachers. This design combines both qualitative and quantitative methods to provide a comprehensive understanding of the topic. By employing a mixed-method research design with purposive random sampling, this study aims to offer a nuanced understanding of the use of artificial intelligence teaching and learning practices among State University teachers. Purposive random sampling was used to select participants based on specific criteria. For the Inclusion Criteria, State University teachers with a minimum of 3 years of teaching experience, actively involved in incorporating artificial intelligence teaching and learning practices. For the Exclusion Criteria, Teachers with less than 3 years of experience, those not actively using artificial intelligence in teaching.

Purposive sampling was employed to select a subset of participants from the quantitative phase for in-depth interviews. For the inclusion criteria, participants demonstrate innovative and effective use of artificial intelligence in teaching. For the quantitative data collection, a structured survey questionnaire was made to gather quantitative data on the frequency, effectiveness, and challenges faced by State University teachers in using artificial intelligence teaching practices. A semi-structured interview protocol was developed to explore in-depth experiences, challenges, and success stories related to the integration of artificial intelligence in teaching. Qualitative variables may include emerging themes, personal experiences, and contextual factors influencing the use of AI. Thematic analysis was used for the qualitative analysis to identify patterns, themes, and insights from qualitative interview data. The Integration of Results compared and contrasted findings from the quantitative and qualitative phases to provide a more comprehensive understanding of the research questions.

Results and Discussion

Artificial Intelligence (AI) practices among university teachers can significantly impact the educational landscape. One of the main advantages of using AI in the classroom is that it can give students a more customized educational experience. Furthermore, it provides a wealth of opportunities for students to learn and explore more. But it also threatens moral concerns like data privacy and confidentiality. Below are the themes that emerged from the teachers' responses in incorporating AI in their teaching practices.

AI as a Tool in Teaching provides:

1. Personalized Learning: AI is capable of analyzing data on individual student performance to create learning strategies and materials that are specific to the strengths and weaknesses of each student. This individualized approach can improve comprehension and student engagement.
2. Efficiency and Automation: Teachers can concentrate more on developing creative lesson plans, engaging with students, and conducting research by using AI to automate administrative tasks like scheduling and assignment grading.
3. Data-Driven Decision Making: AI is able to find patterns and trends in student performance by analyzing huge datasets. Teachers can make well-informed decisions about their curriculum design, student interventions, and teaching strategies thanks to this data-driven approach.
4. Chatbots and virtual assistants powered by AI: These tools can help students immediately by responding to frequently asked questions, advising on assignments, and starting conversations. This contributes to the development of a more responsive and interactive learning environment.
5. Enhanced Research: By automating data analysis, literature reviews, and even insight generation, AI tools can help teachers conduct research. This has the potential to quicken the research process and produce more creative discoveries.

AI can be a Threat in Teaching when there is:

1. Absence of Human Touch: AI is incapable of providing the same emotional intelligence and empathy that human educators can. An all-encompassing education depends on the human interaction between teachers and students, which AI might find difficult to replicate.
2. Concerns about privacy: Using AI in education necessitates gathering and examining a lot of student data. One of the biggest challenges is ensuring the security and privacy of this data. Inappropriate handling of student data may result in security lapses and unapproved entry.
3. Algorithm Bias: Artificial intelligence algorithms may inherit biases from the training data. Biased data that is used to train AI systems can lead to discriminatory outcomes that impact marginalized groups and reinforce already-existing inequalities.
4. Concern about Job Displacement: There are worries that the use of AI in education could result in the loss of jobs in specific roles, particularly those involving administration and repetitive work. Regarding the effect on employment in the education sector, this presents moral and financial questions.
5. Dependency on Technology: If teachers and students rely too much on artificial intelligence (AI), they may not be able to develop critical thinking and problem-solving skills because they will grow reliant on automated solutions.

Conclusion

The study identified the use and non-use of AI tools among higher education teachers and concluded that even though using AI in the classroom has many benefits for university instructors in terms of efficiency, personalization, and data-driven decision-making, a balanced and moral integration of AI in education requires navigating issues like job displacement, biases, and privacy concerns. It's critical to see artificial intelligence (AI) as an additional tool to human teachers, enhancing their distinct contributions to the classroom rather than taking their place. The use of Artificial Intelligence among Higher Education teachers have been a tool rather than a threat as AI helped improve students' learning outcomes through personalized

learning. It also provided teachers with efficient instructional delivery as it streamlined the teaching and learning process. AI has been used as a tool in teaching but it can also imply some threats if not properly managed or regulated as it poses ethical challenges in academic work. In conclusion, the integration of AI in higher education presents both opportunities and challenges. Successful implementation requires careful consideration of ethical, privacy, and equity issues, along with effective strategies to address potential resistance and ensure that AI enhances rather than hinders the educational experience.

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The Impact of Community Engagement Within a Learning Community on Students' Positive Development

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Abstract
Positive youth development recognizes the importance of addressing students' broader developmental needs through community engagement and empowering experiences with adults. This paper reports on a project involving secondary school students' engagement in an intergenerational learning community, alongside university students and older adults. Students were empowered to take an active role in planning and implementing a series of activities while being mentored by university students. The project which lasted for two years incorporated service learning and two cycles of action learning. This paper is on the second cycle. A total of 151 students from eight schools took part in this cycle and their feedback was collected through a questionnaire survey and focus group interviews. Results showed that students developed a better understanding of others and were able to learn from and work with other participants in the community. Moreover, they indicated improved self-reflection, enhanced organizational skills, and a strong sense of community engagement. The focus group interviews further attested to the positive impact of the project on students' personal growth. Apart from acquiring knowledge and transferable skills, students felt empowered and demonstrated changes in values and attitudes towards others and the community. These findings highlight the significance of involving students in learning experiences within the community and providing them with opportunities to undertake leadership roles in safe and supportive environments. This project underscores the importance of fostering community engagement among students and creating learning environments that facilitate their holistic growth.

Keywords: Positive Youth Development, Learning Community, Action Learning, Service Learning, Secondary School Students, Hong Kong

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Introduction

Positive youth development recognizes the significance of providing adolescents with opportunities for learning and engagement with others in their community (Conway, Heary & Hogan, 2015, Geldhof et al., 2014). Effective positive youth development programs involve positive and sustained adult-youth relationships in the form of mentoring, provision of activities that focus on the development of a range of life skills including cognitive, behavioral, and social relational skills, and providing opportunities for youth participation in and leadership of valued activities in family, school, and the community (Lerner, 2004; Tirrell et al., 2020; Ettekal & Agans, 2020). Important elements of positive youth development also include the provision of opportunities for students' learning and engagement with others in their community and the need for structured activities (Conway, Heary & Hogan, 2015; Geldhof et al., 2014; Ettekal & Agans, 2020).

This paper presents a project that sought to promote positive development among secondary school students through the implementation of a program based on an intergenerational learning community model. The program involved collaboration between secondary school students, university students, and older adults, integrating elements of positive youth development. The concept of a learning community has gained significant recognition in promoting student development by facilitating connection, inclusion, and empowerment through collaborative processes (Hord, 2004; Mitchell & Sackey, 2011). The intergenerational learning community served as a platform for positive student development by providing a secure environment and supportive conditions. Several features that maximize positive youth development have been utilized within this learning community. These include establishing nurturing relationships, cultivating a sense of belonging, promoting positive social norms, encouraging autonomy, and developing a wide range of interpersonal and life skills (Eccles & Gootman, 2002). The intergenerational learning community was validated through previous studies which provided insight into its structure and operation (Sivan et al., 2016a, 2016b).

To effectively cultivate students' development of life skills and enhance their community engagement, service learning and action learning approaches (Howard, 2012; Zuber-Skerritt, 2001) have been incorporated into the learning community practice. Service learning emphasizes authentic community issues, collaboration, and mutual benefits for both the provider and recipient, with equal focus on service and learning (Furco, 2011; Hacker-Cam & Schmidt, 2014). Several recommendations have been made to best utilize service learning skills. These include involvement of students in activity planning, implementation, and assessment, incorporating reflective processes with higher-level thinking skills, and collaboration with community organizations for professional support in designing and implementing the activities (Billing, 2000; Hacker-Cam & Schmidt, 2014). In the present project involving university students, older adults, and secondary school students, ample opportunities for collaboration, mutual learning, and deep reflection were provided. Secondary school students received mentorship from university students and community members, assuming leadership roles to serve and learn with reflection and reciprocity. They developed and implemented intergenerational learning activities, interacting directly with older adults in community centers to facilitate mutual learning and empowerment.

Action learning involves active learning, problem-solving, and systematic inquiry through ongoing reflection to drive changes and improvements. It utilizes collaborative inquiry and ongoing reflection to enhance social situations for the participants and those affected by its

outcomes (Zuber-Skerritt, 2001). The successful application of the action learning approach has been observed among academics and school teachers in Hong Kong, leading to pedagogical enhancements and improved student learning through reflection (Sivan & Chan, 2014). In this project, the principles of action learning were incorporated, guiding students through the four phases of planning, action, observation, and reflection. Previous studies conducted among higher education students have indicated that students' involvement in service learning and action learning enhanced their learning and contributed to their personal growth (Sivan et al., 2016a). The present project expanded on these investigations with an emphasis on secondary school students.

The project took place in Hong Kong where there has been an increasing emphasis in secondary schools on expanding students' learning beyond traditional classroom settings to their community. As part of the school curriculum, students participate in Other Learning Experiences (OLE) and Life-wide Learning where they engage in real contexts and authentic settings for their whole person development (Education Bureau, 2024). The project aimed to enhance secondary school students' positive development through active participation in the intergenerational learning community which incorporates mentoring, life-skill-building activities and opportunities for students' contribution and leadership.

The project consisted of two action learning cycles, with this paper focusing on the second cycle. It involved six types of activities: an induction event, visits to community centers, joint meetings, implementation of activities, reflection sessions, and a consolidation event. The induction event established connections among secondary school students, teachers, university students, and community center representatives. Visits to community centers strengthened relationships and familiarized students with the context and the people they served. Joint meetings between secondary and university students facilitated guidance and support, as university students acted as mentors. Sixteen activities addressing healthy living and well-being were implemented by secondary school students with university students' assistance. Twelve reflection sessions allowed for self-assessment and learning. The consolidation event marked the cycle's conclusion, providing an opportunity to share achievements and celebrate outcomes. This paper presents the results of the study conducted on the second action learning cycle, highlighting the significance of collaboration and community engagement in fostering positive development among secondary school students.

Methods

Research Design

The study adopted a mixed-methods design, integrating quantitative and qualitative research approaches. Both questionnaire surveys and focus group interviews were conducted at the conclusion of the second action research cycle.

Sample

The sample consisted of students (*N=151*) from eight secondary schools who participated in a series of activities as members of an intergenerational learning community involving university students and staff, and older adults from the community. Students were invited to participate through their schools as part of their Other Learning Experiences (OLE).

Questionnaires. A 10-item questionnaire was designed and administered to the sample. The questionnaire included statements related to students' affective and cognitive learning, social engagement, self-reflection, organizational skills and understanding of older adults. Each

item was rated by the respondents on a five–point level of agreement with each item ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The Cronbach's alpha of the questionnaire is 0.955 demonstrating strong internal consistency reliability.

Focus Group Interview. Twelve focus group interviews were conducted. Each group comprised four to seven students. Students were asked to describe their experiences as members of the learning community and share what they learned from these experiences. Interviews were conducted face-to-face by a trained researcher. All interviews were audiotaped with respondents' consent.

Results

The data collected through questionnaire surveys were analyzed using IBM SPSS, with a focus on descriptive analysis. Overall, the students' evaluation of the project was highly positive, as reflected by their strong agreement with the items. Mean scores ranged from 3.82 to 4.08. Students reported significant learning from their collaboration with other community participants, along with improvements in self-reflection and organizational skills. They also developed a strong sense of community engagement, a willingness to serve, and a deeper understanding of older adults. In general, students expressed satisfaction with their learning experiences in the community.

The qualitative data obtained from the focus group interviews were subjected to thematic analysis (Braun & Clarke, 2006). The analysis revealed the emergence of four dominant themes: feeling empowered, respected, and recognized; developing transferable skills; gaining knowledge and understanding of others; and undergoing changes in values and attitudes. Furthermore, within the theme of skill development, four distinct sub-themes were identified including the enhancement of communication skills, fostering the ability to work in a team, cultivating organization and time management skills, and nurturing leadership skills. Corresponding quotations supporting these sub-themes are presented in Table 1.

Themes	Quotations
Enhancement of communication skills	1) "The project nurtured our planning and communication skills. I got the chance to talk, to plan and to discuss with many different people. I became more patient after participating in the project. The project is not only about studying, as you can only go that far with mere studying. We can experience a range of other different things. (I1, S1) 2) "I would have not taken the initiatives to talk to older adults but this time I learnt how to be more engaged and patient and I proactively talked to them. This is my favorite part: learning to communicate with older adults. I also learned how to team up with people from different backgrounds, like the university students and the project team." (I6, S2)

Fostering the ability to work in a team	1) "I think it is really important to work as a team. We spent much time thinking about what activities we should organize for the older adults. We had different opinions but despite the differences, we found our common grounds and worked together to come up with a plan that each and everyone agreed on. It is a great training of team spirit." (I3, S10)
Cultivating organization and time management skills	1) "The project helped me to improve my organizational skills. I want to be a kindergarten teacher and what I need to do in the future, perhaps, is to organize activities for the kids. Although I was planning activities for older adults this time, I learned that activities should be designed based on the needs of the participants. The participants' characteristics, interests and abilities should also be considered." (I5, S2) 2) "I have learned time management. The activity should be more concise. If we really want to do more, we should manage the time better. It is also important to thoroughly discuss our ideas with teammates from other schools since they suggest different activities and ideas, it is important that we are all on the same page." (I3, S11)
Nurturing leadership skills	1) "I have learned to be a leader. I have never got a chance to take the lead. I did not think I can be a leader. The experience of the project proved me wrong. I could give my opinion eloquently to the team. I can work with new people who do not belong to my school. I could spot what was needed to be done to improve. What I have learnt is about what I am capable of." (I6, S1) 2) "I got better communication and leadership skills. We had to speak up when we planned for our activities. There was a time when my groupmates had no ideas, and I voiced out mine and eventually got their approval and recognition. I really feel so good about it. I feel like I am actually pretty good and creative. I tried to be more assertive and courageous when sharing my opinion in our School-Based Assessment activities, instead of looking down on myself as if I am not confident." (I1, S1).

Table 1: Themes and corresponding students' quotations

Conclusion

This paper examined the impact of active participation by secondary school students in an intergenerational learning community that incorporates mentoring, life-skill-building

activities, and opportunities for students' contribution and leadership. The study's findings indicate that students developed personal and social skills, as well as positive values, through their engagement as active members of the learning community. The positive outcomes of the study affirm the importance of maintaining ongoing adult-youth relationships, as demonstrated through the mentoring process experienced with university students throughout all stages of the project. Furthermore, the results highlight the significance of providing activities that facilitate the development of a wide range of life skills, including communication, time management, organization, and teamwork.

Students' accounts and their sharing of concrete examples further illustrate that the opportunities given to them to take the lead in activities greatly facilitated their contribution to the community and the development of their leadership skills. In addition to these substantial contributions to students' positive development, there was also a notable shift in their values and attitudes towards others in their community, particularly older adults, and an increased willingness to continue making contributions. Moreover, students reported feeling empowered and recognized for their efforts and contributions, which enhanced their self-confidence and potentially motivated them to sustain their positive engagement in the community. Based on the study's results, it is recommended to provide students with opportunities to actively engage in their community while creating a safe and supportive environment that fosters their holistic and positive development.

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Analysis of Trends in the Use of Generative AI for Learning by Attributes and Characteristics of University Students

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Abstract
The emergence of generative AI may fundamentally change the way humans create, share, and use information. Generative AI has the ability to generate all kinds of content, including text, music, images, and code. This will change our creative activities and may require us to fundamentally rethink our notions of the attribution of the content produced, the handling of personal, privacy, and confidential information, etc. This would bring about a sea change in society. In education, it could even have the potential to dramatically change the nature of existing educational practices, such as customizing teaching materials and enabling adaptive learning that responds to learning needs, progress, and comprehension. On the other hand, generative AI poses new challenges such as piracy, information reliability, and cheating, which require a new framework of educational architecture to address them. To this end, it is necessary to clarify the use of generative AI in learning, technical knowledge of AI, and psychological awareness of AI by the attributes and characteristics of students as learners, and to use the results in future measures. In this study, a comparative analysis of the use, knowledge, and consciousness of generative AI among students from economics university, engineering university, and sports science university was conducted. The results showed that students at engineering universities were the most active in utilizing generative AI for learning activities, using it for a variety of purposes. Conversely, students at sports science university felt most strongly regarding their anxiety about using generative AI in their university learning and research activities.

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1. Introduction

1.1. The Social Context Surrounding Generative AI

Generative AI is rapidly changing our information search behavior. Today, browser software comes bundled with generative AI by default, or can be easily plugged into the browser. Smartphone applications are also available, making it possible to easily access the information output by generative AI from a wide variety of digital devices. As of August 2023, the number of unique users of ChatGPT is reported to be 180.5 million (Tong, 2023). The global AI market value is expected to reach approximately USD 2 trillion by 2030, compared with approximately USD 208 billion in 2023 (Thormundsson, 2023). Thus, despite the expanding market, social institutions related to AI have not been sufficiently responsive to the need to address the associated issues, although the need for such initiatives has been identified.

Some have pointed out that this generative AI has the potential to transform the structure of society as well. For example, Stanford University's (2021) AI100 project predicts that the development of AI will bring about significant transformations in areas such as labor markets, education, and public safety. Nomura Research Institute (2023) defined the emergence of generative AI as the fourth AI boom, noting that the ability to generate language, images, and voice via chat functions has the potential to transform industrial structures. Suzuki (2018) noted that the introduction of AI will drive structural changes associated with technological innovation in various areas of human society, including production, mobility, finance, logistics, medicine, care, and education, and the need to foster science and technology into a culture that enables value creation and innovation, given its impact on social institutions and organizations.

The remarkable spread of generative AI in society may also cause new social problems, and it is necessary to deal with such risks. Kamikawabe (2023), based on the regulatory efforts of the European Union, the United States, and the United Kingdom, discusses the direction of regulatory policy from the "human-centered AI development perspective" of the Japanese government. Idei (2018) discusses the current status and issues of intellectual property rights related to AI products and examines measures to address them in order to realize "Society 5.0" as Japan's vision of an ICT society. Shinpo (2023) mentions that, as the establishment of necessary rules for AI, it is also important to consider legal regulation through the enactment of substantive prohibitions for issues that cannot be compensated by merely examining soft law as principles and guidelines.

1.2. Impact of Generative AI on Education and Research Fields

Generative AI is also impacting the education and research fields. Generative AI has high potential, and its capabilities continue to evolve on a daily basis. For example, ChatGPT-4 has been reported to produce passing-level answers to all US Certified Public Accountant (CPA), Certified Management Accountant (CMA), Certified Internal Auditor (CIA) and Certified Tax Accountant (EA) exams (Jolly, 2023).

Although generative AI can produce highly accurate answers to standardized knowledge-based examinations, it cannot provide accurate answers to non-standardized questions at present. This is because such AI only generates and outputs a certain level of “plausible sentences” based on probability theory from a vast amount of data collected by large-scale language models (LLMs).

Additionally, it has been indicated that if there is bias in the data used for learning, the resulting output may also be biased (Angwin, Larson, Mattu & Kirchner, 2016). Critical thinking is required to make appropriate judgements regarding the biases produced by such learning algorithms.

Furthermore, great care must be taken with the input of personal and sensitive information; although it is stated that no user-specific data are stored in ChatGPT, all conversations between ChatGPT and the user are stored, and these data could be used to improve the language model (OpenAI, 2023). If personal or sensitive information is entered, the risk of such sensitive information being viewed by the development engineers of generative AI cannot be excluded.

Generative AI is thus going to have a significant impact in the fields of education and research. If students are able to use generative AI effectively and appropriately, the effectiveness of education and research will be enhanced. To this end, it is necessary to clarify the current status of educational use of generative AI.

2. Literature Reviews

In order to examine the appropriate use of generative AI in university education, this paper will review previous studies related to this research theme. First, review research initiatives on generative AI by the Japanese government and social organizations. The Ministry of Education, Culture, Sports, Science and Technology (MEXT) (2023) has indicated a direction for handling the educational aspect of generative AI in universities and technical colleges. The MEXT (2023) takes the position that it is important for universities and colleges of technology to respond proactively, including reviewing the contents of the guidelines in light of future changes in circumstances, in accordance with the actual conditions of their respective education. The Personal Information Protection Committee (2023) mentions the need to continue to monitor the use of generated AI, including education, to ensure the proper handling of personal information and to protect the rights and interests of individuals.

University Co-Op (2024) conducted a survey of students and found that although generative AI is gradually becoming popular among students, its use in studies and student life is still in its infancy. The survey revealed that about 30% of students are using interactive AI on an ongoing basis.

Next, turn to research on issues related to the actual usage of generative AI in schools and universities. Fujimura (2023) mentions how generative AI can be effectively used in education, based on the fact that the educational usage of generative AI has been the subject of active debate, including both pros and cons. On the other hand, he points out that there is a lack of research on improving the skills of teachers. Uchida (2023) discusses the impact of generative AI on the work of university faculty members, citing examples from the educational engineering approach, and examines the impact of generative AI on educational activities and countermeasures. Norizoe (2023) clarified students' use of generative AI based on a case study of generative AI use at Kyushu University. He points out the importance of using generative AI as a tool to help learners think for themselves.

However, these previous studies have not focused on trends and attitudes toward the usage of generative AI among university students in their respective areas of expertise, nor on educational issues. If issues in each area of specialization of university students could be

highlighted, it would be possible to accurately address the educational issues related to the usage of generative AI in a way that is appropriate for each.

3. Survey Methodology

In order to clarify trends in the use and consciousness of generative AI among university students in their respective fields of expertise, as well as educational issues in each field of expertise, this research investigated trends in the usage of generative AI at a sports science university, an engineering university, and an economics university with liberal arts programs. The questionnaire was administered between December 1 to 22, 2023. It was completed using Google Forms. Participants were first- to fourth-year students at each university.

At the sports science university, 152 students were surveyed, with a valid response rate of 149. At the engineering university, 32 students responded to the survey. The economics university received responses from 20 respondents. Answers were provided to 33 questions using a 7-point Likert scale, with free-text, single-choice, and multiple-choice methods interwoven, as appropriate. This survey was conducted in accordance with the ethical code; no personal information of the participants was collected, and no questions that imposed on the individual's privacy were asked.

Item	Contents
Purpose of the survey	Trends in and attitudes toward the use of generative AI by university students by field of expertise
Period of implementation	1 - 22 December 2023
Survey method	Web-based questionnaire using Google Forms
Participants	Sports science university: number of responses: 152, valid responses: 149 Engineering university: 32 Economics university: 20
Answer format	7-point Likert scale, free-text, single-choice, multiple-choice
Number of questions	33

Table 1: Summary of Survey Implementation

4. Analysis of Questionnaire Data

4.1. Experience With Generative AI

When asked about the experience of using generative AI among students at each university, 87.5% of the students at engineering university and 60% at economic university used it. On the other hand, the use rate among students of sports science university was 30%, a very low level compared to other universities. Significant differences (<0.01) were also found in the results of the 2 x k χ-square test.

	None experienced	Experienced	Percentage	P-value
Sports Science Univ. (n=149)	105	44	30%	<0.01
Engineering Univ. (n=32)	4	28	87.5%	
Economics Univ. (n=20)	8	12	60%	

Table 2: Experience with generative AI

4.2. Fear of Relying on Generative AI

Students at each university were asked a question to clarify their perceptions of whether or not they would be likely to rely on a generative AI. The students were asked to answer on a 7-point Likert scale (1: not at all agree, 2: mostly disagree, 3: somewhat agree, 4: undecided, 5: somewhat agree, 6: quite agree, and 7: completely agree).

The analysis showed that students in engineering (5.15) and economics (4.15) universities were more concerned that they might rely on generative AI, while students in sports science (3.5) were less aware of the possibility of relying on generative AI. A Mann-Whitney U-test was conducted and found a significant difference (p=0.03) among the three. In particular, the students in the engineering university had higher negative attitudes.

	Average Rating	P-value
Sports Science Univ. (n=149)	3.5	
Engineering Univ. (n=32)	5.15	0.03
Economics Univ. (n=20)	4.15	

Table 3: Fear of relying on generative AI

4.3. Expectations of Increased Intelligence Through Generative AI

Students from each university were asked about their expectations regarding whether or not a generative AI would enhance their intelligence, using a 7-item Likert scale. The results of the analysis showed a tendency to believe that a generative AI would enhance their knowledge among students in the engineering university (4.4) and the economics university (4.6). On the other hand, students in the sports science university (2.95) showed lower expectations. A significant difference (<0.01) was also indicated in the Mann-Whitney U-test.

	Average Rating	P-value
Sports Science Univ. (n=149)	2.95	
Engineering Univ. (n=32)	4.4	<0.01
Economics Univ. (n=20)	4.6	

Table 4: Expectations of increased intelligence through generative AI

4.4. Perceptions of the Accuracy of the Content Output by the Generative AI

Students from each university were asked about their attitudes toward the accuracy of the output of the generative AI, using a 7-item Likert scale. The results of the analysis showed that students in engineering university (4.05) and economics university (3.65) tended to rate the accuracy of the output results of the generative AI higher than those in sports science university. A significant difference (<0.01) was also indicated in the Mann-Whitney's U test.

	Average Rating	P-value
Sports Science Univ. (n=149)	2.25	
Engineering Univ. (n=32)	4.05	<0.01
Economics Univ. (n=20)	3.65	

Table 5: Perceptions of the accuracy of the content output by the generative AI

4.5. Recognition That the Data You Entered Is Being Analyzed

Students at each university were asked to identify whether or not they were aware that providers of generative AI use the input data to analyze its content and use it to improve their services. The results showed that students in engineering university had the highest level of consciousness, with 90.1% of students aware of the system. Students in the economics university was 65% aware. On the other hand, students at the sports science university had a lower level of consciousness at 37.6%. However, a 2 x k χ-square test on the responses of the three universities yielded a result (0.52) that was not significant among the three.

	Did not recognize	Recognized	Percentage	P-value
Sports Science Univ. (n=149)	93	56	37.6%	
Engineering Univ. (n=32)	3	29	90.6%	0.52
Economics Univ. (n=20)	7	13	65%	

Table 6: Recognition that the data you entered is being analyzed

4.6. Acceptance of the Use of Input Data for Analytical Purposes

Students at each university were asked questions using a 7-point Likert scale to assess the acceptability of the providers of generative AI to use the input data and analyze its content. The results of the analysis showed that students from the sports science university (3.51) were more accepting of their input being analyzed for data than students from the engineering university (2.47) and the economics university (2.9). A Mann-Whitney U-test also showed a significant difference (<0.01).

	Average Rating	P-value
Sports Science Univ. (n=149)	3.51	
Engineering Univ. (n=32)	2.47	<0.01
Economics Univ. (n=20)	2.9	

Table 7: Acceptance of the use of input data for analytical purposes

4.7. Concerns Regarding the Use of Generative AI

Students at each university were asked using a 7-point Likert scale to determine whether or not they were concerned about the use of generative AI in their university learning and research activities. The results showed that students in the sports science university (3.89) were the most anxious, followed by students in the economics university (3.15), who were more conscious of the issue. The least anxious were the students of engineering university (2.81). A Mann-Whitney U-test also showed a significant difference (<0.01).

From this result, it can be inferred that in sports science university, where the percentage of students using generative AI is low, there is a lack of knowledge and experience in how to use such AI in education. This is supported by the fact that students in engineering university, which use the most generative AI and learn in an environment that is most conducive to using it, have the lowest sense of anxiety. In order to remove their sense of insecurity, it may be necessary for them to try using generative AI and experience its advantages and disadvantages.

	Average Rating	P-value
Sports Science Univ. (n=149)	3.89	
Engineering Univ. (n=32)	2.81	<0.01
Economics Univ. (n=20)	3.15	

Table 8: Concerns regarding the use of generative AI

4.8. Expectations of What Generative AI Can Do for My Future

For students at each university, questions were asked using a 7-item Likert scale to assess whether or not they believed that generative AI would be useful for their future. The results showed that students in engineering university (5.38) had the highest expectations, followed by students in economics university (4.7). In contrast, students in the sports science university (3.94) had the lowest expectations for being useful in the future. There was also a significant difference (<0.01) in the Mann-Whitney U-test.

Students at engineering university are likely to have a high positive attitude toward the use of AI, since they have acquired knowledge and skills related to ICT technologies, including AI, and are planning to use them in their future careers. In contrast, students in sports science university is not currently engaged in learning sports science-related subjects using AI or in enhancing their competitive skills using AI, which may be the reason for this.

However, in sports science and athletics, AI has been used to improve athletic performance by analyzing exercise data, and such technology has already been introduced in top-level consultative organizations. It can be inferred that the introduction of such ICT technology at the undergraduate level will have a positive impact on the expectation that AI will be useful for one's future.

	Average Rating	P-value
Sports Science Univ. (n=149)	3.94	
Engineering Univ. (n=32)	5.38	<0.01
Economics Univ. (n=20)	4.7	

Table 9: Expectations of what generative AI can do for my future

5. Discussion

The highest percentage of students at engineering university (87.5%) used generative AI, followed by economics university (60%). On the other hand, the rate of use among students of sports science university was 30%, which was extremely low compared to other universities. The use rate for engineering university students is considered to be high because they are studying and researching AI technology. In contrast, sports science university students study and research mainly sports science skills, and thus have fewer opportunities to experience the latest technology.

Regarding the concern about over-reliance on generative AI, engineering university students had the highest concern, followed by economics university, and sports science university students had the least concern about relying on generative AI. Since many students at engineering universities actually use generative AI, it can be assumed that many of them are familiar with its usefulness. This is believed to be the reason for this ranking of the concern.

With regard to expectations for increasing the intelligence of the generative AI and to the accuracy of the content output by the generative AI, the results also showed a high level of concern among engineering and economics universities, and a low level of concern among sports science university students. It can be inferred that the students' responses to these questions also reflect the fact that they have actually used AI to generate AI, and thus tend to be able to envision its future possibilities, and that they are conscious of the level of quality of the output.

Conversely, students at sports science university felt most strongly regarding their anxiety about using generative AI in their university learning and research activities, followed by students at economics and engineering universities. In this result as well, it is thought that the anxiety about a technology they have never used before may have led to this difference in consciousness.

6. Conclusion

Currently, generative AI is permeating the field of education and research at universities, raising concerns not only about the possibilities of using it, but also about the various educational risks involved. Such trends are likely to vary within each university's field of expertise.

In order to examine such questions in depth, this study surveyed students in sports science, engineering, and economics universities to determine trends in the usage of generative AI and their attitudes toward it. The results of the survey showed that students in sports science university tended to be more negative in their attitudes toward generative AI than students in other universities. One reason for this may be that the usage rate of generative AI by sports

science students is extremely low compared to other universities. If the use of generative AI becomes more widespread among sports science students, their acceptance of generative AI may also increase. If they can utilize generative AI favorably and appropriately, it may have positive consequences for their future. This will be the subject of the next research project.

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