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***Problems of Writing Discussion Section in the Doctoral Dissertation:
Advisors' and Their Doctoral Students' Perspectives***

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Abstract

In doctoral study, students including English as a foreign language (EFL) students are generally required to write a dissertation and, as a growing literature shows, EFL students often have problems in the writing of this section. While the majority of this research has focused on advisor perceptions, only a few studies have also focused on student perceptions. Most of the perceptions have centered on students' problems when writing dissertation on the whole, instead of particular section. The present study, based on in-depth interviews with three advisor-student pairs, focused on students' problems in writing the discussion section of the dissertation and explored the degree to which the perceptions of the students were line with those of their advisors. The study showed that: (1) students had a rather limited understanding of the overall picture of the discussion section in comparison with that of their advisors; (2) there was a gap between advisors and their students in terms of understanding the nature and cause of the students' problems; (3) students were inclined to use limited English language proficiency to explain their problems while their advisors gave reasons not predominantly related to their language proficiency; and (4) there was incongruence between advisor and student understanding of writing objectives and audience expectations. In view of these findings, it is critical to help students understand the expectations of the academic community. The importance of on-going dialogue between advisor and student cannot be overemphasized. Finally, recommendations are made for helping EFL doctoral students in writing development.

Keywords: doctoral dissertation; writing problems; discussion section; EFL; advisor-student perceptions

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Introduction

Writing problems faced by EFL students at different proficiency levels have been the topic of on-going research in the past few decades (e.g., Casanave, 2010; Gazza et al., 2013; Kamler & Thomson, 2014; Komba, 2016; Paltridge et al., 2012a; Paltridge et al., 2012b; Swales & Feak, 2012). Whereas much attention has been paid to exploring problems in undergraduate and graduate coursework papers, few studies have examined the degree to which these problems continue to pose for graduate EFL students writing a dissertation in English, particularly for doctoral students in writing discussion section.

More recently, studies have started to explore whether, and the degree to which, such students have problems in understanding and meeting the requirements of writing the dissertation. In this background section, past literature regarding the nature of these problems is reviewed.

Literature Review

Problems in writing at sentence and paragraph levels

Dissertation writing plays an important role for doctoral students in the academic community. As suggested by Swales and Feak (2012), it is of great importance to understand diverse student writing practices in academic literacy across the university. Nonetheless, dissertation writing is far from a natural ability. EFL doctoral students often have more problems than native English speakers, particularly at sentence and paragraph levels, such as the use of vocabulary, grammar, mechanics, ideas, and arguments (e.g., Flowerdew & Li, 2009; Komba, 2016; Kwan, 2008).

As stated by Bartholomae (1985), students in the university have to learn “the peculiar ways of knowing, selecting, evaluating, reporting, concluding, and arguing” (p. 134) in writing that define the discourses of the academic community. As a matter of fact, full-fledged EFL researchers also had difficulties with language (Flowerdew & Li, 2009; Li & Flowerdew, 2009), revealing that the language problem is a widespread concern for many EFL writers.

Problems in understanding the requirements of the dissertation genre

In addition to the problems in writing at sentence and paragraph levels, understanding the requirements of the dissertation genre has been pointed out in a number of studies (Cooley & Lewkowicz, 1997; Dong, 1998; Gazza et al., 2013; Kamler & Thomson, 2014; Komba, 2016; Paltridge et al., 2012a; Paltridge et al., 2012b; Swales & Feak, 2012). They particularly indicated that students have problems understanding what content is appropriate for each chapter and section of each chapter, and are unsure about how it should be organized. Kamler and Thomson (2014) explained that these problems are probably due to a lack of clear understanding in text logic. However, as Swales and Feak (2012) explained, they are likely because of a limited understanding of the function of the genre and of their advisors’ expectations.

As for students’ problems in writing dissertation reported by advisors, their major concern is the positioning of arguments in light of the wider literature as a whole. For

instance, they state that students usually either overstate or understate the significance of their findings related to the previous literature. As pointed out by some advisors, this problem could be owing to a failure to use appropriate modal or reporting verbs when making arguments about the findings of their research (Cooley & Lewkowicz, 1997; Kamler & Thomson, 2014; Parry, 1998). Other advisors commented that positioning problems can happen when students have a different understanding of the new academic community or are unsure about who their audience is and what its expectations are (Belcher & Hirvela, 2005; Casanave, 2010; Hirvela and Belcher, 2001; Komba, 2016). It is noted that some studies (Dong, 1998; Knight, 1999; O'Connell & Jin, 2001) explored Chinese students in particular and showed that graduate students have problems with making arguments and rebuttals, with the use of specific and concrete evidence to support their claims, and with the critical thinking and judgment of theories. These problems are likely due to the fact that they have been taught to show respect and not to question the viewpoints of their advisors.

Context in Taiwan in dissertation writing

In Taiwan, although writing dissertation in English has become a requirement for doctoral students in more and more universities, nevertheless, it is usually an additional burden on them because of their lack of academic English writing experiences. For doctoral students in universities in Taiwan, particularly the top ones, most assignments for courses and dissertations are required to be in English. However, despite the fact that this group of students has been continuously required to write research articles in English, their academic writing proficiency is still low (Huang, 2010, 2014, 2017). A major reason may be that few academic English writing courses are provided and most students had never learned how to write academic English compositions as college students. For doctoral programs in Taiwan in general, in addition to some credit-bearing courses, such as 'Thesis Writing' and 'Advanced English Writing', students often do not need to take any other English or writing courses.

Gap in the literature

In view of the previous literature, it can be seen that graduate EFL students may have a number of problems in writing at the sentence and paragraph levels, as well as in understanding the requirements of the dissertation genre. To ensure that students are provided with the best possible start in doctoral programs, it is crucial to understand doctoral students' experience in learning to write dissertation. With this purpose in mind, this study sets out to investigate Taiwanese doctoral students' dissertation writing in English, with a specific focus on their problems encountered in writing the discussion section, both from advisors' and students' perspectives. As suggested by Woodward-Kron (2007), "more research is needed in different teaching contexts and at various stages of students' writing in order to provide a greater understanding of the writing support" (p. 253).

Because a dissertation consists of different sections, students may find some more problematic to write than others. Previous studies (e.g., Kamler & Thomson, 2014; Swales & Feak, 2012) suggest that the discussion section is likely to be more problematic for EFL students, especially if they are educated in an epistemology that does not foster critical thinking. Thus, it is important to explore the level of

understanding that advisors and students have of the purposes of writing the discussion section in doctoral dissertation. Second, past studies showed advisor and student perceptions of the kinds of problems that EFL students had in writing their dissertation. Nevertheless, they did not specifically focus on the problems that they might have in writing the discussion section. Finally, past studies showed problems perceived by advisors and students. However, it did not examine whether there is a mutual understanding of the problems between advisor and student. Three research questions are addressed in the study:

1. What do advisors and students perceive as the purposes of writing the discussion section in doctoral dissertation?
2. What do advisors and students perceive as the problems of doctoral students in writing the discussion section?
3. How does a student's perceive his/her own writing problems in comparison with those of his/her advisor?

Research Method

The participants were 3 doctoral dissertation advisors and their students from a university in Taiwan. The programs included business management, economics and sociology. The students generally strived to improve their academic English writing skills and were in search of excellence in the fields of their studies. The details about the advisors' and students' demographic data are listed in Tables 1 and 2.

Table 1. Advisors' demographic data

Name	Sex	Discipline	Length of interview (hr)
Amy	F	Business Management	1.5
John	M	Economics	1
Sue	F	Sociology	1.5

Table 2. Students' demographic data

Name	Sex	Doctoral year	Discipline	Length of interview (hr)
Bill	M	3	Business Management	1
Emily	M	3	Economics	1
Jean	F	4	Sociology	1

Three pairs of interviews were conducted between winter of 2017 and spring of 2018. Each pair consisted of an interview with a dissertation advisor and an interview with one of the doctoral students that the advisor was supervising.

Data collection

University teachers were invited to participate in the present study. Those who were willing to take part in this study would nominate a student whom they were supervising at the moment. The researcher then invited the nominated students to participate. Three students participated in the study. The individual in-depth semi-structured interviews were held when the students were at the time writing up their dissertations. In other words, the students already submitted drafts of their

discussion section and had feedback from their advisors. The interviewees (i.e. advisor and student) could bring copies of the student's discussion section to the interviews to refer to. It should be noted that in the departments in which the students were writing their dissertations, the dissertation may include a discussion section either as an independent chapter or as a section within the results chapter.

Specifically, the interviews with the advisors were based on a two-part interview phase. In the first part, the advisors were asked to talk about their experiences of supervising doctoral dissertations and the discussion section. They were asked about the number of students they had supervised, their perceptions of what a discussion section included the strengths and problems they found in students' writing of this section. There was also a list of specific possible writing problems in different aspects, such as understanding the purposes of the discussion section, selecting content, organizing content, and showing appropriate stance, grammar and word choice. In the second part, the advisors were asked about their perceptions of the discussion section of the student participating in the study. The interviews were conducted in their first language (i.e. mandarin Chinese), and were all audio-recorded (with the advisors' and students' consent) and fully transcribed. The length of each interview ranged from one to two hours.

Data analysis

Qualitative interviews were analyzed and interpreted in an attempt to understand problems of writing discussion section in the doctoral dissertation from advisors' and their doctoral students' perspectives. The data were analyzed using a general inductive approach for qualitative data analysis (Thomas, 2006). The goal of data analysis was to identify and generate categories in response to research questions, grounded in the data.

The first step in the inductive analysis process was to prepare the raw data files for viewing. The next phase was to read through each page and/or piece of the raw data so that it was possible to be familiar with the data and start thinking about ways to categorize the information. After this stage, the researcher reread the data, identified and defined categories. The fourth stage of the inductive analysis process was to reduce overlap and remove uncoded text from the relevant categories. This helped 'trim down' the bulk of the data collected. Finally, the researcher continued to revise and refine the category system.

To make the study credible and rigorous, two different techniques were achieved using participation review and coding consistency check. First, participation review was achieved by presenting advisors' and students' voices under each theme and by providing detailed description of each of the cases. Triangulation was used consistently with each advisor and student in general. Each of the advisors and students interviewed was asked to review the transcribed interviews to add, delete, or amend any statements made. The transcribed interview documents were then emailed to each student and requested an email response with any comments included in their interview document. To make sure validity and reliability (Merriam, 2002), member checks were used by sending interpretations back to advisors and students by email or via hardcopy to ensure that they were accurate. In this return email each advisor and student was asked to give consent that the information provided in the transcribed

interview document was accurate and aligned with their views and opinions.

Finally, as in all of the interviews with advisors and students the language was conducted in Chinese, the quoted data were translated into English where appropriate and were checked against an experienced EFL educator, and possible errors were discussed to ensure that the intended meaning was conveyed in the translation and corrected as appropriate.

Three main categories (emergent themes) in the study were perceptions of the purposes of the discussion section, perceptions of students' problems in writing the discussion section, and similarities and differences in the perspectives between advisor and student. When the data in an interview were reported in this study, they were indicated by the pseudonym of the interviewee, e.g., Emily.

Results

The comments made by the participants about the purposes of the discussion section were explored. The following three main categories resulting from the transcription and coding of advisor and student responses in the interview data showed the problems of writing discussion section in the doctoral dissertation from advisors' and students' perspectives.

Perceptions of the purposes of the discussion section

Tables 3 and 4 show the perspectives of the advisors and those of their students.

Table 3. Perceptions of advisors regarding the purposes of the discussion section

	Amy	John	Sue
To highlight and discuss the results	✓	✓	✓
To relate and connect between the results and the literature	✓	✓	✓
To interpret and evaluate the results	✓	✓	✓
To consolidate key concepts	✓	✓	✓

Table 4. Perceptions of students regarding the purposes of the discussion section

	Bill	Emily	Jean
To summarize the results	×	✓	×
To show the results	✓	×	✓
To relate and connect between the results and the literature	×	✓	×
To discuss the implications of the results	×	✓	×
To express viewpoints in light of the results	×	✓	×

Table 3 shows the advisors had similar perspectives. All indicated that the discussion section should highlight and discuss the results, relate and connect between the results and the literature, interpret and evaluate the results, and consolidate key concepts. Comments made about students' problems revealed the advisors' perceptions, for instance: "Students do not have a clear idea about the purpose of this section and find it difficult to relate and connect between the results and the literature. Rather, they are

inclined to come up with explanations of their results” (Amy) and “She does not refer to the literature to explain results but tries to do it by herself. At the moment when she does use the literature, she does not really use it judiciously. From time to time, the literature just comes up all of a sudden” (Sue).

Table 4 shows that shared understanding among the students was limited. Two of the students had the similar idea. Bill and Jean both considered the purpose of the discussion section in terms of showing the results. Emily considered the purposes of it in terms of summarizing the results, relating and connecting between the results and the literature, discussing the implications of the results, and expressing viewpoints in light of the results.

Except Emily, the students (Bill and Jean) had less to say about the purposes of the discussion section than the advisors. They saw it as having only one purpose (to show the results). Emily pointed out that the discussion section should not only summarize results and relate and connect between the results and the literature but also be a forum for the student to express her own viewpoints and discuss implications. The advisors commented the role of the discussion section in providing interpretations of results and consolidations of key concepts but these students did not talk about these ideas.

Perceptions of students’ problems in writing the discussion section

The comments made by the participants about students’ problems in writing the discussion section were explored. Tables 5 and 6 show the perspectives of the advisors and those of their students.

Table 5. Perceptions of advisors regarding students’ problems in writing the discussion section

	Amy	John	Sue
Lack of connection between sections/arguments	✓	×	✓
Lack of generalizations	✓	×	✓
Lack of introductions	✓	✓	×
Lack of English language proficiency (vocabulary/grammar)	✓	✓	✓
Convoluted writing with arguments/details insufficiently given and justified	✓	×	✓
Inconsistent use of terms	✓	×	×
Unpolished writing	×	✓	×
Lack of understanding about discussion section as a genre	✓	✓	✓

Table 6. Perceptions of students regarding their problems in writing the discussion section

	Bill	Emily	Jean
Expression of connections between ideas and using transition signals	✓	✓	✓
Clarity of expression of ideas	✓	×	✓
Overall organization of sections	✓	✓	✓
Writing paragraphs	×	✓	✓

Delimiting content	×	✓	×
Giving appropriate arguments	✓	×	✓
Simple writing	×	✓	✓
Lack of English language proficiency (vocabulary/grammar)	✓	✓	✓
Knowing what should include in the discussion section	✓	✓	✓

The advisors had similar perspectives. They all stated that, as a whole, students did not have a full understanding of the discussion section as a genre. One problem mentioned in this respect was closely related to the discussion section to make connections between the present research and the previous literature. For example, Amy pointed out the problem as follows: “I think that students tend to give much weight to their own interpretations and not to use other previous literature to support their arguments. It seems they rely on themselves and their own interpretations instead of more academic-like arguments.”

The advisors all mentioned that the lack of English language proficiency of their students could sometimes be an obstacle. They stated a number of specific points including an inability to hedge, limited ability to choose right words, and vocabulary and grammar problems. Two (Amy and Sue) pointed out that, at times, the written expression of ideas was weak. Specific problems included: a lack of clear articulation of how sections/arguments are connected; a lack of generalizations in the discussion section, arguments being convoluted, and details not being well developed.

The students identified from six to eight problems each. In line with the perception of their advisors, all students indicated that they did not have a full understanding what should include in the discussion section. For example, one student mentioned that she had to ask her advisor what needed to be included in the discussion section. Another mentioned that she realized from her advisor’s suggestion that she had mixed the results and discussion sections without giving a clear distinction between them. Like the advisors, the students all raised the issue of the lack of English language proficiency. For the students, this was perceived as the major problem in their writing. Each mentioned specific language problems (e.g., breadth and depth of vocabulary, language to explain and interpret results of statistics, make comparison and contrast). Jean pointed out that she sought to deal with language problems by consulting the words and phrases in the dictionary.

It is noted that like the advisors, all students indicated problems in expressing and clarifying the relationship between ideas. Nonetheless, unlike the advisors, they regarded this as correct use of transition signals (but, instead of, despite, etc.).

Finally, Emily and Jean in particular were worried about their writing style. They had been asked by their advisors to write clearly. However, they found that their writing was quite simple and boring. In addition, both of them also had problems in writing good paragraphs. On the other hand, Emily found it hard to select content. Sometimes she had too much to say and it was difficult for her to throw away any of her work.

Similarities and differences in the perspectives between advisor and student

In the interviews, the advisors were asked about their student's strengths in writing the discussion section. Although all indicated some strengths, nonetheless, the major focus of this study was on problems. This section reports each advisor's perspectives of the major problem of his/her student and the image that the advisor used to describe it. The image is then compared with statements commented by the student, showing what the student perceived as his/her major problems.

Pair A: Image of the advisor—The holistic arguments

Amy regarded that Bill had tunnel vision to some degree. He was inclined to write about his study narrowly without making links to the holistic arguments of existing literature. Bill could think about "how the result relates and connects to other researchers' findings and figure about the implications." Amy regarded that Bill sometimes also "struggled to present the holistic arguments" by delving into a number of details about his findings rather than developing his major arguments.

Bill found a major problem for him was that he was unable not express ideas clearly because he had problems in linking different ideas and did not use transition signals appropriately. Amy also indicated that Bill sometimes had difficulties in expressing his ideas clearly and effectively. As stated by Amy, Bill expressed ideas weakly because he did not make adequate generalizations in the discussion section and focused too much on details.

Pair B: Image of the advisor—Too much weight to her own interpretations

John regarded that Emily had the tendency to rely her writing too much on her own interpretations and that she did not discuss adequately the connections between her results and the previous literature. He regarded that Emily gave too much weight to her own interpretations and sometimes "inserted her own thinking into the data."

Emily regarded that the purpose of the discussion section was to express her own viewpoints about the results. In the interview, she pointed out that despite the need to make links to the previous literature, there is a stronger need to express her own viewpoints. For instance, she mentioned how she aimed to produce "an amalgamation of my thinking with the result." Emily regarded that her major problem was the lack of English language proficiency and that she made too many errors in the use of vocabulary and grammar. John admitted that Emily had some problems with her English language proficiency but as stated by John, this was not a critical matter. John mentioned that she could "neglect grammar" at the present stage.

Pair C: Image of the advisor—Convoluting writing

Sue regarded the major problem was that Jean's writing at times lacked clear argument and was convoluted. In other words, her different ideas were mixed together. There was an urgent need, Sue felt, for Jean to separate out ideas, explain and justify the rationale behind them, and show how they were connected. Sue mentioned that sometimes she had to figure out Jean's real intention and meaning. She regarded that it was likely that this problem took place because Jean thought in Chinese and then translated into English. Her major problem was in conveying meaning clearly and that this was associated with her lack of English language proficiency. She did not have a good grasp of English language; therefore, there was a problem for her to disentangle

the complicated concepts that she had to express.

On the other hand, Jean regarded that her major problem was her lack of English language proficiency. She lacked such as tool to freely express her ideas. During the interview, Jean commented that she had difficulties in writing English well. Sue, her advisor, had seen language as one of the factors leading to the lack of clarity in English writing but not as the major reason. Jean was also concerned that her English writing was simple and boring. However, what Sue required was clearer expression of intended meaning.

Conclusion

The purpose of the study is to examine problems of writing discussion section in the doctoral dissertation from advisors' and their doctoral students' perspectives. The results were in line with some of the earlier research findings of advisors and students about problems that students face at the sentence and paragraph levels (e.g., Swales & Feak, 2012; Cooley & Lewkowicz, 1997; Dong, 1998; Flowerdew & Li, 2009; Komba, 2016) as well as offered some new understandings of the perceptions of advisors and students regarding the problems in writing the discussion section. In response to the first research question, it was not surprising to find that the advisors had a similar understanding of the purposes of the discussion section in view of their level of experience in conducting and writing up different research projects and in supervising many other doctoral students. On the other hand, there was little similarity in perspectives among the students. As shown in the interview data, not all students indicated the need to summarize the results, relate and connect between the results and the literature, discuss the implications of the results, and express viewpoints in light of the results. Especially in light of no need to summarize the results in the discussion section, this limited understanding of this section was somewhat a surprise.

The second research question explored advisor and student perceptions of the problems of students in writing the discussion section. Not surprisingly, there was a good deal of similarity in the perspectives of the advisors. As earlier research has revealed (Casanave, 2010; Cooley & Lewkowicz, 1997; Dong, 1998; Kamler & Thomson, 2014), all advisors acknowledged their students' problems with limited language proficiency. Moreover, the advisors made repeated reference to problems in constructing and developing clear arguments. Many of the problems were also mentioned by the students. First, students talked about their problem concerning what content should be included in the discussion section and how it should be organized. This was a bit surprising in light of the amount of time and efforts that the students devoted and feedback received from their advisors. Like the advisors, the students also talked about their English language problem. However, the student were inclined to view their problem more at the sentence level while the advisors view it more in terms of constructing clear meaning at the paragraph level and in terms of understanding about discussion section as a genre. It became apparent in the interview data that the advisors had a higher level of awareness of the underlying reasons of their students' problems than their students had. This in turn indicates that advisors have a role to play in helping their students identify and recognize the fundamental problems in writing the discussion section.

In response to the third research question, the results showed a certain degree of similarity between advisor and student perceptions of what posed the major problem for the students in writing the discussion section. In view of the absence of studies in paired perceptions, further research is needed to explore the degree to which this is a worldwide problem and why such incongruences exist. On the one hand, they may be due to communication problems between advisors and students. However, on the other hand, they may take place because students are not able to solidly internalize and remember their advisors' instruction.

One of the new understandings from this study was the level of problem that students had in meeting the requirements of the discussion section as a genre. Both advisors and students indicated that students were unsure about the purposes of the discussion section. More importantly, it showed that the advisors had a more comprehensive and thorough understanding of these problems than the students did. Another important finding was the limited mutual understanding between advisors and their students about the major problem the students had in writing the discussion section and about the underlying reasons of the problem. The students tended to use limited language proficiency to explain their problems while the advisors gave explanations not mainly related to English language proficiency.

Finally, based on the findings, suggestions can be offered to advisors. If they can identify and recognize the main problem that their students have and reflect on the underlying reason of the problem, it could be possible to solve it during the supervision. Nevertheless, some problems may not be easily overcome. For instance, those which rely more on English language proficiency may be more difficult to solve than those related to the specific genre requirements. The problem with connecting different ideas and using transition signals, as the advisors pointed out, may be a more cognitive issue than linguistic one.

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Mandarin Language Classroom Anxiety: Basis for a Proposed Teacher Manual

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Abstract

This study investigated the Mandarin language classroom anxiety of the Grade 8 to 10 students from two schools in Pampanga – Don Jesus Gonzales High School, Pandacaqui, Mexico and Mabalacat National High School, Dau, Mabalacat – with 253 language learners as the respondents of the study. The Chinese Language Learning Anxiety Scale of Lou (2014) was adopted as research instrument which measured the level of language anxiety of the respondents, and the Factors Affecting Foreign Language Learning Process with 24 items adapted from the Foreign Language Classroom Anxiety Scale of Horwitz, et al. (1986) was developed by the researcher and validated by the experts. To interpret the data, statistical tools such as mean and Pearson-r were used. The findings revealed that the respondents' level of Mandarin classroom language anxiety had a significant relationship with the factors affecting their language learning process. However, there was no significant relationship between the level of anxiety and the respondents' performance and the factors that affect the language learning. With these results, the researcher concluded that the design of the teacher manual must focus with the discussion of Mandarin language classroom anxiety and the factors affecting it.

Keywords: foreign language anxiety; Mandarin; teacher manual

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Introduction

The language learning capacity of students across cultural backgrounds has been a common subject in researches. Researches have helped most language educators to have sensitive responses to the needs of classroom instruction, teaching methods and techniques, and instructional materials that suit to language learners over situation. However, there are language learners who are still having a rigid time grasping a new language that can be seen through their performances. Accordingly, Riasati (2011) has confirmed that anxiety is one of the key factors prompting in foreign language learning.

Speilberger (as cited by Huang, 2012) has defined anxiety as a personal feeling of tension, apprehension, nervousness, and worry related with an arousal of the autonomic nervous system which scholars have considered the anxiety-provoking potential of learning a foreign language. Motivation, curriculum, cognition, personality, instruction, and others were listed by Lightbrown and Spada (2013) and Macaro (2010) listed them as in-class and class-related external and internal factors that affect language learning of respondents while Luo (2014) has classified sources of foreign language anxiety mentioned in the existing related literature into four categories known as the Four-Dimension Source Model of Foreign Language Anxiety: classroom environment, learner characteristics, the target language and the foreign language learning process. This model was used for the development and validation of Chinese Language Learning Anxiety Scale (CLLAS).

Wu (2010) and Zheng (2008) have recognized that anxiety has been a matter of considerable interest in language education setting for educators since it is a major obstacle to foreign language learning that learners need to overcome. It causes problems to language learners affectively hindering them to experience a satisfying language learning process (Marwan, 2007; Riasati, 2011). Consequently, foreign language anxiety (FLA) is affirmed to be influencing the four language skills such as speaking, listening, reading, and writing. Horwitz, Palacios and Price (as cited by Luo, 2014) have found that speaking is generally recognized as the most anxiety-provoking skill in foreign language learning especially in front of peers. In the study conducted by Luo (2014), the group of four skills has named as the Four-Component Construct Model of FLA which was later used for the development and validation of CLLAS together with the Four-Dimension Source Model of FLA.

Though the existence of this specific anxiety has been confirmed, the national education sector did not stop in pursuing its thrust to provide learners with opportunities that will make them both locally and internationally competitive as one of the goals of the K-12 program with the Special Program in Foreign Language (SPFL) in public secondary schools countrywide under the Department of Education Order No. 46, series 2012— Policy Guidelines on the Implementation of the Special Curricular Programs at the Secondary Level in reference of DepEd Order No. 31, s. 2012. It started in school year 2009-2010. This aims for learners to develop skills in listening, reading, writing, and speaking that are fundamental in acquiring communicative competence in a second or foreign language.

While China is playing a progressively significant role in world economy, a worldwide concentration in learning the Chinese language (Mandarin) has emerged

(Luo, 2014). Thus, Mandarin was introduced in school year 2011-2012. In recent times there has been an upsurge in the number of learners of Mandarin worldwide. This increase has directed to assumption that Mandarin is becoming a majority global language to the plug of becoming a *lingua franca* (Plumb, 2016).

Teacher manuals are teaching materials that collectively help subject teachers to deliver instruction. They increase learning success. Though they come from different kinds, they all have commonality to support ultimate student learning, to structure planning of lessons and delivery, and to make differentiation of instruction (The Importance of Learning Materials, 2016). These presented related literatures used diverse respondents from different nations with varied determinants like age, gender, beliefs, and others that were correlated with foreign language anxiety with the help of various instrument like FLCAS of Horwitz, et al. (1986), Foreign Language Reading Anxiety Scale of Saito, Horwitz, and Garza (1999), Foreign Language Listening Anxiety Scale of Kim (2000), Second Language Writing Anxiety Scale of Cheng, Horwitz, and Shallert (1999), and to several studies they were translated.

Generally, this study was conducted to investigate the Mandarin language anxiety among Filipino language learners of Mandarin from the two schools in Pampanga that offer Mandarin program. Specifically, it sought answers to the following questions: 1) What is the level of Mandarin classroom anxiety of the respondents in the following skills: 1.1) speaking, 1.2) writing, 1.3) reading, and 1.4) listening?; 2) What is the performance in Mandarin language of the respondents?; 3) What are the factors affecting the level of Mandarin classroom anxiety of the respondents from: 3.1) classroom environment and 3.2) learners' characteristics?; 4) Is there a significant relationship between the level of Mandarin classroom anxiety of the respondents in the following skills: speaking, writing, reading, and listening and their performance in Mandarin language?; 5) Is there a significant relationship between the level of Mandarin classroom anxiety of the respondents in the following skills: speaking, writing, reading, and listening and the factors affecting Mandarin classroom anxiety?; 6) Is there a significant relationship between the performance in Mandarin language of the respondents and the factors affecting their level of Mandarin classroom anxiety?; and 7) How may the proposed teacher manual be designed?

Methods

This study was a quantitative research. It used the correlational research design. The two public schools in Pampanga qualified to offer Mandarin class based from their competence in English as established in their National Achievement Test result: Mabalacat National High School (MNHS) in Dau, Mabalacat and Don Jesus Gonzales High School (DJGHS) in Pandacaqui, Mexico served as the locale of this study. Total enumeration was utilized. The first sections of every grade level from Grade 8, Grade 9, and Grade 10 were the participating groups. There were 128 Mandarin learners in DJGHS consisted of 44 in Grade 8, 38 in Grade 9, and 46 in Grade 10. While in MNHS, there were 125 Mandarin learners comprised of 40 in Grade 8, 45 in Grade 9, and 40 in Grade 10. A total of 253 language learners participated in this study. The developed CLLAS was administered. These items were abstracted from the study of Luo (2014) which discussed the Four-Dimension Source and Four-Component Construct. The next instrument on the factors that can affect the language learning process of the respondents was developed by the researcher and validated by a

language expert; a Chinese-native teacher; and a psychologist. This aimed to determine the prevailing factors that affect the language learning process of the students learning Mandarin. The tool was composed of two significant parts. The first part was for the class environment with a total of 20 statements. It contained four sub-categories such as classroom building, teacher, classroom atmosphere, and instructional materials with five statements each. The second part was for the learners' characteristics with a total of 24 items taken from the FLCAS.

Approval of the school administration for the conduct of the study, approval of the cited authors, and approval of the respondents and their parents or guardians were done prior to accomplishing the following steps. First was the validation of the statements for a scale developed by the researcher in determining the prevailing factors affecting the level of Mandarin language anxiety which was divided into two: classroom environment and learners' characteristics. The first draft of the developed tool was composed of 40 items which was divided by 10 statements into four categories: classroom building, teacher, classroom atmosphere, and instructional materials. It was administered to the Grade 7 Mandarin class of DJGHS consists of 42 language learners. After the reliability check, only 20 items were accepted. These were validated by the three experts. After the validation, the tool was administered to the respondents of the study. The second part of the tool comprised of the adopted 24 statements FLCAS. The adaptation of the FLCAS was from the elimination of nine items from original 33 items. The other eight items were all pertaining to speaking anxiety which Lou (2014) adapted for the completion of the 16-item CLLAS while the other item was eliminated due to low reliability result. Essentially, the scale was composed of four subscales which are fear of negative evaluation, communication apprehension, and fear of tests (Horwitz et al., 1986) and anxiety of English classes (Zhao, 2007). Item numbers 2, 5, 8, 11, 14, 18, 22, 28, and 32 were all inversely coded. Its interpretation of scores states that the higher the score the more reflective it is of the anxiety the learners feel in the language class. As a result, the entire second instrument was composed of 44 items. Afterwards, the administration of the CLLAS was administered by their Mandarin teachers. Next, the final grades of the respondents in the previous academic year in the Mandarin class were gathered to define their performance in the language. It was followed by the administration of the validated scale for determining the prevailing factors affecting the level of Mandarin language anxiety of the respondents which was facilitated by their Mandarin teachers as well.

Results and Discussions

Table 1.1 Level of Mandarin classroom anxiety in speaking

Statement	Mean	DR
3. It embarrasses me to volunteer answers in my Chinese class.	1.75	L
6. I can feel my heart pounding when I'm going to be called on in my Chinese class.	1.71	L
14. I feel confident when I speak in my Chinese class.	3.99	H
16. I feel very self-conscious about speaking Chinese in front of other students.	1.26	VL
Over-All Mean	2.18	L

Table 1.1 presents the anxiety level of the language learners in speaking. This shows that the 253 language learners had an over-all mean of 2.18 which means *low* level of anxiety. This implies that speaking Mandarin in class is not a difficult challenge for the Filipino learners. This affirms the study of Luo (2014) who found that College-level Mandarin learners in the U.S. were not highly anxious about speaking Mandarin also. This may suggest that Mandarin language learners' exposure to the target language decreases the anxiety.

Table 1.2 Level of Mandarin classroom anxiety in writing

Statement	Mean	DR
2. Writing Chinese characters makes me forget what I'm trying to convey.	2.18	L
5. I'm usually at ease when I'm writing in Chinese.	3.83	H
12. I freeze up when I am unexpectedly asked to write Chinese characters during my Chinese class.	1.52	L
15. I feel unsure of myself when I'm writing in Chinese.	1.49	VL
Over-All Mean	1.54	L

In writing, the language learners also showed *low* anxiety level having an average of 1.54. In the comprehensive study of Choi (2013), it revealed the investigation of how foreign language anxiety is related to second language writing anxiety among second language (L2) English learners in Korea and how English writing anxiety affects second language writing performance with use of two survey instruments, the FLCAS (Horwitz, 1986) and the English Writing Anxiety Scale (Lee, 2005) administered to a class of 26 junior high school students of English as a foreign language. The study showed that the following factors contribute to writing anxiety: grammatical mistakes, insufficient vocabulary knowledge, and lack of confidence and anxiety. Thus, the present study affirms the results of Choi's study that students with high foreign language anxiety seemed to have relatively high levels of writing anxiety. Furthermore, the Mandarin language learners' low anxiety level may signify that they are highly confident in writing Mandarin. This can be attributed to the availability of a worksheet that is 1 is to 1 in ratio. This gives more opportunities to language learners to understand and to practice writing in Mandarin.

Table 1.3 Level of Mandarin classroom anxiety in reading

Statement	Mean	DR
1. When I'm reading Chinese, I get so confused I can't remember what I'm reading.	2.09	L
8. I feel intimidated whenever I see a whole page of Chinese in front of me.	1.53	L
9. I have difficulty distinguishing among the Chinese characters when reading Chinese.	1.66	L
11. I feel confident when I am reading in Chinese.	4.31	H
Over-All Mean	2.40	L

In reading, the language learners also showed *low* anxiety level having an average of 2.40. Zhou (2017) found that worries relating to comprehension, unfamiliar topics, unknown pronunciation, and feeling uncomfortable reading aloud were the major

sources of foreign language reading anxiety. However, the result of the present study may suggest that the Filipino language learners of Mandarin managed to control their worries and discomfort and to adjust in the need of the subject. Moreover, Saito et al., (1999), Sellers (2000), Shi and Liu (2006), and Zhao, Guo and Dynia (2013) have found that foreign language reading anxiety is negatively correlated with foreign reading performance (as cited by Golchi, 2012). This may explain why the Mandarin language performance of the respondents was outstanding with low general anxiety level.

Table 1.4 Level of Mandarin classroom anxiety in listening

Statement	Mean	DR
4. I get frustrated when I cannot distinguish among the Chinese tones even after I have worked hard to learn them.	1.43	VL
7. I get nervous when all the Chinese tones sound the same to me.	1.71	L
10. I get anxious when I don't understand what my classmates are saying in Chinese.	1.42	VL
13. It frightens me when I don't understand what the teacher is saying in Chinese.	1.61	L
Over-All Mean	2.30	L

In listening, the language learners also showed *low* anxiety level having an average of 2.30. Two items garnered very low level of anxiety which were item 4 and 10; however, unlike with the other skills, no items in listening skill garnered a remark of high level of anxiety. The similar result of reading and listening anxiety levels reveals that the study conducted by Capan and Karac (2013) that the two macro-skills are intertwining in terms of capacity to be influenced is evident. This negates the results of the study conducted by Chang (2008) that was about the college students' listening anxiety in learning English in a classroom context. The result indicated that the respondents showed moderately high intensity of anxiety in listening to spoken English, but were more anxious in testing than in general situations.

Table 2. Performance in Mandarin language

Variable	N	lowest grade	highest grade	Mean	Std. Deviation	DR
Performance	253	81.00	98.00	91.012	2.961	Outstanding

Table 2 shows the mean of the Mandarin final grades of the respondents in School Year 2016-2017. The 91.012 mean of the 253 language learners signifies an *outstanding* performance. The legend under Table 2 was taken from the Form 138-Class Card of the language learners mandated by the DO 73, s. 2012 - Guidelines on the Assessment and Rating of Learning Outcomes Under the K to 12 Basic Education Curriculum. This further explains the idea that the higher the level of language performance is the lower level of language anxiety. The respondents in this study also proved that Filipino language learners are highly motivated and have positive attitude towards the SPFL of the DepEd even though there are slightly influential factors that become challenges affecting their language learning process.

Table 3.1 Factors affecting the level of Mandarin classroom anxiety of the respondents from classroom environment

Statement	Mean	DR
A. Classroom Building		
1. The classroom is not well organized.	1.79	SI
2. The posters and designs in the classroom lessen my focus.	1.79	SI
3. The classroom is maximized to allow different interactions.	1.71	SI
4. The classroom is a safe learning environment.	2.30	SI
5. The number of students in class is reasonable.	2.06	SI
Over-All Mean	1.93	SI
B. Teachers		
6. The teacher is prepared in every lesson.	1.80	SI
7. The teacher does not monitor the behavior of all students.	1.70	SI
8. The teacher speaks fluently both in English and Mandarin.	2.55	SWI
9. The teacher does not praise or give reward for students' effort.	1.99	SI
10. The teacher does not welcome feedback.	1.99	SI
Over-All Mean	2.01	SI
C. Classroom Atmosphere		
11. Every examination is dreadful.	1.97	SI
12. The procedure of the lesson is hard to follow.	1.70	SI
13. Lessons are appropriately engaging.	2.59	SWI
14. My classmates do not use English or Mandarin in conversation.	1.99	SI
15. My classmates are often noisy.	1.96	SI
Over-All Mean	2.04	SI
D. Instructional Materials		
16. The instructional materials are inefficient in general.	1.80	SI
17. The instructional materials are related to the subject matter.	1.69	SI
18. The instructional materials are not meeting the objectives of the curriculum.	2.71	SWI
19. There are different of instructional materials.	2.27	SI
20. The instructional materials do not arouse my interest to learn.	2.01	SI
Over-All Mean	2.10	SI

Table 3.1 shows the five statements describing the classroom building garnered an average of 1.93 that means *slightly influential*. Being able to visit the schools, the researcher found the classrooms of the language learners as reasonable and helpful having electric fans, bulletin boards, strategic seating arrangement, and other important materials. However, some improvements can be done like fixing the old chairs, wrecked windows, destroyed designs, and others. Furthermore, the result agrees to Ghaith, Shaaban, and Harkous (2007) study on the effectiveness of teaching and learning that emphasized the significance of classroom environment as a key factor of learners' achievement and psychosocial adjustment. Then, the five statements describing the teachers garnered an average of 2.01 that means *slightly influential* also. This implies that the language learners were treated positively by their language teachers. Considering the result of the classroom atmosphere, they find the strategies and techniques of their teachers as advantageous, too. However, in the

present study, this has only a slight influence which may mean that teachers created a positive and safe-learning environment for the learners that allow them to acquire the language outstandingly. Also, the five statements for the classroom atmosphere which corresponds to pedagogical methods used and communicative situations garnered an average of 2.04 that means *slightly influential*. The statement numbers 11, 12, and 13 were reflective of the pedagogical methodology employed by the teacher with the guidance of the Mandarin syllabi while numbers 14 and 15 was reflective of the usage of effective foreign language communication of the classmates to the learners. In addition, Masuda (2010) also saw classroom situation like competitiveness and noise as a negative source of anxiety. However, these were not an issue to the language learners because they managed to stand out the possible little negative effects of it as reflected to their over-all performance. Lastly, the five statements under the instructional materials garnered an average of 2.10 that means *slightly influential* as well as the other factors. This may mean that learners appreciate the existing instructional materials their schools have for their language learning. This can be understood also to the 1 is to 1 ratio of a worksheet for all the learners provided by the schools. In terms of variation, bulletin posts with Chinese characters, slide desks with the Mandarin lessons, and other tangible tools like Chinese paintings assisting teacher's instruction were given valued by the learners that brought out a slight influence in their language learning process. Generally, this implies that the language learners having an overall low anxiety level were being affected slightly by the factors under classroom environment.

Table 3.2 Factors affecting the level of Mandarin classroom anxiety of the respondents from Learner's Characteristics

Statement	Mean	DR
II. Learner's Characteristics		
1. I do not worry about making mistakes in language class.	4.19	VI
2. I tremble when I know that I'm going to be called on in language class.	1.55	SI
3. It frightens me when I don't understand what the teacher is saying in the foreign language.	1.72	SI
4. It would not bother me at all to take more foreign language classes.	1.60	SI
5. During language class, I find myself thinking about things that have nothing to do with the course.	1.72	SI
6. I keep thinking that the other students are better at languages than I am.	1.56	SI
7. I am usually at ease during tests in my language class.	4.37	VI
8. I worry about the consequences of failing my foreign language class.	1.88	SI
9. I don't understand why some people get so upset over foreign language classes.	1.80	SI
10. In language class, I can get so nervous when I forget things I know.	1.58	SI
11. I would not be nervous speaking the foreign language with native speakers.	4.17	VI
12. I get upset when I don't understand what the teacher is correcting.	1.84	SI
13. Even if I am well prepared for language class, I feel anxious		

about it.	1.73	SI
14. I often feel like not going to my language class.	1.90	SI
15. I am afraid that my language teacher is ready to correct every mistake I make.	1.68	SI
16. The more I study for a language test, the more confused I get.	1.51	SI
17. I don't feel pressure to prepare very well for language class.	1.59	SI
18. Language class moves so quickly I worry about getting left behind.	1.58	SI
19. I feel more tense and nervous in my language class than in my other classes.	1.42	NI
20. When I'm on my way to language class, I feel very sure and relaxed.	1.35	NI
21. I get nervous when I don't understand every word the language teacher says.	1.49	NI
22. I feel overwhelmed by the number of rules you have to learn to speak a foreign language.	1.47	NI
23. I would probably feel comfortable around native speakers of the foreign language.	4.24	VI
24. I get nervous when the language teacher asks questions which I haven't prepared in advance	1.82	SI
Over-All Mean	2.07	SI

Table 3.2 shows that the respondents had a *slightly influential* remark with 2.07 overall mean. This lies in the fact that young learners are yet unaware of the difficulties in learning a foreign language, or that they have not yet gathered sufficient experiences (positive or negative) with the foreign language for anxiety to play a significant role in their performance. This result was affirmed from the study of Cicek (2014) which suggests that younger learners experience more positive attitudes towards language learning, but as learners get older, the attitudes become less positive. Experiences of anxiety in early foreign language learning can lead to learners having doubts about their ability to learn a foreign language. Four items (1, 7, 11, and 23) got a remark of very influential. It reveals that the manifestation of having a low anxiety level in the Mandarin class came from their fear of being with native speakers as audience of interlocutors of the language. The classroom environment and learners' characteristics got a close mean result with the difference of 0.05 and a similar descriptive rating of slightly influential.

Table 4 Relationship between the level of Mandarin classroom anxiety of the respondents in speaking, writing, reading, and listening and their performance in Mandarin language

Variables	r-value	degree of correlation	p-value Sig. 2-tailed	Interpretation
level of anxiety vs. performance	-0.066	strong negative	0.294	not significant

Table 4 presents the correlation values of the variables in this study. As shown, there is *no significant relationship* between the level of Mandarin classroom anxiety of the respondents and their performance in Mandarin language with a value of -0.066. This

shows a strong negative correlation dictating that however the level of anxiety is the level of performance will not be affected by it. This discusses to the common connotation that when the level of anxiety increases, then the level of performance decreases. Furthermore, it means that Mandarin classroom anxiety level of the language learners is not influential to their capacity to learn Mandarin in the class. This idea affirms the results in the study of Horwitz in 2001 (as cited by Al-Shboul, Ahmad, Nordin, & Rahman, 2013) which showed the correlation of the foreign language anxiety and foreign language performance of the 78 English students learning Spanish or French expressing that students who experience higher levels of foreign language anxiety receive lower grades. However, in the study of Sanchez-Herrero and Sanchez in 1992 (as cited by Al-Shboul, Ahmad, Nordin, & Rahman, 2013) which used Spanish sixth, seventh and eighth graders as respondents showed significant negative correlations between foreign language anxiety and achievement in different groups with different English achievement tests. In the present study, the result can be attributed to how determined or focused the learners in learning Mandarin despite of the challenges they perceive in the Mandarin class.

Table 5 Relationship between the level of Mandarin classroom anxiety of the respondents in speaking, writing, reading, and listening and the factors affecting Mandarin classroom anxiety

Variables	r-value	degree of correlation	p-value Sig. 2-tailed	Interpretation
level of anxiety vs. factors	0.131*	very weak positive	0.038	significant

Table 5 shows that there is a significant relationship between the level of anxiety of the respondents and the factors affecting the level of Mandarin classroom anxiety of the respondents. This expresses that the language anxiety of the learners came from the classroom environment comprising of classroom building, teacher, classroom atmosphere, and instructional materials; and their characteristics toward foreign language learning. This result embodies the importance of in-classroom and class-related external and internal factors for a language process to succeed. In studies conducted, the language learners manifested high level of anxiety proving the impact of the factors above mentioned in their foreign language learning process. Lou (2014) synthesized all available literature studying factors affecting Mandarin language learning and formed the Four-Dimension Source Model that consists of the classroom environment, learner characteristics, the target language and the foreign language learning process which later used for the abstraction of the CLLAS.

Table 6 Relationship between the performance in Mandarin language of the respondents and the factors affecting their level of Mandarin classroom anxiety

Variables	r-value	degree of correlation	p-value Sig. 2-tailed	Interpretation
performance vs. factors	-0.064	strong negative	0.314	not significant

Table 6 also reveals that the performance of the language learners was not affected by the factors affecting their level of Mandarin classroom anxiety. This presents that there was no direct connection between the Mandarin final grades of the respondents

and the factors affecting their low anxiety level. A negative correlation between two variables means that one variable increases whenever the other decreases. Through the utilization of varied methods like unstructured interview and survey questionnaire, the researchers gathered data explaining that the respondents were concerned with the factors as they found their foreign language performance affected by them.

In cognizant with the results of the study, the researcher designed a Teacher Manual. The target users of this output are the Filipino-native teachers of Mandarin. It consists of 38 pages with a cover, table of contents, and foreword. Relevant and helpful articles were also added to further deepen awareness of real-life classroom setting. Also, photos and quotes were supplemented to motivate teacher-users. There are Mandarin letters and symbols, translation of Mandarin words to English, etc. were also incorporated to let the teacher-used get familiarized. Understanding the SPFL of Department of Education and appreciating the Mandarin language origin and characteristics were included as Unit I and II respectively to further foster the language teachers' collaboration in the success of the foreign language program. It is believed that knowing the purpose of a teaching activity will produce a deeper enthusiasm to achieve the best results. Also, this manual focuses on the following units: identifying the challenges language learners face and how to overcome them; understanding the classroom environment by studying the significance of the building, the teachers, the atmosphere, and the instructional materials; and appreciating the learners and valuing their characteristics as language learning. Unit III Challenges in Teaching Mandarin deals with understanding anxiety, effects of the language anxiety to the learners, understanding language learning, overcoming the language anxiety, and the five classroom cures for foreign language anxiety. Unit IV deals with the result of the Table 3.1 which was about the factors affecting the level of Mandarin classroom anxiety of the respondents from the classroom environment. The last part of the manual which is Unit V intended for Understanding Your Learners. This comprises the importance of getting to know the students which is an article about learners' strengths and weaknesses, how to understand better the learners intentionally is also discussed with an article that deals on how to properly train the learners in the language. The motivation of the learners in language learning is emphasized also.

Conclusions

Based on the results of the study, the following conclusions were drawn: 1) The respondents are experiencing a low anxiety level in four macro-skills. 2) The respondents generally perform with outstanding remarks; 3) The respondents are slightly influenced by their classroom environment and their characteristics towards language learning; 4) The respondents' level of Mandarin classroom language anxiety does not affect their performance in the Mandarin language; 5) The level of Mandarin classroom anxiety of the respondents affects the factors affecting the language process as presented in classroom environment and the learner's characteristics; 6) The respondents' performance in the Mandarin language is not affected by the factors present in the classroom environment and their characteristics; and 7) The teacher manual is developed with the concepts assisting the understanding of classroom language learning anxiety and the factors influencing them.

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***The Features of Quick Response (QR) Code as an Attendance Monitoring System:
Its Acceptability and Implication to Classroom***

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Abstract

The study was conducted to determine the features and acceptability of Quick Response (QR) Code innovative platform as an attendance monitoring system. Purposive sampling was used in the study involving 20 teachers who adapted the QR code and 36 students who were exposed to the attendance monitoring system during the first quarter of the academic year 2018-2019. Descriptive data analysis was used in the study using the adapted standardized survey questionnaire intended for evaluating database interface. The digital application was available and free on Android smartphones that can be exported to Microsoft Excel, while the system doesn't require an internet connection and ideal for a big class. With the combined evaluations of the teachers-user and students, data revealed that QR Code as attendance monitoring system was generally very highly acceptable in terms of reliability, efficiency, accuracy, usability, while highly acceptable in terms of security and confidentiality. The views of the participants imply that QR code as attendance checker was environment-friendly, cost-effective, user-friendly, innovative, very fast and readable codes. Hence, this study is geared towards evidence-based practice using this type of innovation that will serve as a preference towards continuous improvement and successful adaptation of the QR code that is essential in modifying and simplifying the checking of attendance of students in the classroom.

Keywords: Quick Response Code, Attendance Monitoring System, Environment-friendly, Cost-effective, User-friendly, Environment friendly

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Introduction

The development of smartphones proliferates the use of QR code obtaining features of scanning and decoding barcodes are becoming a popular tool in modern education (Lamey, 2018 and Santisteban, 2017). The advantage of checking the daily attendance in class can influence the performance of the school. Studies believed that academic performance thus improved if students are regularly present to the class. Checking the attendance is one routine that teachers always go through every day in every class student goes to. This is where normally a teacher will individually call the names of the students and wait for them to raise their hands. Though this may seem effective, perhaps this takes a lot of time and repetitive which may lose the interest or motivation of the students to come to class (Rizal et al., 2016). Indeed, the traditional means of checking the attendance in the classroom takes time and consume a lot of papers and money.

QR codes are being widely used for linking to companies' website, advertising products, price, online menus and contest sign-up pages (Singh, 2016). With the technology we have available now, making QR codes are so easy to generate and can be read even if you use a downloadable barcode reader in your smartphones. The emergence of smartphones increases the use of QR code because a smartphone has features of scanning and decoding a QR code (Singh, 2016). Perceived benefits or value after scanning a QR code is a huge driver for continuous use (Asare and Asare, 2015). In this perspective, the use of QR Codes would increase in line with the increase in related technologies like smartphones and tablets (Durak et al., 2016).

In the educational world, teachers and administrators also found out the potential of utilizing this type of technology in education. Technological advances brought applications of innovations to education (Durak et al., 2016). The Quick Response (QR) code is highly secure as all the delicate data put away and transmitted is encoded, easy to utilize and cost-efficient management system (Kadu et al., 2017). Scanning QR codes also allow a person to record a huge amount of data and transfer them to a Microsoft Excel file through a mobile app.

Whether in public or private schools, a majority of the students already uses smartphones, and all connected to the internet. Thus, students nowadays are more technology savvy, routine activities and teaching strategies must also advance. There has been many studies and researches about the use of QR codes in checking the attendance or used as a school id system or even used of a barcode in the business industry. Most of the studies are specially meant for their school id system where a specific program has been made and implement which may cause a lot of money and sometimes maybe too expensive to afford.

In this research, the proposed attendance system will be using two Android applications that are completely free. By scanning the QR codes of the student that they have generated free on the internet. The teacher will be using a smartphone as the scanning device to scan the students' code upon entering the classroom. The records of the student will then be saved on an Excel format that can be exported easily to a laptop. An Excel summary sheet will also be generated to identify the number of absences each student has incurred. As awareness increases about the usefulness of these codes, we can expect them to be used in more public domains (Singh, 2016).

Since the researcher pioneered the QR code as an attendance monitoring system, the study was limited to 20 teachers' participant from different places in the country who adapted and utilized QR code in managing the attendance of their students for one quarter. It involves 36 students as participants who were engaged in QR code as a means of checking their attendance during the first quarter of the academic year 2018. The scope underscores the features of the QR code as attendance monitoring system; the level of acceptability in terms of the reliability, efficiency, accuracy, usability, security, and confidentiality of the platform. It provides a perspective and an avenue for continuous adaptation and development of an innovative mobile application for education purposes.

This study is a significant initiative in promoting an innovative attendance monitoring system that is environment-friendly, cost-effective and easier access to data. This system would also provide teachers with a proper motivational intervention for students who are not always present at school. It would be beneficial to the school personnel in adapting the QR code electronic-based attendance monitoring system that is essential in simplifying the checking of attendance more efficient and fast that has easy access to QR code readers. The attendance monitoring system using QR code evidence-based practice will be an indicator of the 21st-century skill competitive advantage that will serve as a guide for other institution in institutionalizing action plans in accordance of QR code mobile application database program interface and ICT integration embedded on educational purposes. Moreover, this study would be helpful to schools in building motivation that will improve students' attendance. Hence, this would add excitement to come to class, to have their codes scanned and it will also give students an idea that there are limitless possibilities in the use of technology while they are having fun. This pioneering study would serve as a model to implement the innovative mobile application for checking the attendance of the students in the classroom. Moreover, teachers' empowerment and advocacy are significant towards a productive and successful adaptation of the database program interface in school.

It is in this context, the researcher wanted to conduct the study to enabling awareness of the features of the attendance monitoring system using the QR code. It also intended to determine the level of acceptability of QR code attendance monitoring system as perceived by particular teachers-user and the students of General Emilio Aguinaldo National High School as participants of the study. Thus, this study is geared towards evidence-based practice using this type of computer system that will serve as a preference towards continuous improvement and work on the recommendation on how this type of system can be adapted in the school context.

Review of Literature

This section presents the conceptual and related literature from various entity where the study anchored upon to provide evidence and significant review of the topic grounded with the current study. The coherence and consistency of this review of related literature illustrated from empirical studies.

Propagation of QR Code System Application

These past few years, the use of technology in has grown rapidly faster than we could ever imagine. Almost every year, new technological ideas emerged that are smarter, innovative, and more affordable (Lamey, 2018). With all these technological resources that we have or available, is there any way we can utilize them as part of the educational strategies? In the educational world, our students have embraced this idea since they were little. It can be said that students nowadays are digital natives where they are already exposed to state-of-the-art technology such as computers, video games, and internet, while teachers are considered digital immigrants since they were not born into the digital aspect of the new technology (Santisteban, 2017).

QR codes are two-dimensional matrix barcodes used to provide easy access to digital information through a smartphone. Last decade witnessed a steady growth in commercial and business-oriented usage of these QR codes with the advent of smart and web-capable mobile phones (Shettar, 2016). Indrayani (2014) explores the extent of the effectiveness and the efficiency of the use of biometric systems categorized based on quality systems indicators such as relevancy, capacity, timeliness, accessibility, flexibility, accuracy, reliability, security, economy and simplicity can increase productivity and efficiency as well as reduce job turnaround time in checking the accuracy of the data with the card owner.

For a QR code campaign to be successful, the study suggests a company needs to have clear objectives, know who they are targeting, provide valuable contents and place the platform at appropriate locations for ease of scanning. Qianyu (2014) the QR Code is still updating, therefore, further research possibilities explore the security of using the QR Code for organization which can be suited and adopted.

Practical Uses of QR Codes

Here are some ways for using QR codes that are mostly in practice now, as well as a few that we will be seeing in the very near future. QR Codes could be used: The back (or front and back) of your business card, your brochures, and other marketing materials, the sides of trucks and trailers, product tags and packaging, convention and event nametags, restaurant menus, event ticket stubs, point-of-sale receipts (Korhan, 2011). The potential for QR Codes is limitless and the next generation of barcodes will hold even more information wherein the content will be effectively embedded in the code and an internet connection will not even be necessary (Korhan, 2011).

QR Code in Education

Singh (2016) analyzed QR code from the perspective of their significance and uses. It was recommended to increase awareness about the usefulness of the QR codes, to make public aware and be familiar with the QR code. According to (Asare and Asare, 2015) for a QR code campaign to be successful, the study suggests a company needs to have clear objectives, know who they are targeting, provide valuable contents, place code at appropriate locations for ease of scanning, decide on the right time for the campaign and finally execute it in a creative way that anyone could efficiently adapt the system. It's been proven that the use of this two-dimensional QR code is one of the best to use compared to barcode and RFID (Radio-Frequency Identification). It

can also be used in different teaching strategies depending on the like of the teachers like games, reading, science, in math and many more.

In the study carried out by Durak et al. (2016) though it is easier to use QR Codes, it is not possible to use them without technological necessities, so, QR Codes would increase in line with the increase in the related technologies like smartphones and tablets. The propagation of the smartphones and tablet PCs could soon be the first choice when surfing and scanning quick response codes with the support of internet access.

The study of Rizal et al. (2016) concludes that Smart Attendance System Applying QR Code enables to speed up the process of taking attendance and would save us valuable teaching time. He further stressed that this initiative helps students avoid consequences that may result from poor attendances that should be stipulated in the policy and academic regulations of the school.

There are many other ways you can use QR codes in school are becoming a popular tool in modern education. (Lamey, 2018 and Santisteban, 2017). Teachers of the 21st century are generally enthusiastic to embrace the used of modern technologies, considering a sound fiscal allocation and management. Teachers are more likely wanted simplicity and efficiency with combine speed, ease, and novelty with the capacity to hold a large amount of data that can actually do a lot to enrich such classroom management (Lamey, 2018).

Methodology

This chapter contains the discussion of the research design used, the sampling method, the research instrument, the data gathering procedures, and the plan for data analysis.

Research Design

The descriptive research design was employed in the study. The descriptive method was used to provide a detailed organization of data and information collected using a survey questionnaire. Unstructured interview was also conducted to support the findings of the study and it was analyzed, synthesized and coded accordingly. It described the features of the platform and the level of acceptability of QR code as an attendance monitoring system. The standardized tool was adapted from ISO 9126 used in evaluating computer program interface.

Sampling Method

The participants of the study was purposively composed of 20 teachers-user of the QR code as an attendance monitoring system and 36 students who were involved in the study handled by the researcher.

Data Gathering Procedure

The respective participants evaluated the QR code as attendance monitoring system based on components of the standardized evaluation checklist for computer program

interface. An unstructured interview was conducted to generate participants' view on the use of the QR code as an attendance monitoring system. Using online survey technique, the survey questionnaire was distributed electronically. The data were interpreted and analyzed based on participants' evaluation. To run the program, these were the following step by step procedure of QR Code Attendance System procedures executed by the researcher:

How to CREATE a QR Code for Teacher

1. Download QR ATTENDANCE CONTROL on Android Google Play.
1. Download the BARCODE SCANNER as per advised by the QR ATTENDANCE CONTROL.
2. Open the App and start Scanning.
3. Press SCAN and put the students' QR codes inside the box and wait for it to beep.
4. CONTINUOUS SCANNING: The app made a recent update and added Continuous Scanning. This makes scanning QR codes faster with only a single tap on the Scan Button. Make sure to ENABLE that option. Before Scanning, make sure that Arrival is ticked. Although optional, Teachers can tick the DEPARTURE to before students leave the room.
5. EXPORTING CSV FILE. Click on the TOOL icon on the lower left and click on EXPORT.
6. QR Attendance Control will default the Date as the file name which can be replaced by the teacher in charge.
7. One saved, go to your FILE FOLDER and click on INTERNAL FOLDER.
8. Click on the QR ATTENDANCE CONTROL folder and click on the File Name. This file can be transferred on to your laptop/desktop via Bluetooth for consolidation.

How to a CREATE a QR Code for Students

1. (ONLINE). Open your Internet browser and type in www.qr-code-generator.com. Choose TEXT and write the name of your Student, Grade Level and Section (if any). Once done, click on CREATE QR CODE. Each student must have their own unique code for scanning. Save the QR Code or students can take a photo and save it on their phone. Printing the QR code is the most recommended.
2. (OFFLINE). Open your Internet browser and copy the link below of the QR CODE STUDIO. Once Link: <https://www.tec-it.com/en/download/free-software/qrcode-studio/Download.aspx>.
3. Once downloaded successfully, you can type the information on the green space and QR code will automatically be generated even when there is no internet connection. Save and print.

Research Instrument

The primary tool used in the conduct of the study was the used of the survey questionnaire. It consists of evaluation criteria that measure the level of acceptability of the QR code mobile application as an attendance monitoring system. To evaluate the QR code mobile application, five main components to measure the system of a

computer database interface namely: reliability, efficiency, accuracy, usability, security and confidentiality and unstructured interview with regards to the views and opinions of the participants on the use of the QR Code. A set of survey questionnaire was distributed electronically to the participants of the study.

Plan for Data Analysis

To interpret the level of acceptability of the attendance monitoring system using the QR code. The following scale was used.

Table 1. Arbitrary Scale and Verbal Interpretation of the Data

Response	Arbitrary Scale	Verbal Interpretation
5	4.21-5.0	Excellent - Very Highly Acceptable
4	3.41-4.2	Very Good - Highly Acceptable
3	2.61-3.4	Good - Acceptable
2	1.81-2.6	Fair - Less Acceptable
1	1.0-1.8	Poor – Not Acceptable

Result and Discussions

This part presents the findings of the study in an illustrative table, analysis, interpretation, and discussion of results based on the gathered data.

Features of the QR Code Attendance Monitoring System

1. The QR code is easy to generate and it's free. QR code generators are available online for free and there is also other software where you can download the generators for free and can be used even when not online. If a student tends to forget his/her QR code, generating a new one only takes seconds.
2. Scans very quickly with a 2-dimensional barcode. QR codes are two-dimensional codes making it very easy to use because they carry a lot of information both vertically and horizontally and can be printed or save on the phone for scanning.
3. Paperless. The attendance system doesn't use much paper since everything is done digital making it very environment-friendly and use a lot of paper compared to the traditional way of checking attendance.
4. Apps Available Free on Android Smart Phones. Compared to other attendance systems available now and costs a lot of money making it impossible for the public sector to afford. The attendance system being used here are completely free on Android smartphones and Microsoft Excel for creating the summary.
6. System doesn't require internet connection. Aside from downloading the apps on the Google play store, the rest of the system doesn't require an internet connection. QR codes can be generated offline and scan students QR codes using the QR attendance Control App can also be used without an internet connection. This is very useful especially if your school is located in remote areas where internet and phone signal are limited.

7. Very Fast and Efficient. Whether printed or saved on the phone, whatever size as long as it's not stretched, scanning QR codes only takes a few seconds making attendance checking for the whole class fast and efficient.

8. Ideal for a Big Class. Checking attendance especially if a teacher has a big class normally takes a lot of time to figure out who's absent or not. With the use of QR codes, scanning each one of their codes only takes second which makes checking quick and easy. An ideal type of system if you have a lot of sections and students teaching every day.

Level of Acceptability of Attendance Monitoring System using QR Code

Table 2. Evaluation of the Attendance Monitoring System Using QR Code

Components	Mean			Verbal Interpretation
	Teachers	Students	Total Mean	
1. Reliability	4.27	4.51	4.39	Very Highly Acceptable
2. Efficiency	4.32	4.75	4.54	Very Highly Acceptable
3. Accuracy	4.43	4.6	4.52	Very Highly Acceptable
4. Usability	4.42	4.66	4.54	Very Highly Acceptable
5. Security	3.92	3.98	3.95	Highly Acceptable
Composite Mean	4.27	4.5	4.39	Very Highly Acceptable

Table 2 present the results of the evaluation of the acceptability level of the attendance monitoring system using the QR code. In general, as far as the acceptability is concerned, the teachers and students registered a composite mean evaluation of 4.27 and 4.5 with an overall grand mean of 4.39, which means that the platform is very highly acceptable.

The participants rated the reliability of the program interface as very highly accepted with evaluation means of 4.27 and 4.51 respectively, and a combined mean of 4.39. Both groups of respondents very highly accepted the components of the program interface. Apparently, there was no such trouble encountered by the users. In fact, the data is running and consistent all the time and reduces the potential for data redundancy. This is an indication that both the teachers and students found the QR code program interface highly consistent and reliable to the users.

In terms of efficiency, the participants rated very highly acceptable with evaluation means of 4.32 and 4.75 and a total mean of 4.54. It signifies that the QR code database interface provides a current report on attendance. Furthermore, the program responds proximately and accurately; it's paperless and it generates reports even without the need of internet.

The level of accuracy of the QR code as attendance checker is rated very highly acceptable with evaluation means of 4.43 and 4.6, correspondingly and a combined mean of 4.52. It could be observed that the perception of the participants exhibited that the data entered on the QR code database interface is accurate, valid, consistent, and up-to-date. The content of the program is very organized in a coherent way. This implies that users were able to understand the program interface easily.

The participants' evaluation on the level of usability of the QR rated the platform as very highly acceptable with means of 4.42 and 4.66, respectively with a total mean of 4.54. It signifies that the user interface shows the correct labeling and important information of the program and color themes of the application are pleasing to the eyes and the color combinations are not distressing. Moreover, with the used of smartphones, it provides touchscreen press controls for easy navigation while QR code generates data from the attendance automated records.

In terms of security and confidentiality, it was revealed the teachers' mean evaluation of 3.92 and the students mean evaluation of 3.98 with a total mean of 3.95, interpreted as highly acceptable. The table reflects that the students had a higher mean evaluation than the teachers. It can be said that the program can only be accessed by the teacher who utilized the system using the QR attendance control and barcode scanner installed on smartphones. Meanwhile, the QR code for students can be access on files-QR code Attendance Control Folder. It is clear that both teachers and students find that the program is not protected and secured by access password.

Aguirre, (2016) asserted that another important attribute of using technology is to go paperless. The QR code was developed, applied, and tested designed to decode the data quickly and quite easy to create and use these codes (Durak et al., 2016). This innovation embed in the classroom attract attention and drive to the students to go to school every day. This experiential study showed that the learners using the QR attendance control and barcode scanner demonstrated meaningful improvements in terms of students' attendance. Thus, it fosters motivation among the students.

Teachers-user and Students View about QR Code as Attendance Monitoring System

Environment-friendly. It is very evident nowadays that schools consume a lot of papers. From the students up to the teachers, more papers are being used and a lot of them are put into waste. Some teachers traditionally check their attendance using the traditional method, meaning they will have to print papers which they will use to check the attendance. With the use of the QR code as an attendance system, the number of papers being used by the teachers will definitely be much less. Since everything is done digitally, no papers are being used or papers to be recycled in this process. Everything is done using a smartphone and a laptop to export the file. With this type of system, it is more likely that the number of waste produced can be lessened and it can also create an awareness of how the environment can be protected.

Cost-effective. Compared to other systems already being used by private institutions where a lot of money had been invested to generate the system, the QR code attendance system that the researchers proposed are completely free. With the use of internet connections, teachers can download the app QR Attendance Control and QR Bar Code Scanner for free on Google Play. QR codes of the students can also be downloaded for free over the internet or by downloading a software called QR Code Studio where teachers and students can generate code without the need of internet connection.

User-friendly. The QR Attendance Control uses a very simple yet very easy to use interface for easy understanding. The different options that are found in the

application are very easy to understand. The application had also made an update recently where they added a continuous scanning for fast scanning of the QR codes. Using the export option, users can easily look at the scanned files in an Excel format. Transferring the data to the computer is also very easy with the use of Bluetooth technology.

Conclusions

The benefits of the QR Code is it easy to generate if in case the student lost or misplaced his/her own code. It can be generated for free and the app can also be downloaded for free on Android phones and can also be generated even without the use of the internet which make it cost effective and practical. Both teachers and students agreed that this innovation made an impact on the way they manage their classroom and how students are liking the idea of going digital when attendance is being checked. Teachers also mentioned that aside from checking attendance, the use of QR Codes can also be used in different fields of education. Teachers find it more effective to figure out who is absent from the class especially if you are handling big classes every day. Students on the other hand also enjoy this innovation because they know how fast attendance are being checked. Though this has been done for years this idea is very new in the public school system. QR code attendance system is a very simple app that has a scanner which scans the code of the students when they arrived in the classroom. All the data can be transported easily in an Excel format. The interface is very simple making it very easy to understand and use for teachers of all ages. With the newly updated app, teachers can continuously scan the QR codes of the students. So instead of manually pressing the scan button after each student, teachers can just put the phone in one place, press the continuous scan and just let students place their codes in front of the phone to be scanned. Teachers use bundles of papers each year and some of them go to waste. With this innovation, everything is done in digital format and the number of paper being used is minimized making it paperless and eco-friendly.

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A Phenomenological Study on Experiencing In-class Discussion among University Students in Hong Kong

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Abstract

Adoption of various type of information and communication technologies in different teaching and learning activities have been a common practice all over the world. One of its adoptions is to facilitate an interaction among students through online discussion forum. While such practice wins a lot of adherents in higher education, there is a concern over justification of the employment by arguing that it may not help much or even discourages interaction among students. Instead of adopting information and communication technology, conventional in-class discussion is recommended. In a sense, it is subjected to how students perceive the activity. Experience shapes our perceptions on many things, including the way we perceive the outside world. As phenomenology is one of the theories in probing meaning of experience to a person, it is adopted as theoretical framework for this paper in understanding the experience of in-class discussion among university students in Hong Kong. Collecting data from semi-structured interviews, this paper proclaims that how students perceive in-class discussion is not solely decided by themselves. Their perceptions towards the learning activity and even learnings are shaped by their past experiences in the society. When educationists trying to arouse learning motivation and increase learning effectiveness among students, finding from this paper suggests that past experience of students should be one of the factors for considerations.

Keywords: Phenomenology, in-class discussion, higher education, Hong Kong

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Introduction

Discussion, which is an “effort of a group of individuals who talk informally together in order to solve commonly recognized problems or to arrive at an understanding of values”, is one of the widely adopted pedagogies (Walter & Scott, 1968, p. 186). Discussion can help students recognize their shortcomings, improve their critical thinking and establish a co-operative environment (Gritter, 2011, pp. 445-446; Piro & Anderson, 2015, p. 2). Because of the strengths, discussion is widely practiced in classroom. However, such practice is built upon almost without concerning students’ perception on it. Understanding students’ perception of in-class discussion is important as it can unveil the way of adopted pedagogy in facilitating students’ learning. Therefore, this study was proposed. In the following, there will first be a literature review with a general description on phenomenology. After that, research questions, methodology, analyses and discussions will be presented. Lastly, contributions of this study will be suggested followed by conclusion.

Literature review

Many researches had been conducted over in-class discussion. For example, Lin et al. (2013) used in-class discussion targeting at improving interaction skills among Taiwan’s nursing students. Apart from enhancing students’ interaction skills, Lin et al. (2013) found that adoption of in-class discussion also improved students’ learning contentment at the same time (pp. 679-681).

Isgitt and Donnellan (2014) employed in-class discussion in mathematic class hoped to polish middle school students’ capability in tackling problem (p. 81). Through advancing students’ capability in resolving difficulty, Isgitt and Donnellan (2014) pinpointed that employment of in-class discussion facilitated students in grabbing tough mathematical ideas (pp. 84-85).

Jackson and Chen (2018) interested in exchange students in Hong Kong and looked into their inclination of taking part in in-class discussion (p. 293). Jackson and Chen (2018) pointed out that students’ cultural background was a force that hindered their readiness in joining in-class discussion (pp. 298-299).

In short, attentions from past major literatures focused their concerns on how in-class discussion help to improve students’ learning outcomes without equipping much with theoretical support. Although the study from Jackson and Chen (2018) addressed on students’ inclination in taking part of in-class discussion and was thus relevant to this paper, their focus was beyond local students. Meanwhile, Hong Kong university students’ experiences of in-class discussion can be interpreted as their perceptions of a typical environment at their outside world. At the same time, phenomenology addresses at the way of one’s experience in shaping one’s view towards external world. In view of that, phenomenology was therefore deployed as theoretical approach in this paper.

Research questions and methodology

Based on the above discussions, with a view of probing into Hong Kong university students' perceptions of participating in-class discussion, two research questions were set:

1. How university students in Hong Kong perceive participating in-class discussion?
2. How experience mediate university students in Hong Kong in perceiving participation of in-class discussion?

With a view of collecting students' perceptions of in-class discussion from their own perspectives, data was collected through conducting semi-structured interviews (Byrne, 2012, p. 209 and 215). Four local students (S1, S2, S3 and S4), including three females, were recruited to attend semi-structured interviews. All the interviews, which lasted from around one hour and twelve minutes to one hour and thirty minutes, were conducted in Cantonese, mother tongue for all the students.

Analyses and discussions

All students in this study showed their approbations over in-class discussion. One student said:

“My experiences in attending lessons think that students like face-to-face discussion more” (S1, female)

While the student based on her experiences and suggested her preference over in-class discussion, another student offered an interesting but also challenging viewpoint on that.

“When the discussion does not carry marks, basically no one do it.” (S2, female)

In the context of Hong Kong, usually in-class discussion does not carry marks and does not affect students' academic outcome in the course. At most, it is counted as class participation which just accounts so little proportion of total results that usually students neglect it. Because of this, S2's view could be regarded as challenging to S1. In other words, students in Hong Kong should not like in-class discussion and almost no one is willing to participate as it does not carry marks. Another student seemed to offer her support by pointing out that:

“Most of us lack much incentive on studying. move a bit only when you tell them to do so. (We are) not willing to do.” (S3, female)

By suggesting “lack much incentive on studying” and “not willing to do”, S3 already described a common phenomenon among Hong Kong university students that mark is a significant motivation for their studying. Without mark, students are even inclined not to participate the learning activity. That perception not only applies on students'

willingness in participating in-class discussion but is also consistent with S2. In view of this, further considerations have to be made before arriving a better sociological imagination on why all students in this study indicated their endorsements on in-class discussion.

Meanwhile, a student proposed the followings:

“If you need to do some discussions or need to discuss, sometimes it can be done in lesson very quickly.” (S4, male)

By saying “it can be done in lesson very quickly”, S4 associated participation of in-class discussion with the amount of time she spent on and even total effort that she needed to exercise of. Reason for S4 proposing and highlighting such an association maybe attributed to her experience. While this study has argued that such association is also applicable to other students in this study, phenomenology offers an explanation on the rationale behind it.

Since primary school, Hong Kong students have already been evaluated not by their competencies or characters but by the achievements that they are able to attain. Students’ achievements, however, have always been expressed, measured, compared and judged in term of quantifiable indicators such as their academic performances, the number of certificate or diploma that they have acquired and so on. Nevertheless, personal disposition and ethical practices have almost been excluded from the evaluations and judgements. Owing to keen competition on various educational opportunities and resources, students’ achievements in return have been translated and understood as a way to secure a better prospect. Students are fully aware of it and that have made most of them eager on their studies. Driven by their awareness, generally speaking, students have developed a sense of realistic mindset of just concerning on those activities that help them to attain achievements. For instance, students are much eager to submit their assignments on time because it carries marks. Failure to do so may affect their academic performances. On the contrary, students have tended not to exercise so much effort or even neglect other activities, like in-class discussion, especially when they do not carry mark as those activities cannot help them to attain achievements. Based on students’ past experiences, many of them have perceived that in-class discussion is neither meaningful nor helpful for them to attain achievements. S2 directly put it in the following manner:

“In-class discussion does not help much for learning. Like what I just mentioned, because no matter me or friends around me, actually we would prefer spending time in writing an essay or PowerPoint rather than wasting time in doing this discussion.” (S2, female)

When applying and appreciating students’ perceptions of in-class discussion, however, this realistic mindset has been revealed in a different format. In most of the cases, university students in Hong Kong are compelled to attend lectures as adequate attendance are required before they can get a pass in those subjects. In other words, students’ attained achievements will be affected if they do not attend the lectures. Under this setting, participating in-class discussion turns to be students’ favours. Since students have already attended the lectures, participating in-class discussion

does not require them to spend any additional efforts. On the contrary, when comparing with participating in-class discussion, students have tended to be more unwilling to spend more time and efforts out of their private life in completing the assigned activities after lessons. Because of the tendency of avoiding an extra burden, all students in this study therefore showed their favours of in-class discussion even though it does not carry marks and contributes almost no meaning to their achievements.

In short, based on the afore-mentioned denotations, university students in Hong Kong have perceived participating in-class discussion as something neither meaningful nor helpful to them. Nonetheless, students have tended to show their preferences over in-class discussion because it does not load further burden to them. This study has argued that students' perceptions in return have been mediated by their past experiences of stressing achievement.

Contributions

This paper has helped educationists to realize an existence of contrast between their motivations in employing in-class discussion and students' perceptions of it. Through recognizing the contrast and appreciating the way of experience in shaping students' perceptions towards learning activity such as in-class discussion, educationists not only can review on their existing teaching practices but also enable them to have a better selection, integration and implementation of various teaching and learning activities in the futures.

Conclusion

To sum up, even though in-class discussion has been perceived not useful and unhelpful, university students in Hong Kong still cast their vote on it because most of the time it does not increase their burden. Students' perceptions of participating in-class discussion reflected their mindset which, in return, has been mediated by their previous experiences. Once educationists can make use of students' mindset when formulating pedagogy, students can be really benefited from the involved teaching and learning activities.

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Rethinking Chinese International Student Engagement in a Neoliberal Time

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Abstract

My research aims to examine how neoliberalism affects Chinese international student engagement in Canadian graduate study and rethink their engagement in education. With the landscape of internationalization, Chinese international graduate students have been facing great challenges resulted from the neoliberal ideology. I would like to consider Chinese international graduate students specializing in Social Justice Education as an example to explore how neoliberalism imposes dominant notions of student engagement and challenge stereotypical notions of engagement. I will analyze notions of student engagement in Confucian and Canadian educational models. These two models are examined to expose how differences between both have affected Chinese international students in Canadian graduate schools. I will suggest a critical-democratic framework based on engagement and leadership to advocate for social justice for Chinese international students.

Keywords: student engagement, neoliberalism, Canadian education, Confucianism, democracy education, social justice

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Introduction

With the landscape of internationalization, the number of Chinese international students pursuing their graduate study has rapidly increased each year globally (Calder et al., 2016). The internationalization and diversification in Canada has made Canada attractive to Chinese international students for pursuing high-quality education (Xiang, 2017). Chen (2007) reported Chinese students choose Canadian universities for many reasons, including high-quality programs, affordability, and the perception of Canada as safe and peaceful. The percentage of Chinese international students increased by 886% from 2000 to 2015 and has achieved one-third of Canada's international student population, ranked top among students from other countries in 2016 globally (Canadian Bureau for International Education, 2016).

This study examines how neoliberalism affects Chinese international student engagement in Canadian graduate study and rethink their engagement in the neoliberal educational system. With the landscape of globalization, the number of Chinese international students who pursue their graduate study abroad has rapidly increased. Chinese international graduate students who are situated within Confucian and Canadian educational models, have been facing great challenges resulted from the neoliberal ideology in education.

First, I would like to explore how neoliberalism imposes dominant notions of student engagement, and challenge stereotypical notions of engagement for those students. The impacts of neoliberalism in education such as standardization and profit-making have led to significant barriers that affect those students' engagement.

Second, I will analyze notions of student engagement in two educational models. Confucian and Canadian models are examined to expose how differences between both have affected Chinese international students within the transition from a Confucian-oriented environment to Canadian educational environment. I would like to challenge stereotypical notions of engagement for Chinese students affected by the Confucian model in a Canadian learning environment.

Third, by rethinking student engagement of Chinese international graduates, I suggest a critical-democratic framework based on student engagement and inclusive leadership as a way to advocate for the equity of Chinese international students as well as to fight against the neoliberal ideology in education. This includes the appreciation of different forms of critical thinking and engagement, the environment of student-centered learning, the democratic relationship between teachers and students, and the importance of multiculturalism.

Student engagement in Social Justice Education in the neoliberal time

As SJE work-study international outreach coordinator, I have been in charge of assisting potential Chinese graduate students with their questions and concerns. These issues such as neoliberalism with the landscape of globalization and the limited knowledge of subjects in social justice education have impacted Chinese international graduates in Canada.

First is the impacts of neoliberalism in education on job-hunting and tuition fees. Almost all the potential Chinese international students concerned about their careers after graduation when they prepare for the applications of SJE graduate programs. For instance, is SJE graduates competitive in the job market? What kinds of job we can do after graduating from M.Ed. programs and Ed.D. programs? What average of the salary is estimated as SJE graduates? All of these concerns reminded me about the marketization based on the neoliberal values. Martinez and Garcia (1996) claimed the key points of neoliberalism embodies the rule of the market, cutting public expenditure for social services, and deregulation and privatization. Based on these neoliberal rules, ideals like competition, evaluation, and standardized testing all play into deficit thinking, which affects the oppression of people and organizes school systems to be results-oriented (Portelli & Sharma, 2014; Portelli & Konecny, 2013). Deficit thinking in education stems from the combination of “pseudo-scientific” (Sharma & Portelli, 2014, p.255) research and the resulting “socio-economical framework” (Sharma & Portelli, 2014, p.257). Neoliberal hegemony in current education has led to ‘deficit thinking’ that has seriously impacted on inner-city and international students (Sharma & Portelli, 2014).

Some prospective Chinese international students claimed that they had the opportunities to study the M.Ed. and Ed.D. programs due to meeting programs requirements; however, they cannot afford the tuition fees of the M.Ed. program. The minimum number of years to pay tuition in M.Ed. is 1.5 years and, in Ed.D. programs, it is three years. The minimum tuition for M.Ed. and Ed.D. are CAD \$51 330 and CAD \$105 970, respectively plus incidental costs (OISE, 2018). According to Chinese 2017 statistics, the average of each working-class family annual income is estimated up to CAD \$50 000 (Xiang, 2017).

Financial issues become one of the main obstacles for these Chinese international students who come from the working-class family to study in SJE program in UofT. This made me rethink neoliberalism in education in a broader scope. The commodification of humanity, the public services privatization, and the global diktats of international capital all lead to education that centers on setting education that aims for profit making and allows educational businesses to profit from international privatizing activities (Hill & Kumar, 2012). It is time to start thinking about practical ways to reconstruct the education system placing it on offense against neoliberal capital under the background of globalization.

As educators not only in SJE but also in other fields, we need to come together to challenge the neoliberal ideology in current education and reconstruct the educational system in the neoliberal settings. We need to provide practical solutions to fight against issues such as high tuition fees and marketization in the neoliberal education system and advocate for international students’ engagement as a democratic and inclusive way to make spaces and possibilities for every student including international graduates in education. I believe this is crucial that a democratic framework that includes robust democracy and cosmopolitanism, anti-oppressive education, Bias-free education, and social justice education can create the possibilities of diversity and equity not only in the education field but also in the global society.

The neoliberal ideology such as standardization and marketization (Portelli & Konecny, 2013, p.4) has especially marginalized Chinese international graduate students in Canada and challenged their engagement in Canadian graduate schools. For instance, as a work-study international outreach coordinator, I argue that there have been limited knowledge of Chinese potential international graduates about subjects of multidisciplinary and diversity in Social Justice Education due of usefulness resulted from marketization and standardization.

Subjects like black studies, Indigenous studies, disability students, gender studies and queer studies are not understood in depth by Chinese international graduates. According to black studies, some prospective Chinese international students raised questions such as why do we need to study black studies while in China we did not experience the inequity those racialized people have suffered from in North America? Based on their opinions, it is hard for Chinese students to “put ourselves in their shoes” to do research in black studies.

According to Indigenous studies, some prospective Chinese international students raised concerns about their limited knowledge about the backgrounds of Indigenous people in Canada. For instance, what is the Truth and Reconciliation Commission of Canada? What had happened in Canada’s residential schools in the history? What do we understand Indigenous worldview and the relationship between Indigenous and non-Indigenous people? According to disability studies, some prospective Chinese international students did not have strong interests on disability issues because they or their family members have no related experience or working with disabilities so that they did not think they had enough research or experience to offer in disability studies.

According to gender and queer study, some prospective Chinese international students had the concerns that the public attitudes on gender in China have been rooted within Chinese traditional culture as “Oriental despotism”, which is hostile to both individual freedom and feminism (Lan, 2003, p. 240); therefore, all of these are difficult to make a change in a short time. According to queer studies, almost all the potential Chinese students raised the concerns that Chinese historical traditions and current policies have negative impacts on queer identities and gender diversity. For instance, it is “illegal for minors to change their officially-listed gender, stating that sex reassignment surgery, available to only those over the age of twenty, was required in order to apply for a revision of their identification card and residence registration” (Jun, 2010, p.4) according to Chinese law since 2009. Also, gender identity discrimination or sexual orientation is not explicitly dealt with in the Constitution in China (Jun, 2010).

As educators, we need to explore more ways to help Chinese international students who have facing challenges resulted from different educational backgrounds and cultural difference actively engage in classrooms. For instance, it is recommended to encourage Chinese graduates to rethink Black studies with race in China, Indigenous studies with Environment Justice and Indigenous people and communities in China including Tibet, disability study with social theory and Buddhism, gender study with Chinese characteristics such as empowering girls in education, and Queer study with LGBTQ identity in China in classrooms. All of those can be regarded as effective ways to explore in Canada graduate schools.

Student engagement in Confucian and Canadian educational models

As an Ed.D. student and international outreach work-study coordinator in Social Justice Education department, I have been exploring how to critically understand the different values for Confucian and Canadian education models as a way of critically understanding student engagement of Chinese international graduates.

With the landscape of globalization, there have been more Chinese international students who pursue graduate study in Canada. However, due to the difference between Confucian and Canadian education values, the engagement of those Chinese international students affected by the Confucian educational model and values have been stereotyped and misunderstood based on deficit thinking in the Canada learning environment. On the one hand, according to traditional Confucian values, student engagement requires students to follow the master, and respect his/her teachers (Liu, 1986). Chan (1999) posited that the Chinese student engagement is mostly based on a strong hierarchical teacher-student relationship. Teachers provide lecture-based one-way communication, indicating that teachers have absolute authority, and students receive this knowledge and avoid challenging teachers' authority. Chinese student engagement reflects that students "not go beyond the instructor's expectations" and "replicate the instructor's lecture or the facts in a textbook instead of presenting their own thoughts in assignments and examinations" (Flowerdew & Miller, 1995, p.23). On the other hand, for Chinese Confucian values, knowledge needs to be "conserved and reproduced" rather than "developed and rethought" as Western values (Ballard & Clanchy, 1991). Therefore, Chinese students are regarded as lacking critical and creative thinking and less engaged, which are highly valued in Western education (Flowerdew & Miller, 1995).

For instance, the silent performance of some Chinese international students in Canadian graduate study has been regarded as less engaged in learning (Liu, 2001). Liu (2001) highlights the stereotype and misunderstanding as follows:

Such cross-cultural misunderstandings occur when Chinese students' silent behavior in class as a way to show respect to the teacher or as a concern over wasting other students' time is thought of as a lack of respect or lack of engagement in the class. (p. 52)

These stereotypes and misunderstandings based on cultural difference and language barriers have been impacting the forms of engagement of Chinese international students. Critical understanding and engagement are significant but challenging to some Chinese international students because this Western value is deemphasized in Chinese traditional values (Zhou et. al, 2015). According to Ryan (2010, p. 43), these are significant differences between Western and Confucian academic values as shown in Figure. 1:

Western	Confucian
• Deep learners	• Surface or rote learners
• Independent learners	• Dependence on the teacher
• Critical thinking	• “Follow the master”
• Student-centered learning	• Respect for the teacher
• Adversarial stance	• Harmony
• Argumentative learners	• Passive learners
• Achievement of the individual	• Achievement of the group
• Constructing new knowledge	• Respect for historical texts

Figure. 1 Western versus Confucian Academic values (Ryan, 2010, p.43)

This lack of critical thinking, as Choudry (2015) notes, reflects “the passive consumption of education, and hierarchies of knowledge and power relations between “teachers” and “students” (p.95). It is not easy to break from this conditioning for Chinese international students; however, they need to develop their own critical thinking and engagement based on different cultural values in order to better learn and engage with the landscape of globalization. Based on this critical framework, Chinese international students can explore the history and analyze the truth by examining the knowledge of “how”, “where”, “when”, “why”, and “what” they have learned. Newman (2006) noted the correlation between critical engagement and social justice, and claimed that “the domestication of the term critical thinking in universities and corporate workplace learning contexts, stripped of its connections to and its roots in the pursuit of social justice” (p.10).

For instance, according to Canadian educational models, Social Justice Education in OISE offers unique and interdisciplinary graduate programs specializing in social justice. More importantly, it provides students with critical understandings and engagement of the social, historical, cultural, political, economic, and ethical contexts of education. As the SJE website states, “The Department of Social Justice Education (SJE) is a multi-interdisciplinary graduate program whose mission is to provide students with critical understandings of the social, historical, philosophical, cultural, political, economic, and ethical contexts of education, broadly conceived” (OISE, 2018).

According to the study in Social Justice Education, students can develop critical engagement based on research, dialogue, and collaboration by getting involved in an inclusive community through engaging themselves as well as collaborating with other students and educators in the diverse and inclusive environment. As Choudry (2015) suggested, student engagement based on critical thinking can be fostered by engaging in self-empowering processes of dialogue and conversations on a global basis. With the study of Social Justice Education, dialogues based on critical understandings and conversations between different values and cultures can be well developed and implemented. According to Apple (2017), education is about values, human rights and cultural diversity, which includes “nourishing peace and fostering inclusive and sustainable development” and “reaching one’s full potential as a human being” (p.36).

A critical-democratic framework based on Chinese international student engagement and inclusive leadership

Democracy education based on a critical-democratic framework can be an effective way to fight against neoliberalism in education and advocate for Chinese international student engagement. Enacting a critical-democratic framework in education should include anti-oppressive education, Bias-free education, and social justice education based on Chinese international students' engagement and leadership.

First, anti-oppressive education aims to deal with the oppression of class, race or gender in youth education that can make more effective schooling. North (2008) emphasized anti-oppressive education is a way to achieve education for social justice and democracy (p.1184). To achieve these goals, the democratic leadership that "integrates the participation and the growth of whole people" (Griffiths & Portelli, 2015, p.87) is prominent in anti-oppressive education. The "power sharing", "transforming dialogue", "holistic meaning" and "holistic well-being" of democratic leadership provide a sense of belonging so that people including Chinese international students feel confident, respected, empowered, connected and collaborative (Griffiths & Portelli, 2015, p.88). We should develop the educational leadership and engagement of Chinese international student based on the anti-oppressive education.

Developing the inclusive educational leadership in order to enhance the engagement of Chinese international students based on the anti-oppressive education can help to break the deficit thinking of Chinese international students. As Ryan (2012) indicated, the inclusive leadership includes a collective process and fair involvement and participation of everyone, which starts with self-awareness and the ability to listen and learn (Anand & Winters, 2008). Thus, developing the inclusive leadership can help Chinese international students' participation and engagement in Canadian graduate schools as well as making sure Chinese international students' voice be heard. This can help to eliminate unequal power relationships between teachers and students, promotes horizontal relationships among students, and generate inclusive practices, and promote critical learning and engagement (Ryan, 2012), which is significant to break the deficit thinking of Chinese international students. Created by "sociological-cultural" assumptions, this deficit thinking of Chinese international students is closely related to the marginalized group and the 'privileging and othering' (Sharma & Portelli, 2014, p.256). To deal with such privileging and othering, educators in Canada should tailor their pedagogy based on an anti-oppressive and critical-democratize framework, which highlight the importance of inclusive and respecting.

For instance, due to cultural difference and language barriers, the Chinese international students who have been facing presumptuous and disrespectful treatments based on the deficit thinking from the neoliberal schooling and may not have access to leadership roles in the Canada schooling system because of the lack of confidence resulting from culture difference and language expression. Moreover, Chinese international students are hard to receive bursaries or scholarships for graduate students due to the marketization of the neoliberal educational system and the stereotype that there is less need for Chinese international students on financial support because of Chinese rapid economic development nowadays. Deficit thinking of Chinese international students as a crucial terminology forces us as educators to

examine where this thinking comes from and figure out ways to break down this undemocratic values in such neoliberal education systems and explore practical ways to practice democracy in education. “spearhead the total infusion of anti-racism curricular, pedagogic, and instructional approaches in schools for the education of our young learners” (Griffiths and Portelli, 2015, p.102).

Based on the anti-oppressive education, a sense of community belonging could be meaningful to Chinese international student engagement with the curriculum in the classroom as well as the “hidden curriculum”, as Portelli (1993) posited, out of the classroom where Chinese international students feel connected and engaged. In order to develop the sense of community belonging for Chinese international students and empowering Chinese international students’ engagement, as Gruenewald (2003) highlights, can “encourage young people to examine the inequitable structures and oppressive relationships within communities” (McInerney, 2009, p.33).

Second, democracy education based on the bias-free framework is applicable in the education field and social practice by clarifying key issues as gender, race, class, and disability (Eichler, 2006, p.63), which can also improve Chinese international student engagement in a global educational basis. The bias-free education aims to address global inequity and domination issues based on reducing biases in social hierarchies, examining and respect differences, and avoiding double standards in the schooling. The bias-free framework, which is aiming to love and care all the youth students including Chinese international students and help them build up the social values such as morality, fair play, and honesty, is necessary to enact democratic engagement in education. Youth engagement, as McMahan and Portelli (2004) argued, is “generated through the interactions of students and teachers, in a shared space, for the purpose of democratic reconstruction, through which personal transformation takes place”.

To promote a critical pedagogy of Chinese international student engagement, it is significant to develop a student-centered curriculum and a democratic student-teacher relationship that meet the Chinese international students’ needs and interests in the neoliberal education. Moreover, the inclusive educational leadership based on the bias-free education is significant. As Griffiths and Portelli (2015) noted, “in the field of education, the responsibility of leadership is to ensure a fair, just, and equitable educational system, one that is able to promote education for all learners” (p.99). A collective leadership that aims to social justice based on the bias-free education needs to be rooted in spirituality and community (Griffiths & Portelli, 2015). Educational leaders need to “have the fortitude to speak the alternatives into existence” (Smyth et. al, 2014) in order to make Chinese international graduates actively engaged in Canadian education.

Third, a critical-democratic framework based on social justice education is significant to the democratic pedagogical practice as well as social justice practice against the neoliberal ideology (Portelli & Konecny, 2013, p. 91). Democratic pedagogical practice including “inclusive education and minimizing both racial and gender discrimination” (Griffiths & Portelli, 2015, p.132) are essential to achieving social justice in education. Practicing democratic educational leadership is significant in democratic pedagogical practice. It is not only being a moral leader of the youth but also continuously challenging the dominant discourses from social, political, and

historical aspects (Bogotch, 2000). Social justice is noted in different ways not only in the field of education but also in social settings. Freire's pedagogy of critical consciousness also encourages engaging students to "make connections with the broader exploitative social structures and relationships" (Martin, 2004, p.12) based on social justice values. As stated by North (2008), knowledge about the economy, society, history, and politics can lead to action and social change, so it is vital for educators and policymakers to think about "put social justice on the leadership agenda" (Blackmore, 2002, p.215) that can develop positive changes.

Democracy education based on social justice education is rooted in those democratic values such as "equity, fairness, inclusion, valuing difference, autonomy and connectedness, and open and free discussions" (McMahon & Portelli, 2004, p.73). Thus, the critical-democratic framework of engagement and inclusive leadership is significant to the practice of democracy education. The critical-democratic engagement and inclusive leadership can "preparing students for democratic citizenry" (McMahon & Portelli, 2004, p.73) and positively make social changes based on their engagement and leadership in dialogue with political democracy and civic engagement (McInerney, 2009) in social settings.

According to Chinese traditional values and educational policy, multiculturalism has been important key terms since the founding of the People's Republic of China (Fei, 2012). As an interpreter to support 3 Chinese visiting scholars in 2017 Language Policy and Planning Conference during my work-study experience, I have learned how multiculturalism is being used as an effective way to implement Xinjiang' educational policy and leadership and student engagement in China. As a famous Chinese social activist and researcher of sociology specializing China's ethnic groups, Fei (2012) stated multiculturalism indicates "difference in unity" (求同存异) that "every form of beauty has its uniqueness (各美其美) and precious is to appreciate other forms of beauty with openness (美人之美); if beauty represents itself with diversity and integrity (美美与共), the world will be blessed with harmony and unity (天下大同)" (p.52). I argue these social justice values uniqueness, openness, diversity, and integrity insightfully pointed out a great way to make positive impacts not only in developing Chinese traditional values and Chinese current educational policy but also can bring an impact in a broader way with the landscape of globalization such as in the reconciliation of Indigenous community in Canada. To implement social justice values based on a critical-democratic pedagogy and develop Chinese international students' engagement, as educators, we need to think about how social justice value are developed with Chinese characteristics and how social justice education can be used as a framework to implement inclusive educational leadership and student engagement with the landscape of globalization and multiculturalism of "difference in unity" (Fei, 2012, p.52).

Conclusion

As an Ed.D. student specializing in Social Justice Education as well as a SJE work-study international outreach coordinator, I hope through rethinking Chinese international student engagement in Canadian graduate study with the landscape of neoliberalism on a global basis. This aims to explore how to effectively develop

Chinese international student engagement based on social justice pedagogy and China traditional education.

It is hoped that rethinking student engagement of Chinese international graduates based on a critical-democratic framework and inclusive leadership can be a practical way to advocate for Chinese international students' rights and empowerment on democracy and equity in education. By rebuilding the democratic student-teacher relationship based on the inclusive leadership, we can collaboratively advocate for everyone students' rights and freedom including Chinese international students in the neoliberal educational system and to restructure democracy education for fighting against neoliberalism in education based on inclusive leadership and social justice values.

Given the magnitude of current global challenges of facing Chinese international student engagement in a neoliberal time, the study provides valuable insights and effective ways of supporting Chinese international graduate student experiences. This study can also make Western institutions aware of the features of Chinese international student engagement in Canada graduate studies and a broader understanding of student engagement. Thus, those institutions can have a more inclusive academic environment and offer better community support to Chinese international students in order to assist their engagement based on meaningful learning and practicing experiences in and out of the classroom. Theoretically, the study adopts a critical post-modern framework to rethink the current understanding of student engagement and will shed light onto deconstructing and reconstructing student engagement to empower student experiences in such neoliberal educational system.

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Secondary School Students' Educational Perceptions and Experiences in Nyarugusu Refugee Camp

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Abstract

In Tanzania's Nyarugusu Camp, one of the world's largest and most protracted refugee camps, only 7% of youth are enrolled in secondary school. These rates are surprising, especially considering that primary school enrollment rates stand at nearly 80% (UNHCR, 2017 March 31). This study, which is in-progress, explores the question of what it means to be a secondary school student in Nyarugusu Camp. Much of the literature on refugee education has focused almost exclusively on organizational aspects of planning and monitoring education (Kirk & Winthrop, 2008), and much of the research that has been done on student and community perspectives in relation to education tends to be conducted by stakeholders (eg/ UNICEF, UNESCO, UNHCR, International Rescue Committee), which has significant potential to be undertaken for certain objectives (Pottier, 1996). Therefore, this study uses a symbolic interactionist framework and grounded theory methods, including written responses, individual interviews, and observation. The intent of this research is to gain more of an understanding of the youth's experiences and perceptions, so grounded theory is appropriate, as it gives voice to the constructions that youth make of their situation and experiences (Woodgate, 2000). I will employ grounded theory in an attempt to build a theory that helps to explain how this aspect, secondary education, "works" or functions in Nyarugusu Camp. Whether or not that theory might be substantive, or transferable to other refugee camp settings, remains to be unseen. This study has been approved by Lakehead University's Research Ethics Board and data collection is currently underway.

Keywords: refugee youth, refugee camp, education, sociology of education

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Introduction

In Nyarugusu Camp, a protracted refugee camp situation located in Northwestern Tanzania, International Rescue Committee (IRC) reports that despite their target of having 50% of youth (who they define as 15-18 years of age) enrolled in school, only 7% were actually enrolled in secondary school (UNHCR, 2017 March 31). It is therefore important to be concerned about the educational opportunities available to young people in this particular camp, as many of them would be spending a greater part of their school-age years here.

Many different factors come into play when providing education in emergencies, and thus, it is important to both hear and incorporate refugee voices and perspectives when creating policies and programming (Winthrop & Kirk, 2008). However, Winthrop and Kirk (2008) note that when exploring the relationship between refugee students' well-being and schooling, researchers tend to adopt one of two approaches: (1) the *educationalist* approach, where the focus is on education systems, and refugee perspectives are most often not heard; or (2) the *child protection* approach, in which researchers focus on children's experiences of conflict, eliciting their perspectives, but only in relation to the conflict, not to their schooling (p. 640). Winthrop and Kirk (2008) conducted their own study in an attempt to incorporate the voices of refugee students themselves, but this study focused on primary school student perspectives, which in fact, is true of most studies in the field of education in emergencies. This particular priority on primary schooling and primary students ignores the importance of secondary schooling, especially in protracted refugee situations. It also ignores the status of education, specifically secondary education, as a fundamental human right.

In the context of education, refugee communities often emphasize the importance of education, but enrollment and completion statistics paint a different picture. There are numerous studies in which refugee communities discuss the importance and value of education (Affolter & Allaf, 2011; Ali, Briskman, & Fiske, 2016; Clark-Kazak, 2011; El Jack, 2011; Waters & Leblanc, 2005), but the reality is that enrolment and completion rates are very low (Crea & McFarland, 2015; Montjourides, 2013; Oh & van der Stouwe, 2008). Given that only 7% of the population that is eligible for secondary school is actually enrolled in Nyarugusu Camp, this 7% is the phenomenon, especially considering that targets are being met at the primary school level. UNHCR (31 March, 2017) has set a target of 75% of primary-aged children in school, and they report having actually achieved 79% enrollment. Therefore, at the secondary school level, I want to understand what sets this group, this 7%, apart, or perhaps gives them the advantage, over the 93% of their peers that are not in secondary school. I want to consider how their perceptions of and experiences with education have led them to this point, to be enrolled in secondary school in Nyarugusu Camp, while so many of their peers are not enrolled. Specifically, this study asks:

1. What do students perceive to be the purpose and function of education?
2. How do students' perceptions of the purpose and function of education develop?
3. How do students feel about access to and availability of educational opportunities?
4. What types of interactions do students experience while in the school setting?

5. What do students identify as being positive and negative experiences in the school setting?
6. How do these experiences make students feel?

Theoretical Framework

This study, and grounded theory as a whole, is underpinned by symbolic interactionism. According to Benzies and Allen (2001) symbolic interactionism emphasizes the importance of individual understandings of their world and what they believe is important. In this study, as outlined in my research questions, the meanings that youth make within the context of education are a focus of the research, which means that symbolic interactionism is important in understanding how youth interpret meanings and act in specific contexts and settings (Benzies & Allen, 2001). Symbolic interactionism recognizes that truth is not absolute because context and situations can cause meanings to change (Benzies & Allen, 2001).

Methodology

For this study, I have chosen to use grounded theory, and more specifically, constructivist grounded theory, as I am most interested in exploring youth's perceptions and experiences with education in Nyarugusu Camp, including how youth make sense of their experience and which factors they identify as influencing, enhancing, or impeding their educational experiences. While there is some research on education in refugee camps, many participant voices are missing, especially those of youth and secondary-school students. As such, I will use an inductive research approach, as I cannot begin to hypothesize or predict what participants' experiences may have been or what their perceptions may be. Grounded theory will be used in an attempt to develop a substantive theory that furthers understandings of these youth, an area where little research has been conducted (Chenitz & Swanson, 1986). Mills et al. (2007) state that grounded theory is a useful research approach because it seeks to discover issues of importance in participants' lives. These are things that, as an outsider, one may not recognize or identify. As Clarke (2005) points out, grounded theory is useful because it relies on post-modern perspectives and acknowledges the researcher as a participant, rather than an 'all-knowing analyst.' Because the intent of this research is to gain more of an understanding of the youth's experiences and perceptions, grounded theory is appropriate, as it gives voice to the constructions that youth make of their situation and experiences (Woodgate, 2000).

A constructivist research paradigm assumes that there are multiple realities and that understandings are created between the participant and the researcher, making both a part of the research process (Denzin & Lincoln, 2005). The idea of the researcher and participants co-constructing knowledge and understandings is an aspect of constructivist grounded theory that also differs from classic grounded theory. Classic grounded theory claims that the researcher is separate from the data and from any theory that emerges from the data (Glaser & Strauss, 1967); however, constructivist grounded theory recognizes the researcher's "past and present involvements and interactions with people, perspectives, and research practices" (Charmaz, 2006, p. 10). Constructivist grounded theory also acknowledges that what the researcher brings to the data influences what they see within it (Charmaz, 2006, p. 15). For example, in the case of this study, I acknowledge that my professional experiences and my

worldviews influence my research interests and choice of research area. These things do not happen in a vacuum; a researcher always has some type of background in an area prior to undertaking research.

Methods

Interviews.

Although data will be collected in other forms, interviews will be central to data collection in my study (Creswell, 2007). Grounded theory relies on the collection of data that is rich and detailed (Charmaz, 1990). To gather this kind of rich data, I will use the Active Interview developed by Holstein and Gubrium (1995). This way of interviewing explores the realities of research participants and, in accordance with constructivist grounded theory beliefs, acknowledges that both the interviewer and respondent are active participants in the interview process (Holstein & Gubrium, 1995). They see the interview not as a “pipeline for transmitting information,” but as a “social encounter” (p. 3). This means that both interview and respondent are involved in a collaborative conversation and are viewed as co-constructors of knowledge. The interview becomes dynamic and connections between experiences and information is made in the moment; there is no sense that there is a ‘right answer’ (Holstein & Gubrium, 1995). Instead, according to Holstein and Gubrium, the participant “constructs his or her experiential history as the interview unfolds, in collaboration with the active interviewer” (1995, p. 32). The participant is able to provide complex descriptions of his or her experiences as they tell their story. By using active interview methods, I will be able to better “incite or encourage respondents’ narratives” (Holstein & Gubrium, 1995, p. 77). This allows them to consider and reflect on the *hows* and *whats* of experience (Holstein & Gubrium, 1995).

A grounded theory study typically consists of 20-60 interviews with individuals, but usually more like 20-30 interviews are required to develop theory (Creswell, 2007). Based on these recommendations, I intend to interview at least 20 participants. I anticipate that interviews will last approximately 60-90 minutes; however, given the reflective nature of interviews and the fact that there may be translation involved, the length of interviews may vary greatly. In a refugee camp context, it is important to maintain high levels of participant confidentiality and safety. Given that mobile phones are extremely prevalent in this particular camp (GSMA 2017), I feel that conducting interviews by phone is most appropriate in this context.

Written accounts.

Given the nature of the refugee camp situation, and the politics and power dynamics involved, I feel that anonymous written accounts may be able to provide data that I may not otherwise gather in a phone interview (Charmaz, 2006; Creswell, 2007). In addition, written accounts have the potential of being more reflective than oral accounts (Handy & Ross, 2005), as participants have more time to consider the question, think about, and even change their answer. The questions will be constructed and presented as they would in an oral interview, and I will ask participants to answer them as briefly or as fully as they would like.

Observations.

Charmaz (2006) notes that grounded theory allows for a researcher to discover “what our research participants take for granted or do not state, as well as what they say and do” (p. 19). Of course, interviews will allow me, as the researcher, to discover what participants say, and do not say. To discover what they do, I will also rely on observations.

Memo Writing.

A final form of data collection will occur in the form of memos, which are important in grounded theory studies as they capture the researcher’s thoughts, ideas, comparisons, and questions regarding the research; essentially, the memo exists as a way for the researcher to have a conversation with him/herself (Charmaz, 2006). These memos not only keep the researcher involved in constant analysis, but also assist in defining relationships and bringing new levels of abstraction to your ideas and concepts (Bryant, 2017; Charmaz, 2006). They also provide a way for the research to retain ideas and thoughts before they are forgotten (Glaser, 1978). It is important to note that while memos can be written at each stage of the research process, they are not written directly within data sources, such as transcriptions, because it can blur the lines between the participants’ comments and the researchers’ interpretations (Glaser, 1978). Instead, data from transcripts and fieldnotes can be included into memos.

Memo writing is similar to journal writing (Birks, Chapman, & Francis, 2008). They can vary in length and content, including abstract or concrete ideas, the use of diagrams or flowcharts, for example (Creswell, 2012). Charmaz (2006) presents an entire chapter on memo-writing in *Constructing Grounded Theory*, and poses helpful questions to consider at different stages of the research process. I intend to use many of her useful suggestions when writing early and more advanced memos.

Ethical Considerations

This study has been approved by Lakehead University’s Research Ethics Board, but I want to highlight some of the ethical considerations undertaken in developing this study. First of all, I acknowledge that can be many vulnerabilities experienced by a refugee, who has fled conflict and persecution, and now finds themselves in a state of limbo. Mackenzie, McDowell, and Pittaway (2007) claim that this vulnerability is one of the most challenging aspects of conducting refugee research; however, Block, Riggs, Haslam (2013) note that “deeming whole populations or categories of people as vulnerable lacks sensitivity to context and fails to consider what a person might be vulnerable to” (p. 6). Instead, Coleman (2009) highlights the importance of three specific vulnerabilities in refugee communities: risk-based vulnerability, consent-based vulnerability, and justice-based vulnerability, which I used to help design my study.

Risk-based Vulnerability.

Confidentiality is an important factor in my research study. I will collect anonymous written accounts or answers, but individual interviews are obviously not anonymous. Besides conducting individual interviews by phone, to help protect participants’ safety and confidentiality, I will also do a few other things. First, I will conduct two separate educational sessions, outside of school hours but at the school, during my time in Nyarugusu Camp. These sessions will have many purposes: to enable me to

get to know some of the students better; to give something back to the community; and to provide a place to safely and privately provide written responses, should students choose to participate in the written interview component of the study. Those who have consented to participate in a phone interview will be assigned a pseudonym to use in the interview. The pseudonym will be assigned to the participant prior to the phone interview being recorded, so that only the researcher knows which pseudonym corresponds to which participant. In this way, participants can use the pseudonym when the phone interview begins, and the translator will not know the participant's true identity.

In a further effort to maintain safety and confidentiality, I will bring an English-Kiswahili translator with me, from outside of the camp and from outside of the local area. I feel that this is important because participants will not have to worry about sharing their thoughts and experiences with someone who may work for the humanitarian agency that is, largely, in control of their livelihood in the camp.

Finally, and importantly, in terms of risk, it is necessary to consider the fact that many people living in Nyarugusu Camp have experienced past, and sometimes present, trauma. While I have attempted to structure my interview questions in a way that bypasses discussions of conflict and war, or their reasons for being in Nyarugusu Camp, these are topics that can still easily find their way into our conversations. I will provide participants with a list of resources that are available in the camp and ensure that they know how to access these resources, should they need to access any services, counselling or otherwise, following our interview sessions.

Justice-based Vulnerability

Mackenzie et al. (2007) note that “protracted displacement situations can undermine people’s sense of their own identity, their sense of self-worth, as well as their trust in themselves, thereby impairing, at least to some degree, their capacities for self-determination” (p. 303). At the same time, Gifford (2013) argues that the refugee label should not assume vulnerability and that we need to respect the fact that refugees are still “capable of determining their own life and making their own decisions” (p. 50). In a setting such as Nyarugusu, respect and reflection on the nature of power relationships need to be acknowledged and addressed. In a refugee camp, refugees largely find themselves at the mercy of others, and these one-way relationships can have an impact on my own relationships with participants and community members. It is important for me to continuously reflect on my identities (academic, woman, White, Canadian, etc.) and how they may be at play during the informed consent, data collection, and analysis processes, as well as in my relationships with potential participants and community members.

There may also be increased levels of mistrust in the community (Mackenzie et al., 2007). This is another reason why it is extremely important for me to build relationships with community members and potential participants prior to data collection and to ensure that appropriate member-checking takes place once data collection has begun. Member-checking is a way for participants to validate that what has been transcribed, and potentially translated in some cases, is accurate and resonates with the thoughts and experiences that they were trying to convey (Birts et al., 2016). It is important that participants feel that their thoughts and words are being

accurately presented, and I will outline in my consent form the processes for member-checking.

It is also important that the purpose of my research is clear and that participants clearly understand that I have no affiliation with the agencies and organizations overseeing services in Nyarugusu Camp, and that their participation is voluntary and can be withdrawn at any time, without any penalty.

The use of translators can result in the possibility of poor translation (Mackenzie et al., 2007). To combat some of these potential issues, there will be careful translation and back-translation. For example, in this study, back-translation might look like this: English question – question translated to Swahili – participant answers in Swahili – translator translates participant answer to English – I summarize what the participant has said – translator provides my understanding back to the participant in Swahili. Discussions with participants about the interview's main themes and codes will also take place, in order to ensure that their meanings and ideas are most clearly and accurately presented.

Consent-based Vulnerability.

In this particular study, where I am spending time in Nyarugusu Camp, informed consent will be more of an ongoing and dynamic process, rather than just a single event where participants read and sign a form (George, 2015; Kadam, 2017; Kirby et al., 2012). This is important because in working with a population with different linguistic and cultural backgrounds, and possibly different experiences with research, sufficient time needs to be allowed to increase understanding and emphasize voluntariness (Gillam, 2013; Kirby et al., 2012

In addition to allowing time to help all parties understand the study and the consent process, many scholars highlight the importance of consent procedures that are culturally appropriate (Block et al., 2012; Ellis et al., 2007; Ford et al., 2008). Taking into consideration potential differences in understandings of adulthood or ages of consent, I have chosen only include participants under the age of 18 years if they also have consent from a parent or legal guardian. This results in a potential power dynamic, as someone else is providing consent, so it is very important that participants understand their rights as a participant and that the student also provide written consent.

To help increase the likelihood of truly informed consent, study information sheets and consent forms need to be linguistically appropriate (Benitez, Devaux, & Dausset, 2002; Kadam, 2017; Nakkash, et al., 2009; Ruiz-Casares & Thompson, 2016). For example, Kadam (2017) suggests using short, simple words, to keep sentences under 12 words, and to keep paragraphs under seven lines. Similarly, Nakkash et al. (2009) recommend reducing difficult, technical language. All study information sheets and consent forms will be provided in English, Swahili, and French, so that potential participants can choose the language(s) in which they feel most comfortable. These forms will also follow the recommendations of using simpler, less technical language and maintaining short sentence and paragraph lengths. In addition to providing sufficient time to read and discuss the forms, I will also go over these forms verbally at the start of individual interviews, to ensure that participants understand their rights and do not have any further questions. Because individual interviews will be audio-

recorded, I also plan to record this process, using Tilley's (2016) suggestion of audio-recording the process of consent.

Conclusion

This paper has presented the background for, and the need for, exploration into the perceptions of and experiences with education among Congolese youth in Nyarugusu Refugee Camp. As much of the literature on refugee education has focused almost exclusively on organizational aspects of planning and monitoring education (Kirk & Winthrop, 2008), and much of the research that has been done on student and community perspectives in relation to education tends to be conducted by stakeholders (eg/ UNICEF, UNESCO, UNHCR, International Rescue Committee), this study has been designed with the intent to gain more of an understanding of youth's experiences and perceptions, in their own words. By exploring refugee youths' perceptions of education in Nyarugusu Camp, those responsible for planning and delivering educational programming may have a better idea of both what encourages them to attend school and what discourages them from attending. Having a stronger understanding of these factors may work to promote higher rates of enrollment and completion at the secondary school level. In this way, the findings may have the potential to benefit both educational administrators and teachers, but also more importantly, the students and communities, as education has the potential to be linked with positive personal life outcomes.

I have also highlighted the importance of ethical considerations in conducting such a study. These considerations are many, and while refugees are frequently referred to as extremely vulnerable, they are also the most important voices in conversations about what is going on in their lives. It is important to give voice to the constructions that youth make of both their situation and their experiences when it comes to secondary education. Overall, this study will add to the small, but growing, body of research on the experiences of youth living in refugee camp situations.

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***Information Management Practices and Challenges in School Governance:
Basis for Localized Digital Archive***

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Abstract

Information plays a vital role in school governance as it is a primary basis for policy planning and development. The Department of Education recognizes this significance as it launched its own management information systems known as EBEIS (Electronic Basic Education Information Systems). In the school level, however, technology and resources for information management remain a challenge. To address this concern, this research examined the data management practices and challenges in a local public secondary school in the Philippines to develop a school-based online information management system. Focus group discussions were conducted among school administrators and personnel who are directly in charge of managing school data. The existing information management process involves: 1) data gathering and receiving of reports, 2) filing and storage, and 3) retrieval of data. Time consumed in the filing and retrieval of data; unorganized storage of paper-based documents; and absence of school policy on information management were observed as primary challenges of the existing process. Hence, project GEARS (GEANHS' Electronic Archiving & Retrieval System) was developed and introduced for pilot testing. The system is an online archive of school data, utilizing a free-hosting website and a cloud storage application to remain economical for a public school. Implications on the new system were positive and were observed as efficient, accessible, organized, and secure. The new system can be modified for information management needs of both local secondary and elementary public schools.

Keywords: information management, data, archive, system, school governance

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Introduction

The systematic control of all information is known as data management (Pali, 2009). It can be done either in electronic format or printed materials from their creation until its final disposition. The process includes the development and application of standards to the creation, use, storage, retrieval, disposal and archival preservation of recorded information. Makhura (2005), suggested the two phases in the life cycle of data. The first phase in the life cycle of a record is the creation and receipt. A paper document is in this phase when the document is written; an electronic document is in this phase when it is sent from a person to another. The second phase is maintenance and use. This is the part for which the life of a records exists. A record's purpose is for retrieval of information used in daily operations. In summary, an effective data management program will ensure that records are available for use when needed, that privacy and confidentiality are maintained, that redundant records are destroyed and that records ultimately contribute towards sustaining service delivery.

At present, however, some organizations still maintain a paper-based data management system, which in turn, faces a major challenge (Gregg, 2013), in terms of accessibility. Since paper-based information can only exist in a single location at a time, only one person can access that information at any given time. This serialized method to information management does not play well in today's "I need it now" business environment. Hence, data management has evolved from a paper-based function to technology-based investments (Mokhtar and Yusof, 2009). Electronic data management gives unlimited storage space as compared to conventional method of office cataloging that allow for retrieval when needed (Iziomo, 2014).

Institutions, especially public schools, produce increasingly large volumes of information in both paper and electronic forms, which should be stored, managed and preserved in an organized system that "leads to quick decision making, saves office space and promotes good corporate governance" (Adu, 2014).

The setting of the study is a large school in City of Imus, Gen. Emilio Aguinaldo National High School (GEANHS). As of March 2017, GEANHS has a total enrollment of 7,854 students. 26% of which are Grade 7, 26% are Grade 8, 24% are Grade 9, and 28% are Grade 10. Moreover, founded in 2017, the Special Education Program has an enrollment of 58 students. As the enrollment ballooned since its founding in 1996, the number of teachers also increased. As of February 2017, GEANHS has 304 teachers and 7 Head Teachers, divided into the 8 subject departments.

The school is required to submit important information, reports, and documents in various time frames (i.e. monthly, quarterly, and annually). The monthly reports include Supervisory Plan and Report, Canteen Report, Monthly Accomplishment Report, Learning Action Cell (LAC) Plan and Report, Feeding Report, Narrative Reports (i.e. Monthly School Celebrations, Awards, Seminars) School Form 2, and School Form 4. Quarterly reports include Adopt-a-School, Gulayan sa Paaralan, Quarterly Accomplishment Report, Mean SD MPS per Subject Area, and Personnel Services Itemization and Plantilla of Personnel (PSI-POP). Other reports are submitted during either or both the start and end of the school year, such as

Nutritional Status Report, Brigada Eskwela Report, NSBI, BED and BAR, and School Forms 1 to 7.

GEANHS' huge population contributes to the heavy flow of administrative information that the school needs to produce, submit, and store. Moreover, the School Improvement Plan (SIP) to be submitted by the end of the school year requires all the data produced and submitted during the entire school year. Hence, data must be stored effectively, with an accessible way of retrieval for future use.

With varied data as discussed, an attempt was made to develop a school data storage and retrieval system, focusing on administrative information, for enabling data search and retrieval from a digital interface. This study aims to improve the data management process of Gen. Emilio Aguinaldo National High School. Specifically, it sought to answer the following:

1. What are the data management practices in the school?
2. What are the challenges in data management?
3. What are the factors for designing an effective data management system?
4. How does electronic archiving and retrieval system improve the school's data storage and management system?

In order to answer these questions, the study used the qualitative research method in gathering and analyzing data. Qualitative research uses methods such as participant observation or case studies which result in a narrative, descriptive account of a setting or practice. The research aimed to identify the administrative offices' viewpoint on the data management practices before and after the creation of an electronic data management system.

Participants in the study are 14 individuals who are directly involved in the production and safekeeping of various administrative reports and documents. These include the: 8 Department Heads, 3 Principal's Office personnel, and 3 E-BEIS personnel. To gather data for the study, a focus group discussion was conducted among the participants of the study. Focus group methodology is useful in exploring and examining what people think, how they think, and why they think the way they do about the issues of importance to them without pressuring them into making decisions or reaching a consensus. There were two sets of focus group discussion with the participants. The first set concentrated on the participants' experiences and opinions on existing archiving and retrieval practices before a new system was created and implemented. This set answer the first three research questions. The second focus group discussion was conducted to identify the participant's views on the new system and its implications to the school's data management process, shedding light to the final research question. Since the study focused on individual experiences, beliefs, and perceptions of the participants towards data management, thematic data analysis was employed. Using open-ended questions and conversational inquiry allows research participants to talk about a topic in their own words, free of the constraints imposed by fixed-response questions that are generally seen in quantitative studies. The conversations were transcribed and noted down. The responses were then coded and organized into emerging themes for analysis.

Findings

The themes identified within the data include: (a) the existing management practices, (b) challenges in the existing data archiving and retrieval process, (c) participants' suggestions on how to improve the data archiving and retrieval system, (d) the design and implementation of project GEARS and (e) their perceived implications of the new system on the data management process in school.

Existing Data Management Practices

The analysis of participants' experiences led to an understanding of the existing process of data management in the school: a) data gathering and receiving of reports/documents by E-BEIS and Principal's Office, b) filing and storage, and c) retrieval of data. Figure 5 shows the overview of the existing management process.

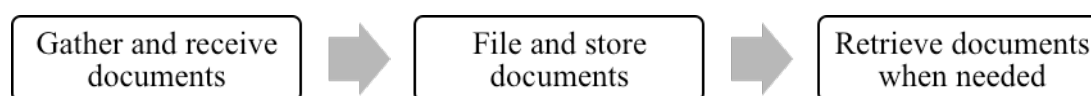


Figure 1. Data Management Process of Administrative Offices in Gen. Emilio Aguinaldo National High School

Data Gathering and Receiving of Reports. Data gathering in data management involves the process of submission of required reports and documents by teacher/department head to the E-BEIS and the Principal's Office. An E-BEIS personnel described that *“to ensure that all necessary data are gathered, the offices inform the concerned teacher either personally or through electronic forms of communication such as a text message, a phone call, or an online message (Facebook)”*. Submission of data to the offices occur in two ways: a) handing a printed copy of the document, and b) sending a softcopy of the file. In handing a printed copy of the report, the submitting party prepares three copies of the report—a copy each for the E-BEIS and Principal's Office, and one as a receiving copy. On the other hand, a softcopy can be sent through email, Facebook, or external memory stick.

Filing and Storage. The E-BEIS and Principal's Office also serve as a storage facility for submitted documents and reports. Both have cabinets filled with filing boxes and binders which are labelled according to content (e.g. Supervisory Plan and Report, School Form, Memoranda, etc.). The document, once received by an office personnel, is assessed according to content and placed in its appropriate box/binder. For softcopy files, .doc, .xls, and .pdf files are saved in the internal memory of one of the computers in either the E-BEIS or the Principal's Office. Often, these files are saved in “My Documents”, a default folder in a Windows computer. Another practice in saving softcopy files is through the use of Facebook groups. This feature of Facebook is used as a cloud storage where files are uploaded and stored.

Retrieval of Data. In cases when teachers, department heads, school head, or the Schools Division of Imus City personnel asks for data, retrieval of archived documents is necessary. E-BEIS and Principal's Office personnel will look for the document in the boxes/binders, produce a photocopy of the document, and return the document to the same box/binder. Softcopy files are retrieved in two ways. If the file is saved in the computer's internal memory, the office personnel searches through the files until the document is found. Another option is by finding and downloading the uploaded document in Facebook group.

Challenges in the Existing Process

In the course of the focus group discussion, participants recalled their experiences with data management. They were asked to tell about challenges or struggles that they encountered with any part of the data management process they have defined previously. In the reflections of the participants, two themes emerged: a) time, and b) organization.

Time. The present process was identified by one of the participants as a “traditional form of data management, involving filing of printed documents”. Upon reflection, they considered the existing process as time-consuming, particularly the sub-processes of filing and retrieval of data. When filing data, the office personnel needs to look for the appropriate box among the cabinets in the office. Once found, the personnel will search for the folder where the document belongs to. If no such folder exists, the personnel will have to make one by printing a label and pasting it to the folder. Afterwards, the box will be put into its original position in the cabinet. A common struggle in this filing method, encountered by the participants, is the lack of proper labels. Once a personnel forgets to put a label onto the box, it will be difficult to find the most appropriate box/binder to which the document will be filed. The same issue is observed with retrieving data. When asked for a document, the personnel will have to search through the cabinets, boxes, and binders, to get the required data. Often, the party asking for the document will have to wait until the data is found.

Organization. The participants were asked to clarify what they meant by lack of organization in the current process. Most of the participants defined organization as “a state of sorting and storing documents”, as in an archive. Both the E-BEIS and the Principal’s Office lack room for storage, given that they keep documents dated as far as three years ago. One of the challenges faced by office personnel is how to keep all the documents well-sorted out, properly labelled, and easily retrieved when necessary. Once the documents are not properly sorted, it leads to missing or misplaced files and data. On the contrary, one participant defined lack of organization as “*redundant style of data management*”. When asked to explain further, she pointed out that it was “*redundant to have two offices store the same documents*”. It was a waste of space, energy, and time to have two offices file the same data, with neither being able to retrieve data as quickly as possible, without the need to search through boxes and folders.

The New System: GEANHS’ Electronic Archiving and Retrieval System (GEARS)

Upon identifying the participants’ challenges with regards to data management, they also shared their ideas on how to make the process more efficient for all personnel involved. Their unified response to this matter is having a data bank for the school. They described data bank as a platform which is more secure, safe, timely, and organized, addressing the concerns and challenges previously mentioned. Hence, upon hearing the concerns and suggestions of the participants, the Principal’s Office initiated a project entitled GEARS or GEANHS’ Electronic Archiving & Retrieval System. The project involved creating a Google Drive account for the school where all documents submitted to the office are scanned and stored. Links to these

documents are placed in a Wix.com website in an organized manner so that these files could easily be retrieved.

Wix and Google Sites, web hosts, and Google Drive, a cloud service database management system, were chosen for developing Project GEARS. The main online platform chosen is Wix.com, a cloud-based development platform, which allows users to create web sites through the use of online drag and drop tools, with no coding needed. To serve as a back-up platform, Google Sites was also be utilized. Google Sites is a structured web page creation tool that allows users to create a team-oriented site where multiple people can collaborate and share files. Google Drive, to be used together with Google Sites, is a file storage and synchronization device that allows users to store files in the cloud, synchronize files across devices, and share files.

The Home Page of the Data Bank contains three important parts: The Upload Box is used to add files to the archive; the Menu Tab enables a user-friendly navigation through monthly, quarterly, semiannual and annual reports, and; the Search Box gives instant results for reports typed. A special feature of the site is the clock, which symbolizes timeliness of reports. Once a user clicks any tab from the menu bar, it gives a menu containing links to different reports, which are categorized as monthly, quarterly, semiannual and annual documents. Clicking on a link, for instance, Supervisory Report, will open a Lightbox (similar to a Pop-Up Page), which contains links to the google docs format of the reports. Scanned documents are saved as Google Docs files, and stored in the school's Google Drive account, which is then linked to Wix.com and Google Sites. Once the links are clicked, the copy of the document corresponding to the clicked link will appear on a new tab on the browser.

As designed, the system stores: 1) all reports submitted to the Schools Division Office, sorted by monthly, quarterly, biannual, and annual basis; 2) Narrative Reports; and 3) School Memoranda. Once uploaded, these reports can also be retrieved by simply clicking the link on the website. The administrative offices, particularly the Principal's Office, Department Heads' Office, and the E-BEIS office will act as the main consumers and suppliers of data on the system.

Implications of GEARS

The purpose of GEARS was to address the challenges that reflected on the prior focus group discussion with the participants. After a two-week dry run on the implementation of the new system, a focus group discussion was again made in order to gain the insights of the research participants. For the second phase of the interview, they were asked about the implications of the project with the data management process of the school. As codes and thematically organized, the responses of the participants were categorized into four: 1) efficient, 2) accessible 3) organized, and 4) secure.

Efficient. Through project GEARS, the participants observed important changes in the data management practice, particularly in saving time and finances. A Principal's Office personnel noted that the new system enabled "an easier way of storing, organizing and retrieving documents, which saves about half of the time spent on the old process." In the new process, the document is scanned and saved in the Google drive. This, according to a clerk, "spares us from manually labeling each file and

folders. We also do not have to purchase many folders, binders, and filing boxes because documents are already stored in the cloud.” This is similar to Richmond’s (2010) findings that electronic filing saves production cost for the company, which also enhances productivity. Costs are reduced by an effective data management system because less money are spent for equipment.

Accessible. Another significant change in the new system is its advocacy for transparency and accessibility. Since all documents are linked to the Wix.com site, they can be easily accessed anytime and anywhere with internet connection. This is especially necessary for an organization that is geographically dispersed, such as GEANHS which has faculties and offices in different building around the campus. According to Gregg (2013), when there is only one file of the data, managing the printed document involved becomes a physical challenge. Through the new system, this challenge is addressed. One of the Department Heads stated that they “do not need to go to the E-BEIS or Principal’s Office to retrieve data we need; as long as we have internet connection, we can easily access all the documents, saving us the time, effort, and energy.” When the schools division office also asks for information on school data, “clerks can simply turn to the website, click on the links of the documents or use the search button, and they easily access the information needed.”

Organized. Since the uploaded documents are sorted into categories, it is much easier to organize data, as compared to the manual filing which involved pasting labels to folders and putting them in boxes and cabinets. Data are organized and it is simpler to retrieve data for there is no need to search for boxes and folders. Moreover, electronic data management gives unlimited storage space as compared to conventional method that involves categorizing several printed papers in a cabinet to allow for retrieval when needed (Iziomo, 2014).

Secure. As a participant stated, with the new system, “there is no fear of getting data lost.” As mentioned earlier, all files in electronic format are saved in Google drive and Wix.com, aside from the server’s internal storage. An office clerk narrated that “with manual filing, natural disasters, like the typhoon and flooding we experienced in the past, damaged most of our documents. We managed to save the papers but the data written on them were already lost since they were drenched.” By safekeeping electronic files of printed documents, data is more secure and protected.

Conclusions

The existing data management practices in the school involves: 1) data gathering and receiving of reports/ documents by E-BEIS and Principal’s Office, 2) filing and storage, and 3) retrieval of data. The same process is undergone by both the hardcopy and the softcopy of a files. A printed document is received personally by an E-BEIS or Principal’s Office staff; assessed and labeled according to content before being filed in folders, boxes, and cabinets; and retrieved by locating the folder where it was placed. A softcopy, on the other hand, is received by the E-BEIS or Principal’s Office staff through email or Facebook; saved in the computer’s internal memory or uploaded in Facebook group; and retrieved by clicking links in the group or by asking for a copy from the offices. Challenges in the existing process mainly revolves around time, and organization. The existing process was time-consuming, particularly with filing and retrieval of data. When filing data, the office personnel needs to look for the

appropriate box among the cabinets in the office. When retrieving, the personnel will have to search through the cabinets, boxes, and binders, to get the required data.

The new system introduced is project GEARS or GEANHS' Electronic Archiving & Retrieval System. The project involved creating a Google Drive account for the school where all documents submitted to the office are scanned and stored, and linked to a Wix.com website for retrieval. Implications on the new system were positive and was observed as efficient, accessible, organized, and secure. First, the project helped saved time and finances in data management. Second, files can be easily accessed anytime and anywhere with internet connection. Third, organizing files became easier, as compared to the manual filing. Finally, data is more secure and protected by saving electronic formats in the cloud.

The study reveals the importance of a data bank manager/ coordinator. It is imperative for the school to appoint a coordinator whose responsibilities will be compilation, maintenance and utilization of the data bank and the documents filed within. Records management function should be incorporated into the organization-wide strategic planning initiatives. Most importantly, senior management should embrace the records management function to ensure its effectiveness and should be incorporated into their performance management targets. It is also necessary that administrators and key personnel are trained on data management, particularly on the use of online data bank. This will ensure sustainability of the project and will encourage future improvements of the system.

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Restoring Women's Status in Rural Afghanistan by Building a Sustainable Livelihood through Education and Capacity Building to Overcome Poverty (Case of Afghanistan)

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Abstract

Since 2002, billions of dollars in foreign aid has been invested to bring about sustainable social change for women in Afghanistan's large cities through education, literacy projects, and capacity building. However, very little is known about the impact on women in the rural areas of Afghanistan. This paper examines the importance of education and building strong capacity in rural Afghanistan to ultimately lead to a sustainable livelihood and overcome poverty. Once a woman is educated and skilled in many ways, she can change her social status from a housewife to a decision-maker in her household and the community. A woman with a secure financial status has purchasing power; hence, she is able to build a positive dialogue and earn the trust and respect of the community elders. She will be an affluent woman and will support other women in promoting women's empowerment through education and capacity building. The paper reviews the importance of women working together at the grass roots to bring changes to their community and find ways to avoid the poverty trap. The paper reviews the importance of women's involvement in community affairs which contributes to creating confidence and the self-esteem needed to overcome daily challenges in a Muslim, male-driven society. The paper showcases best practices and success stories from Afghanistan and neighboring countries.

Keywords: Afghanistan, Capacity Building, Education, Rural Women, Poverty Alleviation

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Introduction

Four decades of civil war have ruined the infrastructure of Afghanistan, especially in the education sector and for girls and women in rural areas. Although women enjoyed freedom of movement during the reigns of many Afghan kings, their situation worsened during the Taliban regime. Afghan women experienced the harshest treatment under this regime and were forbidden to attend schools and universities. After the fall of the Taliban, schools were reopened, and teacher's training colleges were constructed in almost all of the country's 34 provinces to build the capacity of the teachers. The aid funds pouring into the country, mainly channeled through the Ministry of Education and the Ministry of Higher Education, caused a major flux and corruption, leaving nearly one-third of 398 districts with no access to education or decent teachers (Naryan, Rao, & Khan, 2010). In some parts of the country, mainly in large cities, female students were able to attend school; however, in many rural areas women were deprived of education due to lack of proper infrastructure, absence of teachers, corruption, and other factors.

This paper provides a succinct overview of the effect of building a strong capacity for women in rural Afghanistan, where women are deprived of basic human rights and anyone attempting to create social change is perceived as a liability rather than an asset. It is a success story of one Afghan woman in the rural western province of Ghor who, against all odds, persisted to build a strong workforce of 20 vulnerable women, taught them new skills, and created the first women-owned bakery in a province where women are outcasts from society.

Overview of Afghanistan

Afghanistan has gone through many wars and interventions during the past 40 years, which have disabled its physical infrastructure as well as hindered human development in many areas. Afghanistan is a rugged, mountainous country with a population of 36 million people and 14 ethnicities spread throughout 34 provinces, which causes ongoing religious and cultural conflicts (Central Intelligence Agency [CIA], 2014). The country borders China, Pakistan, Tajikistan, Uzbekistan, and Iran.

The religion is 99% Muslim, divided into 84% Sunni and 10 % Shia, with 6% following other religions (CIA, n.d.). The official language of the country is Dari, which is widely spoken in the western, northern, and central provinces (CIA, n.d.). Pashtun is the second official language, which is spoken in the East, Southeast, and South (CIA, n.d.).

The unequal treatment of women in the Pashtun region (situated in the South, East and Southeast provinces) captured the attention of the world after the international invasion of Afghanistan in 2001. Pashtuns are defined as the backbone of Afghanistan; they are the most extremist and restrictive tribe in the country. All Pashtuns follow a strict code of conduct called *Pashtunwali*, which has prevented women from living with self-determination (Wahab & Youngerman, 2007). The

Any kind of discrimination and privilege between the citizens of Afghanistan are prohibited. Life is a gift of God and a natural right of human beings. No one shall be deprived of this right except by the provision of law.

Article 23, Chapter 2

Pashtuns are known for their strict rules, regulations, and limitations imposed on women (Wahab & Youngerman, 2007), which limits movement outside of the home and keeps them in isolation within their living quarters. In contrast, among the Hazara tribes, neighboring with Tajikistan and Iran, women have more freedom of movement; they work outside of the home, mainly in the agriculture sector. These tribes live in the central, north, and western regions of Afghanistan. The overall assumption of the men in rural areas is that women in many rural provinces are not treated in accordance with the protections article outlined in the first and second Constitutions of Afghanistan (1923, 1963).

Afghan Women's Status (1880-1994)

The myth that Afghan women and girls form an uneducated, ignorant subclass of society has captured the minds of millions of people around the world. However, few know that throughout the centuries, Afghan women have gone through suffering; yet they have still managed to rise to top positions and obtain higher education, starting with the reign of King Abdul Ahmad Rahman Khan (1880-1901; Nemat, 2011). The first gender equality reform took place during his reign, when he challenged the tradition and the cultural status quo by giving equal rights to women in all aspects of life (Nemat, 2011). The king and his wife promoted western attire and putting aside the veil. Women learned new skills and soared in business and industry. These were landmark events, the first steps toward modernization and improving the status of women in Afghanistan. The state reformation process continued under the king's son, Habibullah Khan, who was assassinated in 1919; his son Amanullah Khan promoted women's advancement and valued women as active members of the society. During his reign (1926–1929), Afghans from all over the world returned home to contribute in rebuilding the country. The educated women were ambitious to rebuild the country and create a strong female work force. Afghan women gained access to higher education, learned new skills, started businesses and became active key players in the government and public sectors (Nemat, 2011). This revolutionary move caused a major backlash among Pashtunwali conservatives and tribal elders, who had viewed women as a commodity and not as valuable members of the society.

Muhammad Nadir Shah became The King in 1929. His priority was to maintain a positive rapport with the conservative tribes of Pashtunwali and to keep the peace; hence, he contributed very little to women's empowerment in order to please the tribal leaders. His rule was short-lived, as he was assassinated in 1933 (Nemat, 2011).

The golden era of peace and prosperity for Afghan women began with the reign of Zahir Shah, the last king of Afghanistan. He reigned for 40 years (1933-1973) and is known as the king who worked diligently to promote women by giving them access to higher education and skill development and encouraging them to become active in key official positions. He was the pioneer in banning the traditional Afghan attire for women, known as the *burka*.

By 1959, women could appear unveiled, and they strengthened their social status through advancement in education and health. They pursued careers in the business world and established small businesses. In 1964 an amendment to the Constitution of Afghanistan gave a boost to women's equal rights and allowed them to enter the

political arena. However, this freedom was limited to major cities like Kabul and Herat, while the rural areas remained socially conservative.

The first president of Afghanistan, Mohammad Daoud Khan (1973–1978), continued his support of women's empowerment by establishing the Revolutionary Association of the Women of Afghanistan in 1977. The presidency of Daoud Khan and his legacy came to an end with the Soviet invasion of Afghanistan in 1978. A decade-long Soviet regime empowered women to seek higher education and be an active member of the society. Over 40% of medical doctors were women; over 60% of women worked as teachers or were employed in public sectors (Schulz & Schulz, 1999). During the Soviet era, women enjoyed their freedom and held higher ranking positions in private corporations and universities and were employed as doctors and nurses; however, this freedom came to a halt when the Soviet troops departed in 1989 followed by a decade of civil unrest which stripped women from their freedom. Women were removed from positions in the public sector and remained confined to their home, resumed wearing the traditional burka, and were seldom allowed to be seen in public (Ahmed-Ghosh, 2003).

Afghan Women Under the Taliban (1994–2001)

The darkest years for Afghan women were under the Taliban Regime. The Taliban ("students of Islam") emerged in Afghanistan in 1996, bringing with them strict rules of conduct and discrimination that were in violation of the first Afghan Constitution and the United Nations Universal Declaration of Human Rights, which Afghanistan ratified in 1948. Taliban leaders followed Wahhabism, an extremist branch of Sunni Islam. The codes of Wahhabism justify their crimes and violations of human rights; they do not acknowledge or recognize women as human beings and do not extend human rights to them. After taking control of Kabul on September 26, 1996, the Taliban issued strict rules forbidding women to work outside of the home, attend school, or even leave their homes unless accompanied by a male chaperone (Schulz & Schulz, 1999).

Once an active part of Afghan society, women were torn from their basic human rights, such as health, education, and freedom of movement. To make matters worse, in September 1996 the Taliban leaders issued an announcement in the Kabul and Herat provinces forbidding women from employment in all sectors; even worse, a ruling denied women the back salaries owed to them for work performed during the Soviet period. All this caused extreme financial hardship, especially for 40,000 affected war widows whose livelihood and support of family depended on employment outside their living compounds (Schulz & Schulz, 1999). Women fell from grace and became invisible, begging in the streets.

Afghan Women Postintervention (2001)

The events of September 11, 2001, which claimed over 3,000 civilian lives in the United States, marked the beginning of the ensuing international intervention in Afghanistan. To oust the Taliban and Al-Qaeda, the United States and United Kingdom, followed by Canada, Australia, Germany, and France, launched Operation Enduring Freedom and invaded Afghanistan in October 2001. In early December 2001, the Taliban rolled out of most of the provinces in Afghanistan. In November

2001, at the fall of the Taliban, international donors urgently worked together to implement a series of new initiatives to develop concrete institutions to help rebuild Afghanistan. In addition to providing humanitarian assistance, international organizations and international financial institutions administered donor conferences, trust funds, and reconstruction programs, all with one objective in mind: to rebuild a self-reliant Afghanistan.

Finding a balance between building a stable development framework to ensure sustainable livelihoods for women and restoring peace was a difficult task for the international donors. While the ongoing efforts intended by 30 international donor agencies to bring humanitarian relief to Afghans with priorities in health and education, very little focus was given to building the capacity of women and providing them with skills to earn a sustainable income.

The Ministry of Women's Affairs (MOWA) was established to ensure that all women throughout 34 provinces have equal access to aid funds. With the support of many donor agencies, especially the UNDP, MOWA launched the first National Action Plan for the Woman of Afghanistan. This is a 10-year plan with the main objective of ensuring that women in both urban and rural areas have equal access to health, education, and skill development. The plan heavily emphasizes skill development and capacity building as an effective tool to avoid poverty in rural areas.

Despite all the efforts made by the MOWA, the international donor community, the government officials raised their dire concern of women's condition in the rural areas. With limited to no access to resources, these women were left to fall into a poverty trap. The International Rescue Committee's (2014) research in several provinces of Afghanistan indicated that women in rural areas were willing and capable of creating a sustainable income to contribute to their family and the community, given the proper resources and tools to build their capacity.

Current Situation of Afghan Women in Education and Employment in the Rural Areas

The three decades civil wars have ruined every sector of Afghanistan especially the education sector which damaged the most. The schools were ruined and burnt in every part of the land. People migrated to different countries and especially those who were literate left the land early and left the county with the black clouds of ignorance. The three decades civil wars have ruined every sector of Afghanistan especially the education sector which damaged the most. The schools were ruined and burnt in every part of the land. People migrated to different countries and especially those who were literate left the land early and left the county with the black clouds of ignorance. The three decades civil wars have ruined every sector of Afghanistan especially the education sector which damaged the most. The schools were ruined and burnt in every part of the land. People migrated to different countries and especially those who were literate left the land early and left the county with the black clouds of ignorance.

The four decades of civil war have ruined every infrastructure in the country, especially in the education sector for girls and women in rural areas. After the fall of the Taliban, schools were reopened, and teacher's training colleges were constructed

in almost all provinces to build the capacity of the teachers. Despite pouring billions of dollars of aid funds through the Ministry of Education and the Higher Education, the latest report by the UN Educational, Scientific and Cultural Organization (UNESCO), says 90 percent of Afghan women in rural areas are illiterate. (<https://en.unesco.org>)

Afghan women have the right to study and there should be no implications and challenges for them to seek higher education. To reinforce this matter, Afghanistan's Islamic Laws indicate that "all persons may study, and men and women have the same right to have access to education" (Constitution of Afghanistan 1923). In many cases, women are granted certain privileges stipulated under Article 21 of Afghanistan's new constitution, which dictates that "any type of discrimination towards men or women is forbidden; the right to education is the same for all citizens of Afghanistan" (Constitution of Afghanistan 1963). In addition, All these articles show that the government has a responsibility and obligation to provide free access to education for women throughout Afghanistan.

The state shall devise and implement effective programs to create and foster balanced education for women, improve education of nomads as well as eliminate illiteracy in the country.

Article 44

The World Bank (2018) has reported some progress in women's empowerment in the rural areas in education and governance sectors; however, there is very minimal improvement in women's skill development and vocational training, which leads to a sustainable livelihood. Women in rural areas are largely confined to agriculture and farming, which does not require specific skills; in fact, their labor does not count as employment. Despite the ongoing aid funds from the international donor communities and the most recent grant by the World Bank (2018) of \$325 million for women's education and empowerment in the rural areas, there is very little evidence that funds have been allocated to skill development to secure a sustainable income.

Given the ongoing war for the past four decades and the country's current social, political, cultural, and economic situation, there are a variety of factors that exacerbate these problems. The Asia Foundation's survey of Afghan people in 2018 revealed that the major challenge for women in rural areas is the lack of access to education; while 84% of Afghans agreed that women should be given equal rights to pursue education, there are very limited opportunities for women to seek education in the rural areas. Unemployment is another major challenge facing women in rural areas. The survey indicated that there seems to be a paradigm shift in many rural areas: 70% of Afghan male populace agreed that women should be given proper tools and resources to learn new skills and work outside the home. This percentage does not include the conservative provinces in the Pashtunwali (Asia Foundation, 2018).

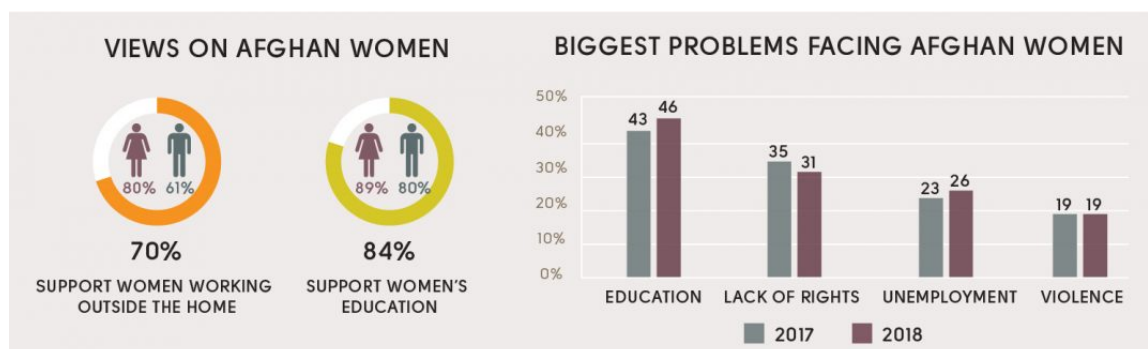


Figure 1: Survey of opinions on Afghan women. From *Afghanistan in 2018*

Correlation of Capacity Building to Reducing Poverty

Poverty is a growing phenomenon and an issue of concern within underdeveloped, conflict, and post conflict countries. Although the definition of poverty may vary from one donor to another and one country to another, the United Nations has defined poverty as “a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information.” The simple definition of poverty is “the inability of people to meet their basic human and daily needs such as: decent living condition, access to health and education, food and sustainable employment” (1995, para. 19)

In Afghanistan, 70% of the current population of 340,940,837 lives in the rural areas, with 54.5% living below the poverty line (CIA, n.d.). As part of the annual United Nation Human Development Report (HDR), that measures human development progress in all areas, a Human Development Index (HDI) report of 2018 has ranked Afghanistan 168th out of 189 countries.

(<http://hdr.undp.org/en/countries/profiles/AFG>)

The UNHDR report was developed based on the theoretical foundation of the development theory as designed by two economists, Mahbub ul Haq and Indian Nobel laureate Amartya Sen. Both Haq (1999) and Sen (2000), both economists suggested that their theory of sustainable development through capacity building is the only way to get out of poverty. Sen (2000, p. 42) mentioned that the “true purpose of development is to enhance people’s quality of life which is best achieved by giving them tools and resources to expand beyond boundaries.” Within the Afghan context, once a woman has explored her ability to overcome the cultural protocols and receives the full support of her husband or a male figure in the household, she is capable of learning new skills and pursue working outside of the home. Once she established a stable income, she will have purchasing power, gain the trust and respect of the community leaders, contribute to family finances, and ultimately become a decision maker in her family and the community, she no longer is being perceived as a liability but an asset.

There are many definitions for capacity development which varies from one donor to another. The United Nations Development Programme (UNDP) Capacity Development and the Measurement of Poverty report defines capacity building as “a tool for people to understand their full potential and starts from the principle that people are best empowered when the means of development are sustainable”

(<http://www.undp.org>). Simply put, capacity development is about transformations that empower individuals, leaders, organizations, and societies.

The World Bank (2012) defined capacity development as “the availability of resources and the efficiency and effectiveness with which societies deploy those resources to identify and pursue their development goals on a sustainable basis.” Internationally known economist Jeffrey Sachs (2005) examined many underdeveloped countries such as India, Bangladesh, and sub-Saharan Africa and determined that only through capacity development can an individual secure a sustainable livelihood, prosper financially, and avoid poverty traps. In the end, if properly strategized, capacity development can be a great tool to reduce poverty in underdeveloped countries.

Women in the Grassroots Unite to Build a Sustainable Livelihood: A Success Story in Ghor Province

The province of Ghor is a remote rural province in the Northwest of Afghanistan in a Hazarajat region. Agriculture and animal husbandry are the main sources of income for people. Due to high unemployment and lack of access to stable jobs, the province has experienced a major depopulation of young men, who migrate to neighboring provinces to seek employment. Ghor has the highest overall poverty rate in Afghanistan (over 65%), and more than 75% of the women there are illiterate.

In a province where a woman is confined to her household with no knowledge of how to generate an income, a woman’s quest to build a strong female-driven work force came to fruition (Grigorian, 2016). Mrs. S. was the head of a women’s empowerment NGO in the province. With the support of a small grant from a donor agency, she managed to implement a baking project to build the capacity of 20 vulnerable women in learning how to operate baking machineries and provide the community with variety of sweets in the city of Chagcharan. Although the project faced much resistance and many challenges from the participants’ husbands or male figures and the community elders, Mrs. S. with the support of her husband convinced the affluent members of the community that this project would contribute to local economic development and be an asset for the city. The project was implemented in 2009 and is still in operation, with only a small handful of women. This is a success story and a testimonial that once women work together, they can overcome challenges and obstacles and be able to build a strong female work force in a highly conservative, male-driven society.

The findings of the research revealed that the status of the remaining women changed significantly (Grigorian, 2016). The participants were able to contribute to the household finances, which led them into the decision-making process. They had purchasing power, contributed to the local economy, and in turn gained the trust and respect of the community leaders. The research findings emphasized heavily the importance of the support of a male figure and the affluent members of the community to be able to venture beyond the veil (Grigorian, 2016).

Rural Microfinance as a Pathway Out of Poverty (Cases of Pakistan, Bangladesh, India, and Nepal)

Jeffrey Sachs's (2005) research from rural Bangladesh revealed that women working in garment factories were happy with a small surplus from their meager income and still managed to save, go to school, and enhance their literacy and job market skills. His findings from several countries in South and Southeast Asia revealed that to avoid poverty, people should explore beyond their boundaries to learn innovative skills to earn a sustainable living. The importance of capacity building to avoid poverty has also been underlined by Purushothaman (1997), who revealed that women in rural India, Nepal, and Pakistan learned new skills and with the help of local NGOs had access to market to sell their products. In underdeveloped countries, the NGO community plays a key role in women's empowerment. For example, the Nepalese NGO Women's Skills Development Organization (n.d.) helps thousands of vulnerable women in rural areas by providing small loans and free training in carpet weaving, handicrafts, and tailoring to earn a sustainable income and sell their products online.

The noble concept of rural microfinance, which became popular in the 1970s, was initiated by social entrepreneur Muhammad Yunus from Bangladesh. Yunus recognized that access to finance is a gateway for the poor to generate an income and alleviate poverty. He created the Grameen Bank, a microcredit institution, to give collateral-free loans to rural Bangladesh. As of today, the Grameen Bank has given loans to 7.5 million clients in 82,072 villages in Bangladesh, 97% of whom are women. Yunus received the Nobel Peace Prize in 2006. He has proven rural microfinance has helped millions of women in rural India, Pakistan, Bangladesh, and Nepal to start a microbusiness and build a sustainable livelihood. With the help of microfinance millions of women are building a stable income which enables them to stay out of poverty trap. (Grameen Foundation, n.d.).

In Afghanistan, microfinance has become popular during the past decade. The World Bank (2018) revealed that the Afghan microfinance sector has grown during the past decade, with the total number of clients standing at 0.22 million. However, only 12% are in rural areas; microfinance does not follow Sharia law, which prohibits interest paid on all loans. In addition, borrowing money through microfinance requires collateral (e.g., land), which automatically disqualifies women; the cultural expectation is that a woman's husband or any other male figure in the family is the breadwinner, hence entitled to the land. A woman has no right to any property.

Conclusion

The past four decades have been nothing but social and economic turmoil for Afghan women, who have somehow managed to overcome these horrendous challenges and move ahead in society. Once active members of the society, holding high-ranking positions, Afghan women fell from grace to grave under the dark terror of the Taliban regime. Their liberation from oppression by the Taliban was reinforced by the international invasion of Afghanistan in October 2001.

In Afghanistan, the international donor community, the government, public sectors, and policymakers did not pay a close attention to develop and implement a long-term strategy for women to learn new skills and create a stable income in rural

Afghanistan. Many donor-funded projects with an emphasis on rural women's empowerment consisted of a multitude of short-term trainings and capacity building initiatives that had no long-term result. Although billions of dollars of aid funds were channeled to the Ministry of Education and Higher Education, there is no evidence that women in the rural Afghanistan gained access to literacy programs or learned new skills to earn a stable income. Too often trainings did not address the needs of the target groups and did not provide them with tools and resources to overcome cultural barriers and able to work outside of their home.

Breaking the poverty shackles in the rural areas of any country will be achieved only through equal access to education and skill development programs. Education plays a key role in building the capacity of the people. Unfortunately, the women in rural Afghanistan suffer from a high illiteracy percentage rate; UNESCO has estimated that nearly 90% of women are illiterate in rural Afghanistan (citation needed here). In a society with such a high illiteracy rate, a capacity development approach will be fruitful through a customized process. The first phase must concentrate on adult education and literacy programs, which should be implemented in the community level to provide women with a basic outlook of the importance of learning new skills to build a sustainable livelihood. The next phase must concentrate on addressing the needs of the participants and develop a capacity-building strategy considering the local and cultural protocols. It is important to note that capacity building does not begin and end with trainings; history has proven that ad hoc training does not serve any purpose. To lead a successful capacity development program, a value chain approach must be implemented that begins with adult training, skill development, understanding the basics of business, and access to finance, and ends with access to market. Only through this approach can rural women prosper and be able to build a stable and sustainable livelihood.

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Visual Basic Coding in PowerPoint-Based Lessons for Grade 6 Mathematics

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Abstract

There is no doubt that education and the learning process has changed since the introduction of computers such as PowerPoint-Based Lessons. It includes pedagogical approaches like interactive learning, inquiry-based approach, discovery learning and contextualized-localized learning that promotes student-centered activities and lessons, teacher-assisted instructions and appreciation of the locale by-products, livelihood, academic-occupational relevance, and individuality. Mixed method was used in getting the impression and significance increase of the pre-test and post-test. There was a large effect and significant increase in the pre-test and post-test scores in the learners' conceptual understanding ($d = 1.36$ & 0.89), problem-solving skills ($d = 0.56$ & 0.39), and interest ($d = 1.56$ & 1.05) towards Mathematics in experimental and control group respectively. Unfortunately, there was only a small effect and no significant difference between the groups. However, it doesn't pose any conflicts in the use of technology in the classroom context rather it clearly showed the versatility of the pedagogical approaches in the reality of the educational system. Overall, the quality of the instructional material and the assimilation of technological progress in the classroom are crucial for the teaching and learning process. In relevance with the changes, educators should accept and wholeheartedly embrace technology-based tool in teaching as one of the proofs of the continual professional development, keeping abreast with needs and interests of the 21st century Millennial learners. The challenge is to incorporate technology in a more engaging (active) rather than entertaining (passive) manner.

Keywords: PowerPoint-based, pedagogical approaches, and student-centered

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Introduction

According to the International Bureau of Education the design of primary education is to meet the basic learning needs of the learners such as literacy, oral expression, numeracy, and problem-solving which are intended to prepare pupils to benefit from secondary education. One possible solution to achieve this goal is the use of computers as it increases the conceptual understanding and problem-solving skills of the learners¹. Nowadays, an increasing number of educators utilize technology-based materials in facilitating discussions and lectures. However, even technology is ubiquitous in teaching, many are still cannot maximize its uses. Effective use of ICT in teaching and learning process is needed to suffice the prerequisite aspects to have conducive learning in relation to the 21st-century learners². And being familiar with these technology-based tools is not enough to achieve the goal because “teachers should be geared to the teaching of fundamental ideas in whatever subject is being taught – Bruner, 1960”³. Additionally, proficiency in teaching is related to effectiveness. Proficiency demands being flexible or being able to work effectively in a diverse kind of students in any situations or environment and across a range of mathematical content⁴. In general, the results of teachers' abilities to design lessons based upon robust instructional principles are vital in making effective technology-based teaching⁵. Consequently, the instructional principles integrated in the PowerPoint-based lessons were premise in the provision of Philippine Republic Act 10533, Enhanced Basic Education or K+12 Program, which states that curriculum shall “be contextualized and globalized, shall use pedagogical approaches that are constructivist, inquiry-based, reflective and collaborative and integrative, and shall be flexible enough and allow school to localize, indigenize, and enhance the same based on their respective educational and social context...”.

Methodology

The study used a developmental method to have a systematic process in designing, developing and evaluating the developed instructional materials. Also, it integrated mixed method with quasi-experimental design in which the gathered data in quantitative data were compared and analyzed the effects in the learners' conceptual understanding, problem-solving skills and interest, while qualitative data was used to validate and support the numerical claims. The first phase of this research was to think the applicable approaches to the chosen topics, then it followed by conceptualizing the lesson plans along with the development of the PowerPoint-based lessons. After these, the developed tools were assessed and evaluated by the experts,

¹ Lazakidou, G & Retalis, S. (2010). Using computer supported collaborative learning strategies for helping students acquire self-regulated problem-solving skills in Mathematics. *Computers & Education*. Vol 54, Issue 1, January 2010, pages 3 – 13.

² OFSTED (2002) ICT in schools: Effect of government initiatives. Progress report April 2002. Office for Standards in Education, London. Online: <http://www.ofsted.gov.uk/public/index.html>

³ Weibell, C. J. (2011). Principles of learning: 7 principles to guide personalized, student-centered learning in the technology-enhanced, blended learning environment. Retrieved July 4, 2011 from [<https://principlesoflearning.wordpress.com>].

⁴ Kipatrick, J., Swafford, J., Findell, B. et al (2001). Adding + IT UP: Helping Children Learn Mathematics. p. 369. National Academy Press, WashingtonDC. Retrieved from: <https://www.nap.edu/read/9822/chapter/12>

⁵ Savenye, W., Davidson, G., & Smith, P. (1991). "Teaching Instructional Design in a Computer Literacy Course." *Educational Technology Research and Development*, 39(3), 49-58.

thus, all suggestions were applied before the conduct of the study. The locale of the study is at Travesia Elementary School, Travesia, Guinobatan, Albay, Philippines. There were four sections and out of those sections only two groups were analyzed to be comparable. After identifying the groups, the researcher tossed a coin to determine which group will be the control and experimental. The two sections have 40 students, and only 33 and 34 learners in control and experimental group respectively were accepted in the analyzation of data because others did not meet the required hours for the implementation.

Effects of the PowerPoint-based lessons.

The purpose of developing an intervention is to have effects on its recipient. For example, in education, many educators and researches developed instructional materials which deem to show positive results specifically in the performance of the learners. In this study, the researcher developed instructional material, PowerPoint-based lessons, which provides provide digital learning experiences with student-centered lessons and activities through guiding questions, learning-by-doing, and localization of examples and situations. Hence, statistical treatment such as mean scores and standard deviation for pre-test and post-test, the p-value for a significance level, and Cohen's d for the effect size are shown in table 1.

Domains	Statistical Treatment	Experimental Group		Control Group	
		Pre-test	Post-test	Pre-test	Post-test
Conceptual understanding	\bar{x}	6.18	9.21	7.35	9.38
	sd	2.65	2.75	2.63	3.04
	p-value	<0.0001*		<0.0001*	
	Cohen's d	1.36		0.89	
	Effect size	Huge		Very Large	
Problem-solving skills	\bar{x}	8.58	10.00	7.50	8.82
	sd	3.16	3.13	3.38	3.34
	p-value	0.001508*		0.0146*	
	Cohen's d	0.56		0.39	
	Effect size	Large		Moderate	
Interest	\bar{x}	3.81	4.24	3.86	4.28
	sd	0.26	0.20	0.36	0.22
	p-value	<0.0001*		<0.0001*	
	Cohen's d	1.56		1.05	
	Effect size	Huge		Very Large	

Table 1. Effects of the PowerPoint-based lessons in the domains of learning

Table 1 shows the differences between the used of instructional technology in teaching, PowerPoint-based lessons, from conventional teaching despite the significant increase in the mean scores from pre-tests to post-test in both groups. The effect sizes of $d = 1.36$, 0.56 , & 1.56 of experimental group versus the effect sizes of $d = 0.89$, 0.39 , 1.05 in the conceptual understanding, problem-solving skills and interest, respectively, explains that the integration of instructional technology in teaching is greater than the implementation of conventional teaching alone. Likewise, the significance level under the problem-solving skills is in favor of the experimental group, a p-value of 0.001508 is less than 0.0146 , which is closer than to 0.00 . The

first good point of using technology in the classroom is it saves time because even the only last five or ten seconds of giving instruction are critical moments in any discussions⁶. Also, well-defined applications of pedagogical approaches promote remarkable results, like the used of interactivity in the classroom as a premise in the Edgar Dale Cone of Experience, that the retainment of active learning is 70% to 90% unlike the passive learning that up to 50% only. Moreover, cognitive load theory which explains “the free exploration of a highly complex environment may generate heavy working in the memory load that is detrimental to learning”⁷ was not observed since two features, enhanced discovery learning and inquiry-based learning, were properly integrated into with the discussion. Lastly, the used of contextualized problems help learners to enhance their problem-solving skills because they were familiar with the situation or context of the problems⁸.

In the learners’ focus group discussion, a question was asked “What can you say about the PowerPoint-based lessons?” then a pupil replied “*Maganda siya colorful, nakakaattract sa mga bata para makinig. At mas naiintidihan kasi step-by-step* – (It is beautiful and colorful; it attracts the learners to listen. Also, the lessons were very easy to understand because it provided a step-by-step process”. Also, another pupil expressed his answer in the question, “What is the impact using this kind of material in teaching” - “*Mas nadedevelop and kaalaman ko magsolve ng math problems and naencouraged ako to participate na nagiging dahilan ng pagdevelop ng aking skills in solving* – (It really developed my knowledge and encouraged me to participate in the discussion which honed my skills to solve math problems”. In addition, teachers observed notable behaviors during the implementation of the study, such as increasing number of active learners which made them recite during the lessons, solve problems on board, being attentive in the lectures, doing their individual activities, and above all most of the learners were present during the discussions.

Conclusion

The four pedagogical approaches, interactive learning, enhanced discovery learning, inquiry-based approach, and discovery learning, integrated in both PowerPoint-based lessons and conventional teaching promote student-centered lessons and activities, teacher-facilitated instructions, appreciation of locale-by products, livelihood, academic-occupational relevance, and individuality. Results showed that there were significant increase and remarkable effect size in the performance level and interest of the students for both groups. Statistically, there was no significant difference in the two groups, yet there is a very small effect size in using the instructional-technology in teaching which still deems to be positive and evident in the focus group discussions. It also implies that well-designed lessons and application of pedagogies either in the integration of technology or conventional showed versatility in the reality of the Philippine educational situations, where some schools in rural places do not have a power supply.

⁶ Scrivner, J. (2014). Classroom management techniques p. 128. Cambridge University Press (4th Print)

⁷ Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive Load Theory and instructional design: Recent Developments, Educational Psychologist 38: 1 – 4.

⁸ Bottge, B. (1999). Effects of Contextualized Math Instruction on Problem Solving of Average and Below-Average Achieving Students. Journal of Special Education - J SPEC EDUC. 33. 81-92. 10.1177/002246699903300202.

Recommendation

There have been immense advances in technology in most aspects of people's lives including in the field of education. And as computers are becoming a common tool for teaching, teachers should be more aware of the role as a guide in the acquisition of knowledge rather than transmitters of facts. They must be open-minded to the changes that are taking place, serve as problem solvers and innovate approaches or methodologies in the learning process; thus, allowing learners to discover facts for themselves. However, there are factors that are still holding the teachers to put these ideas into reality. But these are not enough to be excused in improving the way of teaching. Hence, the researcher's study contemplates how interactive learning varies in e-classroom-based learning and usual classroom setup. It showed that either of the two situations will make a significant effect on teaching. In addition, synchronization of other approaches like inquiry-based approach, discovery learning and contextualized can make an impact to acquire a meaningful way of learning, because its counterparts the weaknesses and strengthen the benefits of each other. Another factor that was considered is the capability of teachers in delivering the lessons with a distinct setup. Thus, the key to making real the ideal pedagogical approaches will depend on the teachers' skills and determination

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***The Implementation of K to 12 Science Program in Public Elementary Schools:
Teachers' Pedagogical Practices and Problems Encountered in Teaching Science***

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Abstract

The study aimed at conducting formative evaluation of the implementation of K to 12 Science Program of public elementary schools in Santo Tomas District, Santo Tomas, Isabela for the first semester of school year 2017-2018. Specifically, the study aimed to determine the teachers' pedagogical practices along with the common problems encountered by teachers and administrators, and the degree of seriousness of these problems. The respondents of the study were nine (9) randomly selected public elementary schools in Santo Tomas District. From these randomly selected schools, nine (9) administrators, 36 teacher respondents were obtained and participated in the study. Following the CIPP (Content, Input, Process, and Product) evaluation model of Stufflebeam (1971), the study used quantitative and qualitative designs of research. Quantitative methods were used in generating numerical data through survey questionnaires. The survey questionnaires solicited for the extent of the implementation of teachers' pedagogical approaches and the degree of seriousness of problems encountered. Qualitative approach of research was used to uncover the common problems encountered by teachers, administrators, and learners in the implementation of K to 12 Science Program. Results of the study pointed out that generally, teachers of the district implement the prescribed pedagogical approaches of teaching K to 12 Science at a great extent. Pedagogical practices which are mostly implemented by teachers, include the use of 5-E Instructional model, Inquiry-based learning, contextualization, integration of concepts in other subject areas and the linking of what learners already know with the lesson or concepts to be tackled. The survey questionnaire revealed major problems on lack of K to 12 trainings, lack of resources and facilities, and curriculum enhancement. Responses of teachers and administrators from interviews exposed two broad categories of causes of problems arising in their classroom Science instructions: teacher factor and pupil factor. Pupil factor includes lack of prerequisite knowledge on contents, poor comprehension in the English medium and some topics are too high for the level of the pupils. While teacher factor includes lack of knowledge on the teaching approaches and techniques and contents in teaching Science, unavailability of teaching-learning resources and significant number of disrupted classes. The study suggests that the problems that teachers are facing particularly on the lack of trainings and learning materials should be addressed as soon as possible because these are the defining factors towards the successful implementation of the program and the attainment of its objectives.

Keywords: K to 12 Curriculum, Teachers' Pedagogical Practices, Problems Encountered in Teaching Science

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Introduction

The general vision statement of the implementation of the new curriculum reform of the Department of Education (DepEd) states that, “Every graduate of the Enhanced K-12 Basic Education Program is an empowered individual who has learned through a program that is rooted on sound principles and geared towards excellence”. DepEd considers that the enhanced curriculum would benefit Filipino learners and families, society and economy, in view of the fact that K-12 is affordable, conceived to produce more productive and responsible citizens equipped with the essential competencies and skills for both life-long learning and employment.

With its initial years of implementation, K to 12 has introduced significant reforms in curriculum and instruction and even series of changes of some aspects of its implementation. This is due to the aim of DepEd to ensure continuous improvement of its system to guarantee the attainment of the vision of the program. To achieve the goal of ensuring continuous improvement, sound information and data are required as bases for the improvement of programs for learner development, curriculum implementation and school effectiveness. This is where the essence of program evaluation and assessment comes in, which is to provide information and evidence to oversee the on-going implementation of the K to 12 Basic Education Program and to pin-point areas where improvements might be made.

Program evaluation is a valuable tool for both planners and implementers who are seeking to strengthen the quality of their programs and improve learning outcomes. It finds out “what works” and “what does not work.” Knowing “what works” helps program implementers to focus and replicate inputs on the essential components of the program model that benefit participants and volunteers; knowing “what does not work” allows program implementers to improve and strengthen their service delivery models. Not knowing what is working may waste valuable time and resources, thus compromising the efficiency of the implementation of a program. Program evaluation answers basic questions about a program’s effectiveness, and evaluation data can be used to improve program services (Metz, 2007).

Truly, the implementation of K to 12 Program of the Department of Education serves a noble purpose for every Filipino learner. Aimed at the successful implementation and realization of the program vision, DepEd has been very determined in pouring out its efforts in pushing open and consultative processes among stakeholders and major implementers, creation of task-forces for implementation monitoring and evaluation, regional consultations leading to national summits to solicit inputs and feedback, curriculum review and enhancement, massive teacher training and development of learning resources and infrastructures.

Monitoring and evaluation of a program is an essential activity and integral towards its successful implementation. Evaluation of K to 12 Basic Education Program particularly in its initial phase of implementation is necessary so as to draw feedback for its improvement. Through evaluation, a rich picture of the program will be learned, and doors will be opened for prospective learning. The success and failure of the on-going implementation of a program and the reasons behind these can be determined.

It is in this light that the researchers wanted to conduct formative evaluation of the implementation of K to 12 Basic Education Program in terms with the pedagogical practices of teachers specifically in the field of Science in public elementary schools in Santo Tomas, Isabela, Philippines.

More specifically, this study sought answers to the following questions:

1. What are the Science pedagogical practices implemented by teachers?
2. What is the extent of implementation of these pedagogical practices?
3. What are the common problems encountered by teachers and administrators in the implementation of K to 12 Science Program?
4. What is the degree of seriousness of the common problems encountered by teachers and administrators in the implementation of K to 12 Science Program?

METHODOLOGY

Research Design

To address the problem statement, this study utilized both qualitative and quantitative designs. Qualitative approach of research was also used to uncover the common problems encountered by teachers and administrators in the implementation of K to 12 Science Program. The researchers made use of individual and focus groups interview as data collection method. This data collection method provided an opportunity for a systematic, in-depth evaluation of the research questions. Furthermore, this method added to the quantitative results through explanations and clarifications from the respondents.

Quantitative Research method was used to quantify the problem by way of generating numerical data that can be transformed into useable statistics. It is used to quantify variables and generalize results from it. It uses measurable data to formulate facts and uncover patterns in a research. With the use of survey questionnaire, this study generated numerical data to describe the extent of pedagogical practices in the implementation of K to 12 Science Program and the degree of seriousness of common problems encountered by teachers and administrators in the implementation of the program.

Sources of Data

The study was conducted in public elementary schools in the district of Santo Tomas, Isabela. The population of the study includes all Science teachers and administrators from 18 public elementary schools in Santo Tomas District. Schools covered in the sampling were randomly selected by the researcher. Out of the 18 schools, nine (9) schools were included in the selection of respondents. All Science teachers and administrators from the randomly selected schools were part of the respondents of the study. The totality of the respondents of the study includes the 36 Science teachers and (nine) 9 administrators.

Research Instruments

The researchers made use of interview guide and survey questionnaire test in gathering and collecting data from the respondents.

A self-made interview guide was developed and used to determine the pedagogical practices and common problems encountered by teachers and administrators in the implementation of K to 12 Science Program. Interviews were also meant to validate data from the questionnaire answered by the respondents especially on the problems encountered in the program implementation. Due validation by experts of the interview guide was also taken into account.

A self-made survey questionnaire was developed by the researchers. It was used as the primary data gathering instrument in collecting information regarding the level of implementation of the identified areas of implementation of the K to 12 Science Program of teachers and administrators along with the problems encountered in the implementation of the program. Prior to the development of the researcher-made survey questionnaire, pre-interviews were done among target respondents. This was done to solicit all possible problems encountered by the teachers and administrators and such findings were included as predetermined problems or items in the questionnaire. Other items or problems added in the questionnaire were based from related literature and studies. The instrument underwent content validation by three experts in the field of thesis writing.

Data Gathering Procedure

Primary data were gathered by means of interviews and floating survey questionnaires among Science teachers and administrators. The researchers personally floated the questionnaire to the respondents and subsequently validated answers of the respondent through follow-up interviews. While secondary data were obtained from related studies and literature.

Data Analysis

For a clearer interpretation of the data gathered from the survey questionnaire and interviews, the researchers used the following statistical procedures:

Mean was used in measuring the extent of implementation of the Science pedagogical practices of teachers and in describing the degree of seriousness of common problems encountered by teachers and administrators.

The following intervals were used in interpreting the computed weighted mean for the extent of implementation of Science pedagogical practices:

Table 1
Arbitrary Scale on Describing the Extent of Implementation of Pedagogical Practices

Weight	Scale/Range	Description	Code
5	4.50 – 5.0	Very Great Extent	VGE
4	3.50 – 4.49	Great Extent	GE
3	2.50 – 3.49	Moderate Extent	ME
2	1.50 – 2.49	Little Extent	LE
1	1.00 – 1.49	Very Little Extent	VLE

In describing the level of seriousness of problems, the following intervals were used:

Table 2
Arbitrary Scale on Describing the Degree of Seriousnes of Problems Encountered

Weight	Scale/Range	Description	Code
5	4.50 – 5.0	Very Serious	VS
4	3.50 – 4.49	Serious	S
3	2.50 – 3.49	Moderately Serious	MS
2	1.50 – 2:49	Slightly Serious	SS
1	1.00 – 1.49	Not a problem	NP

RESULTS AND DISCUSSION

Prior to the development of the survey questionnaire, the researcher conducted random pre-interviews among Science teachers and administrators. These pre-interviews solicited for the Science pedagogical practices of teachers and the common problems encountered by program implementers. Such findings were considered and included by the researcher in the items of the survey questionnaire.

Pedagogical practices which are implemented and verbalized by the teachers and administrators during the interviews are listed on the Table 3 with corresponding frequencies.

Table 3
Science Pedagogical Practices Implemented by Teachers

<i>Common Pedagogical Practices</i>	Frequency (f)	
	Teachers	Administrators
1. Uses Inquiry-Based Approach	18	8
2. Uses pupils' schema to encourage participation	24	3
3. Patterns instruction in the 5E Learning Cycle Model	26	6
4. Uses various teaching approaches in Science :	12	2
5. Uses Constructivist Approach	3	1
6. Employs contextualization in teaching the subject	24	8
7. Uses hands-on learning activities	20	7
8. Uses evidence in constructing explanation	7	2
9. Integrates Science lessons in other subjects	24	3

Based on the data table, it appears that pedagogical practices which are implemented by most of the teachers include the use of Inquiry-Based Approach, use of the 5^E Learning Model, employing contextualization, integrating Science lessons in other subjects and use of hands-on activities.

Table 4 shows the common major problems of teachers and administrators verbalized during the interviews. The table suggests that the most frequent problem encountered by teachers is the lack of Science facilities and equipment.

Science Pedagogical Approaches

Numerical data were gathered through the survey questionnaire distributed to teachers and administrators. The questionnaire solicited for their assessment on the extent of the implementation of Science pedagogical practices. Follow-up questions from the interviews served also as a way of validating numerical responses of the respondents in the questionnaire.

Table 4
Common Problems Encountered by Teachers and Administrators

Common Problems	Frequency (f)	
	Teachers	Administrators
1. Teacher's guides and learner's materials are insufficient and are not yet available	14	5
2. Lack of mastery on contents of Science	4	0
3. Lack of Science of K to 12 Science trainings	8	2
4. Lack of Science facilities and equipment	21	4
5. Lack of ICT equipment that could be used in Science instructions	16	4
6. Limited knowhow and skills on the different teaching approaches and techniques in Science teaching	11	0
7. My pupils poorly comprehend Science in English medium	18	2
8. Limited knowledge on enhancing Science Curriculum by means of contextualization and localization	14	1
9. Some Science topics are hard to teach for they are too high at the level of my pupils	8	1

Table 5 shows the extent of implementation of Science pedagogical practices by teachers and administrators. The over-all grand mean of 4.01 supports that teachers and administrators are implementing the identified Science pedagogical approaches to great extent.

The extent of implementation by teachers and administrators of K to 12 Science program in terms of the identified areas is shown in Table 7. The over-all extent of implementation is also reflected in the table.

An over-all grand mean of 4.09 was computed. It can be gleaned from this that in general, teachers and administrators are able to implement orders, policies and procedures related to the implementation of K to 12 Science program to a great extent.

It cannot be denied though from the findings that few aspects of the program are not implemented with considerable degree of extent. Confirmed by interviews conducted, some teachers admitted that they have not satisfactorily implemented the program in terms of achieving desired outcomes.

Common problems encountered by teachers and administrators were further translated by the researcher into more specific items and were classified into four (4) areas of problems in the survey questionnaire. The survey questionnaire determined the level of seriousness of the enlisted problems as encountered by the program implementers. The following discussions tackles the level of seriousness of common problems encountered by the Science teachers and administrators in terms of the following areas: Teacher Preparation and Preparedness, Learner Preparation/Readiness, Teaching Strategies and Techniques and Learning Resources and Facilities.

Table 5
Extent of Implementation of Pedagogical Practices of Teachers

Pedagogical Practices	Teachers		Administrators		Over-All	
	Mean	Description	Mean	Description	Grand Mean	Description
1. Makes connections to what students already know	4.25	GE	4.25	GE	4.25	GE
2. Use pupils' schema to encourage participation	4.22	GE	4.25	GE	4.23	GE
3. Patterns instruction in the 5E Learning Cycle Model	3.94	GE	3.88	GE	3.91	GE
4. Uses Multi-Disciplinary Approach	3.72	GE	3.88	GE	3.80	GE
5. Uses Inquiry-Based Approach	4.09	GE	4.25	GE	4.17	GE
6. Constructivist Approach	3.88	GE	4.00	GE	3.94	GE
7. Employs contextualization in teaching the subject	4.09	GE	4.38	GE	4.23	GE
8. Uses hands-on learning activities	3.91	GE	3.88	GE	3.89	GE
9. Uses evidence in constructing explanation	3.97	GE	3.88	GE	3.92	GE
10. Integrates Science lessons in other subjects	3.94	GE	3.63	GE	3.78	GE
Over-all Grand Mean					4.01	GE

Teacher Preparation and Readiness

Level of Seriousness of problems under the area Teacher Readiness/Preparedness is shown in Table 6. It reveals that problems under Teacher Readiness/Preparedness have an over-all grand mean of 2.65. This means that teachers and administrators encountered moderately serious problems regarding teacher's readiness and

preparedness which have direct effects on their capacity to implement the Science Program. However, teachers are still capable of addressing the problems and look into possible interventions in order not to compromise the intended implementation of Science Program. Based on interview, due to insufficient K to 12 training provided by DepEd, some teachers opt to enhance their teaching competencies, by accessing web-based portals and web-based readings. Science teachers have learned to utilize the internet as supplementary source and reference when it comes to dealing with Science contents and pedagogy.

Specifically, Table 6 shows that among the items under the area of Teacher Readiness and Preparedness, problem on Inadequate K to 12 Seminar/Training ranked first with mean rating of 3.55. This suggests that teachers and administrators met serious problems on the inadequacy of teachers' trainings on K to 12.

It can also be inferred that teachers in public elementary schools in Santo Tomas District are in need of trainings/seminars on teaching strategies and techniques related to K to 12. Trainings and seminars aim to equip every teacher with contemporary teaching strategies to be used in classroom instruction. In teaching to be able to give children quality learning, varied teaching strategies and techniques are necessary. These inspire pupils to learn more. This is based on the concept that education is a preparation for adult life, mental discipline, transfer training, acquire knowledge for its sake, seeking truth and perception, and habit formation.

Notably, Insufficient Knowledge on Educational Technology registers the item with the lowest mean rating of 2.21. It shows that problems encountered in terms of Educational Technology are slightly serious. This means that teachers possess basic skills and knowhow on Information and Communication Technology (ICT) in their instruction and clerical tasks. This may be attributed to the constant exposure of teachers to ICT demanded by the trend of today's education, yet some aspects on ICT-operation and integration are still needed to be improved.

All other problems under this area have mean ratings that lie from 2.33-3.35 which are categorized as slightly serious and moderately serious problems.

Table 6
Problems encountered in terms of Teacher Preparation and Readiness

Problems	Mean Rating		Over-all Mean Rating	Rank	Description
	Teachers	Administrators			
1. Inadequate seminars/trainings related to K to 12.	3.57	3.53	3.55	1	S
2. Insufficient readings and study materials on K to 12	3.44	3.25	3.35	2	MS
3. Lack of knowledge, skills, attitudes, values pertinent to K to 12	3.07	2.25	2.90	3	MS
4. Poor awareness on the goals, purposes, and objectives of K to 12	2.94	2.13	2.54	5	MS

5. Lack of confidence to appropriately teach K to12	2.94	1.88	2.41	6	SS
6. Inadequate knowledge on varied teaching strategies and techniques	2.82	2.38	2.60	4	MS
7. Insufficient knowhow on how to address the needs of learners	2.94	1.75	2.35	7.5	SS
8. Lacks mastery on teaching content and objectives	2.94	1.75	2.35	7.5	SS
9. Inadequate knowhow on the use of varied assessment tools.	2.66	2	2.33	9	SS
10. Insufficient knowledge on educational technology	2.66	1.75	2.21	10	SS
Grand Mean Rating			2.65		MS

Since teachers have the most direct, sustained contact with students and considerable control over what is taught and the climate for learning, improving teachers' knowledge, skills and dispositions through professional development is a critical step in improving student achievement. Various studies reached similar conclusions based on research that tracked the academic achievement of individual students over long time periods and have shown that well qualified teachers and high quality teaching can close the achievement gap between economically disadvantaged students and their more affluent peers.

Learner Preparation/Readiness

Problems encountered in terms of Learner Preparation and Readiness and their level of seriousness are shown in Table 7.

Table 7
Problems encountered in terms of Learner Preparation and Readiness

Problems	Mean Rating		Over-all Mean Rating	Rank	Description
	Teachers	Administrators			
1. Poor awareness on the goals, purposes and objectives of the K to12 curriculum	2.97	2.5	2.74	3	MS
2. Lacks orientation, symposium to broaden the knowledge in K to 12	2.91	2.75	2.83	2	MS
3. Lacks knowledge on the rationale why the enhanced basic education curriculum is implemented	2.50	2.38	2.44	6.5	SS
4. Lack of understanding on concepts and class activities	2.51	2	2.25	10	SS
5. Relating personal experiences for the long retention of learning are not observed	2.94	1.75	2.35	9	SS

6. Various materials needed for instruction are meager	3.10	2.13	2.61	5	MS
7. Shows passivity in class discussions and making projects	2.88	2	2.44	6.5	SS
8. Performance assessment tools are not clearly explained	2.94	1.88	2.41	8	SS
9. Lack of knowledge and poor understanding on underlying concepts and principles that can be applied to problems/ situations in new contexts	3.00	2.75	2.88	1	MS
10. No orientation about the new ways on how the lessons are presented	2.96	2.5	2.73	4	MS
Grand Mean Rating			2.57		MS

As a whole, items or problems under Learner Preparation/Readiness are moderately serious as encountered by teachers and administrators. This was justified by the grand mean of 2.57. It indicates that learners lack knowledge and have poor understanding on underlying concepts and principles that can be applied to problems/ situations in new contexts. Learners have poor awareness on the goals, purposes and objectives of the K+12 Science curriculum.

The findings also reveal that schools through school heads and teachers failed to conduct regular symposia/proper orientations to learners, parents, stakeholders about the K+12 Science curriculum. According the interview among administrators, there has been no formal orientation of pupils regarding the K to 12 Curriculum.

Learner Readiness is essential towards achievement. One of the most popular laws of learning by Thorndike, the Law of Readiness points out that one learns only when he is physically and mentally ready for it. In other words, preparatory set on the part of the individual is an important condition for learning. When the student is prepared to learn, the act of doing it is satisfying, and not doing it is annoying. Conversely, when he does not want to work, forcing him to work is dissatisfying. If students are not willing to learn, forcing them to learn will cause dissatisfaction and annoyance.

Teaching Strategies and Techniques

Table 8 presents the findings regarding the problems encountered by teachers and administrators in terms of teaching strategies and techniques. Generally, it reveals that teachers and administrators encounter moderately serious problem regarding in this area. This is supported by the computed over-all grand mean of 2.89.

Teachers' major problem under this area is the meager resources of the community for pupil exposure. Pupils are not given the opportunity to extend learning through out-of-school experiences due to meager resources in the community. It was also found out that schools do not use team teaching strategies and that teachers lack technology-assisted instructions, manifested by the mean ratings of 3.26 and 3.03 respectively. It is also revealed that teachers still have inadequate knowledge on contextualization as indicated by the item mean rating of 2.91 which means a moderately serious problem.

Based on these findings, it can be inferred that Science teachers in Santo Tomas District are in need of seminars and trainings to improve their technical knowhow on the pointed out weaknesses in terms of teaching techniques and strategies.

The fundamental importance of teaching strategies and techniques is to execute and carry out instructional plans effectively. Teaching strategies help students take more responsibility for their own learning and enhance the process of teaching for learning. Appropriate teaching strategies and techniques make the environment that are more interactive, where applicable and conducive for effective learning to happen.

Learning Resources

The degree of seriousness of problems encountered in terms learning resources and facilities is presented in the Table 9.

Among the four (4) areas on problems met by teachers and administrators in the implementation of K to12 Science Program, lack of learning resources appeared to be the major problem. Indicated by the computed over-all grand mean of 3.78, teachers encountered serious problems pertaining to Learning Resources.

Table 8
Problems Encountered in terms of Teaching Strategies and Techniques

Problems	Mean Rating		Over-all Mean Rating	Rank	Descri ption
	Teacher s	Administ rators			
1. Team teaching to bring about effective teaching is not done	3.45	3.07	3.26	1	MS
2. Various assessment tools to rate students' performance are not used	2.85	1.75	2.30	7	SS
3. Lack of appropriate technology-assisted instruction	3.08	2.97	3.03	3	MS
4. Insufficiency of varied teaching strategies and techniques	2.91	2.13	2.52	6	MS
5. Limited incorporation of students practical experiences with the lessons	2.83	1.75	2.29	8	SS
6. Resources of the community are meager for student exposure	3.27	3.13	3.20	2	MS
7. Inadequate knowledge in contextualization (localization and indigenization of instructional materials)	3.00	2.82	2.91	4	SS
8. Groupings in accomplishing projects are not employed	2.69	1.5	2.10	10	SS
9. Difficulty improvising instructional materials in Science	2.94	2.13	2.54	5	MS
10. Monotonous use of teaching strategy and approaches	2.62	1.88	2.25	9	SS
Grand Mean Rating			2.59		MS

Problems ranked the highest include Limited Number of Books and References, Few available materials for projects and research work and No Available Laboratory Room and Equipment, with computed mean ratings of 4.28, 4.16 and 4.13 respectively. Other items under in this like no available learner's materials in the subjects, inadequate community resources as an aid of student learning an absence of library are all serious problems encountered by teachers and administrator in the implementation of the program.

Learning Resources according to Jocelyn Right (2014) are the resources teachers use to deliver instruction. Teaching materials can support student learning and increase student success. Ideally, the teaching materials are tailored to the content in which these are used, to the students in whose class these are used, and the teacher. Teaching materials come in many shapes and sizes, but they all have in common the ability to support student learning.

However teachers have been very resourceful in addressing such problems. Based on interviews, teachers mentioned that they learned to be resourceful in reproducing the learning materials. Teachers have also learned to download instructional and other teaching materials from web-based portals like the LRMDs and to make use of uploaded files from teachers Facebook groups.

Table 9
Problems encountered in terms of learning resources and facilities

Problems	Mean Rating		Over-all Mean Rating	Rank	Description
	Teachers	Administrators			
1. Insufficient computers in school to be used in teaching	3.13	2.88	3.00	9	MS
2. No available projector and ICT related materials needed in teaching-learning process.	3.10	2.88	2.99	10	MS
3. No available learner's materials in the subjects	3.88	3.75	3.82	7	S
4. Lack of textbooks needed in the lesson	3.82	4	3.91	5	S
5. Inadequate community resources as an aid of student learning	4.00	3.75	3.88	6	S
6. Few reference materials are found in the school library	4.07	4.25	4.16	2	S
7. No available laboratory rooms and laboratory equipment needed in laboratory activities or experiments	4.25	4	4.13	3	S
8. Limited numbers of books and references are found in the community	4.32	4.25	4.28	1	S
9. Few available materials for projects and research work	4.13	4	4.06	4	S
10. No available Teacher's guide in the subject	3.56	3.67	3.62	8	S
Grand Mean Rating			3.78		S

CONCLUSIONS

K to 12 curriculum is one of the biggest of educational reform in the Philippine educational system which commenced in the year 2013 as it was deemed necessary to cope with globalization. Since the program is new, evaluations must be done in order to see and monitor the progress made and its implementation which are necessary in decision-making. It is in these reasons that this study was conceptualized.

In terms of pedagogical practices, the implementation of K to 12 Science program in Santo Tomas, Isabela is on track. This is supported by the Science pedagogical approaches which are implemented by teachers and administrators at a great extent. The district of Santo Tomas therefore is compliant with the teaching experiences provided and learning outcomes demanded by the K to 12 curriculum. Teachers and administrators are doing and performing as the result is overwhelming.

However, despite the good implementation of K to 12 science program, there are still problems that require immediate attention to ensure that the objectives of K to 12 are met. Teachers still lack adequate trainings in implementing the K to 12 program and learning materials are still insufficient to satisfy the demands of the K to 12 science program. While there are initiative made by the administrators, teachers and the Philippine education department, still there are more that should be done to successfully implement the program.

There may be inadequacies on the way, but Science teachers and administrators in Santo Tomas made sure that the curriculum prescribed the education department is followed. As manifestation, the performance of the pupils in science particularly in grades 3, 4, 5, and 6 is 78 which surpasses the 75 benchmark. Although it passed the performance threshold still the performance is quiet low but at least, the minimum program objectives are met. The problems that teachers are facing particularly on the lack of trainings and learning materials should be addressed as soon as possible because these are the defining factors towards the successful implementation of the program and the attainment of its objectives.

RECOMMENDATIONS

In the light of the findings in this study, the following are recommended:

1. The education department shall provide more training/seminars for K to 12 teachers so they will be equipped with adequate knowledge and skills to effectively implement K to 12 curriculum.
2. More intensive orientation should be done to increase the knowledge and eventually understanding of pupils on the underlying concepts and principles that can be applied to problems/ situations in new the contexts.
3. Teachers and administrators shall strengthen community linkages and seek more educational partners that can be of help to minimize the effects of inadequacy of budget.
4. The government shall increase the budget allotted in the education department to procure more learning materials and facilities which can eventually increase learning opportunities for learners.

5. The education department shall conduct additional trainings and seminars on contextualization and localization to assist teachers in developing materials and strategies to enhance learning.
6. Results of this study may be disseminated to the respondent schools for teachers and administrators to be informed on the extent of their implementation of the program and the problems encountered. By knowing the results, problems may be given constructive and immediate solutions.
7. Since the study was limited to public elementary schools and teachers who handle Science subject, it is recommended that such parallel research study should be conducted to determine the extent of the implementation of K to 12 Basic Education Program in other subjects and even in secondary level considering their vital role in the totality of the program.

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***Interdisciplinary Approach to Student Exchange:
The Case of ITMO University***

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Abstract

Interdisciplinarity and arising from it an interdisciplinary study approach have long been known to positively influence the science and innovation evolution. Being a response to the global market demands, interdisciplinarity encourages higher education to revise and modernize curriculum plans which are still placed within borders of one discipline. As the result, higher education institutions are gradually implementing interdisciplinary programs and nurturing the generation of global citizens who possess and utilize professional competences, skills and knowledge at the cross-section of disciplines. The paper includes a literature review of an interdisciplinary approach exercised by leading world higher education institutions and, in particular, by ITMO University, Russia. Furthermore, it demonstrates the application of this approach upon the practice of a student exchange. The choice of ITMO University is advocated by its increasing emphasis towards interdisciplinarity at the master's level and elimination of background requirements for a student admission. In the paper framework, an interdisciplinary student exchange is viewed as an applicable platform for attending courses from a different discipline, and is asserted to facilitate a prudent choice of a professional track and students' competitiveness in the labor market.

Keywords: Interdisciplinary approach, Interdisciplinarity, ITMO University, student exchange

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Introduction

Since knowledge is considered to be the most significant world-wide value and the main engine of progress, the vast majority of the countries in the global arena endeavor to respond to this challenge via education area. Nowadays, the Higher Education Institutions (HEIs) have come to the fore and play one of the most important roles in searching for solutions as they are responsible not only for establishing of knowledge but also for serving the new economic system as well as new international order (Panibrattsev, 2014).

According to Humburg & Van der Velden (2017), the analysis of the up-to-date global socioeconomic trends discloses the following features: increasing uncertainty, information and technology (ICT) revolution, high performance workplaces, globalization and the change of the economic structure. These features have a strong impact on skills that should cater for the demands of the 21st century and respond to the current global circumstances. The compilation of competences includes professional expertise, flexibility, innovation and international orientation (Humburg & Van der Velden, 2017). It can be concluded that, from the perspective of skills, the role of graduates' has undergone a qualitative transformation.

Interdisciplinarity

Within the context of the transformation, interdisciplinary approach can become an appropriate solution to better facilitate the mentioned socioeconomic trends. ICT revolution forces cutting-edge technologies to evolve rapidly; therefore, innovation has become the cornerstone of the process. Humburg & Van der Velden (2017) state that creating of innovations require not only broad academic skills including basic analytical and critical thinking but also the ability to overcome disciplinary borders to consider other perspectives. Basically, a significant part of current innovations is located on the periphery of disciplines therefore successful teamwork of specialists from different fields is partly supported by interdisciplinary knowledge (Humburg & Van der Velden, 2017).

While discussing working in teams, there is a need to highlight the necessity of making shared decisions, a joint search for solutions and assessing work of each other. The statement is based on the analysis of the European context by Felstead et al. (2007), Allen et al. (2011), and Miles and Martinez-Fernandez (2011). Furthermore, it is advocated that teammates who come from different disciplinary backgrounds should undertake a preliminary educational insight into each other's sphere in order to provide more qualified assessment and authoritative opinions while working on one project.

Another role of the ICT revolution is marked by the emergence of high performance workplaces which require wide range of competences and completion of multiple tasks (Humburg and Van der Velden, 2017). According to the research carried out over the past 20 years, organizations which integrate high performance work practices have been discovered to have higher effectiveness and better financial indicators (Appelbaum et al. 2000; Bartel, 2004; Black & Lynch, 2004).

To sum up, all the above mentioned skills generated by the trends of the 21st century can be formed during interdisciplinary studies. In the paper by Nissani (1997) the studies are defined as a course that involves the combining of two or more academic disciplines into one activity which can be either a cooperative research or a group project. Interdisciplinarity serves to seek solutions for complex problems that affect various scientific spheres.

According to Vincenti (2001), interdisciplinarity stimulates academia to advance curricula correspondingly. In order to meet the demands in specialists capable of managing interdisciplinary tasks, HEIs are launching interdisciplinary courses, short-term programs, bachelor's and master's degrees which cover several disciplinary fields. For instance, the University of Essex, the UK, runs an Interdisciplinary Studies Centre which allows students to opt for modules from across subjects in humanities and social sciences and receive learning experience from professors from various departments. Another example accounts to the faculty of management and law at Bradford University, the UK, that is in the process of eliminating departmental division. Moreover, interdisciplinary research centers promote cooperation between faculty and students, and facilitate the connection between teaching, learning and research.

Case of ITMO

Realizing that the future of innovations is laid at the cross-section of scientific fields, ITMO University took an international interdisciplinary path several years ago. Firstly, there were established Master's interdisciplinary programs, the vast majority of which nowadays are already considered as a natural combination. Bioinformatics, which requires knowledge of Biological Sciences as well as Programming and many others might fall into this category. However, ITMO went further and launched creative interdisciplinary studies that combine two extremes, for instance, Lighting Design (Optics & Design), Data, Culture & Visualization (Programming & Humanities) and Art & Science. It should be added that Art & Science at ITMO University is the first program which was set in Russia and also, due to it, ITMO is in Art & Design top-200 by QS Subject Ranking in 2019.

Secondly, this extraordinary synthesis demanded ITMO to eliminate background requirements for a student admission. As the result, designers, architects, historians of art, linguists meet programmers, engineers, physicians, biologists at one classroom and since there are no limitations, it is predicted that more unexpected combinations are yet to come. Moreover, the Data, Culture & Visualization program is a brand new program at ITMO. The decision to open it in upcoming academic year was rationalized by the high demand among students in interdisciplinary studies.

Lastly, it is of a prime importance to stress the fact that it is obligatory for students of all level of studies to attend at least 6 ECTS from a different discipline. In this sense, ITMO University realizes necessity of interdisciplinarity and integrates it in at different levels of the educational process.

Interdisciplinary student exchange

In order to meet current globalization tendencies, HE institutions (HEI) not only transform their curriculum but also commonly utilize student exchange as an

internationalization strategy by initiating exchange agreements with partner universities (Altbach & Knight, 2007). These agreements enable students to undertake a study program at a host university as a part of their degree without tuition fees increase. As a general, exchange period can last for either one semester or for an academic year.

Student exchange is widely argued to positively impact universities' international outlook, academic outcomes, students' career perspectives and personal qualities (Doyle et al. 2010). From the institutional respect, sufficient international student exchange strengthens HEI's positions in the world university rankings, and, therefore, facilitates their competitiveness in the global educational arena. From the educational respect, long-term exchange lasting for at least three months is advocated to improve student academic performance (Hansel & Grove, 1986; Dwyer, 2004), quality of learning (Severiens & Wolff, 2008), and to evidently develop students' individual human capital that is essential for entering professional fields (Messer & Wolter, 2007). Moreover, student exchange has been researched to enhance students' soft power qualities such as communication and adaptation skills, and ability to work in a team (Atkinson, 2010). Hutteman et al. (2015) also underline the importance of the exchange experience for the students' positive personal development and self-esteem.

The paper argues that student exchange further can serve as a platform for an interdisciplinary experience and an important stage to acquire knowledge and skills at the cross-section of different disciplines in a fast and productive way. Firstly, internationalization is interdisciplinary since it unites knowledge from multiple disciplinary fields in order to create new and more comprehensive ways to understand global tendencies and phenomena (Childress, 2010). Secondly, according to Vincenti (2001) and Fleischmann and Hutchison (2012), international experience shows positive impact upon advancement of interdisciplinary competences. Moreover, unfamiliar social, academic and research environment can facilitate flexibility, faster knowledge and skills acquisition, and, therefore, expand both students' learning and professional proficiency (Gerner et al. 1992).

Therefore, it is proposed that students who spend a semester or an academic year at a host university can benefit from joining peers studying another major. Even a semester-long insight into curricula of another academic program abroad is asserted to be significant for forming students' professional interests and priorities, and increasing cognitive abilities (Dwyer, 2004; Nunan, 2006). Moreover, Vincenti (2001) argues that qualities and skills necessary for specialists in interdisciplinary fields can be compared to those qualities and skills that are advanced or increased during international and multicultural experience.

Conclusion

Nowadays, national states are to establish educational institutions which best uncover creative abilities and innovative environments and which contribute to economic development (Crouch, 2005). Positive impact of interdisciplinary approach exercised by leading world universities and in particular by ITMO has inspired the authors of the paper to offer another innovative approach which accounts to application of interdisciplinarity upon student exchange. The paper restrains from offering a manual on how to correctly implement changes into the current HE system and allow

interdisciplinarity during a period of student exchange. Instead the paper presents an innovative idea supported by current researches on how HEIs can better adapt to global tendencies today (Humburg & Van der Velden, 2017). Moreover, profound efforts are to be done by home and host HEIs to revise and match own administrative rules, study programs and curriculum in order to offer exchange students an individual interdisciplinary study path. These changes should be supported by further researches in the sphere of the interdisciplinary approach and interdisciplinary student exchange.

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***Teacher Literacy Policy Recommendation and Program for Action
on the Neurobiology of Learning Differences***

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Abstract

This article outlines the program and policy recommendation for teacher literacy into the neurobiology of learning differences. The introductory formation course for teachers describes how, in a 12-hour program for regular schools, teachers can understand how neurological development should look like in typical and atypical trajectories. To attain this objective, the landmarks for neurological linguistic development are discussed as much as the differences in development for boys and girls. Specific language impairments and learning disabilities regarding listening, speaking, reading and writing, math, attentional processing and executive functioning are contemplated. Additionally, instructional strategies for accommodation and intervention are analyzed as well as the main characteristics of Attention Deficit Hyperactive Disorder and Autism Spectrum Disorder. The risks concerning Traumatic Brain Injury and Executive Dysfunction are also discussed. To conclude, an analysis of the necessary elements for an effective and productive communication with the general community (parents, leaders, school-related professional) is conducted.

Keywords: accommodations, learning differences, neurobiology, trajectories, strategies

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Introduction

In preparation for the educational agenda for teacher formation, this program addresses the issue of teacher literacy in relation to learning differences. Grounded on several anecdotal cases¹, there is a pressing demand from school leaders and parents for teachers to be literate in neurological development in respect to learning. This demand needs to receive special attention in view of the heightened consideration placed on teachers as enablers of better students' learning outcomes. Having been employed to devise a framework for a 12-hour teachers' development program about teacher illiteracy regarding the neurobiology of learning differences, I will specify what kind of literacy teachers need and the thought, organization and action progression in the acquisition of such literacy skills. The content of the modules for the program are discussed and policy recommendations are given at the end.

The program is the practical part of the policy recommendation. The delivery (in-site interaction) for the teacher program is divided into four modules. Each module comprises material for roughly three hours of work with tasks for teachers to discuss and complete based on their experience and with the input of new content. The whole program should take two days of intensive work (six hours each day). The modules are sequential and build on one another. Therefore, it is essential that all participants take this course as programmed. The program is thus sequenced: the first module is about neurobiological development; the second module analyses infant and language development; the third module gives specific information about the differences and similarities to be found among learning disabilities; the fourth module considers the communication with community members.

To achieve this breadth in scope, there must be some guidelines. The core directives underlying the program rationale are:

1. the provision of equal opportunities to those most in need;
2. the provision of information to teachers through an approach that allows for the generation of ideas which, coupled with practice and execution, can enable the transfer and application of the knowledge created to their settings;
3. the provision of a set of recommendations to be followed for the appropriate implementation of such policy.

General Overview

Educational Policy

To work as a nation and provide education to our entire future work force, we need to devise a common fertile ground to serve as a growth medium of curricula and pedagogical proposals from Pre-K to K12. In the procurement of such ways and methodologies, an educational document, like Common Core Standards, should establish the knowledge, competencies and skills expected from our students along their learning trajectories. The ultimate goal of such directives is to have a more inclusive, democratic and fair society.

¹ There is a huge compilation of anecdotal cases in the minutes of PTA meetings in each of the schools that I consult with. Unfortunately, a quantitative method has not been applied, rendering the collection of more structured data an unfeasible task. This is also a key goal for the proposed plan: objective data collection on the issue of learning differences and unmet learning needs.

In establishing the essential learning elements, this document has to be anchored in the notions of equality, diversity and equity. Equality is consubstantiated in serving our diverse population of learners with fair opportunities in entry points and continuity to safeguard their right to learn. Equity is reflected in acknowledging that diverse students have differing needs and those needs should be addressed adequately. There is no service or address that can happen without the proper recognition by teachers how different struggling learners are and wherein their differences lie so that adequate treatment can be given to their learning needs.

Teacher Literacy in Neurobiology of Learning Differences

In defining the lack of knowledge by teachers of how atypical patterns of development affect learning as illiteracy in learning differences, there is an acknowledgement that literacy is intrinsically the ability to understand and communicate, to interpret and comprehend the world where we live and operate (Drisdale, 2015). In this process, teachers need to learn how to differentiate fact from opinion or anecdotal beliefs; they must also be attentive towards inaccuracies between typical and atypical learning trajectories and they need to start asking for and implementing practices that acknowledge those atypical trajectories (Lewis, 2018a).

The more capacity teachers acquire to rapidly process the decoding of atypical behaviors, the more time they will have for deeper analysis and selection of activities to effectively address struggling learners' needs (Wolf, 2007). To attain that goal, teachers need navigational skills that will allow them to: know when they need information, identify what information is needed, find it, assess it to apply that same information so that a solution can be implemented and evaluated (Gok, 2015).

The information teachers need to generate new thoughts about neurodevelopment for learning is grounded in typical and atypical features. Teachers need information on cognitive, affective, psychomotor, and behavior systems. They also need to know what effects certain medications produce in learning as well as disorders that do not abide by what is commonly found in typical learning trajectories (Lewis, 2018b). It is not simply a question about what to learn, how to learn, and why to learn; it has a lot to do with perceived differences in expected levels of production, in discrepancies in processing and comprehending content and in how interventions and accommodations may interfere with learning. This is the critical kind of literacy that our teachers need, and this is a matter for educational policy and concern (Elmborg, 2012).

Course Content

In this section, the content that is developed in each module of the 12-hour program is specified. Important to mention that the brevity which is given to some deeply complex topics, such as brain development, happens in relation to time and purpose. Teachers taking part in this formation course do not become experts in neurobiology. That is not an expectation nor a demand. But knowing the very basics of such topic is central to an overall understanding of how biology underlies learning differences. This will make them better apt at dealing with diagnosis and atypicality in the classroom. In each module below, the main content is made explicit and references are provided. During the program, a variety of tasks, ranging from computer-based quizzes, total-physical response tasks and game-like activities, like bingo and jeopardy, are employed.

Module about Neurological Development

To better understand how learning differences or disabilities emerge, teachers need an introduction to neurological development. Therefore, the first topic examined within this module is brain development. Within this broad topic, the program delves deeper into the reason for humans' long term in uterus and how neurons follow a pre-programmed route that is chemically based. A lot that happens during pregnancy is activity dependent and the concept of critical period must be well understood within this time frame. Teachers are guided to reflect on the precise patterns of activations that our complex structural and functional architecture entails. In this process, there needs to be an overall understanding that environment is constantly shaping the brain (Aamodt & Yang, 2011).

Following brain development, the topic of myelination is tackled. In this part, STEAM activities developed with participants lend much strength to understanding. By working with cables and insulation properties, teachers quickly grasp the idea that myelin is an outgrowth of a glial cell that insulates the axons of neurons. That insulation is needed for connections to work in much the same way that electric cables can only conduct electricity once they are properly insulated. If that does not happen, accidents are bound to occur, and much the same happens in the brain. Participants get to know how myelination happens, before birth, in the motor and sensory systems, and the importance that it has for motor learning afterwards. It is also within this topic that teachers get to understand that differences in the timing of neural responses may be related to impairments in cognitive abilities (Dehaene-Lambertz & Spelke, 2015).

After myelination, the program moves onto the notion of mirror neurons and how that relates to social learning. Knowing that infants process sensory experience within one hour of birth confers deeper appreciation for the concept of reciprocity (Bulf, Johnson, & Valenza, 2011). The notion that newborns match orofacial movements shown to them lays the foundations of shared representations of self and others and of language acquisition (Werker & Tees, 1999). To better understand students within autism spectrum disorder (ASD), teachers need to grasp that it is from the imitation of surroundings stimuli (faces/sounds), that language emerges to communicate needs and thoughts. If there is a failure in neuronal pruning and/or less myelination in neural connections, these students may not develop language in the same way as children in typical development trajectories do (Bartzokis et al., 2010; Courchesne & Pierce, 2005).

Moving on to early years (1st to 3rd years of life), there is much value in knowing about apoptosis. Neuronal death, which is a natural ontogenetic process, plays an important role in uncluttering the infant brain. During the first year, the brain is programmed to select ineffective neurons that go unused or do not transmit the electrical signal properly. It is during this period that neuronal networks undergo a great change; the skills that do not get developed, dissipate. Also present is the well-acquainted notion that the second year of life is a 'blooming buzzing confusion'. Understanding that human brains are, at that age, typically dealing with an overflow of neural connections is central to a more biologically-driven perspective. At 24 months old executive functions are still maturing so toddlers can not be helped, nor expected, to interpret and manage their emotions. Participants also get to know why a lot of procedural learning is typical of this period as much as what to look for, in

typical and atypical development, in relation to language; sense of time and sequence; and small motor and hand-eye coordination.

To close this module, potentials and limitations in relation to development are examined. Human learning demands the development of multiple, hierarchically organized levels of structures and of connections (Dehaene-Lambertz & Spelke, 2015). In early infancy, the development of knowledge should follow a regular pattern which converges into a system. Early brain lesions, developmental disorders and abnormal environments disrupt that delicate – and individually-gauged balance – and that is when atypical cognitive development may occur. There are three domains that should be in every teacher's radar: brain areas and structure; connectivity; and temporal constraint.

Module about Infant & Language Development

Teachers must understand that susceptibility for learning differences results from the interaction between individual neurobiology and environmental influences. That is rooted in gene x environment interaction (Belsky & Pluess, 2009; Boyce, 2007). A child that is overstimulated at infancy may present some failure in pruning 'noisy' connections as much as that who is understimulated may fail to adequately develop some necessary networks. This is known as the Goldilocks Principle and safeguarding this 'zone' for optimal development has to be within teachers' capability. Teachers need to know that a demand for something that is not at the appropriate level of development, in terms of connectivity, may end up in disruption or malfunction.

Another topic within this module is that of gender differences. As much as 20 weeks in womb is enough for girls to become more mature than boys. That discrepancy will only grow in the years ahead. In kindergarten, a typical developing girl is, on average, one-year ahead of a typically developing boy (De Bellis et al., 2001). That is mother nature's doing and that knowledge can confer great latitude for teachers who suffer in differentiating instruction. At puberty onset, girls will typically be two years ahead of boys. But, by age 13, i.e., during puberty, girls' brains reach a plateau, and boys even them out. It is only after puberty that differences between sexes are fewer to be found than those between individuals.

The following topic deals with memory and the ages and different stages that signpost developments. At 3 months old, babies have but a functional working memory (WM), that memory accessed for what is needed at the moment, but that development is crucial for language development (Friederici, 2011). From that cornerstone on, we should observe developmental gains in phonological short-term WM, which translates into more efficiency in storing, ordering, rehearsing, retrieving and reconstructing information, i.e., acquiring new words. Complex WM, which translates into gains in processing efficiency and attentional capacity, takes more time to develop and greatly increases during childhood. It underscores learning (Gathercole, 1999).

To better appreciate how chronological age brackets are paired with typical stages of development, teachers get immersed in a series of tasks involving certain parameters. An example is that from 4-6 years, typically developing children have more hippocampal connectivity, central to memory formation, due to better myelination. That confers them gains in declarative/episodic memory. It is also when children start consolidating memories about their lives. From 6 years on, long cerebral pathways

myelinate. These pathways are employed, for instance, in learning how to write. That skill develops within a large range in age, and anything from 3 to 7 years is normal in terms of development of writing. When adolescence comes, there is an abundance of hormones leading to greater synaptic pruning. The amygdala, a central brain structure for emotional regulation, gets enlarged. There is great myelination in the corpus callosum, the fibers that connect our brain hemispheres, signaling that maturation in hemispheric interconnectivity is underway. So, the attention and correction mechanisms - located throughout the brain - that permeates impulse and control functions are not at their prime, yet. Therefore, external support, and understanding, is much needed (Blakemore, Burnett, & Dahl, 2010).

The next topic to be examined is that of language milestones. Knowing what is expected for a typically developing child since gestation till the age of 5, both in comprehension as in production, sets some cornerstones of development that teachers should be aware of (Saxton, 2010). Far from expecting the same developmental trajectory in relation to time, as some individual variability must be always considered, parameters in language acquisition aid teachers that should be on the lookout for atypical trajectories. Such trajectories can be better understood once the three domains of children's receptive skills are clearly comprehended: sensibility to sounds and vocalic combinations, i.e., phonology; inference of the abstract structure of speech, i.e., syntax; parity of words to objects, i.e., semantics. Disturbances in any of these domains when clearly signaled by an informed adult can be crucial for early detection of a learning disability.

Next in line comes reading and writing. As human brains are not biologically preprogrammed to read and write, as opposed to listen and speak, such abilities need investments of time and skill. Teachers are central to the process that every student in school undergoes and their correct appraisal of this restructuring of the brain is necessary. Knowing, for instance that for reading readiness children have to mature nothing less than 16 different neuronal networks does lend breadth to an accomplishment that may remain unparalleled throughout schooling (Pugh et al, 2013; Schlaggar & McCandliss, 2007; Tokuhama-Espinosa, 2011). In the case of writing, the concept of myelination dealt with in module one is explored in greater depth. The long fibers connecting the motor cortex to our fingertips take time – which is a variable factor - to myelinate. And motor learning, based on procedural memory, is extremely resistant to change. Once a student that is forced to write prematurely learns how to do it in the wrong way, i.e., not with fingertips, but with hand or elbow movements, unlearning is exponentially harder. This will, in time, lead to disinterest and a real hardship in writing development. Good intentions, when misdirected can lead to disastrous consequences. Teachers have to appreciate, understand, respect and support individual variability.

To close this module, comes the notion about numerical cognition. Knowing that the concept of natural numbers is strictly human (Dehaene, Izard, Spelke, & Pica, 2008.) can stimulate teachers who may inadvertently bring their personal math anxiety to classes. By working with the five properties of numerical cognition observable at any age (Dehaene-Lambertz & Spelke, 2015), teachers can skillfully scaffold students in investing on their spatial skills to better prepare for STEAM careers, regardless of learning differences (Newcombe, 2013).

Module about Learning Differences/Disabilities

The moment that teachers come to this module, they have fully grasped the reason why we should be talking more about differences and less about disabilities. Besides our potentials and limitations, we are all endowed to survive and thrive. Making use of mechanisms, within the boundaries of the contextual influences we are subjected to, is what should steer our efforts, and decisions, about how we learn. Along these lines, it is important to know that what is generically named *learning disabilities* should be indeed understood as a holdall term for heterogeneous disorders which present **significant** difficulties in listening, speaking, reading, writing, reasoning, and math abilities. They can cooccur without causal link. Determining them is a function of capacity in relation to performance.

When talking about these hardships, important to note that they relate to neurodevelopmental areas that can be better understood if presented within the domains of motoric capacity, language development, and organizational skills (Levine, 2003). Besides, there needs to be an understanding of where a disability lies as in, for instance, does a student present problems in oral comprehension or expression? Is the significant difficult to be found in math reasoning or calculation? Does the problem appear in reading comprehension or in written expression? As academic skill deficits may be found in neurobiology, in cognition, in behavior and in the environment, the testing route may not be the most adequate, lest reliable, to determine a condition. Investigations into a student's response to an intervention - the way through a deficit - may provide more effective answers.

After examining neurodevelopmental areas, next in line are the characteristics of individuals with learning disabilities. Among the ten general features, teachers start to pair some of what is being worked in the program with the faces and reactions of many a student. It is adamant, at this point, to retrace steps taken to remind participants about the relevance of significant differences for some of the characteristics that can cooccur in students with severe learning issues. It is not a single characteristic that defines a learning disability. There needs to be discretion and humility on the part of teachers who are not to diagnose learning disorders. This is a job for another class of professionals. Nonetheless, teachers are in charge of effectively managing the implications of diagnosis for learning purposes.

Moving on to oral expression and to the impairments that may be present, teachers get to know that a specific language impairment (SLI) is not due to a cognitive deficit, poor hearing, neuropsychiatric condition, or social problems. What happens in this area may be more related to a weak procedural learning that is highly heritable (Newbury, Bishop, & Monaco, 2005). In relation to SLI, teachers need to discreetly understand the components of oral expression. Besides phonology, syntax and semantics, there is morphology and pragmatics. Knowing these different areas aids teachers in identifying the difficulties inherent to the different subtypes of SLI that students may present.

Taking the large bandwagon of phonological processing, a common deficiency for SLI, the program moves forward to a possible comorbidity by analyzing Dyslexia, which is also connected to a faulty phonological processing (Catts et al, 2005). Dyslexia is a specific reading disability, according to the DSM-5, that has a neurobiological nature. It is a persistent functional deficit and not a delay in

development. The telltale signs are, although not limited to, slow, difficult and inaccurate reading, frequent spelling mistakes, and sub-par writing skill. The treatment has to be scientific and evidence-based, with techniques and strategies that approach learner needs' wholly. That demands that teachers, and education leaders, acquire enough knowledge to change educational practices and policies that are not in tandem with what we presently know about dyslexia. Additionally, there needs to be more information on the kind of dyslexia a student may present; processing issues are different than comprehension problems. However, both types translate into a low decoding ability that leads to poor reading. In time, if left unattended, these students will have less vocabulary and knowledge gains.

Comorbidity in relation to processing speed may happen for dyslexia and ADHD (Mahone, 2015). Considering that an ADHD diagnosis is highly influenced by beliefs and profiles, i.e., boys regarded as more ADHD-prone than girls (Bruchmuller, Margraf, & Schneider, 2012), there are biomarkers, such as connections that mediate attention, memory and EFs which are not strong in ADHD learners (Shaw et al., 2007). ADHD is not a neuromyth lest an invention of pharmaceutical companies. However, any medicine for this condition has to be used in conjunction with other behavioral interventions. Apart from being a condition hard to diagnose as it has to be done, presently, by exclusion; there are three subtypes that have to be considered for interventions and accommodations that take place in the classroom. Teachers have to know that a demand from students in class for excessive speed, dual tasks (reading and writing), and multiple rules is too much for a student with ADHD. Therefore, teachers once again are led to appreciate the value in distinguishing planning, like time management and sequencing, from organization, as in class settings and materials. Such confusion can cause much damage in instruction (Lewis, 2018c).

In getting more knowledge about ADHD, another issue has to be introduced as cooccurring characteristics may be found. Many ADHD learners present an inability to infer language, self-monitor, organize materials and apply strategies, commonly found in Executive Dysfunction (EDF) (Reader, Harris, Schuerholz, & Denckla, 1994). Although, teachers may attribute this processing problem, i.e. EDF, to many students, the persistence of symptoms defines the problem. In the case of EDF, there is an array of teaching strategies, that can accommodate, i.e., work around the deficit, till students are better able to inhibit their attention, sustain it in order to deliver on tasks.

Attention is the common thread for another possible comorbidity: between ADHD and ASD. Whereas learners with ADHD have difficulty in selecting the stimulus for attentional focus, ASD subjects have problems in shifting their attentional focus. And the intervention that is highly effective for both scenarios is called ABC (Antecedent; Behavior; Consequence). In this intervention, circumstances that precede the action are proactively examined, the behavior is treated as it is, a manifestation of an underlying condition (and not an inconsequent attitude, as in misbehavior), and consequences are ascertained, i.e., results from said behavior are subjected to a needs analysis. But ASD deserves time in the program as it presents greater challenges for the educational community.

To begin with, teachers get to know how ASD, a highly heterogenous neurological disorder, has no 'cure', as it is not a disease. But the fact that there are no medical

tests, nor a definitive cause to this disorder, does cause great anxiety. That is not conducive to an effective approach for ASD students in schools. Although each case is a case in ASD, there are some core deficits that allow for an identification. These are: repetitive patterns of behavior, persistent difficulties in social interactions and in verbal and non-verbal communication. These features translate into qualitative impairments, analyzed in greater detail during the program, that bring a constellation of challenges. Far from discouraging participants, this program makes sure that each group of challenges presented are coupled with possible accommodation strategies. But there can be no sugar-coating to the difficulties that ASD students face. They have to be supported, aided and understood so that their atypical learning trajectories also find room for success in schools.

The last topic in this module is about Traumatic Brain Injury (TBI). This condition, which is not always so obvious, results from an acquired injury to the brain due to external forces. As with ASD, each case of TBI is unique and presents challenges that have to be individually assessed. The diagnosis is based on the level of consciousness and focal signs. There are two subtypes: primary injuries, those resulting from sustaining a blow to the head through an acceleration/deceleration movement with cooccurring rotational trauma; and secondary injuries, those resulting from decreased cerebral flow, increased cerebral blood volume and intracranial pressure. The impairments after a TBI can be of a mild, moderate or severe nature to one's cognition, behavior and/or motor capacity. But, pre-lesion factors, such as age and development, play a major role in recovery and treatment. After the TBI, some cognitive and behavioral deficits can only be detected once the individual returns to a challenging environment, like a classroom. There is a range of abilities that may be altered after a TBI, such as attention, memory, language, motor and executive functioning. However, greater impairments will affect those with preexisting learning disabilities. To note, recovery in the first 2 years after a TBI can be crucial. Unfortunately, the fact that among those affected, half do not get reported or treated, makes the case for TBI awareness much more pressing (Blankenship & Canto, 2016).

Module about Connections with the Community

In this module, we deal with a thorny issue for education professionals: communication. Teachers live surrounded by students and other teachers. Therefore, the vocabulary that is used and the conversations that take place, while may give them the notion of pervasiveness, correspond, to a fraction of the conversations and of the vocabulary that students use. These students take part of other circles, such as family, community centers, and social groups. And in these circles, the vocabulary used changes.

Therefore, when teachers get to talk to parents or students about learning differences, misunderstandings may occur. And a common reason for them is lack of shared vocabulary. Teachers have to take steps to make sure that, when communicating about learning disabilities or disorders, and the difficulties that students face, parents and students themselves get to understand where the problems reside and how expectations should be expertly adjusted.

Parents are the greatest allies that teachers of students with severe learning difficulties may have. They are the ones that can furnish precious information about early development so that teachers can better understand the individual in class. On the

other hand, parents who have been thoroughly informed about curriculum choices, expectations, content and assessments may aid the work that is taken home by the learner. Treating that ally with confidence is the first step towards trust. Teachers have to invest in building a solid, patient and professional avenue of communication with parents. In this work, the learner is the one that is most benefited (Lewis, 2018a).

In scaffolding this communication, it is adamant that teachers share information with parents on how cognitive impairment impacts pace and learning. Likewise, students with deficits should know about development stages and how to invest in their strengths to compensate for their weaknesses (Levine, 2003). Being able to pinpoint their successes is, therefore, a must. Another important step is to make clear how cognitive development relies on language and social development. The stages of development may serve as a good foundation for what modifications/accommodations can be done in schools. Parents should also be aware and coached on how to support them at home.

Recommendations

In this section, recommendations will be furnished for education leaders and policymakers in relation to teacher literacy on the neurobiology of learning differences. Each paragraph highlights one recommendation in view of what has been exposed in this article and program for action.

Accelerate the inclusion of struggling students to match Common Core Directives

Education leaders and parents have already expressed their dissatisfaction with current teachers' knowledge of learning impairments. In view of Common Core Standards, that call matches the foundational basis for learning outcomes in relation to content and development of competencies and skills that are essential to learning.

Our recommendation is that state and local education policymakers work together to promote mechanisms to address teachers' lack of knowledge in relation to learning differences. Blaming teachers for struggling learners' difficulties does little in advancing practices for the effective inclusion of such students in alignment with Common Core demands. The procurement of a coherent, balanced and effective system of teacher continued formation should answer that pressing need more thoroughly.

Adopt a teacher literacy program to develop their knowledge in neurobiology of learning differences

Teacher initial formation does not presently cater for the knowledge that they should have to address those with learning disabilities. That realization does not prevent our society from developing mechanisms to fill that void. Such is the adoption of a literacy in learning impairments that will provide teachers with the fundamental knowledge they need to design learning experiences that will accommodate the learning needs of all students, especially those with specific needs.

In view of the fact that teacher literacy in learning differences is strategic and central to the effective enactment of Common Core Standards, teachers who do not have information on what is atypical in learners' neurological development will not be able to enact practices that guarantee learning through adequate curricula and learning

programs. A program that develops teacher literacy in this area should be a priority in teacher development programs to be adopted.

Develop a STEAM approach to teacher literacy in learning differences

An approach that promotes integration across levels and subjects as STEAM does is in line with the attainment of successful continued learning. Teachers can make effective use of the problems that are central to this new literacy by using discovery learning through STEAM. To develop an effective inclusive education, experience is the adamant recommendation. By developing teachers' literacy in learning impairments, it becomes possible to accommodate all learning profiles through a feasible and commendable approach. That can be done through the integration of subjects and the complimentary possibility of discovery and creation in learning designs. STEAM courses for teachers provide that possibility with a greater probability of successful outcomes.

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A Study on the Design of Teaching Materials for the Mobile Learning Apps in Printing Professional Courses

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Abstract

This study aims to explore the design of teaching materials for the Mobile Learning Apps in printing professional courses. This study firstly conducts literature review to understand the development status of the content for the Mobile Learning Apps, the production process and the teaching materials that conform to the requirements of the printing professional courses. Then, this study will conduct in-depth interviews, use relevant literature and refer to the subject matter in printing professional courses as well as the current printing education materials to design a systematic printing professional course. Then, experts or scholars with work or teaching experience will assist in confirmation of the course content. The results obtained for this study show that students can obtain a complete curriculum content from the printing professional courses, but only the undergraduate students that major in relevant studies may enjoy improvement to their knowledge and practical abilities based on the current course content.

Keywords: mobile learning app, printing professional courses, teaching material content

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I. Introduction

Research Background and Motivation

According to the “Policy Guidelines for Mobile Learning” promulgated by the United Nations Educational, Scientific and Cultural Organization (UNESCO), Mobile Learning means learning with mobile technologies or other Information and Communication Technologies (ICTs). Chi-Yu Chen and Hung-Chang Lin (2007) thought that learners could more quickly have access to the information required through the mobile devices, and they could select their own ways to conduct mobile learning. Learners could take active action and obtain instant feedback, thus experiencing more convenience in mobile learning without limitations of time and space.

Mobile Learning has specific benefits like “Expanding the Scope of Education and Fairness,” “Helping the Disabled to Learn,” “Promoting Personalized Learning,” “Providing Immediate Feedback and Measurement,” “Supporting Situational Learning” and “Improving Communication and Management” (UNESCO, 2013). But as most teaching materials for mobile learning are rarely designed for specified subjects, and the teaching materials contain inconsistent messages, information acquisition, memorization and learning are pretty difficult as a whole (Chi-Yu Chen and Hung-Chang Lin, 2007). Hence, how to design mobile learning materials for certain subjects is indeed a topic worth studying and further investigation.

Via literature review and in-depth interviewing, this study analyzes the findings to reach conclusions on the apps for printing professional courses, which may be referenced during the design of teaching materials for mobile learning apps in printing professional courses.

Research Purposes

This study aims to investigate the design of teaching materials for mobile learning apps in printing professional courses, or more specifically, to understand the Development Status of Teaching Materials in Mobile Learning Apps, the Work-flow of Making Teaching Materials in Mobile Learning Apps and the Mobile Learning Apps that contain Teaching Materials for Printing Professional Courses.

Research Questions

Based on the above-mentioned Research Purposes, the research questions in this study are:

- (1) What is the Development Status of Teaching Materials in Mobile Learning Apps?
- (2) What is the Work-flow of Making Teaching Materials in Mobile Learning Apps?
- (3) What are the mobile learning apps that contain teaching materials for printing professional courses?

Research Scope and Limitations

This study mainly aims to investigate the design of teaching materials for mobile learning apps, and thus, this study must investigate the two major aspects in the teaching materials in mobile learning apps, which include the “Development Status” and the “Work-flow of Making Teaching Materials in Mobile Learning Apps.” However, development of mobile learning apps is not within the Research Scope in this study.

The limitations faced by this study include the rarity of printing professional courses and most attendees of the printing professional courses are majoring in Art and Design. Thus, the findings in this study may not be applicable to courses of other subjects.

II. Literature Review

Development Status of Teaching Materials in Mobile Learning Apps

As e-Learning has changed with the changing times, teaching materials have also been modified and adjusted accordingly, from discs that contain the electronic learning content, to the learning content presented by web browsers, and further to the digital learning content provided for the learners through the multimedia, which has officially ushered in the era of Mobile Learning (Jung-Kui He & Yen-Chen Lin, 2011; Chen-Yu Li, Hsin-Jung Wu & Hui-Chung Kuo, 2011).

IEEE (2002) defines Learning Objects (LOs) as any digital or non-digital resources that can be used for learning, education, and training. The learning content design framework is formed by the combination of Learning Objects. In terms of Mobile Learning, the content of the architecture can be divided into five types, including: films, pictures, texts, sounds and QR codes. (Paulins, Balina, & Arhipova, 2015).

According to the research data, it is found that with changes in the forms of e-Learning, the content will also be transformed and presented in a way that fits the mobile device. And the concept of Learning Objects can also be used in the development architecture to organize the teaching materials.

Work-flow of Making Teaching Materials in Mobile Learning Apps

In most of the cases, teaching material developers already have some learning objects and resources. But, Mobile Learning can appear in many forms. Thus, it is necessary to re-design the existing content or prepare the new content (Jung-Kui He & Yen-Chen Lin, 2011; Chen-Yu Li et al., 2011; Shan-Ju Lin & Ya-Hung Hsiao, 2012; Paulins et al., 2015).

Ravi, Banoor, Jignesh and Nawfal (2016) also think that e-Learning is a fast and simple learning method, as it converts conventional teaching materials to digital teaching materials, and implements fast e-Learning courses based on different teaching goals and expected results.

According to analysis of relevant data and findings, the Work-flow of Making Teaching Materials in Mobile Learning Apps can be divided into 4 phases:

- (1) Identify the App type;
- (2) Analyze and classify teaching materials;
- (3) Develop auxiliary elements and other detailed items;
- (4) Conduct expert certification or teaching experiments.

Teaching Materials for Printing Professional Courses

Professional education can be defined in different ways. If it is defined in terms of the educational goal, it will be a different level of education, that is, to qualify people for a particular occupation or profession; if it is defined by the type of educational institution, it refers to the education obtained in vocational schools, universities and colleges (Tarasova & Sarkisov, 2008).

According to the above definition, printing professional education is not only a professional qualification for printing practice, but also a type of education obtained in vocational schools, universities and colleges. Al-Radaideh (2013) pointed out that the introduction of printing technology education in graphic design learning can enable students to gain technical understanding. The printing technology education must provide professional teaching and practical courses. Not only shall the specific subject content be taught. Students must be allowed to engage in the practices of the printing process to improve their ability to handle the print quality, design, composition and media.

In the “Curriculum Guidelines of 12-Year Basic Education—Design Group (Draft)” formulated by the National Academy for Educational Research (2016), the teaching goals mentioned in the synopsis of printing and design practices (Graphic Arts and Design Practices) include:

- (1) To understand printing theories and design practices/concepts;
- (2) To apply 5 major elements of printing in the design;
- (3) To apply post-press finishing methods and materials in the design;
- (4) To become professionals with practical experience in printing and design.

The teaching content concerning printing and design practices includes:

- (1) Printing Overview;
- (2) Printing Development History;
- (3) 5 Major Elements of Printing and 3 Major Fields;
- (4) Print Layout Principles;
- (5) Scanning/Screening Principles;
- (6) Color Reproduction Techniques;
- (7) Plate-making Techniques;
- (8) Make-up (Imposition);
- (9) Post-Press Finishing;
- (10) Understanding the printing paper;
- (11) Making the final draft for printing;
- (12) Digital output.

According to the research data, printing knowledge, printing process handling and application of practical printing skills are the important parts of printing professional

courses. The combination of theories and practices allows students to become professionals with practical experience in printing and design.

III. Research Methodology

This study aims to investigate the design of teaching materials for mobile learning apps in printing professional courses. This study conducts in-depth interviews with experts and scholars with work or teaching experience to confirm the content of the relevant course. The research framework, research objects, research tools and the content of data processing are respectively specified as follows.

Research Framework

According to the research purposes of this study, the Research Framework is shown in Figure 4.

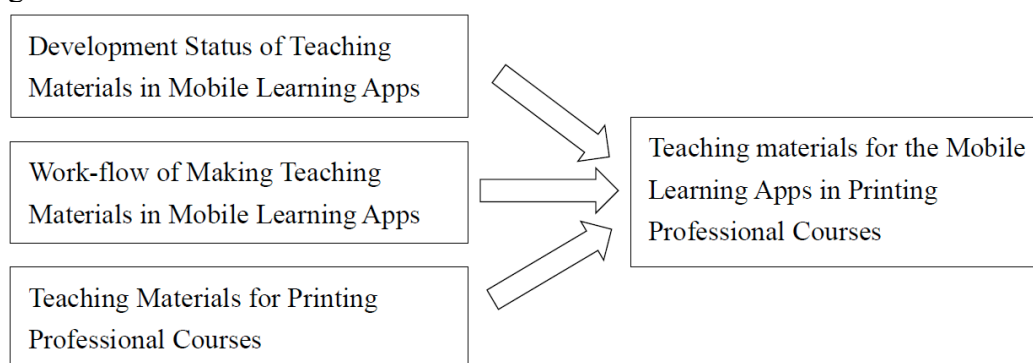


Figure 4. Research Framework

Research Objects

In conjunction with information gathering from relevant literature, this study also uses the in-depth interviewing method to confirm the correctness and applicability of the course content, and further clarify the information on the topics related to the course content. Through in-depth interviews with experts and scholars in the printing field, this study tries to understand their views. This study is just a preliminary study in its nature, so mainly 3 research objects are selected for the in-depth interview. The qualifications for research objects are set as follows:

- (1) Company owners or managers with work experience of 5 years or more in the printing business.
- (2) Design educators with teaching experience of 5 years or more in technical and vocational colleges.

Research Tools

According to research purposes and methods, the interview outline is the main research tool used in this study. This study applies the topics in the current printed teaching materials to design a systematic printing professional course. And through the classification of the course content, including: (1) business cards; (2) posters; and (3) work collections, the items in the interview outline are developed sequentially, so that the interviewer will explain the interview outline item by item and ask relevant questions. The items in the expert interview outline are set out as follows:

- (1) If it is necessary to assist vocational high school students and improve their knowledge and practical abilities, do you think the course content is appropriate? (Why is it appropriate/inappropriate? What parts need to be modified?)
- (2) The course content planning mainly includes Pre-Press, Printing and Post-Press Finishing. Do you think the content can fully represent the three dimensions? (Why is it complete/incomplete? What parts need to be modified?)
- (3) At present, the course content planning is divided into three topics of business cards, posters and work collections. Do you think the contents of the three topics are complete? (Why is it complete/incomplete? What needs to be added?)
- (4) In the course content concerning the business card, what do you think are the shortcomings and mistakes?
- (5) In the course content concerning the poster, what do you think are the shortcomings and mistakes?
- (6) In the course content concerning the work collection, what do you think are the shortcomings and mistakes?
- (7) In the course content concerning the business card, do you think there is a gap as compared with the current situation of the industry? (What are the reasons for yes/no? What parts need to be modified?)
- (8) In the course content concerning the poster, do you think there is a gap as compared with the current situation in the industry? (What are the reasons for yes/no? What parts need to be modified?)
- (9) In the course content concerning the work collection, do you think there is a gap as compared with the current situation in the industry? (What are the reasons for yes/no? What parts need to be modified?)
- (10) Think about this course with your work experience and professional knowledge. Do you think the course content is complete enough? Do you have any other suggestions or supplements?

Data Processing and Analysis

In this study, to process in-depth interview data, the recording files are first converted into verbatim drafts, and then the items in interview outline are sequentially tabulated as the basis for confirming the correctness and applicability of the course content. Through interviews with industry experts, this study aims to confirm the correctness of the course content and whether it has a gap with the current situation of the industry, and through interactive dialogues with the interviewees, the specific suggestions on the course content are obtained for this study.

IV. Findings & Analysis

Regarding the design of teaching materials for mobile learning apps in printing professional courses, this study conducts in-depth interviews with experts and scholars in the printing field to confirm the correctness and applicability of the content of the printing professional course, and further confirm whether the course content is wrong and whether there is a gap between education and industry through analysis of the interview on the content of the printing professional course.

According to the analysis on the results of the above interviews, the content of the printing professional course in this study can provide students with a complete course content, including the three topics of: (1) business cards; (2) posters; and 3) work

collections. There is no gap between the course content and the current situation of the industry. However, only the undergraduate students that major in relevant studies may enjoy improvement to their knowledge and practical abilities based on the current course content.

V. C o n c l u s i o n s

This study aims to investigate the design of teaching materials for mobile learning apps in printing professional courses, and draw relevant conclusions as follows:

- (1) Through literature review, we can understand that the Development Status of Teaching Materials in Mobile Learning Apps as follows: As the form of e-Learning changes, the content is also changing to fit mobile devices, and the Learning Objects are also used in the development architecture to organize the teaching materials.
- (2) Through literature review, it is known that the work-flow of Making Teaching Materials in Mobile Learning Apps can be divided into 4 phases: (a) Identify the App type; (b) Analyze and classify teaching materials; (c) Develop auxiliary elements and other detailed items; (d) Conduct expert certification or teaching experiments.
- (3) Through literature review, we can understand that teaching materials for printing professional courses shall contain topics about printing knowledge, printing process handling and application of practical printing skills.
- (4) As for confirming the correctness and applicability of the content of the printing professional course, according to the analysis results obtained from in-depth interviews with experts and scholars in the printing field, the printing professional courses in this study can provide students with a complete curriculum content that is congruent with the current conditions of relevant industries. But only the undergraduate students that major in relevant studies may enjoy improvement to their knowledge and practical abilities based on the current course content.

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***The ICT-assisted Classroom: From Teacher-dependence to
Independence and Interdependence in Learning***

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Abstract

The paper narrates the experiences of Senior High School students and teachers in two *ICT-assisted* classrooms, one in Mathematics and another in Science. It traces the transition of students from teacher-dependent learning to more autonomous and cooperative learning when instruction was transformed from traditional to ICT-assisted. Two Grade 11 classes in a private secondary school in Quezon City, the Philippines, were randomly assigned as experimental groups in which ICT-assisted instruction was introduced after one month in one of their subjects. In Experimental Group 1, ICT-assisted instruction was implemented in their Math subject, *Statistics and Probability*, while in Experimental Group 2, it was applied in their Science subject, *Disaster Preparedness and Risk Reduction in Philippine Setting*. Two other Grade 11 classes served as their controls. Experimental and Control participants were taken from academic strands of Senior High School in which the two subjects (Mathematics and Science) were required in their curricular programs. These strands were ICT strand (for the Math subject), and General Academic strand (for the Science subject). For each strand, students were randomly assigned to Experimental and Control groups; stratified random assignment was utilized to ensure that class sizes were equal, and so was gender distribution. ICT-assisted instruction came in the form of *digital* copies of textbooks and an *Internet-based* teaching-learning *platform* in which teachers uploaded class materials, and students submitted their class work and assignments. *Tests*, which had undergone validation and reliability analyses, were administered three times: prior to the introduction of ICT-assisted instruction (as diagnostic), at mid-semester and at the end of the semester (as posttest). *Classroom observations* were also conducted *every* month during instruction, to capture classroom *interaction* between teachers and students and between/among students, particularly after *transition* from teacher-dependent to ICT-assisted was implemented. Separate *Focus Group Discussions* (FGDs) with *students* from all four classes (two experimental and two control) were held at the end of the four-month semester to obtain students' descriptions and perceptions of their classroom experiences. *Teachers* were likewise interviewed individually to find out their assessment of the ICT-assisted instructional method. *Problem* areas that hindered independent and interdependent learning were pointed out, and suggestions for addressing these problems were also offered by students and teachers.

Keywords: ICT, Computer-aided instruction, Digital classroom

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Introduction

One of the commitments that the Philippines has signed up to is the so-called Sustainable Development Goals (SDGs, which are actually a continuation of the Millennium Development Goals or MDGs). Of particular interest to us the Goal 4, Quality Education, and more specifically, the third outcome target, *equal access to technical/vocational and higher education* achieved through effective learning environments which include upgraded education facilities.

Eclaro Academy, a relatively young educational institution providing basic education (Kindergarten to Grade 12), was established primarily to provide an ICT-based instructional program. In 2016, the Academy was fortunate to obtain partnership with a local book distributor and development company (C&E Publishing, Inc.) to undertake an experiment on the use of tablets among students in Grade 11 of Senior High School. We wanted to compare the advantage of having an ICT-assisted classroom relative to the traditional teacher-centered classroom. For this reason, we chose to apply ICT in a mathematics classroom and a science classroom, and to compare the students' and teachers' experiences with those in "regular" classrooms. Our question was, "*How do technology-assisted instructional methods enhance both instruction and learning in Grade 11 Mathematics and Science?*"

Method

Two Grade 11 classes (with an average of 40 students in each) were randomly assigned to ICT-assisted classrooms, one to be taught Mathematics, specifically, *Statistics and Probability*, and one Science, specifically *Disaster Preparedness and Risk Reduction in Philippine Setting*. The experiment was conducted during the Second Term of School Year 2016-2017, spanning five months, from November 2016 to March, 2017, with the Math classes taught by one teacher and the Science, by another teacher. Analysis of data was completed in 2018. ICT-assisted classes utilized digital copies of the textbooks as well as an online teaching-learning platform in which teachers uploaded supplementary materials, assignments, class activity guides, quizzes, and feedback on student work which students could download and study on tablets, laptops or android-based cellphones.

Both teachers received briefing on e-learning, the use of digital copies of the textbooks, and basic troubleshooting, and an intensive training on the use of the online platform from e-learning specialists. Students were likewise given a briefing on how to use the digital textbooks and the online platform on their preferred devices. A survey on ICT use was conducted among students in the ICT-assisted classroom a week before the start of implementation to determine whether students needed additional instruction on how to use gadgets and how to navigate the Internet. Results showed that students were familiar with the use of gadgets and the Internet, spending anywhere from 30 minutes to 11 hours on them for word processing, computing, emailing, searching for information, and social networking.

Classroom observations were conducted monthly in the course of the five-month experiment. Following each observation session, teachers were given feedback on how to improve ICT-assisted instruction during the first two months. Formative and summative tests were administered to monitor students' progress. At the end of the semester, separate focus group discussions (FGDs) were conducted among students in the ICT-assisted classrooms, and brief interviews with teachers. Students were also asked to evaluate their experiences.

The ICT-assisted Classrooms: Students' and Teachers' Descriptions of their Experiences

Students' experiences. When technology was introduced in the classrooms, the students' reaction was one of *excitement* (“*We felt very excited*”) and *energy* (“*...and explored the internet-based teaching-learning platform right away*”). They felt it was “*cool*” (modern, great) to be able to learn using technology. In fact it made them feel good as it meant it would make studying easier (“*mas madali mag-aral*”). The excitement elicited by the novelty of the technology applied in the ICT-assisted classroom seemed to have served as an impetus for students to get into the lessons with eagerness and vigor.

In the Mathematics classroom, students navigated digital copies of the textbook on their gadgets, and were able to read lessons in advance, reading from approximately 6 to 8 hours each meeting day. They used their gadgets to access the digital textbook and the platform whenever they needed to study their lessons (“*ginamit pag kailangan aralin ang topics*”), not only in school but also at home (“*hanggang sa bahay*”). When the class was engaged in using their gadgets for learning activities, students worked quietly (“*tahimik sa room*”, the room was quiet). However, during group activities, there was more dynamic student participation (“*mas active*”).

They had swift access to solutions and examples for exercises which made learning the concepts and formulas a lot less difficult than it would have usually been in a traditional classroom. One student said it was easier for them to solve exercises (“*mas madali mag-solve ng problem*”) and they easily finished their tasks (“*mabilis matapos ang schoolwork dahil sa apps*”). They downloaded instructions and activities, quizzes and assignments. The online Internet-based teaching-learning platform was useful in viewing the teacher's and their classmates' feedback posts regarding class work. They took screenshots of their own progress. Their gadgets also enabled them to browse the Internet for more information about topics discussed in class. They looked up for meanings and definitions of difficult terms in Google and verified formulas when it was discovered that there were typographical errors in the textbook and that formulas were not accurate.

In the Science classroom, students were likewise eager about the technology because of the help it could give them in their studies (“*excited kami, kasi malaking tulong ang technology*”). They used the gadgets in class, during free time, and at home (“*sa school, sa bahay*”) for class requirements (“*pag gumagawa ng homework*”) and for other purposes (“*personal na bagay*”). They were able to view audiovisual materials

uploaded by the teacher (“*may live video*”), which helped them comprehend lessons (“*mas naiintindihan*”, “*natuto*”) such as the video on volcanoes (“*maganda gaya ng volcanic eruption*”). They also used their gadgets for *note-taking* and taking *screen shots* of *definitions*, *key words*, *important details*, and *teacher’s lectures*. Through their gadgets, they were able to *consult* other resources such as *Oxford Dictionary*, *Merriam-Webster Dictionary*, *Google*, *Wikipedia*, and *YouTube* (video about volcanic eruptions). All these helped them grasp concepts better (“*mas naiintindihan ang lesson*”). The class activities and assignments enhanced their performance (“*mas maganda grades dahil sa activities*”).

Aside from applications used in their Science class, students used their gadgets for other purposes. They used it for word processing (“*pag-type ng report*”), sending messages (“*Instagram*”, “*Twitter*”, *email*”, “*messenger*”, and “*texting, nilagyan ng SIM*”). They also used search engines for information, documents, and useful video clips (“*Google*” and “*YouTube*”). For “*techy-savvy*” learners, they thought that technology was an important component of instruction (“*mahalaga talaga, especially dahil techy-savvy na lahat*”). With all these advantages, students assessed the use of technology as better (“*mas maganda ang tablet*”) and easier than the print copy and traditional teaching approach (“*mas madali kaysa book*”). The technology helped them to realize “(it) *became more interesting to learn from the tablet than from the book*”. Students agreed that technology was an effective delivery technique for instruction if crucial components are provided (“*kung maganda ang connection at ang applications*”). One student suggested that continuing with this approach should be carefully studied (“*Minsan mabagal ang connection, application, sana pag-aralan muna*”).

Using technology-assisted instruction also had some *setbacks*. The major difficulty encountered during the semester was connectivity, possibly due to the location of the classrooms and the service provider itself. There was an occasion when much of the class time was used downloading lecture materials or instructions for activities. “*Naubos ang oras (namin) sa pagda-download kasi laging nag-a-update ang gadget*” (We used up our time downloading the material which was interrupted by constant updating of software on our gadgets). A few students who were not used to using the Internet for class work expressed discomfort about submitting assignments on the platform. One student commented that he could not turn in requirements because his Internet access at home was not very good (“*Mahirap mag-work sa Internet sa bahay; minsan di nakaka-submit assignments*”).

Like their counterparts in the Mathematics class, students in the ICT-assisted Science classroom were met with problems with connection. They could not access the platform (“*di nabubuksan ang applications*”), and even if they were able to, downloading was rather slow (“*matagal mag-open*”; “*nagko-connect kami pero mabagal*”), and sometimes it would be interrupted (“*nag-hang*”). Sometimes logging on to the platform was difficult (“*erratic ang access*”), which made occasionally hindered early submission of assignments (“*hindi nakakapasok, mabagal ang connection*”). When faced with such difficulties, students helped each other by

“*sharing gadgets*”. In such situations, teachers understood students’ problems and gave extensions in deadlines for submission of assignments.

Students praised their Science teacher for making herself available for consultation through the chat feature of social media and for putting up her advice on the platform (“*nakipag-chat sa assignment*”, “*nag-upload ng mga advice*”). As for the activities provided by the teacher, students appraised them positively but also thought that there ways to make them work better in the future (“*maganda, pwede pang i-perfect*”).

Despite these setbacks, generally both Mathematics and Science students supported continued use of technology because it facilitated learning (“*Tablets are ok, especially in accessing lessons*”) and gadgets, unlike print copies, were not heavy to carry around (“*Di mabigat dalhin sa bag*”). As for the digital copies of textbooks in their gadgets, they liked the pictures and graphs, and found the explanations complete (“*kumpleto ang explanations*”) and the exercises made the lessons easy to understand (“*madali kasi may mga exercises*”). They appreciated that they were able to enrich their learning with the video clips that the teacher had uploaded on the platform (“*na-clarify ng mga video and lessons*”). One student disclosed that assignments could be altered to the point of excellence (“*pwedeng ma-perfect*”). Those who wanted to monitor their own progress could simply take screen shots of their submissions (“*kailangang i-screenshot para may copy*”). Notwithstanding these concerns, students endorsed the use of technology for the entire school.

Teachers’ experiences. With regard to the platform, the Mathematics teacher had this to say: “*It was very useful and could easily be navigated. But content could be improved, that’s why (I) had to make preparations for class presentations, even if meant additional work for (me). It functioned as interactive tool and was useful when there were additional lessons and topics on the platform.*” With regard to the digital textbook, she revealed, “*It enabled us to spot some typographical errors on one formula and set of data presented, and some topics that needed to be modified. I was able to give the corrected formula and discuss these in time for students’ class activities and assignments. In addition, I uploaded more exercises and activities to develop mastery.*” A statistical calculator software application was also provided by the teacher for the Experimental group, particularly in solving correlation and regression exercises. Once, when Internet service was erratic, the teacher “*provide(d) a portable broadband connection*”. She also requested the school technician to extend time allotted for Internet use when necessary. These were ways by which the teacher performed “trouble-shooting tasks.

No matter what difficulties were encountered in implementing ICT-assisted instruction, the Mathematics teacher enumerated a number of advantages. She said, “*When (the students in the Experimental group) needed more explanation to understand lessons, I didn’t need to reteach them because there were available tutorial videos I had uploaded on the platform about the lessons so it was very convenient. The quizzes were automatically checked, and I could see the students’ progress. When we had activities that needed computations, we often used the statistical calculator software application to make solving the problems faster.*” The

students lauded the technology-based instruction, with descriptions such as “*maganda, natuto kami dahil nag-a-upload (ang) teacher ng lesson* (good, we learned because the teacher uploaded the lesson)”, “*may live video* (there was live video)”, “*mas naiintindihan* (we could understand the lesson better)”, “*mas maganda ang tablet* (using the tablet was better)”, “*mas madali kaysa book* (easier than the book)”, and “*mas maganda grades dahil sa activities* (grades were better because of the activities)” while acknowledging the important role of the teacher (“*kailangan pa rin ang guidance ng teacher sa exercises*”). Many preferred using the digital copy of the textbook to the print copy, although when the connection failed, they thought the book was more advantageous. One student suggested, “*Sana pwede pang i-perfect* (I hope they can perfect the system)”.

Using technology-assisted instruction was a *challenge* that became also *profitable* to the teacher, because she felt she had to be “*knowledgeable in front of (the) students in terms of the use of the platform and the gadget; it took some time for me to get used to incorporating it in the classroom; and in situations where internet connection was interrupted, I needed to think of another way to teach the lesson.*” If asked about using the technology for the entire school, her response was, “*Yes of course, provided the appropriate technology would be ready for used.*”

Traditional Classrooms

In the traditional Mathematics and Science classrooms, students used print copies of the textbooks, and relied on the teacher to give them instructions on class activities. Sometimes, finding the pages for the day’s topic took some minutes as students flipped through pages of the textbooks. Group activities were often conducted in almost muted tones, and hushed voices. Group leaders seemed to have difficulty coaxing members to give contributions to activities, some of whom sat on desk chairs reading their textbooks so that only a few group members contributed to group work. There was also less attentiveness among students, with a few choosing to simply watch what others were doing. The teacher herself had to go around the room to ensure that group members were taking part in discussions and preparation of outputs. Moreover, completing the activity took the entire class time, with only a few groups getting the opportunity to explain their outputs. Using hand-held calculators, Mathematics students checked each others’ computations, as some lacked certainty in their answers to class exercises. recomputed their answers. In the Science classroom, the teacher showed slides of natural disasters, describing the sequence of events in words as students followed using their textbooks.

Summary

Students in both ICT-assisted and traditional classrooms complimented the formats of their textbooks (digital vs. print) as “*suitable*” and “*helpful*”. Both digital and print copies of the textbooks enabled users to understand the lesson (“*mas madaling maintindihan ang lessons*”). They used these textbooks, no matter which format, during class, and at home when they did homework (“*pag may assignment*”) and prepared for class (“*advanced reading*”). In terms of content and language, textbooks

were “*user-friendly*” and comprehensive (“*kumpleto bawa’t topic, detailed*”, “*kumpleto ang images, diagrams, tables, at explanations, madaling maintindihan ang lessons*”) and provided “*optional activities*”. Textbooks in both formats, digital and print, made it easier for students to learn (“*mas napapadali*”) and comprehend lessons (“*mas madaling maintindihan ang tinuturo*”). They enabled students to follow the lectures and discussions (“*mas madali makasunod sa lecture*”, “*nakakasabay sa teacher*”). They were most useful in doing homework (“*pwede makatulong sa mga assignments*”) and class activities (“*naghahanda sa role-playing*”), and when one missed a class (“*lalo na kung absent, may reference*”). Digital copies loaded in gadgets such as tablets were handy and easy to open anywhere, anytime. Print copies were likewise convenient for students, allowing them to use these materials anywhere, anytime also, without relying on Wi-Fi connectivity. They could also scribble notes on print copies and mark important sections (“*highlight*”), but so could students who had digital textbooks. However, the equivalence of the two classrooms probably ends here.

Unlike print textbooks, digital textbooks were *interactive*. Some parts of the digital textbooks were linked to supplementary texts and/or sites which provided additional information in one touch of a button. Thus, using digital textbooks increased students’ knowledge about their lessons, thus enriching their learning for a give topic. Moreover, the online platform on which students and teachers uploaded and downloaded additional materials, instructions and outputs for class activities and quizzes, and feedback on lessons and student products facilitated both instruction and learning. Providing other materials, class activities and feedback are also possible in traditional classrooms, however, the process is not as fast, immediate and timely as that on an Internet-based platform.

The most noticeable effect of ICT in the classroom was the level of *student engagement* and *teacher-student interaction*. As soon as the teacher gave instructions for the day’s activities, students immediately worked in groups, each with his/her own gadget. Although there was a designated “*leader*” or “*facilitator*” for group activities, group members gave their own inputs without being asked, sometimes speaking simultaneously. In one Mathematics class session, groups were asked to work on different problems, and had to show their solutions on the board for group discussion. The classroom atmosphere became electric to the point of possibly being considered “*chaotic*” by any passerby, since almost everyone was standing in excitement about arriving at the correct answer, with chairs in disarray and the “*noise*” to an almost intolerable intensity. Students did *not* have to be prodded to participate in class discussions and activities, but took the *initiative* to do so. The energy level in the ICT-assisted classroom was so high that discussions were kept at a lively pace and student participation was sustained through the entire class period. As one teacher said, “*Learning was made more fun and students developed to be independent learners.*” Moreover, while student developed skills in managing their own learning, they nonetheless became inter-dependent one each other as they worked on class requirements in groups and individually. Information acquired on one’s own was shared among them, and peer-teaching became an almost natural effect of learning.

Conclusion

ICT in the classrooms assisted teachers in their *delivery* of *instruction*, *monitoring* of student *progress*, and *assessment* of student *performance*. First, teachers provided *supplementary* materials on the teaching-learning platform such as video clips on volcanic eruptions which made the topic more easily comprehensible to the Science students, and software *applications* for online computations which facilitated problem solving in class activities and assignments for Mathematics students. Second, teacher-student interaction was expedited by online channels such that teachers kept students *informed* of how they were doing through the platform, and *other* messaging portals. Finally, teachers uploaded assignments, activities and quizzes online, and rated student submissions promptly, thereby encouraging students to *improve* their performance.

In view of these, students in ICT-assisted classrooms benefited from technology in three ways also. First, they acquired *knowledge*, navigating the digital textbooks and the Internet-based platform according to their own needs and interests, and in their own individual paces. Student *engagement* in academic work increases when learners are provided easy *access* to learning materials and class activities anywhere, anytime, most especially at *the* time their interest and desire to gain knowledge are stimulated. The availability of *other* resources on the Internet facilitates understanding of otherwise confusing or nebulous topics and lessons. Learning is achieved at a much deeper and faster way when students have all the possible help at their *fingertips* whenever wherever they need them. With the ubiquitous android handheld information and communication devices readily available, one's learning is no longer limited to physical materials and places; technically the universal body of knowledge is before the learners at the touch of a button. Thus, technology *favorably* alters classroom *environment*, instructional *quality*, and learning *outcomes*.

Second, students complied with school *requirements* as soon as they could and submitted these online, not having to wait for the class period to do so. Technology enabled teachers and students to carry out tasks with *facility* and *efficiency*. Teachers were able to impart valuable instructional aids in the form of supplementary materials that were readily available in the Internet. Class activities that bolstered understanding of lessons were accessible to students even outside the classroom.

Finally, students received timely *feedback* about errors in assignments, activities and quizzes, thereby enabling them to improve their performance in an auspicious way. Student progress was closely monitored and feedback was promptly delivered through technology. When Internet services were adequately provided and strongly supported by schools, tablets and software programs did increase student class participation and enhanced teaching effectiveness. When delivery of instruction using technology was implemented with adequate technical support and services, it became an effective, and better, alternative to the traditional method

Providing learning materials, guide for activities and homework, and feedback on a student's class standing, all of which supplement classroom instruction, do encourage

student initiative with regard to his/her academic work, a trait on which independent learning is grounded. Moreover, online portals that expedite communication between teachers and students generate the kind of support that independent learners need in order for them to take charge of their own learning. Independent learners who know their own limitations realize their need for *other* fellow-learners, thereby enabling them to accept inter-dependence in school work, and any endeavor for that matter.

Recommendations

We recommend the following if we are to develop independent learners and interdependent students. First, we must see the *value* or importance of independent learning. Second, we must believe in students' *capability* to be independent learners. And third, we must put such a belief into action by affording them opportunities to learn on their own.

In this day and age of the 21st century, when economies have made it possible to provide many learning opportunities, such as free basic education, and population growth remains to be steadily increasing, ICT-assisted, (and even-ICT-based) instruction should be a viable option toward management of large class sizes in view of limited school space, which is a burden for many urban areas. When students are trained to be independent learners, the teacher's role will become that of a facilitator and assessor of learning, no longer the age-old or usual function as "delivery", even "source" of learning. When textbooks are carefully and clearly written they can become "substitutes" for teacher lectures, in the same way that modules have become in many online courses. Independent learning is good not only for schools and teachers, but for individual students themselves. Schools can be physically decongested, and teachers are liberated from large class sizes. Students who have the ability to manage their own learning do not have to be forced to sit up on a chair for hours, physically present but mentally absent.

Belief in students' ability to engage in independent learning can be generated and developed by imparting the necessary skills that are required for them to do so. We need to explore and study the traits of independent learners and develop a strategy for enhancing or drawing out these traits among young learners. More specifically, we need to examine how ICT skills can be "scaffolded" into zones of proximal development (ZPDs) as theorized by Vygotsky. Perhaps some of the ineffectiveness of ICT-assisted and ICT-based instruction may be traced back to the fact that there is little we know, as of now, about the "hierarchy", if any, of ICT-related skills. Teachers assume that all students know how to use a desktop or laptop, that they are familiar with the Internet and how to extract knowledge from its vast store of information, and that minus any sort of briefing, they are able to use technology for learning. Our belief in students' capacity to learn on their own through ICT is shown by our equipping them with skills that will enable them to learn independently.

Finally, valuation and belief produce nothing unless they are worked out. This we can do by furnishing students with *opportunities* to learn on their own, in their own time, according to their own needs, and in their own pace. By creating ICT-assisted and

ICT-based educational programs we can, in a manner of speaking, “throw students into the water and force them to learn to swim, or else sink”. Courses that integrate ICT in class discussions, activities, and assessment are ways by which we can test just how far ICT can go insofar as instruction and learning are concerned. Teachers should be encouraged to explore how to take advantage of ICT as an aid in managing classes. Internet-based platforms where teachers and students can meet online, even in so-called “virtual classrooms”, push students to develop independence, and inter-dependence, in charting their own academic voyages. When properly guided, students can learn even faster through ICT-assisted and ICT-based programs, compared to traditional classrooms. Administrators must also be prodded to support the use of ICT products and services as complimentary and supplementary, if not critical, to 21st Century education and the attainment of the fourth Sustainable Development Goal: Quality Education for all.

Without a doubt, technology will continue to become an essential component in twenty-first century educational programs, thereby revolutionizing both instruction and learning. The benefits of technology are almost innumerable, but possibly the most important might yet be this: with technology, students discover how they can manage their own learning, and thereby develop independence, and inter-dependence in their academic work. This is one of the key traits if we are to pursue life-long learning

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Integration of Cultural Practices in Teaching Mathematics

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Abstract

The interdependence between culture and education is not new to educators anymore. Educators acknowledge the fact that culture defines and gives identity to education while education strengthens culture. Indeed, these two disciplines are inseparable and complementary. However, cultural relevance in mathematics instruction is seldom evident. This qualitative-quantitative study designed lesson plans that drew upon the context of students' cultural background and experiences. Primarily, this study presented several ways on how teachers, especially those with less technological opportunities, can make use of locally-available materials. Interviews and observations were conducted to determine the cultural practices along traditional games and livelihood activities of a certain cultural group. The identified mathematical practices were examined to develop appropriate and culturally relevant lessons which were implemented to two groups of students to determine its effects on students' conceptual understanding and interest towards Mathematics. Results revealed that there is a significant difference between the performance of the two groups of students, within the considered constructs, before and after being exposed to culture-related activities. Inclusion of the cultural aspects of students in mathematics instruction has deepened their understanding of mathematical concepts, boosted their interest in mathematics and has widened their view of their own culture by making meaningful connections between mathematics and their cultural practices. Furthermore, the role of community as co-partner in the teaching and learning process was maximized when they serve as key resource persons. Hence, the researcher encourages educators to become culturally responsive in instruction.

Keywords: Cultural practices, traditional games, livelihood activities, locally-available materials, culturally responsive instruction.

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Introduction

Mcleod (1994) stated that students tend to dislike math as they move from basic to higher mathematics. Peterson (2005) opined that this was brought by the anxiety and fear of numbers that have been developed to students due to pedagogical approaches that are based only on rote calculations, repetitive drills, and endless worksheets. Such teaching approaches failed to match with students' learning styles and interest resulting to their low academic performance as affirmed by Tate (2005). In support of this, Eukoha (1995) stated that students perform poorly in mathematics because both the content and the method of teaching mathematics do not reflect the cultural environment of the learners. Hence, there is a need to bring in a method that will personally involve students to arouse and sustain their interest and result in a better academic performance. With this notion, Ladson-Billings (1994) encourage teachers to acknowledge students' significant cultural references and experiential filters in delivering their instruction. In this way, students' ideas and strengths will be empowered making them copartners in the teaching and learning process. This is in parallel to the standards set by the National Council of Teachers of Mathematics (NCTM, 1991) that the key to effective teaching is to understand students' mathematical thinking, interest, lived experiences, cultural references and how these constructs affect all aspects of learning. Consequently, a new teaching approach was presented, described as culturally responsive instruction.

Culturally responsive instruction was defined by Gay (2002) as an approach to teaching that recognizes cultural components and experiences of students in their immediate environment as conduits to facilitate teaching-learning process. When students come to school, they bring with them some values, beliefs, practices and concepts that they acquired at homes or within their communities. These acquired practices were confirmed by Bishop (1994) to be mathematical in nature. Specifically, these practices are mathematics in the community, symbolic systems, practical construction techniques, specific ways of reasoning and other cognitive activities which can be translated to formal mathematical representations as expounded by D'Ambrosio (1985). Indeed, mathematics is not a culture-free subject. According to Zincheko (1989), constructivist and cultural people around the world are endeavoring to make education culturally based. They opined that mathematics divorced from culture can never sustain itself. Thus, teachers must widen their view of mathematics and let students be exposed to activities grounded within the context of students' cultural backgrounds. Taking this into account, students will have the opportunity to experience a unique learning environment that nurtures their identities and culture as part of learning mathematics.

Eglash (1999) studied the mathematics in the designs of traditional bead work and basket weaving in native cultures. Massarwe, Verner & Bshouty (2012) studied the relationship between geometry and culture in the construction of geometric ornaments. Sheets (1999) also suggested initiating cooperative learning groups and assigning students to projects that involves issues or concepts within their community. In the Philippines, Rubio (2016) identified the ethnomathematical practices of the *Kabihug* tribe along simple counting, ciphering, measuring, classifying, ordering, inferring and modeling patterns arising from their environment. The identified practices were then integrated to mathematics lessons intended for the *Kabihug* students. Indeed, culture is rich with mathematical concepts that students must see to

widen their mathematical perceptions. Moreover, in an article written by Cheryl Ernst, featured in Mathematical Association of America, Linda Furuto (2010) stated that she integrates culture by exposing all her students in the field to discover the relationship between mathematics and real world. One of the activities conducted by her was when they aboard a two-hulled canoe in Hawaii. They investigated the traditional way-finding techniques used by their ancestors like celestial navigation to arrive at their destinations without knowing much about complex mathematics. According to Furuto, first-hand experiences tell her that culture integration engages people in mathematics. She also added that it is indeed important to know and learn the math written in textbooks. However, knowing how their ancestors sailed thousands of miles across the Pacific Ocean without any kind of modern navigational tool is equally important for the students. All these creative and innovative activities made mathematics exciting and pleasurable to learn.

On the other hand, not only students are seen to benefit from this new approach. Teachers, especially those in the upland or urban areas will have access to a variety of cultural resources to be used in teaching. This allows teachers to become resourceful in using the locally-available materials since immediate environment of school can offer unexpected resources that will improve the quality of instruction. Additionally, teachers will gain insights on how culture, social interactions, family and everything that surrounds the learner affect their attitude and intellectual development. According to Feiman, Nemser and Melnick (1992) such insights enable teachers to draw on those experiences to represent school knowledge to their students meaningfully and embed learning activities in contexts that are familiar to students.

However, despite of several research groundings, integration of cultural components in mathematics instruction is seldom evident, especially in the Philippines. Some educators have not seen yet the need for it to be implemented disregarding its potentials in enhancing mathematics curriculum. But, according to Ladson-Billings, inclusion of these cultural aspects is a critical need in mathematics instruction that teachers must not neglect. Delpit (1995) also argues that culturally responsive teaching must be an integral element in the mathematics program especially for the urban students. Subjects like language, music and arts, physical education and social studies have already considered inclusion of these cultural components but not much in mathematics. Four (4) probable reasons were presented by Ukpokodu (2011) why mathematics teachers are still not engaged in culturally responsive teaching. First, most teachers view mathematics as culturally neutral. Mathematics is too abstract for it to be partnered with cultural elements. Culture and mathematics are two divergent disciplines as believed by most teachers. Second, textbook-based instruction is dominant. In the Philippines, the content of instruction was determined by textbooks and competencies indicated in the curriculum. The teachers were pressured to cover all topics specified in each quarter. So, inclusion of such cultural components is not much given attention. Third, curriculum is standardized. Due to high stakes testing, teachers teach just to gain high results from the students improving only test scores but not the quality of learning and instruction. Lastly, the lack of culturally responsive mathematics teaching models to emulate. Since culturally responsive teaching is new, only few materials or references yet are available that will help them structure a culturally relevant instruction. Many teachers are still unaware to use it in teaching mathematics efficiently. As a result, teachers are unable to implement this new approach.

To address this issue, the researcher attempts to connect culturally relevant content to mathematics by disclosing the cultural practices of the people in San Isidro. This is pedagogically done through identifying significant cultural practices that exhibits mathematical concepts. These practices are along traditional games and livelihood activities.

This notion is supported by Rosa and Orey (2011) that infusing mathematics with familiar cultural contents makes mathematical knowledge meaningful and relevant to students. These are all based from the assumption of Gay (2000) that when academic knowledge and skills are situated within the experiences and cultural background of students, they are more meaningful, have higher interest appeal and are learned more easily. Thus, the researcher tries to build a successful link among mathematics, culture and community. Primarily this study aimed to seek answers to the following questions:

1. What cultural practices in San Isidro can be integrated in mathematics instruction along;
 - a. traditional games; and
 - b. livelihood activities?
2. What are the effects of the lessons integrated with cultural practices to students:
 - a. conceptual understanding?
 - b. interest towards Mathematics?

Methodology

This study utilized qualitative and quantitative research design. The qualitative approach was used in identifying the cultural practices in the locale and in the analysis of students' responses in interviews. The quantitative approach was done through pre-experimental design with two experimental groups. Thus, no comparison between the two groups was done. For the area of study, an upland area and school, Barangay San Isidro and San Isidro National High School, respectively, were purposively selected for the goal of providing pedagogical ways in integrating culture in mathematics instruction resourcefully to teachers with less technological opportunities.

The preliminary data were collected through formal and informal interviews, and observations in the upland community using a modified interview guide questions from the works of E. Lynch & M. Hanson (1998) on developing cross-cultural competence. The informants were elders, livelihood workers and students that were purposively selected for the study. After a month of exploring the culture of the locale, the field notes and responses of the informants were collated and analyzed. The cultural practices are limited along traditional games and livelihood activities. Then, the cultural practices that were identified mathematical were carefully integrated into mathematics lessons in lined with the competencies given by the Department of Education for the Enhance Basic Education Curriculum also known as K to 12 for Grades 7 and 10 covering the topics under Geometry and Probability. These were thoroughly examined by experts of the same field to ensure the correctness and appropriateness of each lesson. Revisions were made in accordance with the jurors' recommendations for the said learning plans and activities.

Before the implementation of the lessons, a teacher-made pretest was administered to both groups of students. This was pilot tested and was found to have internal consistency. Likewise, a modified Mathematics interest inventory checklist from the works of Dela Rosa (2000) was given right after the exam. Both were administered again after implementing the lesson to know the effects of culturally relevant lessons to students conceptual understanding and interest towards mathematics. To obtain more in-depth information, focus group discussions, with randomly selected students in both groups, were also conducted.

Cultural Practices along Traditional Games

The following are the most mentioned traditional games played by the elders and of the students in the locale. The first game is “turubigan” widely known as *Patintero* in the Philippines. Its name came from the root word “tubig”, which means water. This is used to draw the lines of their playing field that is marked off in a rectangle about five or six meters, divided into four equal parts. *Turubigan* is played by two groups, with at least four (4) members each. The leader of each group must do *bato-bato-pik*, widely known as *rock-paper-scissors* to determine which group will be the *taya* or “It” and the *madurulag* or the “runner”. The group assigned as *taya* will arrange themselves, showing permutation, in each line to guard the entry points which represent parallel lines. The goal of the *taya* is to block the runners and catch at least one of the runners. The goal of the *madurulag* is to surpass all parallel lines in the playing area and be back at the starting point without being caught by one of the *taya*. If one player is caught, the two groups will now switch roles. The second game is *Piko’t bado*. The players will draw their playing area that will look like a *bado* or a shirt. Each player must have their own *pamato*, usually a small stone, that is thrown in each shape in the playing field. The goal of the player is to jump in all shapes back and forth without falling and be able to get the stone from where it was thrown. The figure below shows children playing *Piko’t bado*.



Figure 1. Children while playing Piko’t bado.

The arrangement or order of the players in playing *piko’t bado* exhibits permutation. The throwing of *pamato* (stone) in the playing field to make *balay* also involves probability wherein the players have 9 possible shapes where the stone can land on.

Another game is called *Ikus-Kino*. This is played by two (2) or more groups with at least five (5) members each. The leader of each group will choose one member as the *ikus* or cat and another member as the *kino* or mouse, this already involved probability since the players don't have the idea who among them will be picked as the *ikus* or *kino*. All members of the group will stand one behind the other forming a line, each holding the waist of the one in front. Permutation will now occur in this scenario. The *ikus* and *kino* must be on the endpoints of the line and the other members must arrange themselves between the *ikus* and *kino*.

Indian game is played outdoors by both male and female players. It is usually played during copra production or *paglukad*. Half of the coconut shell or *binungan* is used to play this game. The goal is to flip one coconut shell and aim that the coconut shell shows its outer part while the open part of the shell touches the ground. The concept and the goal are just similar to flipping a coin in a typical probability discussion. Another game played during copra season is *Siripaan Binungan*. The objective of the game is to kick a half coconut shell (*binungan*) towards a small circle drawn about 1 to 2 meters far from them given with three chances.

Siklot is like Jackstone. The only difference is that they use small stones or pebbles instead of jackstone stars as shown in figure 3.



Figure 2. The Students while Playing Siklot

The game is played by grabbing a specific number of stones at a time which demonstrate combination. Similarly, in the game *Dulay-dulay*, the players are sitting on the ground or floor in a circular formation. The goal of the *taya* is to leave the stone behind a player without being noticed and will go around the players and go back to where he put the *balay* or stone.

Table 1 shows the summary of the cultural practices that were identified mathematical along traditional games.

Table 1. The Cultural Practices Along Traditional Games

Traditional Games	Cultural Practices	Mathematical Concept
Turubigan (Patintero)	Having Bato-bato-pik before the start of the game	Probability (Game of Chance)
	Selecting the members of the group	Combinations
	Arranging the members of the <i>taya</i> to stand on the lines.	Permutation
	The starting line and the end line of <i>turubigan</i> playing field.	Parallel Lines
	The two lines that crossed at the center of the playing field.	Perpendicular Lines.
Ikus-Kino	Choosing of the player to be the ikus or kino	Probability
	Selecting the members of a group.	Combination
	Arranging the members of each group between the <i>ikus</i> and <i>kino</i> .	Permutaion
Indian Game	Flipping one coconut shell and aiming that the <i>binungan</i> will show its outer part while the open part of the shell touches the ground	Probability
Siripaan Binungan	kicking <i>binungan</i> towards the small circle in three chances.	Probability
	Chances that a player will receive a punishment	Probability
Siklot	Arranging the players in a circle.	Circular Permutation
	Getting a certain number of stones at a time.	Combination
Piko't Bado	Order of the players in playing the game	Permutation
	Throwing of <i>pamato</i> , without looking at each shape in the playing field of <i>pikot bado</i> , to get <i>balay</i> .	Probability
	Throwing of <i>pamato</i> to a certain area in the playing field that indicates their level in the game	Points
<i>Dulay-dulay</i>	Arrangement of the players in the circle.	Circular permutation
	Chances that the <i>stone</i> is put at the back a player.	Probability

It is observed that the dominant concept falls under permutation, combination and probability. These topics are discussed during the third quarter as indicated in the K to 12 Mathematics Curriculum Guide for Junior high school, specifically for Grade-10. These practices were carefully integrated to the lessons to match the level of understanding of the students and avoid additional confusions since they were not used to the said approach.

Cultural Practices along Livelihood Activities

The first livelihood observed in the locale is *sinamay* weaving. *Sinamay* is woven from the processed stalks of the Abaca tree, a banana palm that is native in the Philippines. In San Isidro, *sinamay* weaving is one of the major sources of income of

the families. Below shows a woman weaving sinamay in an *abulan*, a special weaving machine made of scrap woods.



Figure 3. The Sinamay weaver while Combing the Abaca Strands in an *Abulan*.

It is noticeable that the arrangements or placements of the abaca stands, the colors that they use, the arrangements of the strands in straight lines which are also equidistant from each other illustrate geometrical concepts.

Next is *banig* making. *Banig* is a handwoven mat made of *karagumoy* leaves. The *banig* is made from dried leaves that are sometimes dyed before being cut into strips and woven into a mat. The students discovered that the selection of colors involved combination since the arrangement of the colors in each *banig* does not matter as long as the colors used are distinct in each *banig*. Each strip of *karagumoy* leaves represents line.

A *banig* maker will start making the corner part of the *banig* instead of starting at the middle. This makes the *banig* easier to move without getting disassembled making sure that the adjacent sides or consecutive sides of the *banig* are perpendicular, to achieve a perfect rectangular-shape *banig*.



Figure 4. An unfinished *banig* or mat.

Similarly, *Abaniko* making shows concepts in geometry like intersecting lines, vertical lines, angles and other geometrical figures. *Abaniko* is a hand-held fan made of *anahaw* or round-leaf fountain palm. Figure 5 shows the three stages of *abaniko* making.



Figure 5. Three phases of Abaniko making

Another major source of income in the locale is *Paglukad* or Copra production. This is done year-round with an interval of every two months. Copra can be obtained by separating the coconut meat from the whole coconut shell followed by sun drying and smoke drying for about 6 to 8 days as seen below.



Figure 6. Agunan Used in Smoke Drying of Copra

All of them, especially the boys are helping in *paglukad*. The practices within copra production that are found mathematical are in terms of collecting the coconuts where there's a big chance that a farmer might get a spoiled coconut from a set of coconuts. Aside from copra production, they also plant crops like vegetables and root crops but mostly rice. This is basically for their daily consumption and sometimes, whenever possible, they try to sell it for additional income. Farmers usually plant in parallel lines for many reasons, one of these is for better weeding and easy harvesting. The figure below shows cassava planted in parallel rows.



Figure 7. Kamoteng Kahoy (Cassava) planted in Parallel Rows

Lastly, Carpentry or construction works. This is also a work for men. The researcher took time to visit a construction site. It is very evident that there are several

geometrical figures that can be found in a construction site. The geometric figures were intersecting lines, parallel lines, and parallel lines cut by a transversal producing pairs of angles. Even the wall studs of the house are representing parallel lines.

Table 3 shows the summary of the cultural practices that were identified along their livelihood activities with their corresponding mathematical concepts.

Table 2. The Cultural Practices along Livelihood Activities

Livelihood Activities	Cultural Practices	Mathematical Concept
Pag-abol or Sinamay Weaving	Arranging the strands in a straight line which are equidistant to each other.	parallel lines
	Transferring the Sikwan side by side perpendicular to the parallel abaca strands	Parallel and Perpendicular lines.
	The <i>surod</i> intersecting the abaca strands in the middle to make the strands still in line.	Perpendicular lines
	Combining colors of the <i>rotex</i> in sinamay	Combinations
Banig or Mat Making	Edge of <i>karagumoy</i> leaves	Line
	The banig itself	Plane
	The intersection of the edges of the <i>karagumoy</i> leaves	Points
	Selecting colors of the banig. Arrangement of the colors is not important.	Combinations
	Making the first two consecutive sides perpendicular	Perpendicular lines
Paglukad or Copra Production	Chances that you might get spoiled coconuts in 50 katibo or pieces of coconuts.	Probability
Abaniko or Fan Making	Choosing of colors every <i>abaniko</i> regardless of the arrangement.	Combinations
	Crisscross patterns in <i>abaniko</i>	Angles and Intersecting Lines
	Chances that a customer will choose the 10-peso abaniko from other abanikus .	Probability
Construction or Carpentry	intersecting woods visible in scaffolding	vertical angles, transversal
	Ladders	Parallel lines and transversal
	Wall studs	Parallel
	Roof frames	Angles, perpendicular, Parallel Lines and Transversal Lines
Farming and Crop Production	Planting in parallel rows	Parallel lines
	Combination of crops to plant	Combination
	Arranging the plants to be planted	Permutations

As reflected in table 2, the cultural practices were linked to its corresponding mathematical concepts. The third column shows that most practices had displayed concepts in geometry. Pedagogically, the lessons developed integrated with cultural

practices along traditional games and livelihood activities were anchored on the theories of Kolb (1984) and Vygotsky (1978), experiential and socio-cultural learning theories, respectively. The curriculum set by the department of education in the Philippines also served as guide to the researcher, specifically on crafting some parts of the lessons. Section 5 of RA 10533 known as the “Enhanced basic Education Curriculum” served as the legal base stating that the curriculum shall be learner-centered, culturally responsive and contextualized enough through localized lessons.

These lesson plans contain four essential features of a culturally responsive instruction; (1) Community-based learning. According to Scott (2000) a culturally responsive instruction, without community involvement, will never be successful. A community can offer a variety of resources creating a unique learning experience that could widen students’ mathematical perceptions. In the lesson, the students were given the opportunity to converse with elders and livelihood workers and be exposed to the livelihood activities in their community. Additionally, instructional materials used were all locally-available materials that are familiar to students. Strengthening link among students, school, members of the community and community itself; (2) Outdoor learning. Activities situated outside classroom let students explore mathematics within their immediate environment and lived experiences. Also, exposing them to traditional games, which they use to play before and those introduced by the elders, reminded them of their traditional games, appreciating its beauty and effects in learning mathematics; (3) Collaborative learning. According to Vygotsky (1978) learning is a social process. Collaborative activities require teamwork enabling them to work in groups, share their ideas, and reflect from gathered facts, opinions, beliefs and others point of views. Additionally, the NCTM standards suggest pedagogical practices that includes the use of inquiry-based and cooperative learning, which are aspects of culturally responsive teaching; (4) Lastly, Problem-based. Letting students create and solve problems on their own is one way of acknowledging and recognizing students’ mathematical thinking.

Effects of the Lessons Integrated with Cultural Practices

To determine the effects of the lessons to students’ understanding of the concepts, a researcher-made pretest and posttest were administered to students before and after the implementation of the lessons together with the Mathematics Interest Inventory Checklist to measure the interest towards Mathematics.

Conceptual Understanding.

Conceptual understanding was operationally defined as the students’ level of understanding of the mathematical concepts guided by the competencies set by the curriculum. This was also measured through the proficiency level of the students after exposure to culturally relevant activities. Table 3 shows the performance of Grade-7 students in the pretest and posttest.

Table 3. Performance of the Grade 7 Students in the Pretest and Posttest on Understanding of Geometric Concepts

No.	Learning Competency	No. of items	Mean Score		Mean Gain	Proficiency Level (%)		Gain (%)	Computed
			Pre Test	Post Test		Pre Test	Posttest		
1	represents point, line and plane using concrete and pictorial models. (M7GE-IIIa-1)	7	2.35	5.00	2.65	33.51	71.43	37.92	8.96
2	illustrates subsets of a line. (M7GE-IIIa-2)	6	2.22	4.85	2.63	36.97	80.91	43.94	11.26
3	derives relationships of geometric figures using measurements and by inductive reasoning; supplementary angles, complementary angles, congruent angles, vertical angles, adjacent angles, linear pairs, perpendicular lines, and parallel lines. (M7GE-IIIb-1)	14	3.02	5.91	2.89	21.56	42.21	20.65	6.90
4	derives relationships among angles formed by parallel lines cut by a transversal using measurement and by inductive reasoning. (M7GE-IIIc-1)	13	2.87	5.51	2.64	22.10	42.38	20.28	7.06
Overall		40	10.45	21.18	10.81	28.53	59.23	30.70	19.97

2.67 Critical Value; 0.05 level of Significance

As reflected in table 3, competency no. 3 got the highest mean gain of 2.89, but also got the lowest proficiency level of 42.21%. This means that the performance of the students in terms of deriving relationship between geometrical concepts was still found very low even after exposure to culturally responsive teaching. On the other hand, competencies 1 and 2, both have high proficiency percentages and mean gains, indicating that their performance for the said competencies was enhanced. Overall, the difference between the performance of the students for each competency was found highly significant through t-test with a general computed t-value of 19.97 and critical value of 2.67 at 0.05 level of significance. Correspondingly, table 4 shows the performance of Grade-10 students in the pretest and posttest.

Table 4. Performance of the Grade 10 Students in the Pretest and Posttest on Understanding of Probability Concepts

No.	Learning Competency	No. of items	Mean Score		Mean Gain	Proficiency level (%)		Gain (%)	Computed t
			Pre Test	Post Test		Pre Test	Post Test		
1	illustrates the permutation of objects.	4	2.29	3.54	1.25	57.21	88.46	31.25	8.33
2	illustrates the combination of objects. differentiates permutation from combination of n objects taken r at a time.	3	2.02	2.87	0.85	67.31	95.51	28.2	7.61
3	solves problems involving permutations and combinations.	15	5.60	8.19	2.59	37.31	54.62	17.31	7.04
4	Illustrates events; and union and intersection of events. illustrates the probability of a union of two events. finds the probability of $A \cup B$.	11	3.25	5.48	2.23	29.55	49.83	20.28	8.83
5	Solves problems involving probability	7	2.90	4.58	1.68	41.48	65.38	23.9	6.10
Overall		40	16.06	24.65	8.59	46.57	70.76	24.19	13.00

2.04 Critical Value; 0.05 Level of Significance

Table 4 reveals that the mean scores of the students for each competency was enhanced with a total mean gain of 8. 59 and a proficiency increase of 24.19%. The result for each competency was also tested using t-test for paired or dependent sample and were all found highly significant with a total computed t-value of 13.00 at 0.05 level of significance. To clearly visualize the result, the proficiency level of both group of students, Grade-7 and Grade-10, in each competency is shown in the graphs below.

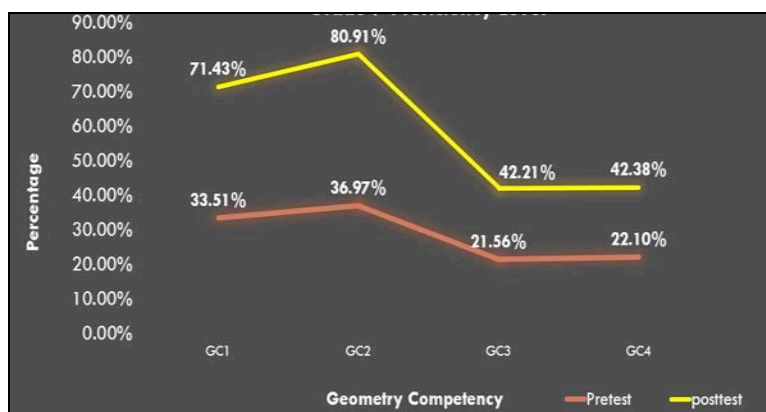


Figure 8. Grade-7 Proficiency Level

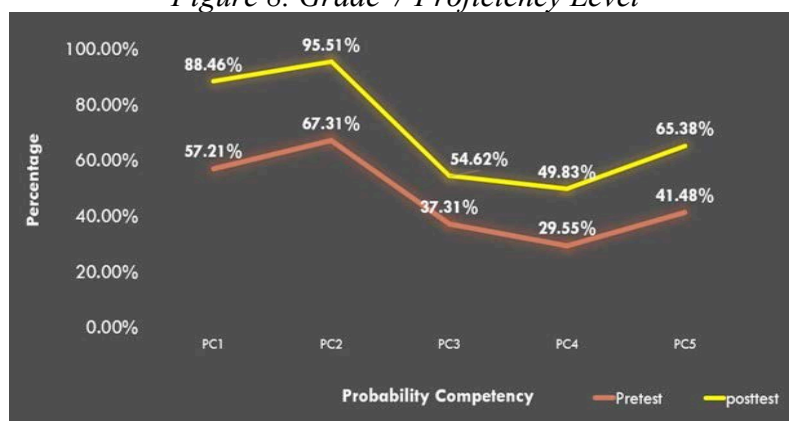


Figure 9. Grade10 Proficiency Level

Both graphs show that there is an increase in the proficiency level of the students after being taught with culturally-relevant lessons. It clearly shows that the first two competencies in Geometry (GC1=71.43%, GC2=80.91%) and in Probability (PC1=88.46%, PC2=95.51%), got higher percentages as compared to other competencies. This implies that the students were able to illustrate, identify, differentiate mathematical concepts and solve simple math algorithms. However, it is visible that the remaining competencies for both subjects got lower percentages even after the implementation of the lesson. This connotes that the students still find difficulty in solving word problems and in deriving relationships between mathematical concepts through inductive reasoning. According to Mayer (1985) many students are struggling to translate problems in their own understanding and represent it mathematically. This suggests that the students still need enhancements for these competencies. But overall, the difference between the conceptual understanding of the students before and after exposure to culture-related activities was found highly significant.

Interest towards Mathematics

The students' interest towards mathematics was determined through the Mathematics Interest Inventory Checklist that was modified from the works of Dela Rosa (2000). It was made based on the observable behaviors of the students towards the subject. This is composed of 15 statements which were classified into three; items 1 to 5 are under the category, enjoyment in Math; items 6 to 12 are under the appeal of Math Activities; and items 13 to 15 are under the appreciation of the importance of Math in real life. The table below shows the result of the mathematics interest inventory checklist of Grade-7 and Grade-10 students.

Table 5. Interest towards Mathematics of Grades 7 and 10 Students.

Interest	Grade -7				Grade-10			
	Mean	Before	Mean	After	Mean	Before	Mean	After
Enjoyment in Math	2.80	SI	3.57	I	3.00	SI	4.14	I
Appeal of Math Activities	2.82	SI	3.62	I	2.96	SI	3.88	I
Math in Real-life	3.08	SI	3.45	I	2.92	SI	3.77	I
Over-all	2.90	SI	3.64	I	2.96	SI	3.93	I

Legend: SI-Somehow Interested, I- Interested

Table 5 highlights that the interest of both group of students had shifted from "somehow interested" to "interested". Grade-7 students got an over-all mean score of 3.64 with a descriptive rating of "interested". Likewise, Grade 10 students also got a descriptive rating of "Interested" with a total mean score of 3.93. Both demonstrated a change in their interest level which means that integration of cultural practices in teaching mathematics indeed stimulates students' interest towards mathematics. It is also worthwhile to note that "appeal of math activities" in Grade-7 and "enjoyment in math" in Grade-10 got the highest mean scores of 3.62 and 4.14, respectively. Thus, the students were actively involved in the activities coupled with their cultural practices making them personally connected to the lesson. Similarly, culturally relevant activities promoted a sense of belongingness among the students, which triggered their motivation and confidence to participate well in the discussion as stated by Villegas (2007).

Conclusion

Identifying cultural practices that can be integrated into mathematics instruction is not as easy as it sounds. This requires extra effort, patience and understanding from the teachers just to become culturally responsive in instruction. The cultural practices that were found mathematical were along traditional games and livelihood activities. These practices prove that mathematics has indeed cultural relevance. Along traditional games, some of the mechanics of *turubigan*, *piko't-bado*, *ikus-kino*, *siklot*, Indian game, *siripaan binungan*, and *dulay-dulay* were found mathematical in nature. For example, the selection of groupmates, arrangement of the member, flipping of

binungan or coconut shell, choosing the *taya* or “It” were all displaying mathematical concepts like permutation, combination and probability. Correspondingly, the practices along livelihood activities that were found mathematical are in terms of *sinamay* weaving, *banig* or mat, and *abaniko* or fan making, crop and *copra* production and carpentry. Specifically, the placement or arrangement of the materials in *sinamay* weaving, planting of crops in parallel rows, choosing of the colors and designs in *sinamay* weaving, *banig* and *abaniko* are all displaying substantial concepts that were integrated into mathematics instruction. Overall, culturally relevant instructions provided the students a unique learning experience that has deepened their understanding of the mathematical concepts and boosted their interest towards mathematics.

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Using Peer Assessment and Feedback to Support Individual Learning

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Abstract

Background: Feedback supports learning but providing detailed individual feedback is time consuming. Involving students in peer marking and providing constructive feedback can enhance student engagement. Delegating marking and feedback has the potential to save staff time but inter-rater variability limits the value. Higher levels of reliability are obtained when markers just decide which of two assignments '*is best*'. This project employed a series of adaptive comparative judgements (ACJ) to overcome the inter-rater variability.

Method: Students were assigned ten pairs of assignments and for each pair they judged which was best. An algorithm used this series of multiple comparative judgements (A is better than B, B is better than C etc.) to create a rank order. Students were asked to provide constructive feedback on each assignment reviewed. Staff reviewed the appropriateness of the student feedback and moderated the rank order before using it to assign individual marks to assignments.

Results: 149 students submitted assignments. 143 students completed the peer review component making 1,415 comparative judgments. The rank order generated by ACJ was found to be in broad agreement with staff judgements during the moderation process. Each assignment received feedback from 6-10 students. The mean length of feedback was 350 words per assignment (range 50-500 words). The length of feedback was not related to the rank order.

Conclusion: A series of comparative judgements can be used to address inter-rater variability in peer marking. Further work is required to explore the effectiveness of peer generated feedback.

Keywords: Peer assessment, Adaptive comparative judgment, Peer feedback

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Introduction

Assessing student assignments is obviously a vital part of education. It enables students to appreciate how their work has been judged and it is also used summatively for progression or to obtain an award. It is frequently necessary to employ several assessors to assess an assignment with large cohorts of students and achieving consistency between assessors can be difficult. It is known that some assessors have a tendency to be ‘hawk’ like whilst others are ‘dove’ like (McManus et al 2006).

Involving students in the assessment process can enhance student engagement and increase the student’s exposure to different approaches to an assignment which could help them to reflect more deeply on their own approach to the assignment (Morris 2001). Delegating the assessment to students has the potential to save staff time but inter-rater variability limits the value (McManus et al 2006).

Deciding which mark to award an assignment can be a challenge for staff. A student would obviously feel aggrieved if they felt their work was assessed by a *hawk* whilst their colleague’s work was assessed by a *dove*. One way of addressing this difficulty involves comparing two pieces of work and deciding which is best. Higher levels of reliability are obtained when markers just decide which of two assignments ‘*is best*’ (Pollitt 2012). If these comparisons of pairs are repeated many times then they can be used to create a rank order. Such comparisons can be conducted manually or using computer software. A manual assessment could involve comparing each piece of work with every other piece of work and awarding the winner of each comparison one mark. The total number of marks each piece of work receives can be used to create the rank order and this can, with scaling, be used to generate a percentage mark if the first and last piece of work is marked by the member of staff (Hall 2018).

The provision of written feedback along with the grade for an assignment can support student learning. Students frequently demand greater levels of feedback to support their learning but providing detailed individual feedback is time consuming. Involving students in providing constructive feedback is an attractive option because it has the potential to further enhance student engagement and to help to address student demand for feedback (Morris 2001). In addition, a mismatch between how students and staff describe helpful feedback has been reported (Blair et al 2012). Involving students in the feedback process has the potential to provide the type of feedback that students want.

This project aimed to use comparative judgments to overcome inter-rate variability of peer marking of a reflective assignment. It employed software called CompareAssess to conduct a series of adaptive comparative judgements (ACJ) to create a rank order. The project also used the software to allow students to provide feedback to their colleagues.

Method

All final year pharmacy students were required to submit a written assignment which included a reflective account based upon a workshop they attended. The reflective account was limited to a maximum of 500 words and was submitted online via the virtual learning environment (VLE). The assignment brief provided students with list

of the assessment criteria which were grouped under the following headings; presentation and language, reflection on learning from workshop; reflection on potential impact on future role as pharmacist; and future learning objectives.

An eLearning technologist uploaded all the student assignments onto the ACJ software called CompareAssess. This programme then assigned each student with ten pairs of assignments. Students were presented with one pair of assignments at a time and for each pair they judged which was best (A is better than B, A is better than C, D is better than A etc.). Students were provided with a guide to comparing the pairs of assignments which was based upon the assignment brief (see figure 1).

Criteria	Comparison
Presentation and language	Which assignment: <ul style="list-style-type: none"> demonstrated the best use of English throughout? was the easiest to understand? had the most typos or grammatical errors? was best presented? (e.g. clear headings, spacing, consistent font etc)
Reflection on learning from workshop	Which assignment: <ul style="list-style-type: none"> included the best discussion of what the student has learned from the workshop? demonstrated the best understanding of the topic?
Reflection on potential impact on future role as pharmacist	Which assignment: <ul style="list-style-type: none"> had the best discussion of how their future practice might be influenced by this topic?
Future learning objectives	Which assignment: <ul style="list-style-type: none"> included the best description of what the student would like to learn more about or experience in the future to develop their understanding of the topic? included the most reasonable and feasible plans?
Figure 1: Student guide for comparing pairs of assignments	

An algorithm within CompareAssess used this series of multiple comparative judgements to create a rank order. The rank order was moderated by staff before it was used it to assign individual marks to assignments. Marks were awarded to the nearest 5%. It was not necessary to grade each individual assignment but rather staff reviewed a sample of assignments to identify the cut off point for each of the 5% grade boundaries. For example; Student 1 = 90%; Students 2 to 10 = 85%; Students 11 to 24 = 80%; Students 25 to 44 = 75%; students 45 to 70 = 70% etc.

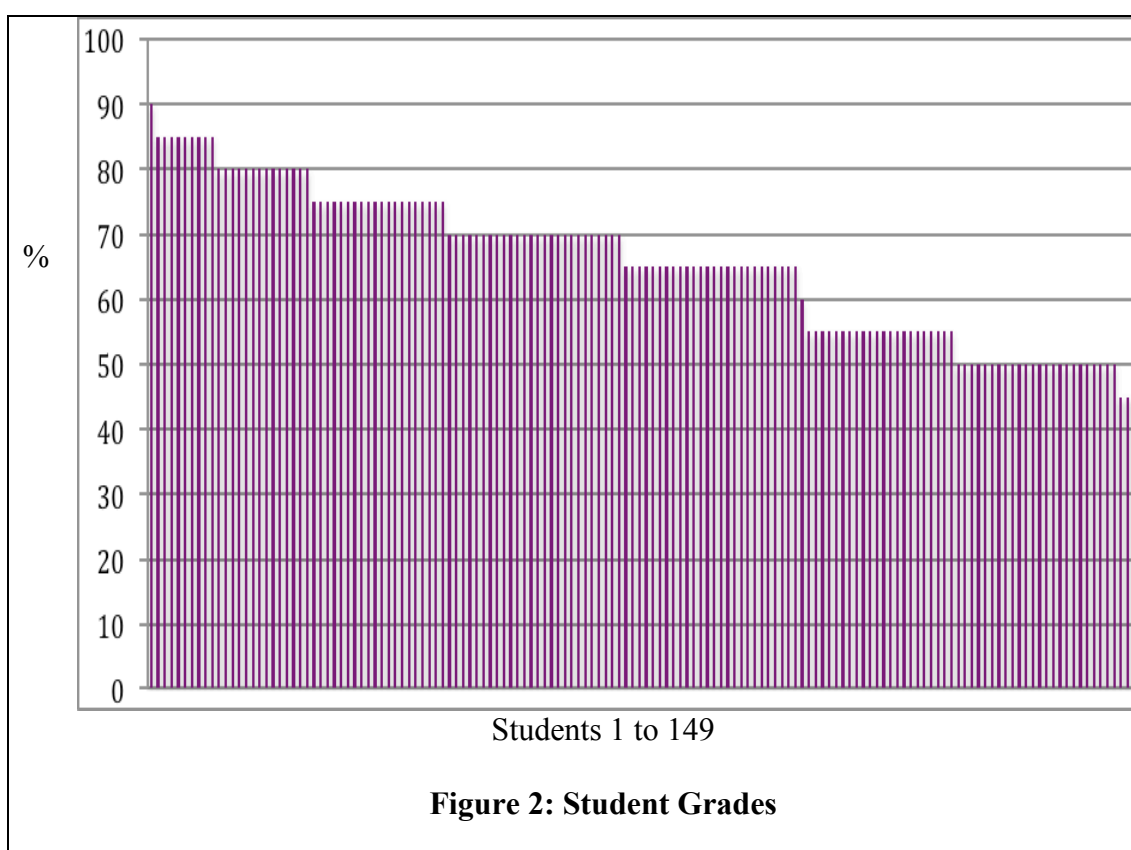
Students were also asked to provide constructive feedback on each individual assignment they reviewed. Staff reviewed the content of the student feedback to ensure there were no offensive statements but they did not make any judgement on the appropriateness of the comments for individual assignments.

Results

All students on the cohort (n=149) submitted a reflective account. The majority of students (n=143) completed the peer review component making a grand total of 1,415 comparative judgments. The rank order generated by adaptive comparative judgements was found to be in broad agreement with staff judgements during the moderation process.

(A) Grading

Staff reviewed the first and the last reflective account from the rank order and assigned marks of 90% and 45% respectively. Staff then reviewed a sample of reflective accounts in between in order to find the cut off point for each 5% boundary. The grades awarded can be seen in figure 2.



(B) Feedback

Each assignment received feedback from 6-10 students. The mean length of feedback was 350 words per assignment (range 50-500 words). The length of feedback was not related to the rank order. No attempt was made to assess how helpful the feedback was to students. Examples of student feedback can be seen in figure 3.

Student 1

"This is a well written and comprehensive reflective account. The structure was easy to follow and you have thought in-depth about how the learning applies to your future practice. I particularly liked how you applied current and past learning/skills to the situations, such as consultation skills. To improve you could comment on the method of learning (i.e. the workshop) and whether you believe it was affective for you."

Student 2

"A decent log that explains what was learnt well however it doesn't particularly reflect on the workshop very well"

Student 3

"Good but didn't really explain your feelings about the session. Could have applied it directly to your learning/future practice more"

Student 4

"Good description of learning but action plan isn't well developed; explains what you want to learn but not how you will do so."

Student 5

"Good description of what the student has learnt from the workshop. The plan described is also very realistic and sensible"

Student 6

"There was probably a little too much information included relating to the particulars of the learning in the workshop - e.g. results of opinions of your group and of the task. This account is more about reflection, not telling the reader what you did step-by-step.

Excellent impact on future career - really showed how you learned how the pharmacist can fit into all of this."

Figure 3: Examples of student comments.

Discussion

Adaptive comparative judgments can be used to generate a rank order and this can be used to generate individual marks for students. Staff are not required to assess each individual assignment and therefore there is a potential time saving for academic staff. Such work does require input from an eLearning technologist and further work is required to ascertain the total amount of staff time (academic and eLearning technologist) required to complete the assessment. Educators must also consider the license costs of the software. Alternatively, manual methods could be used to make the comparative judgments and this would eliminate the license costs but the practicalities of issuing random assignments to students as well as collecting and collating all the results must be considered.

Adaptive comparative judgments helped to overcome inter-rater variability, which otherwise is likely to have been problematic with so many students assessing work. The marks obtained from this assessment were sufficiently robust to enable them to

be used summatively. This is particularly helpful if peer marking is being used to increase student's exposure to different pieces of work and to produce a grade required for progression. Whilst this work did not consider whether adaptive comparative judgements can overcome the challenges posed when staff hawks and doves are required to mark assignment within a large cohort, it would seem likely that it should be able to cope with several staff markers if it can cope with over 140 different students.

A relatively large volume of comments was generated for each assignment. The comments contained a mixture of positive feedback (what they liked) and constructive feedback (what they thought was needed to improve the work). However, it is not possible to comment on the value of this feedback as this was not investigated.

Conclusion

A series of comparative judgements can be used to addresses inter-rater variability in peer marking. Further work is required to explore the effectiveness of peer-generated feedback.

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Design and Implementation of Spatial Navigation Transfer Game for Examining Transfer of Learning

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Abstract

Learners continuously shape and reshape their knowledge base, which allows them to generalize their learning to novel contexts and solve novel problems. Irrespective of the academic domain, it is important to provide students with a variety of opportunities to apply their learning across multiple contexts, thus increasing self-awareness and autonomy, and enhancing transfer. Understanding the cognitive processes underlying transfer and developing instructional strategies that could be used to enhance transfer across various contexts is an important, yet challenging educational issue. This paper discusses the design features of a Spatial Navigation Transfer (SNT) game, which was developed by the researchers of this study to examine problem solving and transfer of learning in virtual environments. The SNT game was piloted with six graduate students at a private, four-year university located in the northeast of the US. This paper presents preliminary findings from the pilot study and implications for instruction and instructional design for enhancing transfer of problem solving skills within higher education.

Keywords: transfer of learning, game design, problem solving, spatial navigation

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Introduction

In adult education, being able to effectively problem solve and transfer problem solving skills across multiple contexts, including virtual and real-world contexts, is vital. As noted by Broad (1997), acquiring the necessary skills to transfer is especially critical for adult learners since they are often expected to effectively and continuously apply knowledge and skill gained during learning activities to their jobs or other organizational and community responsibilities. Furthermore, research by Hung (2013) pointed out that employees are often required to be critical thinkers, independent problem solvers, and lifelong learners to be able to stay competitive in a job market. Therefore, college students or workplace trainees are in need for acquiring skills of applying and transferring knowledge across different settings.

Based on one of its broader definitions, transfer is “a term that describes a situation where information learned at one point in time influences performance on information encountered at a later point in time” (Royer, Mestre, & Dufresne, 2005, p. vii). According to the National Research Council (2013), transfer can be characterized in terms of deeper learning which is described as the process of taking what was learned in one context and applying it to new contexts. Deeper learning can lead to development of expertise within a domain. It results in acquisition of transferrable knowledge, which includes not only content but also procedural knowledge of how, when, and where to apply that knowledge.

Closely aligned with transfer research have been the investigations into the area of problem-solving transfer. According to Jonassen (1997), a problem is broadly defined as “an unknown that results from any situation in which a person seeks to fulfill a need or accomplish a goal” (p. 66). Problem solving transfer was characterized as an ability to use prior learning to solve problems that are different from those provided in the original instruction (Mayer, 1992). Among problem solving strategies, general problem solving has been widely researched as a strategy to enhance transfer (Youssef-Shalala, Ayres, Schubert, & Sweller, 2014). General problem solving strategies, such as simple heuristic, metacognitive strategies, and multistep problem solving routines, transcend specific domains and, therefore, can be applied in a variety of contexts, thus promoting transfer (Youssef-Shalala et al, 2014).

Despite the significant role of problem solving transfer in human learning, enhancing student abilities to effectively transfer newly learned knowledge and skills has always been one of the most challenging problems in education (Kaieser, Kaminski, & Foley, 2013; Haskell, 2000). This can be explained by the complexity and the multidimensionality of the transfer phenomenon. There has been a plethora of research on the factors affecting problem solving transfer. Research shows that changes in task procedure (e.g., addition of a secondary task) (Healy, Wohldmann, Parker, & Bourne, 2005), context (Kole, Healy, Fierman, & Bourne, 2010), task stimuli (Bourne Jr, Healy, Pauli, Parker, & Birbaumer, 2005) or required responses (Healy, Wohldmann, Sutton, & Bourne Jr, 2006) may influence learner performance on the transfer task. Another study, that used the classical Tower of Hanoi and two other analogous problems solving tasks, showed that familiarity of the instructions or the cover story that was used in the learning task influenced the degree to which the participants transferred their learning to new tasks (Kole, Snyder, Brojde, & Friend, 2015).

The purpose of this paper is to discuss the design and development of a Spatial Navigation Transfer (SNT) game by the researchers of this study to examine problem solving and transfer of learning in virtual environments. The design and implementation of the SNT game was guided by Cognitive Load Theory used as a broader theoretical framework.

Theoretical framework

Cognitive Load Theory (CLT), which was developed in the 1980s, informs instructional design by proposing instructional strategies based on human cognitive architecture (Paas, Renkl, & Sweller, 2003; Sweller, 1988). CLT helps to address some essential educational issues, such as stimulating learners' cognitive resources to enhance learning, handling complex learning tasks, and dealing with learners of different expertise levels (Kirschner, Sweller & Kirschner, 2018, Van Merriënboer, & Sweller, 2010). CLT becomes especially vital when dealing with complex learning tasks which can exert a heavy cognitive load on the memory system (Van Merriënboer, Kester, & Paas, 2006).

It is known that unlike the long-term memory, which is characterized by infinite memory capacity, working memory is significantly limited. Working memory was defined as “a limited- capacity system for temporary storage and manipulation of information for complex tasks such as comprehension, learning, and reasoning” (as cited in Goldstein, 2014, p.133). CLT is based on the assumption that human working memory has limited capacity when dealing with new information and can hold five to nine information elements (Miller, 1956). The number of new information elements that can be processed actively at the same time ranges between two and four (Van Merriënboer, & Sweller, 2010). Working memory can process information for only a few seconds. Moreover, after nearly 20 seconds almost all information is lost unless it is maintained by repeated rehearsal (Van Merriënboer & Sweller, 2005).

Working memory load can be influenced by three types of cognitive load, namely the intrinsic cognitive load, extraneous cognitive load, and germane cognitive load. Intrinsic cognitive load is characterized by the intrinsic nature of the task to be learned, extraneous cognitive load is the way in which the tasks are presented to the learner, and the germane load is described in terms of the cognitive resources that learners use to learn something (Van Merriënboer & Ayres, 2005).

Well-Defined and Ill-Defined Problems

Structurally, problems can be classified into well-defined and ill-defined problems (Schraw, Dunkle, & Bendixen, 1995) or well-structured and ill-structured problems (Jonassen, 1997; Schraw et al., 1995). According to Kitchener (1983) well-defined problems are those which have “absolutely correct and knowable solutions”, while ill-defined problems are those “for which there are conflicting assumptions, evidence, and opinion which may lead to different solutions”. (p. 223) Mayer and Wittrock (1996) pointed out that for well-defined problems, the allowable operations to be performed to reach from the given state to the goal are known to the problem solver. For instance, a computational problem such as $3 \times 15 = ?$ is well defined since the given state is 3×15 , the goal state is a numeric answer, and the allowable operation is

multiplication. In contrast, in ill-defined problems, the given state, the goal state, and the allowable operations are not clear to the problem solver (Mayer & Wittrock, 1996). An example of an ill-defined problem is to write an essay about how to prevent global warming. Unfortunately, many educational materials contain well-defined problems, while most problems outside the educational context are ill-defined (Mayer & Wittrock, 1996).

Spatial Navigation Transfer Game

The SNT game was a web application built using modern technologies and consisted of an Express/NodeJS web server and a single interactive HTML page on the front that contained the JavaScript-based game engine and was served as a static resource. The engine was specifically developed for this game and once the user opened the page with a browser, it started running and took over. It made extensive use of jQuery, and was in charge of downloading, showing and manipulating various elements of the game such as the dialog boxes, instruction pages, and the actual game. Moreover, the engine recorded user inputs and interactions, game states and results, and uploaded them to the server.

The SNT game was designed and developed using Cognitive Load Theory as a broader conceptual framework. The game consisted of two well-structured analogical spatial navigation problems and two ill-structured analogical problems. The well-structured problems represented two analogous scenarios: School Bus and Ambulance. Each of the two well-defined spatial navigation problem scenarios included nine analogical tasks of three levels of difficulty: low, medium, and high cognitive load tasks.

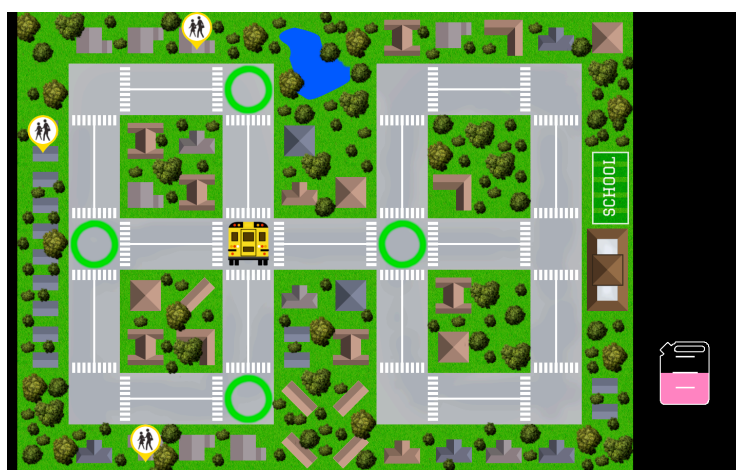


Figure 1. School Bus Scenario.



Figure 2. Ambulance Scenario.

In the School Bus scenario, the player assumed the role of a school bus driver whose task was to navigate the game map to collect students from different locations and drive them to school. In the ambulance problem, the player assumed the role of an ambulance driver who received calls from patients and had to collect them from different locations on the game map and take them to the hospital. The difficulty level of each task for both problems was defined by the number of constraints such as a limited amount of fuel, limited amount of time, limited number of seats, and increasing traffic

In addition, the game provided the players with a tutorial analogous to the well-structured problem scenarios. The purpose of the tutorial was to introduce the players to the game structure and techniques. The tasks within each level were preceded by detailed instruction pages containing the description of the tasks and the type of constraints contained in the tasks.

The ill-structured problems consisted of two analogical scenarios in which the subjects were asked to generate as many solutions as possible. Both tasks were untimed. The problems were of two complexity levels, namely a simple everyday problem scenario and a more complex generic problem scenario.

Pilot Study

The SNT game was piloted with six graduate students at a private, four-year university located in the northeast of the US. The results indicated an overall decrease in reaction time and total time spent on SNT game tasks from week one to week two of the experiment. The analysis of the participant behavioral data and oral feedback collected during the pilot study allowed for modification of certain design features of the game. Some of these modifications included clarifying the instructions and editing the tasks within each difficulty level.

Currently, the SNT game is being implemented in an experimental study with 27 participants. The study uses a within-subject repeated measures experimental design with a neuroimaging tool called functional near infrared spectroscopy (fNIRS) to measure mental workload during the SNT game play. The main purpose of the

experiment was to investigate neurocognitive, behavioral, and task variables involved in general problem solving transfer.

Conclusion

This research was significant since it examined transfer of general problem skills by applying analysis at multiple levels, namely neurocognitive, behavioral, and task levels. Investigating neurocognitive, behavioral, and task-related variables affecting problem solving transfer is essential in understanding the complex and multidimensional nature of the transfer phenomenon. Understanding the neural mechanisms of transfer is closely linked to knowledge of learning, human memory, reasoning, and problem solving. Investigation of the multiple factors affecting learning and transfer of problem solving at the brain level creates multiple opportunities for differentiated instruction characterized by brain-friendly, learner-centered, and customizable learning experiences.

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The Effect of Using Head-mounted Virtual Reality to Improve Learning

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Abstract

In the current class, the limitation of location, season, and presence of insects eliminate students to observe the insects closely. The students usually are confused with insects' appearance and growing process. Virtual reality (VR) removes the limitation of time and space and facilitates students to learn and explore more actively. The head-mounted devices provide a more immersive environment for students to enhance their learning motivation. Studies found appropriate pedagogy should be integrated into virtual reality. In this study, the head-mounted virtual reality were used to improve insect education and further compared their learning experiences.

Keywords: Virtual reality, head-mounted devices, insect education

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Introduction

Due to the limitation of season and size, students usually have little chance to observe insects closely and they could only learn by watching pictures, video clips, and specimens. Students are usually confused with insects' appearance and learning process. Virtual reality eliminates the boundary of time and space, and provides students with interactive learning environments. VR holds students' engagement because it provides exciting experiences and it is challenging to interact in the virtual environment (Kuei-Shu, Jinn-Feng, Hung-Yuan, & Tsung-Han, 2016). The rapid development of information technology facilitates the application of VR to wider fields. The head-mounted devices provide students with more immersive experiences and improve their learning motivation. Virtual technologies promote autonomous exploration and decision-making so VR has the potential to encourage students to become active learners (Gutiérrez, Domínguez, & González, 2015). However, appropriate instructional designs should be integrated when learning in a VR environment (Merchant, Goetz, Cifuentes, Keeney-Kennicutt, Davis, 2014). Inquiry-based learning supports students to discover new causal relations by identifying questions, proposing hypotheses, finding possible solutions, conducting experiments, making observations, and obtaining conclusions (Pedaste, Maeots, Leijen, & Sarapuu, 2012). The learning model encourages learners to participate actively and discover new knowledge to improve learning (de Jong & van Joolingen, 1998). The learners not only obtain knowledge from the learning process but experience the process to think critically. The students become the center of learning and increase their learning motivation. Studies have supported the effectiveness of applying inquiry-based learning to improve learning (de Jong, Sotiriou, & Gillet, 2014). The focus of the inquiry-based learning model may be consistent with what VR could bring to our students.

In sum, because of the importance of elementary students' insect knowledge improvement and the importance of taking appropriate pedagogy into consideration, this study developed a virtual reality environment designed according to inquiry-based learning and tried to enhance the performance of elementary students' insect knowledge developing. The research questions were listed below:

1. Whether the students in the virtual reality environment that was designed based on the inquiry-based learning model (ILM-VR) will improve their learning?
2. Is there a significant difference in the learning outcome between the students using ILM-VR or not?
3. Is there a significant difference in learning motivation, perceived usefulness, perceived ease of use, and satisfaction in students using ILM-VR or not?
4. What are students' learning experiences in the ILM-VR learning environment?

Methodology

The research was conducted in two elementary classes in Taiwan and 27 students participated. A total of 54% of them were male and 46% were female. One class was randomly assigned as experimental (ILM-VR) group (N=13), which used virtual reality technology based on inquiry-based learning model in the class. The other class was named as a control group (N=14), and the course was taught by PowerPoint and video clips. The entire treatment lasted for two weeks. In the study, quantitative data

consisted of a questionnaire, pre-test, and post-test scores, and qualitative data came from semi-structured interviews. The participants were asked to take the pre-test before the treatment. After the treatment, they were asked to take post-test, a questionnaire, and the in-depth interviews were conducted. To determine the validity of the questionnaire, the principal component analysis was performed on the 10 questions. Four factors were yielded by factor analysis. The total variance accounted for by two factors was 83.49%. Respondent ratings of students' perceptions in the learning motivation of using virtual reality obtained from the questionnaire were judged to be fairly reliable with an internal consistency reliability coefficient of 0.86. Respondent ratings of students' perception of perceived usefulness obtained from the questionnaire were judged to be fairly reliable with an internal consistency reliability coefficient of 0.89. Respondent ratings of students' perception of perceived ease of use obtained from the questionnaire were judged to be fairly reliable with an internal consistency reliability coefficient of 0.93. Respondent ratings of students' perception of satisfaction obtained from the questionnaire were judged to be fairly reliable with an internal consistency reliability coefficient of 0.92.

Results

A dependent t-test was used to answer research question one "Whether the students in the virtual reality environment that was designed based on the Inquiry-based learning model (ILM-VR) will improve their learning?" The pre-test and post-test were administered to the students in the experimental group at the end of the two weeks of study in order to answer this research question. There is a statistically significant mean difference ($t = -12.73$, $df = 12$, $p < .01$) between pre-test and post-test in the ILM-VR group. The posttest score (mean = 86.59, $s = 11.72$) was higher than the pre-test score (mean = 56.42, $s = 12.48$). The 95% confidence interval suggests the true mean difference is included in $-32.14 < \mu < -24.57$.

An independent t-test was used to answer research question two "Is there a significant difference in the learning outcome between the students using ILM-VR or not?" The pre-test and post-test scores were administered to the students at the end of the two weeks of study in order to answer this research question. The results from the pre-test showed that there was no statistically significant difference in the pre-test between the ILM-VR and the control groups ($t = .76$, $df = 35$, $p = .48$). The 95% confidence interval indicates the true mean difference ($-.27$) may range from $-2.73 < \mu < 6.42$. On average, participants in the ILM-VR group ($M = 56.42$, $SD = 12.48$) had a similar level of prior knowledge before the treatment ($M = 58.14$, $SD = 11.83$). The results are shown below in Table 1.

Table 1. Scores of the Pre-test

Groups	Mean	Std. Deviation	N
ILM-VR	56.42	12.48	13
Control	58.14	11.83	14
Total	59.27	11.64	27

The results from the post-test showed that there was no statistically significant difference in the post-test between the ILM-VR and the control groups ($t = -.24$, $df = 25$, $p = .27$). The 95% confidence interval indicates the true mean difference (-3.81) may

range from $-7.62 < \mu < -2.04$. On average, participants in the ILM-VR group ($M=86.59$, $SD=11.72$) had similar academic performance with the control group ($M=84.38$, $SD=13.69$). The results are shown below in Table 2.

Table 2. Scores of the Post-test

Groups	Mean	Std. Deviation	N
ILM-VR	86.39	11.72	13
Control	84.38	13.69	14
Total	85.59	15.86	27

Motivation

A composite score from questions 1-4 was used to determine students' perception of motivation towards learning through virtual reality. The composite score ranged between 4 and 12. The results from the survey showed that there was a statistically significant difference between the ILM-VR and the control groups ($t=5.86$, $df=25$, $p<0.01$). The 95% confidence interval indicates the true mean difference (-4.77) may range from $-5.46 < \mu < -4.09$. On average, participants in the ILM-VR group ($M=6.19$, $SD=1.83$) had more motivation towards learning through ILM-VR than the control group ($M=10.24$, $SD=1.76$). The results are shown below in Table 3.

Table 3. Scores of Motivation

Groups	Mean	Std. Deviation	N
ILM-VR	10.24	1.76	13
Control	6.19	1.83	14
Total	8.14	2.43	27

Perceived usefulness

A composite score from questions 5-7 was used to determine students' perception of perceived usefulness towards learning through virtual reality. The composite score ranged between 3 and 9. The results from the survey showed that there was no statistically significant difference between the ILM-VR and the control groups ($t=9.64$, $df=25$, $p=.08$). The 95% confidence interval indicates the true mean difference (-2.47) may range from $-3.28 < \mu < -2.09$. On average, participants in the ILM-VR group ($M=7.85$, $SD=1.64$) felt the VR system to be as useful as the learning environment in the control group ($M=6.42$, $SD=1.53$). The results are shown below in Table 4.

Table 4. Scores of Perceived Usefulness

Groups	Mean	Std. Deviation	N
ILM-VR	7.85	1.64	13
Control	6.42	1.53	14
Total	7.11	1.62	27

Perceived ease of use

A composite score from questions 8-10 was used to determine students' perception of perceived ease of use towards learning through virtual reality. The composite score ranged between 3 and 9. The results from the survey showed that there was no

statistically significant difference between the ILM-VR and the control groups ($t=6.32$, $df=25$, $p=.06$). The 95% confidence interval indicates the true mean difference (-2.39) may range from $-3.31 < \mu < -2.02$. On average, participants in the ILM-VR group ($M=8.19$, $SD=1.73$) felt the VR system to be as easy to use as the learning environment in the control group ($M=7.58$, $SD=1.86$). The results are shown below in Table 5.

Table 5. Scores of Perceived Ease of Use

Groups	Mean	Std. Deviation	N
ILM-VR	8.19	1.73	13
Control	7.58	1.86	14
Total	7.87	1.79	27

Satisfaction

A composite score from questions 11-13 was used to determine students' perception of confidence. The composite score ranged between 3 and 9. The results from the survey showed that there was a statistically significant difference between ILM-VR and the groups ($t=3.16$, $df=125$, $p<0.01$). The 95% confidence interval indicates the true mean difference (-4.83) may range from $-5.96 < \mu < -3.62$. On average, participants in the ILM-VR group ($M=8.59$, $SD=1.63$) had a more positive attitude toward learning satisfaction than the control group ($M=3.41$, $SD=1.27$). The results are shown below in Table 6.

Table 6. Scores of Satisfaction

Groups	Mean	Std. Deviation	N
ILM-VR	8.59	1.63	13
Control	3.41	1.27	14
Total	5.90	3.28	27

From the semi-structured interviews, most of the students found using ILM-VR to be fun and interesting. They agreed the system helped them sustain their attention and motivation to learn about the topic. However, few students got lost in the VR environment and needed more time and guidance.

Conclusions

The purpose of this study was to investigate the effect of using ILM-VR in insect learning. The findings of this study showed that ILM-VR facilitates students' learning motivation and interest. However, there showed no improvement in insect learning in primary education. In the ILM-VR group, the post-test scores demonstrated tremendous improvement from the pretest. From the pre-test scores in this study, there was no statistically significant difference in test scores between the ILM-VR and the control groups. However, the ILM-VR group had a similar knowledge post-test score with the control group. Integrating ILM-VR in learning did not help improve participants' academic performance although ILM-VR was interesting and help them get involved in the learning process. More guidance and clear instructions should be given during learning.

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The Interconnection of Chinese and Western Cultures: The Policy, Development and Expansion of International Early Childhood Education in China

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Abstract

In recent years, the tight control of history narratives and censorship of school textbooks has made the universities suffered by the ideological crackdown from the communist Chinese government. Even though international schools in big cities, such as in Beijing and Shanghai, have been facing the prohibition of using liberal but non-government approved materials in their curricula. In November 2016, all private schools from grades one to nine were banned by the government. As a result, the only ground for the development of western-style schools in China is international early childhood education. According to the policy of early childhood education in China, there are three types of schools: Preschools or nurseries, kindergartens and pre-primary schools. More than ten percent of international preschools and kindergartens use non-Chinese traditional pedagogical approach or westernized teaching methods, and also they can choose any pedagogy of Montessori, Reggio or Waldorf, etc. The richest the parents are, the best and most expansive education for the only child will be. Parents, who have become wealthier or had high income after the rapid growth of economy in China, are willing to invest a lot of money for providing excellent early childhood education for their kids. In fact, the private international preschools and kindergartens are expanding, but they are different from others as the interconnections of Chinese and Western cultures. This paper investigates how Chinese Confucius rules meet the Western pedagogy in the booming international early childhood education industry in China from policy, development and expansion.

Keywords: Confucius rules, Western pedagogy, preschools, kindergartens, early childhood education, policy, development & expansion, Montessori

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1.0. Introduction

Education is one of the top three industries that Chinese government plans to develop and expand in the following decade, as the number of the private international schools has been increasing substantially. In recent years, the tight control of history narratives and censorship of school textbooks has made the universities suffered by the ideological crackdown from Chinese government. Even though international schools in big cities, such as in Beijing and Shanghai, have been facing the prohibition of using liberal but non-government approved materials in their curricula. In November 2016, all private schools from grades one to nine were banned by the government. As a result, the only ground for the development of western-style schools in China is international early childhood education.

2.1. Interconnection of Chinese and Western cultures

In fact, the private international preschools and kindergartens are expanding, but they are to certain degree different from others as the interconnections of Chinese and Western cultures. The distinct features of the early childhood education programs in China could be found in the teaching methods different from those in the Western countries, such as USA, and also much more involvement of Chinese parents than that of the Western ones. Based upon the traditions and philosophy of Confucius, as well as China's socialist ideals, preschools and kindergartens emphasize much more in teacher's authority and working in groups rather than individuality and self-expression.

Since the open door policy forty years ago, China has been changing rapidly economically and socially, whereas both the Confucius rules and socialism have been still deeply rooted in the nation's culture especially in education system. Based upon the Chinese culture, teachers have superior authority as a high-value occupation with expertise in their area, and they are dedicated to their students as well as loyal to the schools with long working hours but comparatively low salaries, therefore, they should be highly respected by the students. The teaching methods are teacher-centered as a teacher directing a large number of students working in groups and learning the same thing at the same time collectively. If any students do not perform well, then they will be seriously criticized of not working hard enough. Under the teacher's guidance, corrections are believed to make the students learn better and faster. Meanwhile, if any students do not follow the disciplines, such as students have to stand up to answer questions in the classroom, then the teachers will make the students lose face and do the behavior corrections in the public without any concern of the psychological damage of the children's self-esteem, which is an emphasis of kindergartens in Western countries. Early childhood education in China is the preparation stage for the more formal education of young children.

As Chinese parents highly value and respect education traditionally, they have large investments for their children's education since early childhood. They have higher expectations of the schools and also much more involvement in their children's education driving for excellence than those Western parents. Concerning the results of exams and tests seriously, Chinese parents emphasize most on efforts that their children put in learning. Since the birth of their children, Chinese parents plan, control and involve very much in their children's education even up to the level of choosing

courses in universities. As a result, Chinese early childhood education produces young children who study and work hard as well as obey and follow the disciplines.

After more trade and interactions with western countries, China is open to Western values and foreign ideas. A study found that the generation of single children is different from those with siblings as the previous ones were more self-centered, less uncooperative and less determined. These characteristics influence how the single children learn, play and communicate with others. Due to the transformation of western ideas for the Chinese parents and the significant change of single children's behavior, childcare practices have to be changed. The conventional forms of preschools and kindergartens could not satisfy all the needs of the parents who have only one child in each family under the "One-child Policy" in China. The richest the parents are, the best and most expansive education for the only child will be. Parents, who have become wealthier or had high income after the rapid growth of economy in China, are willing to invest a lot of money for providing excellent early childhood education for their kids. The swift shift to private and international kindergartens providing environment for fostering creativity, independence and critical thinking meets the expectations of the Chinese families. On the other hand, Chinese traditional values and strong disciplines have been demolished in early childhood education in China. More than ten percent of international preschools and kindergartens use non-Chinese traditional pedagogical approach or westernized teaching methods, and also they can choose any pedagogy of Montessori, Reggio or Waldorf, etc.

2.2. Policy

In 2010, China's Ministry of Education introduced the Outline of Medium and Long-term Programs for National Education Reform and Development from 2010 to 2020. According to the outlines, the international schools are classified into various types in the following table (Table 1):

Table 1. Types of International Schools in China

Types of international schools	Students	Private Owners / public schools
1. Schools for children of foreign workers (SCFW), also known as “Expat Schools”	1. International children from the expatriate community 2. Ethnic Chinese children with foreign passports 3. Ethnic Chinese children migrating from other Asian countries	Private owners: a foreign education company or school
2. Sino-foreign cooperative schools	Both expatriate and Chinese students (Restricted to secondary & higher education)	Joint ventures: a Chinese owner and a foreign education company or school.
3. Chinese-owned private bilingual schools	Mostly serve Chinese students	Private Chinese owners
4. Chinese public/ state schools	High school Chinese students	A few Chinese public/ state high school provide an international stream as an option

Based upon the above table (Table 1), there are four different kinds of international schools: Expat schools, Sino-foreign cooperative schools, Chinese-owned private bilingual schools and a few Chinese public/ state schools running international education in China. All international schools accept Chinese students and some for international students as well, but Type 1 schools only prefer those without Chinese nationalities no matter they are expatriates’ children or ethnic Chinese. However, Types 2 and 4 are restricted to secondary schools, high schools and higher institutes. When we concern the early childhood education in China, only Type 1 schools, which are owned by a foreign education company or school, and Type 3 bilingual schools, which are run by private Chinese owners, will be considered.

Most Chinese parents prefer private international schools rather than local public/state schools for their children mainly because they are worried about “The pressure-cooker effect”. Meanwhile some parents plan to send their kids to study abroad later in high schools, universities or graduate schools in Britain, America, Canada, Australia or New Zealand. Believing that western approach facilitates the development of students’ creativity is another reason why the Chinese parents send their children to international schools. As there were no specific teaching methods stated in the outlines, international preschools and kindergartens have to make their own choice of using the westernized teaching methods of Montessori, Waldorf or Reggio.

According to the policy of early childhood education in China, there are three types of schools: Preschools or nurseries, kindergartens and pre-primary schools. Under the guidelines, there should be 3 years for preschool education and the development of kindergartens was strongly encouraged. Children under 3 attend preschools or nurseries, while 3-6 years old children are in kindergartens. One year before the child

attend the first year of elementary school, there is pre-primary school attached to elementary school that he or she has to attend. Young students are classified into three categories based upon their age by the Chinese government including three-year-old juniors, four-year-old middle and five-year-old seniors.

2.3. Development

Under the impetus of the guidelines released by China's Ministry of Education in 2010, kindergarten industry has been developed considerably. The guidelines covered a wide spectrum of education including preschools and universities, public and private, as well as academic and vocational. Due to the initiatives for promoting services and skills-based economy, there are a lot of opportunities for private local and international education investors to develop in China to serve the increasing middle class.

Table 2. Targets for Preschool education development

	2009	2015	2020
Preschool education			
Kindergarten enrolment (in millions)	27	34	40
Gross enrolment rate at 3 years prior to compulsory education (%)	51%	60%	70%
Gross enrolment rate at 1 year prior to compulsory education (%)	74%	85%	95%

Table 2 displays the major targets for preschool education development in China from the years 2009 to 2020. The numbers of kindergarten enrollment are supposed to go up from 27 million in 2009 to 34 million in 2015, and further up to 40 million in 2020. Gross enrolment rate at the three years prior to compulsory education are planned to increase 10% each 5 years as 51% in 2009, 60% in 2015, and 70% in 2020. Whereas Gross enrolment rate at the one year prior to compulsory education are estimated to have a rise from 74% in 2009 to 85% in 2015, and continued its upward trend to 95% in 2020. In other words, the China's Ministry of Education planned to expand early childhood education by reaching the number of 40 million of kindergarten enrollment and nearly 100% of gross enrolment rate at one year prior to formal primary education in 2020.

In China, the early childhood education industry is booming with a fast development in the number of preschools and kindergartens, especially private ones. The total number of kindergartens rose from 116,000 in 2003 to 219,000 in 2015 with a near to double growth, whereas the number of private kindergartens increased substantially from 55,500 to 143,500 with 2.58 times of growth. The average increase of preschools and kindergartens was 3,637 annually during the period of 2003-2009, whereas 16,044 from 2010 to 2013.

Between the years of 2012 and 2013, there was a considerable increase of early childhood education including kindergarten enrollment, new entrants of kindergartens and gross enrollment rate of children, as well as the number of preschools and private kindergartens in China. The kindergarten enrollment rose from 2,089,279 in 2012 to

38,946,903 in 2013 with 5.7% increase. Meanwhile, there was a rise of 581,117 new entrants of kindergartens equivalent to 3% between the years of 2012 and 2013. Gross enrollment rate of children aged from 3 to 5 years in preschools and kindergartens reached 67.5%, which went up 3% from 2012, whereas 16.6 % up from 2009. The number of kindergartens in China in 2013 was 198,553 with a jump of 17,302 or 9.5% from 2012. In fact, private preschools developed much faster than public ones recently. Across the whole nation, 133,451 private kindergartens were recorded as occupying 67.2% of the total number of kindergarten in 2013. Comparing to the number in 2012, there were 8.813 private kindergartens more and equivalent to 7.1% increase. At the end of 2013, there were 19,902,536 enrollments and 9,079,575 new entrants in private kindergartens, which dominated 51.1% and 46.1% of all kindergartens in China.

However, the development of education industry is unbalanced through over China as there are significant differences among well-developed provinces and cities, and under-developed areas varying from different economic levels. After open-door policy, many expatriates coming to China and Chinese parents with foreign passports living in municipality and economically developed provinces have a great demand of private international kindergarten options for their kids. On the other hand, the considerably increasing Chinese middle class with higher income working in big cities and rich provinces can afford and are convinced to pay more for their children's early childhood education which provides another pedagogical alternative of western style in private international schools. Consequently, the number of private international preschools and kindergartens in economically developed cities, municipality and provinces rose swiftly with very high enrollment rate. Embracing the overall conditions and development of private kindergartens, big cities such as Beijing, Shanghai, Tianjin, etc, and Guangdong province are much more advanced than the western provinces.

China Preschool Education (Kindergarten) Industry Research Report, 2016 by ResearchInChina demonstrates the gross enrollment rate of main provinces and municipality in China in the years of 2010 and 2015. The report shows the different development of education industry in China as follows. In 2010, the top five gross enrollment rate in China's preschool education industry in economically developed municipality and provinces are 100% in Shanghai, around 95% in Zhejiang and Jiangsu, 90% in Tianjin, and 85% in Beijing. Five years later, there was a slightly change of the order for the top five. In 2015, 100% for Shanghai remaining the top of the gross enrollment rate of 3-year kindergartens. Followed by Zhejiang, Jiangsu, Fujian and Guangdong, all are over 95%. Overall gross enrollment rate of kindergartens in economically developed regions and municipality such as Shanghai, Beijing, Zhejiang, Jiangsu, Guangdong and Tianjin provinces reached more than 95%, whereas Guangxi, Yunnan, and Tibet in the central and western regions were 60% only. Having the same upward trend, the gross enrollment rates of kindergarten in all provinces or municipality increased from 2010 to 2015 with different degree.

Concerning the characteristic of Chinese early childhood education market, the kindergartens are scattered with very low concentration, and few nationwide brand preschool education companies exist. Thus, a large number of listed companies invest in the attractive Chinese preschool education market by building their own kindergartens or advocating "Whole Person Education", etc., such as Vtron

Technologies Ltd. and Jiangsu Xiuqiang Glasswork Co. Ltd. Furthermore, development of technology advances preschool education. Most kindergartens relies much heavier on internet than a decade ago by building their school websites for online teaching and learning, using Wechat for group discussion, sharing and interactions between teachers and parents, carrying out orientation or even student enrollment.

2.4. Expansion

For the expansion of early childhood education industry in China, the policies and support of the central and local government are the major concerns. In 2012, only 64.5% of young children at or under 6 years old are recorded in 181,300 kindergartens through the whole country. This historical phenomenon indicates the lacking of preschools. The Chinese government has planned to increase the enrollment rate of young children aged from 3 to 4 attending 3-year preschool to 70%, and 2-year to 80% covering 40 million children by 2020. A series of reform for the preschool education has been implemented, particularly the development of kindergartens in those rural areas lacking schools. The central government shows their favor for the expansion of preschools and kindergartens in China. A large amount of money has been invested in early childhood education including 40 billion RMB from central government and 100 billion from local government. Between the years of 2011 and 2012, around 800 million RMB was distributed to 1.8 million families as a government education subsidy for their young children. Meanwhile, the central government contributed 4.7 billion RMB to 30,000 local preschools and kindergartens. On the other hand, 1.2 million principals and teachers received professional training and upgrading their qualifications under the programs arranged by the central government.

Besides, early childhood education industry attracts more and more investment from foreign companies and private enterprises annually even without any negative effect from economic crisis in 2008. While the amount of money pledged by corporate funding went up steeply, the investment in preschool education in 2014 was 204.876 million RMB, which was 8.37 times of that in 2009. The broker, CLSA, predicted that the enrollment rate of students in private international schools rose 14% in the 315 million RMB private education market through the year 2018. Although there has been a huge amount of money investment for the expansion of preschools and kindergartens from both the government and private sectors, we have to consider whether it solves the existing education problems in early childhood education.

The competition of kindergartens is fierce, so what should the preschools do to improve? The general trend of Chinese parents prefers to send their kids to school as early as possible for preparation of future success in later education with a competitive advantage. Therefore, some preschools provide detailed academic programs preparing for formal primary education, and learning foreign languages, such as English. Shifting of the role of childcare from the grandparents to kindergartens, some nurseries started as daycare centers for the working parents. Although the number of preschools has been growing rapidly in the recent year, there is a wide range of variation in school fees and quality through the country. Some kindergartens closed down after the education reform due to the lack of financial supports from corporate. Private international preschools and kindergartens are luxury

in China with very high school fees. However, the number of private kindergartens overran the public ones and the number of private schools in China rose from 3% to 10% in less than 10 years as recorded by McKinsey report in 2015. Chinese parents believe that private international education in early childhood not only pave the way for international curricular, but also increase the chances for studying universities aboard resulting in getting well-paid jobs for their children in the future. Based upon a study from Hurun publishing the annual list of millionaires in China, the rich Chinese parents invest 20% to 25% of their annual expenditure in their children's education. Serving the parents able to pay, the private international preschools and kindergartens are flourishing by providing a variety of programmes and courses such as private classes once a week, interest groups after class or at the weekend, English, art and music, even full-time boarding. More than 10% kindergartens employ westernized teaching methods, as Montessori is the most popular one for Chinese kindergarteners. Other non-Chinese pedagogical approach originated from Reggio and Waldorf have been promoted as well. Certain schools advocate that they are "Premier preschools" in order to convince the parents to pay off and increase higher enrollment rate of the students. Some schools provide whole person education, while some promote creativity or critical thinking, and others advertise the development of young children's full potential.

The qualifications, professional training, nationalities and salaries of teachers are another factor affecting the expansion of early childhood education industry. Foreign teachers, though most of them are not well-trained, are popular in many schools, especially private international kindergartens. As the Chinese parents are willing to pay more for their kids' school fee for preparation of further study aboard, native English teachers (NET) are welcomed in preschools. Those private international schools employing foreign teachers are particularly popular. Usually, a NET has double or even triple pay of a local Chinese teacher. More foreign teachers create larger financial burden for the kindergartens, therefore, the school fees in most private international kindergartens are relatively higher. One of the problems preschools and kindergartens have to face is low salaries for the local teachers, as even lower than those of elementary teachers. As a result, good and skillful teachers are rarely attracted to teach in childcare practices. Even in chain kindergartens or well-funded preschools, some of the teachers just finished associate degrees, high school or even lower educational level lacking of any expertise, prerequisite knowledge about education and professional training for childcare.

3.0. Conclusion

In sum, early childhood education industry in China is flourishing after development for more than a decade, and also expanding substantially under the policies and support of Chinese government, especially the private international kindergartens. This fastest growing sector attracts not only local, but also international, private and corporate investors. Therefore, the number of private international preschools and kindergartens is expected to increase considerably throughout China in the coming decade with better quality and larger capacity. When the investors establish the kindergartens catering for the young children aged at or under 6, they have to convince the increasing middle-class Chinese to pay higher prices for their kids to receive better education in order to pave the way to have less pressure for exams, the competitive advantage over the peers in formal education, the exposure to western-

styled teaching and pedagogy, and ability to further study abroad resulting in better job offers for their kids in the future. Improvement of childcare teacher qualification, skills and salary in addition to providing more well-trained foreign teachers ensure the competitiveness of the private international preschools in the fierce competition. Finally, of course, the kindergartens also have to offer courses and programmes interconnecting the Chinese and western cultures for fostering creativity, critical thinking, and development of full potential of young children.

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The Relationship Among Family Functioning, Perceived Peer Norms, Future Orientation, and Poor Self-Control in Juvenile Delinquents and Late Adolescent Students

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Abstract

The objective of this research is to explore the relationship among the family functioning, perceived peer norms, future orientation, and poor self-control. This research tests relations among variables by using the Pearson's Product Moment Correlation with 200 juvenile delinquents and 200 late adolescent students (mean age: 17years). Data were collected by measurement scales with reliability ranged from .89-.97. Findings from the Pearson's product moment correlation analysis indicates that family functioning was positively linked with future orientation and perceived peer norms, while family functioning, future orientation, and perceived peer norms were negative linked with poor self-control. The results suggested the same pattern of relationship in both late adolescent students and juvenile delinquents, it is interesting to note that some correlation coefficients are different in separate estimation across the two group. Suggestion and implications for preventive interventions are discussed.

Keywords: Perceived peer norms, Family function, Adolescents, Juvenile, Problem behavior

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Introduction

Teenage stage of life is known to be the transitional age characterized by dramatic changes because it is a phase marking the transition from childhood into adulthood (Jessor, 1991). These changes demand significant adjustments due to changes in physical body and hormone causing emotional instability. Studies have shown that juvenile delinquency as well as adolescents committing both minor and prosecutable offenses is rampant at the adolescence age. This is coupled by the fact that teenagers are prone to emotional disturbances and excitement for experimenting as well as rebellion against societal structures and strictures, aping their preferred idol or leader (Wattananonsakul & Tuicomepee, 2014). As a result, they become deviants and behave in the most unacceptable manner. Usually, teenagers like to behave in a gangster manner, often causing disturbances through committing criminal activities making the community and society at large to paranoia and a feeling of insecurity (Jessor, 1993). By nature, their behavior is dynamic and volatile, often going out of control but at times suppressive or over-confidence, with a number of times faring up in what psychologist call "storm and stress" (Coon & Mitterer, 2013). Moreover, the adolescence stage is marked with vulnerabilities and susceptibilities leading to coping of behaviors that are usually harmful or questionable (Wattananonsakul & Tuicomepee, 2014). This study bases its investigation on the principles of problem behavior theory (PBT) such as the concepts of risk and protective factors, which is in line with the model guiding this study. Jessor, Donovan, & Costa (1991) pointed out that the PBT theory focuses on both the individual-level and the social-contextual factors playing out in various contexts such as neighborhoods, school, peer group and the family. In this connection, this study employs the principles of PBT to explore the association that exists among poor self-control, peer norms, future orientation, and family functioning.

Through measurements in social psychological scales, the variables measure risk and protective factors within the personality structure, which are either directly or indirectly linked to juvenile delinquency and normal behaviors. The normal (conventional) behaviors are likely have a strong correlation with protective variables while delinquent behaviors are likely to be decreased by risk factors (Jessor, 1991). From the existing studies examining the factors influencing behavioral offenses in Thailand, it is clear that a larger percentage (69.5%) of juvenile delinquent teens in the juvenile detention center located in Southern Thailand, comes from areas with most maladjusted behaviors like offenders, over-pampering rearing, and neglected upbringing. Miller (1995) mentioned that additional problematic behaviors and violent outbursts are often brought about by lack of mutual understanding. In a number of behavioral problem studies, it has been highlighted that factors such as peer group norm (influencing student behavior), and family functioning significantly affect the behavior of both boys and girls with up to 75% accuracy. This is a view supported by Kaplan and Adock (1988) by arguing that an effective solution to any

quarrel in the family or problematic behavior is determined by perception in family functioning, level of bonding, intra-family communication, and existence of cordial relations.

In this regard, this study seeks to explore the existing relationship among such factors as family functioning, peer norms, future orientation, and poor self-control among student groups in high school and the group of juvenile delinquency.

Method

Participants and survey procedure

The sample size used in this data analysis was 400, which was divided into 2 groups. The late adolescent students were 200 high school students in Ratchaburi province, Thailand collected through purposive sampling from grade 10-12 with the mean of 17 years ($SD = .98$), and The juvenile delinquents were 200 participants who were prosecuted juvenile delinquency in the 7th Region, Thailand collected through purposive sampling with the mean of 17 years ($SD = 1.10$). Means, Standard deviation and Pearson's product moment correlation coefficient were computed for answering the research questions. The questionnaire takes approximately 20 minutes to complete and the survey protocol was approved by the Ethical Review Committee for Research Involving Human Research Subjects No. SWUEC /X-169/2561. The data collection was administered under confidential condition.

Measures

The survey questionnaire included scale items to measure the protective and risk factors described above. Scale included in the questionnaire are:

Family functioning: This scale was measured by 23 items based on the McMaster Family Assessment Device (Wattananonsakul, Suttiwan & Iamsupasit, 2010). The scale assessed the whole family functioning with 6 domains including affective involvement, communication, affective response, problem solving, role, and behavioral control. The answer had a 4-point response scales ranging from 1 (strongly disagree) to 4 (strongly agree). A 24 - item scale for family functioning had $\alpha = .87$. The item scores were summed and a higher score meant a healthier family functioning.

Future orientation: The scale contains 12 items assessing future perspective based on Nurmi (1991 cited in Wattananonsakul & Tuicomepee, 2014). Each of the 12 items had a 4-point response scale ranging from 1 (very untrue of me) to 4 (very true of me). The reliability of the future orientation scale is .892. Summed score was interpreted for explaining higher score meant a higher future orientation.

Peer norms: The scale based on the theory of reason action (Fishbein & Ajzen, 1975). The measures the ability of teen students and juvenile delinquency group perceived peer influence or peer pressure. The scale consists of two constructs: motivation to

comply and normative belief. This 8-item scale for perceived peer norms had a reliability of $\alpha = .89$

Self-control: From the study of self-control (Wattananonsakul & Tuicomepee, 2014). The indicators of poor self-control were impatience, distractibility, and impulsiveness. The 12-item scale for poor self-control had reliability of $\alpha = .97$. Each item had a 4-point response ranging from 1 (very untrue of me) to 4 (very true of me). The summed score was used from 12 items so that a higher score of poor self-control means higher poor self-control. Wattananonsakul, Suttiwan, & Iamsupasit, 2010)

Data analysis

Descriptive statistics and correlations were computed for the demographic variables and variables in the framework model. Pearson's product moment correlation was used to test the relationship among variables: future orientation, family functioning, perceived peer norm, and poor self-control.

Results

The results show various significant relationship among variables as follows:

Late adolescent students: The late adolescent students are seen to have family functioning positively related to peer norms ($r=.677, p<.01$) and future orientation ($r=.619, p<.01$) but has negatively related to poor self-control ($r=-.770, p<.01$). The results showed that all variables were statistically significant.

Juvenile delinquency group: Poor self-control has a negative correlated to family functioning ($r= -.847, p<.01$), peer norms ($r= -.528, p<.01$), and future orientation ($r= -.653, p<.01$). The results showed that all variables were statistically significant. Correlation, means, and standard deviations of variables are presented in Table 1.

Table 1: Intercorrelations, means, and standard deviations for all study variables among late adolescent students and juvenile delinquency group.

Variables	1	2	3	4	<i>M</i>	<i>SD</i>
1. Family functioning	-	.677**	.619**	-.770**	65.41	7.34
2. Perceived peer norms	.657**	-	.477**	-.674**	32.86	4.0
3. Future orientation	.738**	.729**	-	-.755**	21.13	3.0
4. Poor self-control	-.847**	-.528**	-.653**	-	19.88	7.0
<i>M</i>	31.47	18.40	14.49	50.35		
<i>SD</i>	16.42	9.65	5.12	15.51		

** $p<.01$: correlations above diagonal are of late adolescent students. (n=200), below are of juvenile delinquency group. (n=200)

Conclusion

The study aimed to explore the relationship between variables such as family functioning, perceived peer norms, future orientation, and poor self-control among late adolescent student group and juvenile delinquency group. The data analyzed is developed from a sample of 400 people. Below is a summary of the results. The sample size used in this data analysis was 400, which was divided into 2 groups, the 200 late adolescent students, and the 200 juvenile delinquents. In this sample, the average age is 17 years. The three factor variables used in this study are future orientation, perceived peer norms, and family function positively linked to problematic behavior, having a correlation coefficients range between .47 to .84, with a statistical significance of .01, while poor self-control showing a negative relationship with other variables, and a statistical significance of .01. Wills and Filer (1996, cited in Wattananonsakul & Tuicomepee, 2014) proposed that self-control is seen as important for the deviant behavior since adolescents with high poor self-control experience high levels of emotional distress and hence tend to avoid facing problems rather than trying to cope with them. These characteristics contribute to the tendency to misbehave. However, adolescents with good self-control are able to control emotional state, use coping strategies to deal with their problems and have a planning approach, including conventional behavior (Wills, Sandy & Yeager, 2000 cited in Wattananonsakul & Tuicomepee, 2014)

Future orientation had positive relationship with family functioning and peer norm in both late adolescent group and juvenile delinquency group but had negative correlated with poor self-control that mean increasing the future orientation, perceived of family functioning and peer norm will decrease the likelihood of poor self-control in both sample groups. This finding supported by the Problem Behavior Theory (Jessor, 1993) The result also showed that perceived of peer norms is also important in adolescence period. There are similarity results found in this research. The peer norms correlated positively with family functioning and future orientation but had negative correlation with poor self-control. It can be explained that perceive peer norm is common phenomenon found in adolescence period and consistent with previous model of problem behavior.

Recommendation

1. The problems that caused problematic behaviors in adolescents and late adolescents making them commit crimes are poor self-control, future orientation, perceived peer norms and, family functioning. Therefore, people such as teachers who work with adolescents must be experienced and knowledgeable on these variables so that they can guide the adolescents effectively as well as offer information on training, promoting family institutions in order for adolescents to understand their roles, control themselves, and avoid getting influence by problematic behaviors and criminal activities.

2. The findings of this study should be implemented within the family and society levels to help institutionalize good behaviors and guide adolescents to adopt appropriate behavioral behaviors.
3. The follow-up studies should emphasize selected factors in order to deal with problem behaviors at the adolescence stage so that appropriate behavior can be promoted.
4. It is important to understand the factors influencing adolescent behavior so that parents and teachers can promote the appropriate behaviors.

It is important to note that the generalizability of findings of this study may be limited and cannot be used outside this area. Moreover, discretion is necessary when interpreting and using these results. In the future studies, it is critical to include model testing and development of programs deduced from this study in order to increase the efficacy of preventing future problematic behaviors. There is also need to emphasize the factors that influence adolescent's behaviors such as future orientation, development of cognition process, resistance to peer pressure, family functioning, and poor self-control.

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Teaching Biology Using Contextualized Learning Kit

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Abstract

This study determined the effect of the developed lessons in Biology using the Contextualized Learning Kit (CLK) for Grade 8 students. The features of the CLK are the following: (a) Flipped Classroom Mode of Delivery, (b) Student-friendly Contextualized Learning Kit, (c) 21st Century Skills Development, and (d) Highly Visual Instructional Material. A pretest-posttest quasi experimental design was employed wherein the two groups of respondents were purposively selected. Qualitative and quantitative methods were utilized in analyzing the results during the lesson implementation. Qualitative data were obtained from the students' journals, focus group discussion (FGD), and remarks on the observation sheets while data obtained from the pretest and posttest scores, level of acceptability, and attitude survey responses were analyzed quantitatively. Results show that students in the experimental group had a high level of acceptability of the CLK, scored higher in the post-test and had a more positive attitude in Biology than the comparison group.

Keywords: contextualized, flipped classroom, 21st century skills development, highly visual instructional material

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Introduction

Learners vary in the way they grasp the content of the lessons and this is where individual differences come in (Jonassen & Grabowski, 2012).¹ Being aware of the individual differences present among learners, educators and instructional designers will become more sensitive in the way they teach their lessons and design their instructional materials. Hence, if teachers utilize new methods and instructional materials in teaching inside the class, students will be less bored and instead more motivated to learn.

The study utilized the pretest-posttest quasi-experimental design to test the effect of the five developed lessons in Biology using the Contextualized Learning Kit (CLK) on the Grade 8 students' conceptual understanding, 21st century skills development, and their attitude towards Biology. The researcher included the four features of the developed lessons using the CLK: (1) flipped classroom mode of delivery. The teacher gave the CLK few days or a day before the lesson so that students will have time to read and have prior knowledge. In class, group activities were given and the teacher served as facilitator. Students helped each other, constructed ideas, and shared their opinions regarding the tasks. The teacher gave input or additional information so that students will achieve deeper understanding and provide guidance to avoid misconceptions of the concepts. This constructivist approach gave more chance and time for the students to construct their own ideas. This allowed the teacher to differentiate her instructional method from the usual traditional methods (i.e. lecture). (2) Contextualized Content. In contextualization of lessons, the researcher used local and familiar events, situations, and examples to tap students' prior knowledge to understand the lessons better. The researcher also presented the lesson in a conversational way through anecdotes and humorous examples. The language and sentence construction used were appropriate for the students' age. (3) Highly Visual Presentation. The researcher adapted related images and diagrams for students to understand the lessons well through highly visual presentation. (4) 21st Century Skills Development. The 21st century learning skills were defined as the ability to collect and/or retrieve information, organize and manage information, evaluate the quality, relevance, and usefulness of information, and generate accurate information using existing resources (Pacific Policy Research Center, 2010).² There are four C's (4C's) under the 21st century learning skills namely: communication, collaboration, critical thinking, and creativity.

The experimental group was composed of 37 students. Before and after the intervention, conceptual understanding test and attitude survey was given to this group. The treatment introduced were the five developed lessons in Biology using the CLK. Flipped classroom methodology was implemented in this group. In this case, the CLK was given to students few days before the discussion of the lessons. In that way, students will have prior knowledge regarding the new lesson. The class time was maximized to student-centered activities where the teacher served as a facilitator and

¹ Jonassen, D. H., & Grabowski, B. L. (2012). Handbook of individual differences, learning, and instruction. Routledge.

² Pacific Policy Research Center. (2010). 21st Century Skills for Students and Teachers. Retrieved from http://www.ksbe.edu/_assets/spi/pdfs/21_century_skills_full.pdf

gave input after class activities to deepen students' knowledge. The 21st century skills or which is also known as 4Cs were integrated in class activities. The comparison group was observed in a natural classroom setting where the teacher referred to the teacher's guide for grade 8 Biology and students used their learner's module. This group was composed 30 students. Conceptual understanding test and attitude survey was also given before and after the teacher taught the five lessons in Biology. Both groups were observed by the researcher and two Science teachers.

Conclusion

The developed lessons in Biology were: Lesson 1- Explain ingestion, absorption, assimilation, and excretion, Lesson 2- Explain how diseases of the digestive system are prevented, detected, and treated, Lesson 3- Identify healthful practices that affect the digestive system, Lesson 4- Describe the transfer of energy through the trophic levels, and Lesson 5- Analyze the roles of organisms in the cycling of materials. The Level of Acceptability of the CLK has an overall weighted mean of 4.05 which is interpreted as positive. Conceptual Understanding of Biology concepts was enhanced in the experimental group than the comparison group. Figure 1 shows the comparison of the two groups.

Groups	Tests	Mean	p-value	Significant Level	Effect Size	Descriptive Interpretation
					d	
Experimental	Pre-test	22.03	0.00	Highly Significant	1.74	Huge Effect
	Post-test	33.16				
Comparison	Pre-test	20.57	0.15	Not Significant	0.19	Small Effect
	Post-test	21.37				

Figure 1. Comparison of the effect in the Conceptual Understanding Test of two groups

The 21st Century Skills namely: communication, collaboration, critical thinking, and creativity had ratings that generally fall between excellent (4) and good (3). The results of the Attitude towards Biology had a positive rating in the experimental group than the comparison group. Figure 2 shows the comparison of the two groups.

Groups	Tests	Mean	p-value	Significant Level	Effect Size	Descriptive Interpretation
					d	
Experimental	Pre-test	3.31	0.00	Highly Significant	1.14	Very Large Effect
	Post-test	3.69				
Comparison	Pre-test	3.23	0.02	Significant	0.42	Moderate Effect
	Post-test	3.31				

Figure 2. Comparison of the effect in the Attitude of two groups towards Biology

The students learn more if the presentation of instructional materials is easy to read and understand. Hands-on and minds-on activities improved the retention of the concepts. Having colorful pictures and diagrams in reading material made it more attractive and motivating to read. It helps students to visualize what they are reading. The CLK is a helpful tool not just for teachers but also for students. Through this tool, the teaching and delivery of the lesson was made fun and easy for both teachers and students.

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Keeping Tabs on Reading: Comparing Reading Comprehension Scores of E-Text Readers and Physical Text Readers in Senior High School

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Abstract

Technology plays a powerful role in the field of education (South, 2017), and with digital integration inside the classroom, scholars debated in the use of these e-texts since issues regarding reading comprehension surfaced as researchers tried to tackle new forms of digital learning (Moran et al., 2008). This research aims to compare the pre-and post reading comprehension scores of e-text students and physical text students to find out if there was a significant difference in reading comprehension after the intervention. Alongside obtaining their perceptions towards the use of e-text, this study tackled test cognition levels to determine the development of thinking skills in the students. Pre-and post-reading comprehension exams were administered to two eleventh-grade classes, and were analyzed in order to determine whether the results could be significant. The researchers' two-tailed T-Test yielded a result of 0.0184 which was deemed significant. For the e-text users, their pre-and post-tests revealed a result of 0.2879 which was not significant. The researchers also tried to address the question of the lower thinking skills (LOTS) and higher thinking skills (HOTS) items in the test: for the physical text group, 65% of the lower cognition items exhibited more correct answers while the higher cognition items showed a 75% increase. The e-text group obtained only a 23% and 50% increase, respectively. This study may contribute to this growing field in Philippine education by providing insights on student reading comprehension skills, higher-order thinking capabilities, and student satisfaction about the use of tablets in reading.

Keywords: E-Learning, Digital Learning, Educational technology, Reading comprehension

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Introduction

Technology played a powerful role in the field of education (South, 2017). Its ability to rethink the age-old processes of teacher-student relationships, teaching methodologies, and learning and collaboration created an exciting atmosphere, not only for students, but also for the stakeholders of education. However, in the same vein of most technological advancements, what possessed great potential for progress may also bear grim consequences that can further worsen the existing challenges the pedagogy currently faces, especially, in literacy (Biancarosa & Griffiths, 2012).

Thus, this inevitable call of digital learning and progress posed a challenge for teachers on how to integrate this digital tool into their methods to promote student learning and not to exacerbate the difficulties of the students. With the emergence of this concept of digital learning, varied researchers dedicated their attention into the different forms that digital learning can appear in (Moran, Ferdig, Pearson, Wardrop, & Blomeyer Jr., 2008).

One of these forms took the shape of E-Books or E-Texts. Back in 2010, there was a surge in E-Book sales, indicating that the public's appreciation of digital reading and browsing reached new levels (Doering, Pereira, & Kuechler, 2012). Even a good number of libraries are slowly transitioning into a digital environment where they used e-books and e-texts to promote motivation for reading (Doiron, 2011).

However, varied scholars continue to debate the issue of using e-texts versus traditional texts. Aside from problems with eye strains and other health issues (Waller, 2013), Reid (2016) posited that if children are not able to fully interact with e-texts, or were not exposed to these technologies early, they would not only have a hard time comprehending the text, but that, the gap which they faced between reading and understanding might be permanently closed. This suggested that if the student interacted with the e-text in a detrimental manner such as accessing distracting apps and programs, this will severely affect the way they comprehend the e-text. Thus, due to these and other disadvantages, many of seasoned faculty as well as other teachers advocated for traditional reading. Its ease of use as well as access not requiring electricity or the internet made it a core aspect of every reader.

Henceforth, a question is raised: does the use of e-texts versus traditional texts have an impact on a students' ability to comprehend texts?

To sum it up, the different technological advancements gave digital learning new roles in the field of education. It challenged teachers to integrate technology into their methodologies. However, an important query surfaced which was to figure out whether these different technologies can affect the students, especially, in their own literacy as readers.

There were limitations for this study. The first one is that teacher strategies and teaching styles were not considered as academic freedom is respected for these faculty members. Secondly, the small sample amount was since a good number of parents did not permit their children to join the research, and the researchers had to respect their choices. Thirdly, the change in one of the teachers assigned to one of the classes due to them leaving the school was also found as a limitation which was hard

to control for the researchers; however, they made sure to orient and inform the new teacher on the protocol and the research to assure consistency.

Review of Related Literature

In the study conducted by Biranvand and Khasseh (2014), students exposed to e-books reported an increase in their academic progress and performance. In the same study, the researchers further tested the students' perceptions on the variety provided by electronic materials, and they positively responded. Similarly, Reid's (2016) study found out that not only did the use of e-books or e-texts increase student engagement with the text, it also increased their reading comprehension assessments. Majority of the students yielded improved scores as compared to their pre-intervention results. As such, the researcher was able to suggest that the use of these electronic texts can be an opportunity for literacy development. Both Bickel (2017) and Reid (2016) cited better acquisition of reading strategies among the students when they were using e-books. As Bickel (2017) stated, the different features available on the devices can be used by the student to aid their reading. For example, when one double-taps on a certain passage or word, the device highlights the selected line which can increase student attention to detail on the text.

From a perspective, three factors contributed to a so-called increase in reading comprehension scores: increased student engagement in reading, higher variety of materials, and additional reading strategies employable by students.

However, other studies yielded different results. A study done by Jeong (2010) resulted in lower quiz scores when the students used of e-texts as compared to those when they were working with traditional texts. While the students worked with the physical texts, they obtained a mean score of 86.33, and they used the electronic texts, it yielded up to a mean of 82.94. To explain this, Jeong (2010) mentioned that these results may have been influenced by the screen's resolution size of the e-texts as well as the students' extensive handlings of a physical book. Then again, with Waller's (2013) idea of eye fatigue, this could also be a factor of lowered scores. Jeong's (2010) study brought up the data of eye fatigue, and the study found out that students experienced heavier eye fatigue when they made use of e-texts (3.04 Hz) as compared to those who dealt with physical texts (1.63 Hz). In most cases, eye fatigues are known to cause overall tiredness to the body (which may reduce capacity to fully understand texts) as well as general nervousness or even anxiety. In Bickel's (2017) study, she also found out that there was no significant difference between the scores of the e-text group and the traditional text group. One of the explanations she offered was that the devices used could have given distractions to the students, affecting their ability to comprehend the given texts.

Overall, it can also be viewed that e-texts can provided less benefits, or that they had no significant difference in terms of effects on reading comprehension due to three factors: device technicalities and distractions, students' being more used to physical books, and eye fatigue.

Given these views, the researchers tried to bring in two perspectives: that e-texts can provide significant advantages to a student's reading comprehension, and that e-texts have no bearing or significance in improving student comprehension. The studies

presented here have all dealt with either collegiate learners or elementary learners. Furthermore, the research being done into digital learning in the Philippine context is quite a new field, and as such, there is a need to contextualize these kinds of researches to get a clearer picture of how technology affects Filipino students.

This study may provide new insights as to how reading teachers can utilize the use of e-books and traditional texts in their Senior High School classrooms based on the preliminary results of how selected senior high school Filipino students' reading comprehension of a text.

Gaps and Opportunities for Research

Exclusivity in the use of E-Text and Physical Text

Most of the studies cited herein worked on the methodology of allowing both their sample groups to make use of both e-texts and physical texts. What this means is that all their participants experienced reading the given texts through a gadget and a book before they were assessed. As stated in Bickel's (2017) study, she stated in her suggested researches that it would be advisable for future studies to have two groups (one control and one experimental) which would exclusively use either e-texts or physical texts. Even in the studies conducted by Jeong (2010) and Reid (2016), they made their participants make use of both forms of text. While this is a valid way of conducting experiments, this might shy away from being able to make more concrete and robust conclusions since there might be a difficulty in attributing the reading comprehension scores to either the presence of e-texts or physical texts.

Thus, this study will have two groups where one class (the control group) will exclusively use physical texts during the research's duration. By doing this, the researcher will be able to see how the scores garnered by the students in the assessment would be attributed to the given forms of the text, whether electronic or physical. On this end, this research would not test whether there was a significant increase in the students' reading comprehension after being exposed to both electronic and physical texts (which were one of the focuses of previous studies), but it would look more into a comparison of scores between students who exclusively use e-texts and students who exclusively make use of physical texts.

This may open discussions regarding testing score and whether exclusive use of e-texts or physical texts has an impact on student reading comprehension skills.

Focus on item analysis towards understanding of levels of cognition

Researches done in this field of e-text versus physical texts placed various focus on reading comprehension and vocabulary development. Examples of this trend of growing focus on reading comprehension was found in Jeong's (2010), Reid's (2016), and Bickel's (2017) studies. However, more than just assessing reading comprehension, it was interesting to note that there were studies which paved a connection between technology use and acquisition of Higher Order Thinking Skills (HOTS).

This study was done by Hopson, Simms, and Knezek (2001) where they studied students who were immersed in a technology-dominated classroom and students in a traditional classroom. From their results, they posited that, while the change is minimal, there is still a significant increase in the HOTS scores attained by the technology-immersed students in the areas of synthesis, analysis, and evaluation.

Thus, it was interesting to focus on the issue of e-texts and physical texts not just on scores, but also in the possible acquisition of HOTS within Senior High Students. Comprehension exams such as the ones in informal reading inventories (IRI) and standardized tests often possessed different purposes when it comes to items. Some items were designed to only test knowledge levels while others challenge students' ability to think higher. For example, in the IRI developed by Burns and Roe (2011), the items found in their IRI were often categorized such as ones designed for making inferences, detailing cause and effects, and something as basic as sequencing events.

One way to interpret on this is through this scenario: if the physical text group obtained more items belonging to the lower-order thinking skills (LOTS) while they garnered lower results in the HOTS items, then, it would be possible to have constructed the idea that those who made use of physical texts would more likely be better at LOTS, but they might have a harder time developing their HOTS.

Overall, this study will be capitalizing on two possible research gaps where a group will solely use either e-text or physical text instead of being exposed to both; and the focus on item analysis on the development of LOTS and HOTS in students.

Methodology

Research Questions

The study aimed to answer the following questions:

- a. Was there a significant difference between the pre-and post reading comprehension scores of the “e-text group” and the “physical text group?”
- b. What are the perceptions of Senior High Students when it comes to reading e-texts versus physical texts?
- c. How does the use of either e-text or physical text affect student development of lower order thinking skills and higher order thinking skills?

Procedures

Two HUMSS Reading and Writing classes were used for this study. In each class, there were thirty students. One class made use of physical texts as their reading material throughout the entire duration of the experiment. This was the control group. The experimental group was made up of the second HUMSS class which only used e-texts during the intervention.

At the beginning of the intervention, a pre-test was administered to the experiment and control groups. This test was taken from Fan's (2009) study where he pilot-tested this material before implementing it in his own experiment. After the duration of the experiment, the researcher administered the post-test to the students and the scores were collated and averaged. A T-Test was also employed to effectively analyze the data.

To answer the second research question, this study made use of Jeong's (2010) Feedback Questionnaire to obtain selected students' perceptions regarding the use of tablets versus books through a structured interview. The selected students were given consent forms to make sure that they are willing to be interviewed. If below eighteen (18) years of age, the students were required to present the consent form to their parents. Ethical considerations in using human samples in a research study were observed.

The third research question was answered via item analysis on the students' exam results. Since each item has been assigned a specific category as either a LOTS or a HOTS, then, the researcher gathered how many student in each group were able to get more LOTS items than HOTS items, and vice versa. For example, if the physical text group had a higher average in terms of getting the correct answers on the HOTS items as compared to the e-text group, then, it was possible to draw conclusions on how the use of physical texts can better develop HOTS in students against exclusive e-text users.

Measurement Outcomes

Fan's (2009) Reading Comprehension Exam. This exam was administered before and after the intervention to test the students' comprehension abilities. It was a fifty-item (50) test with assigned texts which the students read, and then, they answered the given questions. This exam was administered for an hour. The researcher marked the tests, and scores were tabulated. Once the pre-and post-tests are accomplished, the researcher obtained the average of the scores for comparison.

Simple T-Test. Once the pre-and post-test averages were obtained, the data were submitted for a T-Test. If the result is less than the level of significance ($0.05 > x$), then, the researchers may be able to state that there is a significant difference in the scores obtained by the students in the pre and post-tests.

Jeong's (2010) Feedback Questionnaire. This feedback questionnaire was used in an interview with selected students to gather their perceptions on the use of tablets versus physical texts. This allowed for a more qualitative data which was used to make connections and analyses between student perceptions and scores obtained in the Reading Comprehension Exams.

Analysis of Means. After the item analysis and counting of frequencies of correct LOTS and HOTS items, the researchers obtained the mean scores from the post administration of the materials. Afterwards, the researchers compared these means to deduce which usage of text form yielded higher results in LOTS and HOTS. The different means were tabulated and compared for analysis and interpretation as well as possible conclusions.

Results & Discussion

Research Question 1: *Was there a significant difference between the pre-and post reading comprehension scores of the e-text and the physical text groups?*

Table 1.0. Results of the Pre-and Post Test of the Physical Text Group

Physical Text Students	Pre-Test (35 items)	Post Test (35 items)
S1	15	27
S2	26	31
S3	16	29
S4	9	30
S5	18	26
S6	29	22
S7	16	26
S8	9	18
S9	29	18
S10	14	31
Mean	18.1	25.8

Table 1.0: Pre-and post-test results of the physical text students' reading comprehension after the intervention.

In order to answer the first research question, the researchers focused first on the pre-and post-test results of the Physical Text Group (PTG). To determine whether the results were significant, the researchers performed a two-tailed T-test.

Upon performing the T-test, the researchers obtained the p-value of 0.0368 with a Level of Significance of 0.05. As such, upon comparison with the values, the p-value is less than the Level of Significance which may have allowed the researchers to determine that the results of the pre and post-test in the PTG was statistically significant since there may be too little a percentage to determine that the results happened by chance.

On the other hand, upon testing the E-Text Group (ETG), the findings were different.

Table 1.1. Results of the Pre-and Post-Test of the ETG

E-Text Group	Pre-Test (35 items)	Post Test (35 items)
S1	30	27
S2	21	4
S3	30	29
S4	27	30
S5	25	29
S6	28	28
S7	27	22
S8	22	26
S9	31	28
S10	31	27
Mean	27.2	25

Table 1.1: Pre-and post-test results of the e-text students' reading comprehension after the intervention.

Upon performing the T-test, the researchers obtained the p-value of 0.2879 with a Level of Significance of 0.05. As such, upon comparison with the values, the p-value is more than the Level of Significance which may have enabled the researchers to determine that the results of the pre and post-test in the PTG was statistically insignificant.

Thus, in the first research question, the researchers may be able to posit that there was a remarkable improvement in the scores garnered by the students in the PTG group as seen by the increase of the group mean from 18.1 to 25.8. This is supported by Ross et al's (2017) study wherein they cited numerous researches which showed that students who made use of physical texts garnered higher scores in comprehension exams due to a so-called easier recalling of information when it is written on print. They also discussed how some studies found out that unlike e-texts where students tended to read in F-patterns or just skimming and scanning, students were more likely to engage with the printed text, resulting in higher comprehension.

However, the opposite may be seen in the ETG results. The presented decrease of the group mean from 27.2 to 25 may have given the notion of a dwindling performance from the ETG students. However, upon looking at it statistically, the decrease may not be called as significant since its T-test exceeds 0.05.

But, looking at the result from another perspective, the reduction in student scores may be attributed to what Jeong (2010) and Ross et al (2017) mentioned about screen factors and eye fatigue. In their studies, they discussed how these factors play into reducing student comprehension since it negatively impacts their consistency in retrieving information since as Ross et al (2017) cited, they just tended to skim and scan when using e-texts.

Thus, to answer the first research question, the improvements manifested by the students in the PTG are statistically significant; however, the reductions in the students' scores in the ETG group are not statistically significant.

Research Question 2: What were the perceptions of Senior High Students when it comes to reading e-texts versus physical texts?

To answer this question, the researchers decided to analyze the student interviews via a thematic analysis which focuses on three major themes: (a) satisfaction, (b) usefulness, and (c) behavioral.

For Satisfaction, it is defined as the e-text's capability as a learning tool alongside its colors and functions. According to the interviews, the respondents agreed that the portability of e-texts was one of the greatest reasons why they are satisfied with it. They claimed that since they could bring their gadgets almost everywhere, it was a good tool for them if they wanted to read something. There is also a notion that using e-texts may be able to help save paper as well as the added flexibility coming from the variety of functions that an e-text can have.

However, when it came to the theme of Usefulness, which is defined as perceptions regarding the e-text's font sizes, ease of use, interface, and clarity of the reading

screen, the students' response became more varied and divided. While some respondents believed that reading through e-texts may be better due to the ability to zoom in and out or to smoothly scroll up and down, most the responses boiled down to the notion that information is harder to comprehend due to smaller font sizes (which would have to require them to zoom in or out) and a more difficult time to cross-reference information in the text. Thus, what they preferred was a physical text or book as a main tool in their hands, and when they plan to cross-reference information, that is when they would turn to technology. Thus, while the students agreed that scrolling through and zooming in the e-text is convenient, they still preferred to use physical texts as it is easier for them to cross-reference information.

Lastly, for Behavioral which pertains to the possibility of the respondent's willingness to increase use of e-texts in the future, the general answer was that it mainly depends on the situation. While the respondents stated that they would most likely use electronic texts in the future due to its ability to its portability and ease of use, the participants made a note that their choice for using it would be influenced by the subject in school (whether or not it requires e-texts), but they would still also keep using physical texts due to familiarity and the ability to easily compare ideas.

Thus, to answer the second research question, the perceptions of students regarding the usage of e-text was that they will most likely use e-texts in the future as a learning assisted tool, but their usage of such a tool would depend on the academic subject at hand since their familiarity with physical texts allowed them to have an easier time in comparing and cross-referencing data.

Research Question 3: *How does the use of either physical text or e-text affect student development of lower and higher order thinking skills?*

To answer this question, the researchers considered the Frequency of Correct Responses (FCR) of the students in each item, and then, they cross-analyzed it with the revised Bloom's Taxonomy of Anderson and Krathwohl to determine whether or not there was a change in the cognitive attainment of each student.

Table 2.0. FCR Results of the Cognition Levels for PTG

Physical Text	Total Items	Number of Items with Increased Responses	Number of Items with Correct Responses	Number of Items with Decreased Responses	Number of Items with Correct Responses	Number of Items with Retained Responses	Number of Items with Correct Responses
Remembering	15	10		5		0	
Understanding	16	10		3		3	
Analysis	4	3		1		0	

Table 2.0: The FCR of the cognition level of the items which showed changes in value of the number of correct responses for each item. This is for the Physical Text Group.

For the items which were categorized under the Remembering level, 66% of the items obtained an increased correct response frequency. A possible interpretation for this could be that the students who were immersed in an academic environment of purely

physical texts exhibited an increase in their competency in reading comprehension when it came to remembering or enumerating details from the text. This is like the Understanding level which presented 63% of the items obtaining an increase in correct responses.

With this, it may be possible to suggest that the students' competency in understanding and explaining concepts were also increased. Lastly, the physical text group also exhibited an increase in correct responses in 75% of the items in the Analysis level of cognition. This could mean that the ability of students in the PTG to analyze parts of a whole were also increased in the intervention.

Table 2.1. FCR Results of the Cognition Levels for ETG

TECH	Total Items	Number of Items with Increased Correct Responses	Number of Items with Decreased Correct Responses	Number of Items with Retained Correct Responses
Remembering	15	2	10	3
Understanding	16	5	8	3
Analysis	4	2	1	1

Table 2.1: The FCR of the cognition level of the items which showed the movement of the values of correct responses for each item. This is for the E-text group.

As presented, most the Remembering level items (65% of the items) had a decrease in correct responses. The same bore a similar case for Understanding, yielding a result of 50% of its items having a reduced number of correct responses after the intervention. However, the Analysis items had 50% of its composition see an increase in its correct responses.

In total, for the PTG, out of 35 items, 66% of its composition obtained an increased number of correct responses. Connecting this with the first research question, the significant difference in the improvement of the students' cognition levels paved signs to the effects of a physical text-centered environment wherein, since according to the second research question, their familiarity with physical texts may have been maximized. The same may not be applicable to the ETG since 54% of its items had a reduced number of correct responses.

It may be plausible to assume that the lack of familiarity as well as factors of eye fatigue or strain as cited in Jeong's (2010) study may have led to this reduction in performance. Furthermore, while the results of the t-test of the ETG may not have been significant, the issues raised by the students in the interviews such as their perception towards the e-text being more on portability rather than academic function could have attributed to this result with the level of cognition.

As stated in Edward's (2016) study, technology's function was not to start these thinking skills, but to build upon them. Additionally, she posited that the concern with technology and students is on how the students would focus on using technology

to “get things done”, not to “do it efficiently”. This statement may support the researchers’ findings wherein the students would tend to focus more on the satisfaction of portability rather than academic functionality.

Thus, to answer the third research question: the PTG may have exhibited increased levels of cognition due to the concept of familiarity with physical texts which could have allowed them to foster these cognition levels after the intervention.

On other hand, for the ETG, it may be plausible to assume that reduction in cognition levels for most the items was due to their perception of technology as a portable object to “get things done”.

Although, the researchers would like to point out that, as cited in Edward’s (2016) study, the teacher’s ability to cultivate these thinking skills in the students was still paramount to the development of appropriate cognition levels.

Conclusions

To conclude, the researchers may have found that the PTG demonstrated more improvement in terms of reading comprehension scores and cognition levels after the intervention, as evidenced by the pre and post-test results. While the ETG may have shown a reduction in performance as well as in cognition, it should be noted that the T-test results for this group was deemed to be not significant.

The interviews may have given light to the notion that while students find technology as a satisfying portable tool to “get things done”, the idea of familiarity and being able to cross-reference information easily gave the students enough to reason to still believe in the use of physical texts over e-texts, especially when the subject does not call for the use of such electronic devices.

All in all, the development of reading comprehension skills as well as LOTS and HOTS could still be dependent on the teacher. A teacher who is comfortable with electronic texts may still perform better at developing the necessary skills in his or her students as compared to a teacher who used physical texts but cannot make an academically-stimulating environment.

For future researches, this study may be able to pave new understandings when it comes to the Philippine context of digital learning, specifically, in students’ literacy development. The researchers suggest that future studies focus on educational technology and the higher order thinking skills of evaluation and synthesis. They may also choose to tackle affective levels of learning to see whether technology can affect the perspective or feelings of a student towards in learning. It may also be beneficial to compare how technology and teaching strategies connect to help students in developing the necessary skills for reading and cognition.

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Data, Data, Data – What Does Management Want and Need to See?

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Abstract

Data is important and use of learning analytics is a major near-term trend (Educause, 2019). What data does administration need and want to see? How can you build data dashboards that have solid source data and are feasible to update on a routine basis while delivering value to management? This paper summarizes how the University of Virginia (UVA) analyzed iterations of reports to identify accurate data with high value for management review.

Keywords: Data, Reporting, Business Intelligence, Online Learning, Return on Investment (ROI), Management

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Introduction

Over the past 30 years, distance education programs have evolved from courses with their online component being discussion forum postings to online programs designed to enable students to engage with content, peers, and instructors in digital spaces (Powell, Watson, Staley, Patrick, Horn, Fetzer, & Verma, 2015). In parallel, our society is in a period of digital transformation with rapid development of new technologies, widespread adoption of technologies and growing digital communities (McGowan, 2019). According to futurist Heather McGowan, the top three most populated spaces are China, India and Facebook (McGowan, 2019). As society engages with technologies and inhabits digital spaces, there have been increased enrollments and programs offered online (J. E. Seaman, Allen, & J. Seaman, 2018). As more online programs become available, there is more competition (Garrett, 2019) and interest from management to understand operational factors such as ROI and profit margins.

Traditionally, non-profit public higher education institutions have focused on teaching, learning, and providing access to education. Alternatively, for-profit, private higher education institutions tend to have an increased awareness of the business of higher education. For-profit universities operate their institutions in mainly a top-down model where management determines the direction of the business and makes most if not all of the executive decisions (Hollands, 2017). Typically, these decisions are informed by data and evaluated based on return on investment (ROI) and risk (Hollands, 2017). At the non-profit, public higher education institution in this paper, decisions are often made bottom-up. Faculty work with students, peers and then deans to develop new programs or explore different tools or modalities for content delivery and learner engagement. For efforts that developed locally but then grow across the institution there is an interest from management to have insight on facets such as quality, student satisfaction, learner outcomes, and ROI.

At the University of Virginia (UVA), efforts in distance learning and online learning have been focused on the quality of teaching and learning and providing access to education. Online learning programs have been developed at a school level by deans rather than at a central level by the Provost or President. According to the Facts and Figures section of the UVA website, there are twelve schools at UVA, approximately 20,000 students and 16,000 faculty and staff. The annual operating budget including the UVA Medical Center is \$3 billion dollars (University of Virginia, 2018).

Some schools, such as Engineering and Education, have been active in online learning for decades. At each school, faculty or staff report to their dean the progress of online courses, certificates and degrees. Reported metrics may be based on quality rubrics such as those developed by Quality Matters (QM) and the Online Learning Consortium (OLC). Other common measures are evaluation of the Community of Inquiry (CoI) components: teacher presence, cognitive presence, and social presence (Garrison, 2000). Historically, what has been tracked is the quality of teaching, learning, and the student experience and not ROI.

A decentralized approach to distance education and online learning has been successful for UVA. Schools that see strategic value in offering their courses online have been able to define, build and run programs within their domain. As more schools begin to offer online learning programs, there has been an interest from the

central administration to understand how to run these programs so they are successful and sustainable. Central administration is keenly interested in how to reduce redundancies and improve overall operational efficiency while enhancing student and faculty support. Another area of interest is how to produce a quarterly report for executive management that summarizes key metrics for status for all online programs in the university.

To address operational efficiency, a working group for the Teaching and Learning with Technologies committee was tasked with auditing resources for online learning. The intent was to get an understanding of the scope of resources and potential redundancies. This working group identified maker spaces, video and sound studios, equipment and staff across the University that supported online and hybrid classes. The working group report provided insight into the resources across the University and identified that resources were more fully utilized if they had full-time, dedicated staff to support the faculty and students (Palmer, 2019). The report identified areas to further investigate such as additional full-time staffing for central resources and tools that help faculty and students find resources to support their work.

To address centralized reporting, the Online Learning Committee worked to aggregate online learning metrics across the University. Reports varied widely from data intensive spreadsheets to graphic intensive and high-level. For example, reports used for accreditation had detail on the degree level, degree title, program name and CIP code. Reports within schools had information such as degrees, certificates, endorsements/licensure, percentage of faculty teaching online, number of students in online courses, number of students for specific semesters, number of online sections offered and average age of online student. Reports within schools that were broader than just online learning also included student and faculty stories. Reports within schools were aggregated and reviewed to create institutional reports in partnership with the central communications and public relations departments. These aggregated reports included beautiful graphics and bold numbers which outlined economic impact, ratings, and budgets (Figure 1).



Figure 1: A sample institutional report.

After different reports were reviewed, a list of potential metrics to track was articulated and shared with stakeholders. This list of possible metrics included data

such as enrollment growth, student completion, number of schools, number of degree programs, number of faculty, and revenue. The list of measures included student retention, graduation rates, faculty training and post-graduation employment (Figure 2).

Measures: Student achievement of program objectives, student retention and graduation rates, faculty credentials, faculty training, program reputation, student engagement measures, post-graduation placement/employment
 Metrics: Enrollment growth, student completion, quality enhancements of online programs, and revenue generation

Possible Metrics (note are any of these automated?):
 # schools
 # degree programs
 # certificate programs
 # online courses
 # faculty
 # students in online courses
 % male, female
 # states and countries reached
 # MOOCs
 # MOOC Enrollments
 # MOOC revenue
 % Mobile
 # Courses Approved
 # Courses in Development
 # Partners (NovoEd, Coursera, Noodle Partners, etc)

Possible Stories:
 Residential student
 Presidential Precinct/Coursera
 Executive Education
 UVA Residential Students
 Transfer Students
 Alumni

News?:
 Would it be of value and would we want to communicate something that was in the news? An example might be the IHE article on business schools moving online or the NMC Horizon Report summary.

Figure 2: A first pass at measures and metrics to track for online learning.

Feedback from this list lead to a concise data set to report on each quarter. A concern at this point was the lack of a single centralized data infrastructure for online learner data. Systems such as the Student Integration System (SIS) has information on instructional modality, but there has not been a consistent standard across the institution for using this field to indicate if a course is online, hybrid, or technology-enabled. The report needed to clearly indicate the data source as well as how and when this data would be updated. For example, the number of students taking at least one online course and students taking online courses during the summer would be reported out annually and the Institutional Assessment and Studies (IAS) team would be the data source. The current version of the metrics report cites data sources in footnotes (Figure 3).

ONLINE@UVA
 University of Virginia is a leader in public higher education offering dozens of online degrees and certificates to learners around the world.

Executive Summary

- # Degree programs
- # Certificate programs
- # Courses
- # MOOCs
- # Million MOOC Learners
- \$ # Million MOOC Revenue
- # MOOC Outreach Scholarships
- # Specializations
- # Students taking at least one online course¹
- # Students taking only online courses¹
- # Students taking online courses during summer¹
- Partnerships and Platforms: XYZ
- In development²:
 - Certificates and Degrees ABC
- [Learning Online Website](#) links to all online programs

Architecture
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

Batten
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

College
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

Curry
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

Darden
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

DSI
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

McIntire
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

Medicine
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

Nursing
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

SCPS
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

SEAS
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

Wise
 # degrees
 # certificates
 # Students taking only online courses
 # Students taking at least one online class

1. Student data is pulled from the Institutional Assessment and Studies (IAS) team and represent the 2017-2018 Academic Year.
 2. Development list based on SCHEV approval processes tracking.

Figure 3: A current report template looking at online learning across UVA.

Conclusion

As society continues through a digital transformation, so does education. As more programs are moved online, there is more competition (Garrett, 2019) between programs. Due to increased completion, more managerial insight is desired to ensure high-quality programs are developed to be successful and sustainable. At UVA, online programs have been developed within schools and there has been little centralized reporting. To develop an accurate report that represents online learning efforts across the institution, a few committees and working groups coordinated efforts to build a metrics report. This paper has described the iterations of the report and the primary stakeholders engaged for the development. At the time of this paper, we are waiting feedback on the report format and anticipate providing this report to management quarterly. The University continues to coordinate resources and promote open communication across domains while tracking programs to support successful and sustainable online programs.

For other institutions that have similar reporting goals, it is recommended to identify stakeholders across the University, collaborate to identify which metrics to track, and clearly state data sources in footnotes on reports.

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Building an E-Profiling System for Technical and Vocational Education and Training (TVET) in Malaysia

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Abstract

The study in Technical and Vocational Education and Training (TVET) has been progressively improving for the past decade supporting all possible market trade in supply and demand for workforce management. In the era of industrial revolutionary, most of the things are connected and administered by big data computational edge technology. The challenge is on how to manage the expansion of data within the workforce of TVET to meet the demand of skilled industrial workers with the right competencies. This study is deliberating on the big data growth of TVET instructors in Malaysia. TVET instructors in this country have distinct characteristics and governed by different background of ministries performing diverse policies including Ministry of Education (KPM), Ministry of Human Resources (MoHR), Ministry of Rural and Regional Development (KKLW), and to name a few. On contrary, they deliver one major similar task in providing technical training and skilled workforce career advancement. This research is to highlight on the use of eProfiling as the portal of TVET instructors as well as to study on the effectiveness of this system throughout the ministries involved in this project. The methodology used in this research includes the frequency study and partial least square (PLS) modeling for the effectiveness of the portal to its users. The eProfiling portal was built with subtlety and tangibility producing comprehensive technical instructors' profiles in this country. The number of profiles keeps growing in accordance to the growth of industrial sectors within the country's occupational framework and trade analysis.

Keywords: TVET, Technical Instructor, E-profiling

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Introduction

A centralized database development particularly for an administration of trainers' profiling and big data management is a project meant to gather the basic information of TVET trainers and instructors including their competency levels, academic qualifications, access of instruction, job assignments, instructor's mobility, pedagogical and self-assessment management for each of the ability checklist. This is with the aim to identify the level of competencies, training pathway planning and preparation, and effective career and expertise development for the personnel. Therefore, since year 2016, eProfiling system development for ability checklist in relevant trade areas has been initiated. The link for this purpose was assigned at <https://eprofiling.ciaast.gov.my>.

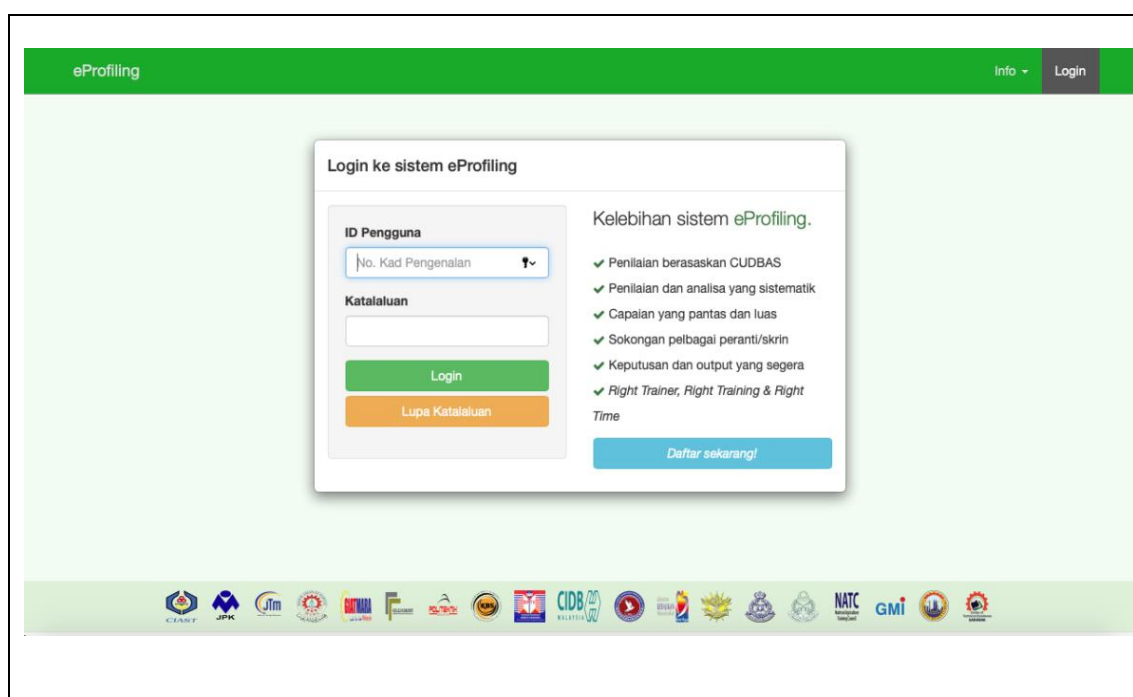


Figure 1. The user interface of the E-Profiling System.

Similar profiling system available include consumer profiling systems (Eldering, 2001) and student profiling system to most higher learning institutions (Tzouveli, et. al., 2008). The same principle goes to profiling systems in bigger application scale such as the airlines users (DeGrave, 2004), the world wide web users (LeMole, 1999) and in healthcare area (Abbas, et. al., 2015).

This project was initiated in year 2010 when Curriculum Development Based on Vocational Ability Structure (CUDBAS) was introduced in collaboration between Ministry of Human Resources Malaysia (MoHR) with Japan International Cooperation Agency (JICA). Later, in the Tenth (10th) Malaysian Plan, the Department of Skills Development had started to manage the implementation of Public and Private skills training rigorously in Malaysia, hence in need for Training Need Analysis (TNA) and a data platform that records on the details of technical instructors (EPU, 2010). Consequently, in Eleventh (11th) Malaysian Plan, under the Strategy of Human Capital Development Empowerment Towards Developed Nation, incentives on E-Profiling system had started (EPU, 2015).

This E-Profiling system was built and governed by one of the renowned TVET institution in Malaysia known as Centre for Instructor and Advanced Skill Training (CIAST). CIAST has her unique historical timeline from her establishment under the Japanese government from 1983 until 1991 and had taken over by Ministry of Human Resources Malaysia from 1991 until today. This institution is a leading institution in the area of Capacity Building and Train-of-Trainers.

With vast training institutions and high volume of training providers, it is crucial to administer and register the details of the trainers to a centralised system. This is what the initiative that has taken by CIAST. Having more than 18 agencies to participate in this system to date and to target for about more 30,000 registered instructors by the year 2020 (EPU, 2015). It is certainly contributing to the big data of the instructors and require meticulous management on the system. Hence, continuous research should also complement it.

Hence, this project has been planned, designed, developed and tested on its feasibility to the need of a centralized system of the technical and vocational instructors' registration, their expertise and their training experiences to be shared and enhanced for the national agenda and human capital development.

In fact, the E-Profiling was built with the aim to be the data centre for TVET Instructors in Malaysia particularly in the details of qualifications and expertise and with the objectives of:

- i. Coordinating Ability Checklist Development in TVET.
- ii. Developing and Training Platform for Trainers' Ability Checklist.
- iii. Building an E-Profiling System.
- iv. Developing A Database Platform for TVET Trainers.
- v. Coordinating Training Needs.
- vi. Performing Evaluation Research Program.

In addition, the functions of E-Profiling consist of the following listing: (i) for Personnel Registration, (ii) Updating the Personnel Details, (iii) Course Application, (iv) Course Approval, (v) Course Evaluation, and (vi) Course Feedback.

Characteristic of E-Profiling System

With the advent of online systems to most of business applications and the utilisation of technology, the challenge of managing increasing number in TVET institutions including their technical instructors are made possible. The area of big data and cloud computing which facilitate the machine learning platforms and Artificial Intelligence, the development of a profiling system to TVET instructors have been materialised and implemented. Among others, this system is to leverage the following items:

- (i) There would be a centralised system that register and contain the details of all available technical and vocational trainers in this country (Malaysia).
- (ii) There is a centralised system for searching the instructors with specific abilities and competencies that they do not limit their teaching delivery within their own institutions rather it can be shared and borrowed.

(iii) Transfer of Technology. Transfer of Knowledge and Expertise. Whence there is one a centre that creates pool of details for skilled teachers, it would be easier to find required master trainers to train others from the same discipline too.

(iv) Providing the instructors with the right Industrial Training Attachment. Once, the system was able to identify the instructor's ability, competencies and industrial sectors that they are capable, upgrading their skills should be simplified to the areas within the gap and within their specific discipline and specialisation.

(v) Further research on training methodology, skill upgrading, technical ability requirements and technology updates should be able to be identified from this system. It is through these researches that TVET training is hoped to be aligned with the latest industry analysis and market needs.

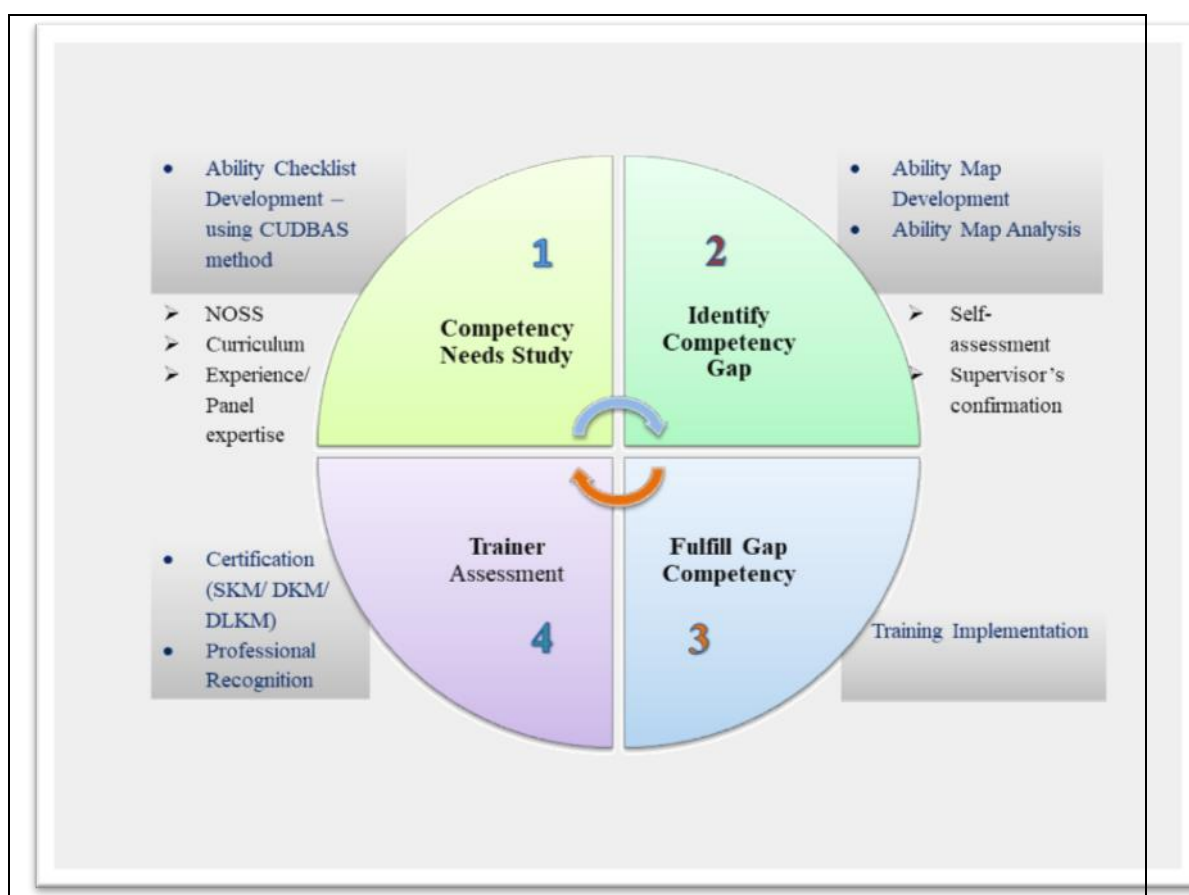


Figure 2. The process of identifying the training needs analysis for e-profiling system.

Satisfaction Survey on the Implementation of the E-Profiling System

Analysis was done in the aspects of frequency test, percentage, minimum value, and standard deviation. The data comprised of the demographic data of the study on the e-profiling system developed by this institution. The min test and standard deviation were carried out to analyze the level of satisfaction, knowledge, and ease-of-use among the users.

Figure 1 is showing the survey respondents who came from 18 governmental agencies that directly involve with E-Profiling system. From the study, the respondents that had submitted completed forms are 5,174 persons.

Respondent background

Table 1 below shows that the respondents of this study consist of all 18 agencies involved with the E-Profiling System. In this study, a total of 5174 respondents have answered the questionnaires that have been posted on the E-Profiling website. This represents 21.6% of the total number of users registered in the system. However, there are 19 respondents who are system users outside of these 18 agencies.

Table 1. The number of training centres under public and private institutions in Malaysia.

Type of Institution	Ministry	Name of Training Institutions	Number of Training Centres
Public	Ministry of Human Resources, Malaysia (MoHR)	Centre for Instructor and Advanced Skill Training (CIAST)	1
		Japan-Malaysia Technical Institute (JMTEI)	1
		Advanced Technology Training Centre (ADTEC)	8
		Industrial Training Institute (ILP)	23
	Ministry of Youth and Sports (KBS)	National High-Skilled Youth Institute (IKTBN)	8
		National Skilled Youth Institute (IKBN)	13
		Youth Skilled Golf Academy (AKBG)	1
	Ministry of Agriculture (MoA)	Institute of Agriculture	7
		Institute of Fisheries	3
		Institute of Veterinar	2
	Ministry of Education (KPM)	Vocational College (KV)	77
		Secondary Schools with Basic Vocational Education (PAV)	>60
	Ministry of Higher Education (KPT)	Polytechnics	36
		Community College	94
	Ministry of Rural and Regional Development (KKLW)	High-Skilled College of MARA (KKTMM)	10
		Skilled Institute of MARA (IKM)	14
		MARA-Japan Industrial Institute of Technology (MJIT)	1
Ministry of Tourism and Culture (MoTAC)	Tourism Training Institute	Unknown	
Private	Not Related	Various Names	650

The highest respondents were from Polytechnic (1207), JTM (1148) and Community College (1070) while the lowest were from ATM (1), Centex (4) and PDRM (4). Table 2 above shows the comparison between survey respondents and the total number of users of the E-Profiling System in their respective agencies. From this data, the highest percentages of respondents were from JTM, which was 50.98% of total users in JTM and followed by AADK (48.6%), KBS (43.1%), and JPK (40.16%). The lowest percentage respondents were from ATM (0.65%), MARA (3.23%), PDRM (3.45%), GMI (5.17), Prison (5.61%) and BPTV (6.15%).

Respondents' access analysis showed that 78.5% of respondents were TVET instructors, 9% were training coordinators, 6.1% were HODs (head of department), 4.7% were Institute Admin, and 1.7% were agency administrations. Respondent distribution of E-Profiling based on access level can be referenced in Figure 2.

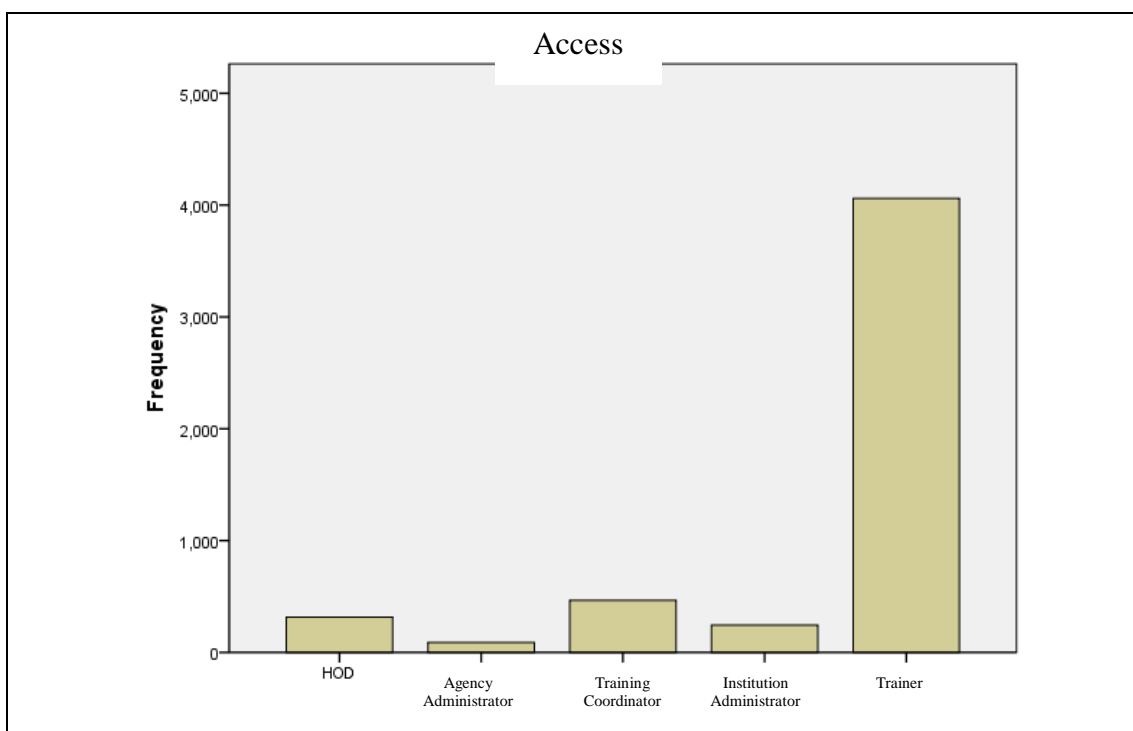


Figure 3. The respondent distribution of the survey.

The three-factor analysis of effectiveness found that E-Profiling users generally have high values for the three factors namely knowledge, convenience and satisfaction. These three factors are at the level of the mean score of 4 which is at a high level. The distribution of this data can be referred to Table 3.

Table 2. below shows the min score by agency for all three factors. Data shows that teachers from BLKP provide the lowest mean score for knowledge factor (3.96). Next to the satisfaction and usefulness factor, the lowest mean score was recorded by the respondents from GMI with a score of 3.79 and 3.75. In addition, almost all agencies recorded a mean score of more than 4.0 for these three factors. However, this value still shows the effectiveness of the system at a high level.

Participation in the number of respondents from the top 3 agencies found that these agencies also had a high number of TVET instructors compared to other agencies. These agencies have more than 2,000 TVET teachers. However, BPTV agency with more than 3,000 educators recorded a low number of respondents. Apart from that, there are two other agencies that have TVET instructors out of more than 1000 people who have lower respondents UNIKL and MARA. Hence this indicates there is a need to encourage TVET instructors to access the E-Profiling System more frequently.

For other agencies with low respondents, this may be due to various factors such as the absence of provisions (PDRM, JKM, Prison, ATM, BPTV, Centex), agency administrator role (BLKP GMI), and lack of engagement.

The findings of the study found that access level found that the distribution of respondents reflects the actual distribution of the respondents' population in which the TVET instructor is a large part of the respondents. The numbers of TVET instructors who are 78.5% of respondents are in parallel with the population.

However, studies have found that a small percentage of users are less likely to understand their access level. This is based on the number of respondents for agency admin and the training coordinator exceeds the actual number from within the system. This is because respondents are found to be choosing different access levels compared to actual access in the system. This data demonstrates the level of understanding of a small number of respondents (especially ranked other than instructors) on the level of accessibility access needs to be improved.

In terms of effective use, the respondents generally indicate that the E-Profiling System has a high effectiveness at 4.10 levels. However, in terms of agencies, survey results found that the effectiveness of GMI and BLKP was at the lowest level compared to other agencies.

Furthermore, this model also describes the relationship with the three factors measured. The proposed model also attempts to predict the effectiveness of users in using this eProfiling system.

Table 2. The min, max, mean value and standard deviation of the three items being assessed from the survey.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge	5174	1.00	5.00	4.1633	.61931
Satisfaction	5174	1.00	5.00	4.0839	.61306
EaseofUse	5174	1.00	5.00	4.0773	.62685
Valid N (listwise)	5174				

Table 3. The Min of the Three Factors for Each Participating Agency.

Agency / N	Factor			Min	Interpretation
	Knowledge	Satisfaction	Ease-of-Use		
<i>JTM</i> (1149)	4.10	4.01	4.03	4.05	High
<i>KBS</i> (465)	4.13	4.04	4.03	4.07	High
<i>MARA</i> (46)	4.27	4.10	4.01	4.13	High
<i>Politeknik</i> (1207)	4.09	4.03	4.01	4.04	High
<i>K. Komuniti</i> (1070)	4.23	4.18	4.17	4.19	High
<i>BPTV</i> (218)	4.29	4.23	4.22	4.25	High
<i>PDRM</i> (4)	4.41	4.33	4.40	4.38	High
<i>ATM</i> (1)	5.00	5.00	5.00	5.00	High
<i>Penjara</i> (23)	4.33	4.23	4.25	4.27	High
<i>JKM</i> (11)	4.24	4.21	4.14	4.20	High
<i>BLKP</i> (37)	3.96	3.88	3.82	3.89	High
<i>AADK</i> (69)	4.36	4.22	4.25	4.28	High
<i>Centex</i> (4)	4.41	4.29	4.40	4.37	High
<i>JPK</i> (196)	4.18	4.08	4.02	4.09	High
<i>CIDB</i> (79)	4.16	4.05	4.03	4.08	High
<i>GMI</i> (12)	4.08	3.79	3.75	3.87	High
<i>UNIKL</i> (95)	4.20	4.06	4.02	4.09	High
<i>GiataMARA</i> (471)	4.22	4.12	4.13	4.16	High
<i>Others</i> (19)	4.31	4.20	4.16	4.22	High
Min	4.16	4.08	4.07	4.10	High

Results and Findings

In this study, there are variables that influence the effectiveness of the E-Profiling System. A conceptual model has been proposed to describe the relationship between each of the variables in this study.

Structural model of E-Profiling System effectiveness is developed based on three variables namely Satisfaction, Knowledge and Ease of Use. PLS-SEM software is used to analyze and develop the model.

The first criterion of the measured measurement model is internal consistency reliability. These measurements are conducted to see the level of validity and reliability of the items for each variable. The evaluation method for testing the internal consistency reliability model of this study refers to a value known as composite reliability (CR). Test results show that CR values for all variables are between 0.7 and 0.95 and do not exceed 0.95. Thus, this indicates that the level of internal consistency of items for each variable is high and reliable.

To see how much individual items in one variable have positive relationships with alternative items measuring the same variable, convergent validity tests are carried out. The items in each particular variable must indicate a high variation between one another so that it can explain the validity of the measured variable. The average variance extracted value (AVE) obtained from the analysis of the measurement model

for all variables is above the minimum set requirement of 0.50. It can therefore be said that the items that measure these variables have a convergent validity level of satisfaction.

Based on the findings of the structural model assessment, it is found that the knowledge factor has a significant positive relationship with satisfaction. This shows that when the knowledge (knowledge) on the E-Profiling System is high among the users, then the satisfaction of using the E-Profiling System is also high.

The findings of the structural model assessment also show that the knowledge factor has a significant positive relationship with ease of use. This suggests that when knowledge in the use of E-Profiling system is high, it will help the user to easily use the system.

The relationship between the ease of use and satisfaction indicates that both factors have significant positive relationships. This finding means that the user feels that the E-Profiling system is easy to use and user-friendly, so the user's satisfaction of the E-Profiling System is high.

Before the final model is proposed, the evaluation of this structural model uses a systematic approach to assess the capability and accuracy of model predictions (R^2), the actual effect of independent variables on dependent variables (f^2) and also whether the model model is relevant (Q^2). R^2 values are between 0 and 1 and the higher R^2 values then the expectation level of expectation will be higher.

The findings show that the value of R^2 on ease of use is 0.654 at 95% confidence level. This means ease of use and knowledge are equally altered in a systematic pattern by sharing 65.4% of those changes. Hence, it shows that there is a correlation between the pattern of ease of use that can be explained by 65.4% by changing the knowledge factor pattern, while the remaining 34.6% changes are explained by other factors.

The second R^2 value is viewed as a satisfaction factor that shares a total of 0.878 changes by ease of use and knowledge, at 95% confidence level. It can therefore be said that the 87.8% change of satisfaction factor is explained by the change of ease of use and knowledge while the other 12.2% is by other factors. It is argued that any change in one of the variables in this model is either an ease of use or knowledge, so it can predict the dependent variable.

The diagram below shows the model that results from the analysis carried out.

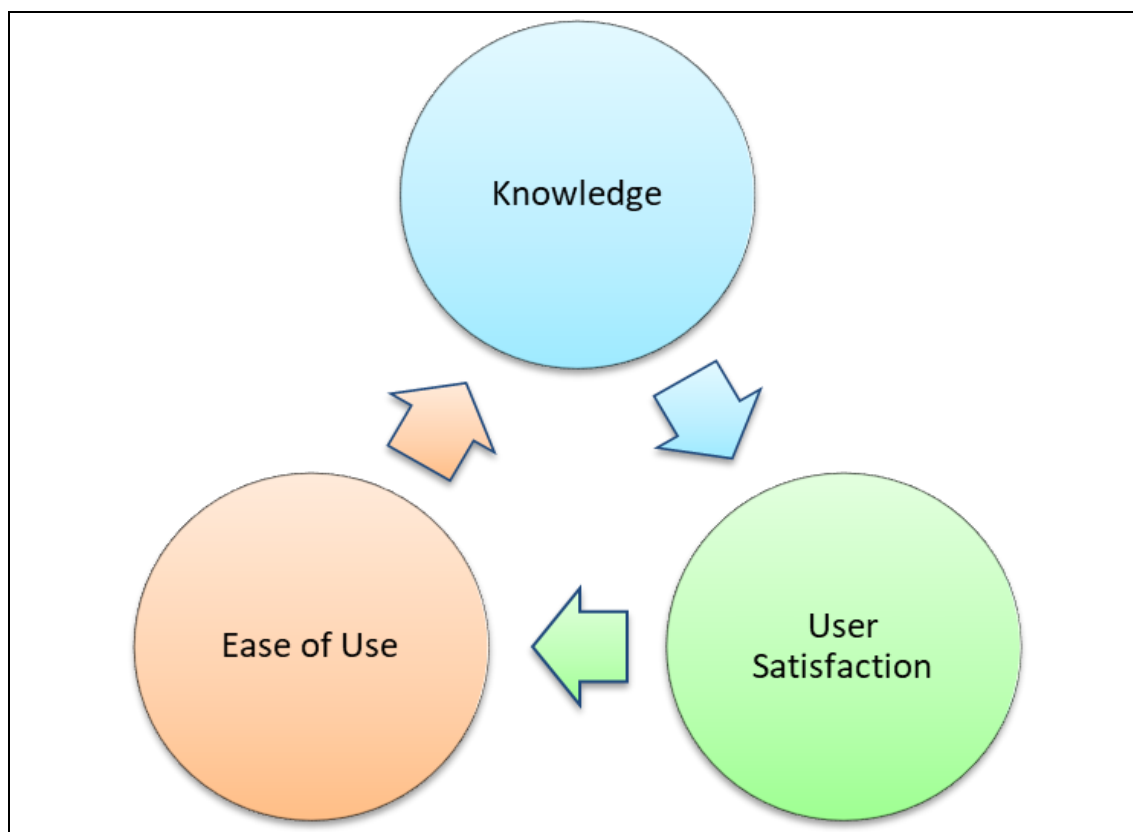


Figure 4. Structural model of E-Profiling System effectiveness.

Conclusion

Participation in the number of respondents from the top 3 agencies found that these agencies also had a high number of TVET instructors compared to other agencies. These agencies have more than 2,000 TVET teachers. However, BPTV agencies with more than 3,000 instructors recorded a low number of respondents. Apart from that, there are two other agencies that have TVET instructors in excess of 1,000 people who have lower UNIKL and MARA respondents. Hence this indicates there is a need to encourage TVET instructors to access the E-Profiling System more frequently.

For other agencies that are low respondents, this may be due to various factors such as inadequate allocation (PDRM, JKM, Prison, ATM, BPTV, Centex), frequent exchange of agency administrators (BLKP and GMI), and less engagement).

The findings of the study found that access level found that the distribution of respondents reflects the actual distribution of the respondents' population in which the TVET instructor is a large part of the respondents. The number of TVET instructors who are 78.5% of respondents are in parallel with the population.

However, studies have found that a small percentage of users are less likely to understand the role of access levels. This is based on the number of respondents for agency admin and the training coordinator exceeds the actual number from within the system. Respondents were found to choose different access levels compared to actual access in the E-Profiling System. This data indicates the level of understanding of the respondents apart from the instructors need to be improved.

In terms of effective use, the respondents generally indicate that the E-Profiling System has a high effectiveness at 4.10 level. However, in terms of agencies, survey results found that GMI and BLKP's efficiencies were at the lowest level compared to other agencies. Three factors of the effectiveness tested were knowledge, satisfaction and usefulness. These three factors also recorded a high score of min with the highest score of knowledge knowledge followed by satisfaction and convenience.

Furthermore, this model also describes the relationship with the three factors measured. The proposed model also attempts to predict the effectiveness of users in using this E-Profiling system.

Acknowledgements

We would like to thank all parties that involve directly and indirectly to this project. Thank you to the TiPS development team who had developed this project and all of the system members who had started from scratch. Thank you to the Government of Malaysia who had funded both the development and the research of this project. Thank you to individuals who had given supportive fund towards the presentation and publication of this paper.

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***Student Reflection to Curriculum Design for Computer Scientist
Comprehensive Examination***

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Abstract

Currently, computer scientists do not need professional certificates for applying their jobs although many organizations have introduced several specific-purpose certificates. The issues of professional certificates in computer science and software engineering have been discussed in several meetings around the world. In Thailand, most professional certificates are granted by authorities in the field. Nowadays, there is still a controversy whether these authorized committees should involve in the curriculum design process or they should act as the third parties in quality assurance process. In designing a current curriculum of Bachelor of Science (BSc) program in Computer Science at Prince of Songkla University (PSU), PSU-BSc-CS-2017, the objectives of outcome-based learning were mainly concerned. Therefore, this new curriculum, PSU-BSc-CS-2017, commencing in 2017, has included the course 344-493: Comprehensive Review and Test for Computer Scientists. The main objectives of this course are (1) to prepare the fourth-year students for job recruitment by self-learning and practice, (2) to assess their knowledge and skills in computing at the end of their BSc program in order to give useful information to stakeholders, and (3) to examine the students' performances in the same manner as an exit examination. Hence, in our preliminary investigation, we started to get some important information from the groups of students who will adopt the course 344-493 called Group-A and who will not adopt the course 344-493 called Group-B. The thirty-nine second-year students were selected as Group-A and the forty-nine fourth-year students were selected as Group-B. These students then were given the questionnaires to express their opinions and suggestions. The results from our preliminary survey show that only 25.6% of students in Group-A know about professional certificates while 36.7 % in Group-B know about this. Thirty-eight percentages of students in Group-A agree with having the course 344-493 in the PSU-BSc-CS curriculum while 69.4 % in Group-B agree with this.

Keywords: Computer scientist, Comprehensive examination, Curriculum design, Exit examination, Student reflection, Undergraduate program.

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Introduction

Nowadays, many universities and institutions are concerned with their educational quality in order to get better results and outcomes for better competition. Graduates' quality is one of key important factors that lead to educational reputation and better competition in terms of student recruitment and enrollment as well as social engagement impacts. These factors seem to be the return of investment for most universities and institutions. Curriculum design becomes a starting point for its implementation during teaching and learning processes, and student assessment processes. Weak curriculum design may lead to weak learning outcomes. This would affect graduates' quality. A program curriculum is strongly related to learning processes and environments as well as learning evaluation and assessments such as student assessment. Thus, not only universities and institutions pay attention to their curriculum design but also most stakeholders are often concerned with this. Outcome-based education (OBE) has gained popularity and successfully implemented for curriculum design, learning and training, assessment as well as other learning activities [Spady, 1994; Tam, 2014; Bergsmann, 2015]. OBE guides clearing learning results at the end of significant learning activities. OBE are often concerned with feedbacks and suggestions from stakeholders and takes this useful information for educational quality improvement. Graduates' competences and expected learning outcomes of a study program can be formed to satisfy its stakeholders' needs. These stakeholders can be considered as significant groups of people such as applicants of the program, students, alumni, employers, funding agencies, teachers and staff. Some quality assurance frameworks also suggest for curriculum design such as ASEAN University Network Quality Assurance (AUN-QA) [ASEAN University Network, 2015]. The 3rd version of the AUN-QA model for program level encompasses the following eleven criteria.

- expected learning outcomes
- program specification
- program structure and content
- teaching and learning approach
- student assessment
- academic staff quality
- support staff quality
- student quality and support
- facilities and infrastructure
- quality enhancement
- output

Although there are several suggestions and guidelines for curriculum design, learning processes, and assessment at higher education levels, this does not always convince the quality of graduates. Therefore, in Thailand, some critical study programs have adopted professional certificates granted by authorities in the fields such as medical programs, nurse programs, and some engineering programs. The national tests and exit examination are also adopted in some programs. Unlike these programs, computer scientists in Thailand do not need professional certificates for applying their jobs although there are some specific purposed certificates [Japan Information-Technology Engineer Examination Center, 2006]. Student and graduate assessment

for computer science (CS) programs at higher education levels vary from university to university although every CS program in Thailand has to compile their programs to the Thailand qualification framework (TQF) for computer disciplines declared in 2009 as the law for higher education standards [Office of the Education Council, 2009]. The TQF is adopted for degree programs in computer including computer science, computer engineering, software engineering, information technology, and business computer or information system. However, evaluation and assessment tasks can be difficult, expensive, and taken time. Therefore, the study reported here is aimed to get understandings and feedbacks about curriculum design from the students who will be our significant stakeholders for the Bachelor's degree of Science (BSc) in computer science at Prince of Songkla University (PSU), Thailand.

Background

The curriculum design for BSc in computer science at PSU has its process as shown in Fig 1. The curriculum design was concerned with OBE in order to meet the following needs.

- the expected learning outcomes of the program
- the graduate competency
- the organizational goals

CS Curriculum Design Process at PSU :

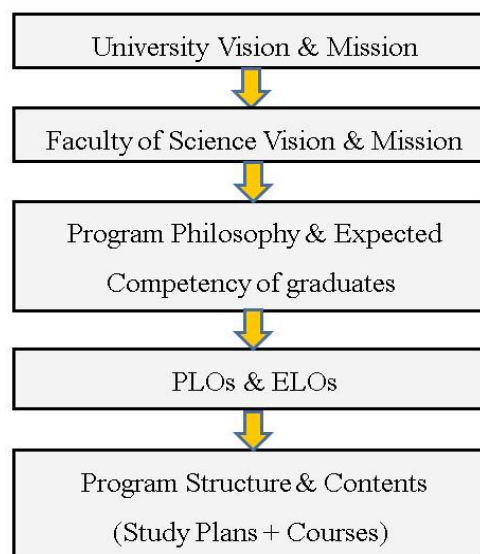


Figure 1: The curriculum design process at PSU

The current curriculum was revised in 2017 (PSU-BSc-CS-2017). It is based on the IEEE/ACM curricula guidelines-2013 [Association for Computing Machinery & IEEE Computer Society, 2013] and the TQF guidelines-2009. The program structure is totally 135 credits, consisting of the following courses.

- General education courses for 30 credits
- Compulsory courses for 75 credits, including basic science courses and core CS courses
- Elective courses for 30 credits

In order to solve some problems of graduate quality, the program committees have decided to add the course 344-493 Review and Test for Computer Scientists to the revised curriculum. This course was designed as the compulsory course in the PSU-BSc-CS-2017 rather than the exit examination. The course description is as follows:

COURSE: 344-493

Review knowledge in core areas (compulsory courses) corresponding to computer science body of knowledge; professional test of knowledge and skills for computer scientist.

Research Methods

The overall research project is planned into four states corresponding to PDCA (Plan-Do-Check-Act) for the curriculum processes as follows:

- P stage : curriculum design
- D stage : curriculum implementation
- C stage : curriculum evaluation
- A stage : curriculum revision

The preliminary investigation reported here is in the P stage. The research questions for the preliminary investigation are as follows:

Q1: Do the CS students at PSU have awareness of professional certification?

Q2: Do the students agree with the exit examination?

Q3: Do the students agree with the newly revised curriculum design in term of having the course 344-493?

Q4: Do the students agree with the learning plans for the course 344-493?

Q5: Do the students agree with the assessment criteria and methods for the course 344-493?

Q6: Do the students agree with having the course 344-493 would enhance education quality assurance?

Q7: Do the students agree with education quality assurance would lead to graduate quality?

Q8: Do the students agree with having the course 344-493 would lead to the students' readiness and confidence for job application and recruitment (employability)?

The populations are current students in the BSc-CS program at PSU. The samples were selected by purposive sampling as the 2nd and 4th-year students in the academic year 2019. The second-year students who will adopt the course 344-495, called Group-A, and the fourth-year students who will not adopt the course 344-493, called Group-B. Questionnaires were used as data collection. Quantitative statistics were applied for data analysis. Group-A consists of 39 students (9 males and 30 females) 30and Group-B consists of 49 students (25 males and 24 females).

Results

The student opinions reflect to the research questions for Group-A and Group-B are shown as Fig 2 and Fig 3 respectively.

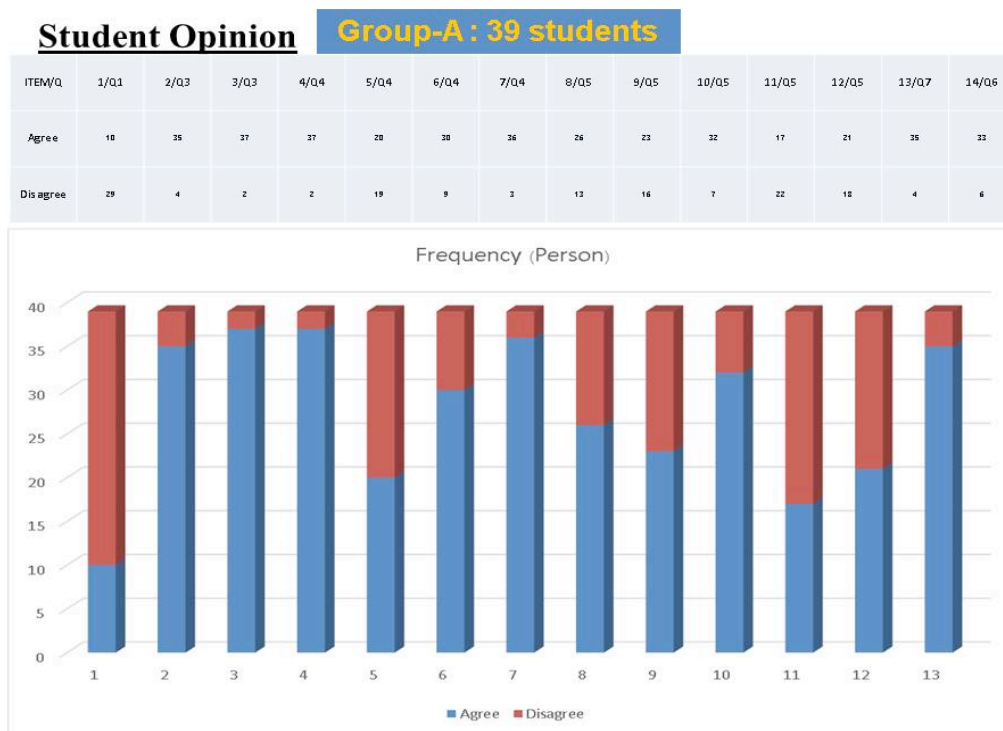


Figure 2: The Group-A students reflect to the research questions

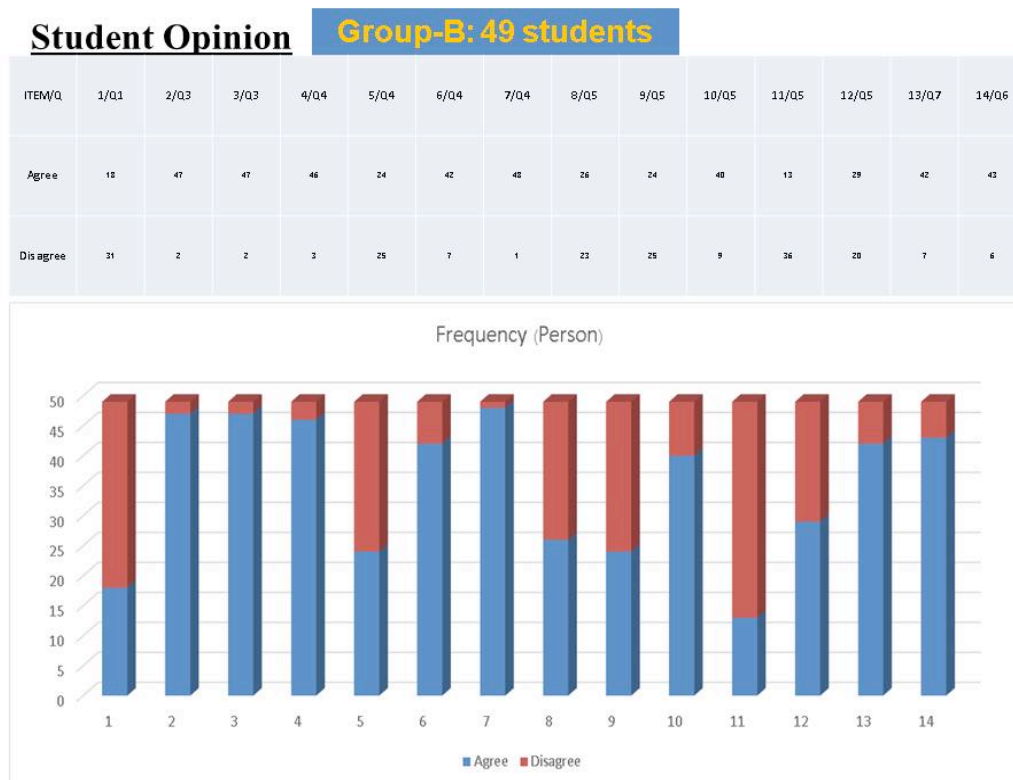


Figure 3: The Group-A students reflect to the research questions

The results from our preliminary investigation corresponding to each research question are as follows:

Answer to Q1

- 25.6 % of students in Group-A know about professional certification.
- 36.7 % of students in Group-B know about this.

Answer to Q2

- 74.4 % of students in Group-A agree with the exit examination.
- 55.5 % of students in Group-B agree with this.

Answer to Q3

- 38.5 % of students in Group-A agree with having the course 344-493.
- 69.4 % of students in Group-B agree with this.

Answer to Q4

- 78.8 % of students in Group-A agree with the learning plans for the course.
- 81.6 % of students in Group-B agree with this.

Answer to Q5

- 61.1 % of students in Group-A agree with the assessment criteria and methods.
- 59.9 % of students in Group-B agree with this.

Answer to Q6

- 84.6 % of students in Group-A agree with the course 344-493 would enhance education quality assurance.
- 87.8 % of students in Group-B agree with this.

Answer to Q7

- 89.7 % of students in Group-A agree with education quality assurance would lead to graduate quality.
- 85.7 % of students in Group-B agree with this.

Answer to Q8

- 84 % of students in Group-A agree with the course would lead to the students' readiness and confidence for job application and recruitment.
- 82 % of students in Group-B agree with this.

Conclusion

The research reported here is the preliminary investigation of student reflection to the curriculum design for the course 344-493 in the BSc program in Computer Science at Prince of Songkla University, Thailand. This course is related to comprehensive examination for undergraduate students in computer science in the similar manner as exit examination in order to improve educational quality in terms of student and graduate quality. This reflection was collected from the 39 second-year students who will adopt the course 344-493 and the 49 fourth-year students who will not adopt the course 344-493 because they adopted the previous version of curriculum. Questionnaires were used as data collection. The study was conducted before the course will be implemented in the year of 2020. The research results would lead to well-prepared implementation of the course and next curriculum revision. These results will be taken to account for the program management. The future works will be related to the major stakeholders of the program and will look through the curriculum implementation, assessment, and revision as the overall research plan.

Acknowledgements

We would like to thank the students who participated in our preliminary investigation.

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The History of English Education in Japan: Focusing on Its Dawn

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Abstract

This is a report on the history of English education in Japan, particularly regarding its very early stages in the nineteenth century. How did the English education start in Japan actually? A strong need to foster human resources to handle situations in the English language (instead of Dutch) arose from “the *Nagasaki* Harbour Incident” of HMS Phaeton in 1808. Facing a foreign power, the Japanese saw that a simple fact - nobody understood English - might have led Japan to a major crisis of extinction. The government at that time (*Tokugawa* Shogunate) suddenly realized this urgent task, and it launched a national project of retraining their Dutch translators/interpreters, *Oranda-tsuji*, into English ones. Fortunately, Japan managed to find a native English speaker as teacher for the *Oranda-tsuji*, which determined the nation’s destiny in the second half of the nineteenth and the twentieth century. Through the observation and exploration of this early phase to the establishment of the public system of English education, we can reflect on our current chaotic status, and try to predict the future. The 2020 Olympic and Paralympic Games in Tokyo are just around the corner, and the present government is proclaiming the need of English-speaking Japanese.

Keywords: English education, Japanese with English abilities, history, native English speaking teacher, Dutch

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Introduction

Japan is a country which has eagerly attempted to acquire new knowledge, science and technologies from outside Japan and absorbed foreign customs and cultures throughout its long history (Nishikawa-Van Eester, 2014, p. 33; Shimizu, 2010, pp. 1 - 4; Montgomery, 2000, p. 202). In order to realize this, Japan needed foreign languages as a medium. By learning, reading and translating them, the Japanese have obtained the necessary information in each stage of the time. As Montgomery referred to (2000, pp. 189 - 190), the acceptance, adaptation and improvement of science and culture in Japan took place almost entirely under strong foreign influences. This is an important point in the Japanese history.

In this article, we first go through a simple overview of the historical background of foreign language education in Japan. That enables us to regard English as one of the influential foreign languages that have affected Japan and to situate it in the whole picture. Other languages are to be explained as well in the series of the events in the relation with English. Then we examine when the English language arrived in Japan, how it was learned (and also taught) and by whom. Subsequently, we discuss the significance of English education in the Japanese society from the historical and pedagogical perspective.

Historical Background

Because of its geographical uniqueness, Japan has enjoyed its own language and culture without any invasion to threaten it (Seargent, 2011). At the same time, however, this means that Japan has had no way to receive external information without making conscious efforts to use (a) foreign language(s) as a tool for information gathering. Baker (2001) and Shimizu (2010) both pointed out that Japan has been accepting and learning various foreign languages and cultures.

As far as we can recognize in some historical records, the language that arrived in the earliest stage in the Japanese history was Chinese. It is reported that the Chinese writing system and literature works had been conveyed to Japan by fourth - fifth century already via the Korean Peninsula (Shimizu, pp. 1 - 2). Since then, the Chinese language (Chinese classics, or, *Kanbun*) has been one of the major and influential foreign languages to be taught throughout the Japanese history. Having been penetrating the axis of the education and culture, Chinese is undoubtedly the major language in Japan. In the description of Gottlieb (2005), “the educated” historically meant the upper class such as aristocrats and *samurai* who got drilled in classical Chinese (Chinese classics, *Kanbun*). Together with Chinese, Korean was also brought to Japan meanwhile (Shimizu, pp. 1 - 2).

Among the languages from the West, Portuguese was the very first that the Japanese encountered. In 1543, a Portuguese shipwreck in *Tanegashima* Island, *Kyushu*, brought Japan Christianity (Catholic Missionaries) and trading with the Western world (Baker, p. 486; Shimizu, p. 3). A great number of Portuguese words were brought, as the result, into the Japanese vocabulary, which are simply believed to be Japanese ones by now. Although Portuguese gave a great influence upon the Japanese society and culture, it became obsolete by Japan facing a totally new phase in its history. Together with Portuguese, Spanish was also brought to Japan (Yamashita, p.

58), but it did not have as much influence on the Japanese culture as Portuguese did. By the new policy of nearly complete isolation of the nation (1633 - 1639), the government decided to “protect” Japan from the rest of the world. Fearing the spread of Christianity, the shogunate, or the government, prohibited Portuguese ships (Seargeant, p. 69). Consequently, the cultural stream flowing into Japan from Portugal was halted, and Japan had to wait for another opportunity to receive new knowledge and information from the world.

After this series of actions in order to isolate the whole country, the shogunate ordered to create an artificial island in *Nagasaki Harbor (Dejima, or Deshima)*, where all Portuguese residents were moved. But, after all, in 1639, the shogunate decided to expel them all (Seargeant, p. 69). Then the Dutch arrived. Actually, they had come before the isolation policy became in effect. In Yamashita’s description (p. 58), we observe that the situation of Japan in those days.

The Dutch arrived at the end of the *Azuchi-Momoyama* period (1573 - 1603), when the Spanish and Portuguese had already established strong relationships with Japan. However, at the beginning of the Edo era (period) (1603 - 1868), the Spanish and Portuguese were banned from the country, because of their inextricable ties with the Christian mission, regarded by the central government as a liability to their rule. Japan was gradually closed off from the outside world and a self-imposed period of isolation began.

The Netherlands became more powerful globally after the independence from Spain, and in Japan, it became the only European power that was allowed to trade with the Japanese government during the isolation policy of the nation. According to Montgomery (p. 227), a great amount of Western science such as Copernican theory, Newtonian physics and the astronomy of Laplace reached Japan between 1770 and 1850, via the Dutch language. Although Dutch was not the language of origin for most of this sort of knowledge, it was the merely means to access the information sources and the Japanese society received tremendous influence by Dutch. Dutch studies (also known as “Dutch learning”), therefore, did not simply mean to study the Dutch language; instead it meant absorbing the cutting-edge technologies, fresh knowledge and cultural phenomena from the outside through studying Dutch.

Dutch studies started to bud during the reign of the eighth Shogun, *Tokugawa Yoshimune*, who showed his great interest in products from overseas. In 1720, he relaxed the Book Ban Order to allow the import of non-Christian books and encouraged to learn Dutch. In Van Sant’s explanatory notes, we can read that, from 1639 to the 1850s, the employees of the Dutch East India Company were the only Westerners allowed to enter Japan, and that through them, the most advanced information and knowledge was transmitted from the European world to Japan. This tendency made a major stream later, in the nineteenth century, that Japan tried to learn almost all the knowledge that they urgently needed, from the West, in order to establish the strong, modern Japan in the entirely new political frame. This learning system was called *Yogaku*, meaning Western studies, or, learning.

Hence, the shogunate kept promoting the Dutch education. Montgomery reported that,

by 1760s, some books on medicine and science had been imported together with some scientific instruments such as telescopes, which gave an enormous impact on the scientific progress in Japan (pp. 203 - 203). By teaching Dutch, the government produced the new intelligent generation. (Traditionally, the well-educated learned *Kanbun*, classic Chinese.)

Oranda-tsuji

As mentioned earlier, the central government encouraged the Dutch education, and there were two types of people who learned Dutch at that time. One is called *Rangakusha* (Dutch scholars) and the other, *Oranda-tsuji* (Dutch interpreters/translators). A number of *Rangakusha* were produced during the second half of the *Edo* period to lead the modern Japanese society in the nineteenth century, however, in this article, we focus on the latter group, namely, *Oranda-tsuji*, who played a more crucial role in our story of the English language education.

How did, then, the shogunate foster *Oranda-tsuji* men? In order to answer this question, we need to know what kind of group this was and how they used to work in the system of those days. According to Kimura (2012, p. 2), they were a group of professional men who were officially employed by the government. This profession was hereditary (there were several renowned families in this business) and the government used to employ a ranking system. They were responsible for all the administrative work related to import and export, actual negotiation with the traders, keeping all the records of the entire work. As described by Katagiri (2004, p. 21), they were a group of highly skillful and intelligent warriors who had to continuously face tough negotiations with their counterparts from overseas.

The Very First English Man in Japan

Regarding the English language, we need to examine when and how the Japanese had their first contact with a person from England. Tokyo Metropolitan Board of Education states that the first English man that arrived in Japan was Ailliam Adams, who was an English sailor on the Dutch ship, *De Liefde*. This ship drifted ashore in *Bungo* (*Oita* Prefecture now) in 1600, and the first *Shogun*, *Tokugawa Iyeyasu*, summoned him. Adams worked for this *shogun* and got a Japanese name from him, *Miura Anjin*. *Miura* was a place where he landed and *Anjin* meant a “pilot of a ship.” It is reported that *Miura Anjin* worked for *Tokugawa*, however, there is no record left that he taught English to the Japanese.

Phaeton Incident (1808)

In the end of the eighteenth century, French, Russian, British and American vessels started visiting Japan. They all wanted to negotiate for trading with Japan. During the Napoleonic War, the Dutch could not send their vessels to *Nagasaki* due to the conflict with Britain (Yamashita, p. 71). In 1808, the English warship, *Phaeton*, intruded in *Nagasaki* Harbor. Disguised as a Dutch ship, the English attacked the local government and demanded food, taking hostages. This incident shocked the *Edo* regime and the government realized that nobody understood the English language (Cullen, pp. 149 - 150).

Facing this reality, The government immediately ordered several *Oranda-tsuji* to start learning English a year after the incident (Cullen, p. 150). Thus, this incident is considered to have been a marked trigger for the beginning of the English education in Japan.

Ranald MacDonald (1824 -1894)

As described earlier, the *Oranda-tsuji* were ordered, by the government, to learn English. It was part of their professional elements that, upon request, they had to master a new target language for a specific purpose. It is well imaginable that they had a relatively straightforward strategy to learn the syntax and lexicon. They had enough experience by learning Dutch. However, there is not much we can imagine about how they learned to orally communicate in English.

Kimura gave an answer to this question. He stated that a sudden, unanticipated arrival of a young American man changed the situation of *Oranda-tsuji* dramatically. Ranald MacDonald, who landed as an illegal entrant in June, 1848, in Hokkaido (Kimura, p. 67; Schodt, p. 185), was sent to *Nagasaki* in October of the same year (Schodt, p. 254; pp. 262 - 263; p. 273) to teach English to the *Oranda-tsuji*. He is the first native-speaking English teacher in the history of the English education in Japan.

It is remarkable that, despite such a limited period of time, MacDonald taught his students “spoken English,” and as the result, some *Oranda-tsuji* such as *Einosuke Moriyama*, became English interpreters/translators, who were ready for the negotiation, when the special envoy, Matthew Perry, arrived from the United States, in 1854. In this sense, Japan was “just in time” to save itself.

Discussion and Conclusion

It is interesting to see that Japan needed English to be able to isolate itself. In order to be comfortably isolated from the rest of the world, Japan had to be able to “explain” nicely to the rest of the world that it wanted to be left alone. Foreign language education was (and is) necessary to protect the country. As examined in Phaeton Incident, you “lose” without proper language tools and arms.

On the other hand, Japan needed foreign language education in order to keep propelling its power in many ways as an independent country. It also needed foreign languages in order to improve its society and cultural level. It is inevitable for any modern country to know what is going on globally. In this century, we all need to keep up with the world in order to survive.

It is ironical to see, when Phaeton attacked *Nagasaki*, the government suddenly realized that there was a strong and urgent need to “foster the Japanese with English abilities,” which is the title of an action plan that the MEXT (Ministry of Education) of Japan launched in *Heisei* 14, or 2002. It is amazing that the situation has not changed very much since the time of Phaeton incident in 1808. Will Japan change? If so, what would be a trigger to make Japan change? It might be, again, a strong power or incident to force Japan to change. After *Heisei*, we are now about to enter the era of *Reiwa*. Japan is going to host G 20 Osaka in 2019, and after that, the Tokyo Olympic and Paralympic Games in 2020. It will be interesting to witness how Japan might change, or might not change in the coming decade.

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What is Expected of Us?
– Study Abroad and Expected Roles of Native and Local Teachers

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Abstract

While the concept of native speakerism has been widely discussed (Braine, 2010; Houghton & Rivers (eds.) 2013; Fukunaga et al., 2018), the amount of research which has applied it to actual classrooms is still limited, especially in Japan. This study addresses that gap by investigating the expected roles of native and local teachers in English language preparation courses in Japan. The thirty participants from a study abroad college were studying for IELTS with British teachers, and had lessons with Japanese teachers in the middle school. A questionnaire of closed questions and open-ended comments was conducted to discover which aspects of study the different teachers were thought to have helped with more and the expected roles or benefits of native and non-native local teachers. Results were analyzed according to their proficiency levels and expectations. The categorized expectations collected from open-ended comments implied that native English teachers seemed to have the biggest effect on linguistic performance and acquisition of cultural background. Meanwhile non-native local English teachers were expected to provide insider strategies. These results were discussed focusing on the gap between stereotypes and their actual needs.

Keywords: Native speakerism, NET, NNET, LET, study abroad

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Introduction

When teaching English to other language speakers, the influence of native speakerism in English classrooms can be often recognized, especially in non-English speaking countries. Although it is often described negatively, as “a pervasive ideology” in English teaching (Holliday 2005), it is said to provide a certain impact in terms of not only academic but also business prospects. Researches such as Davies (2003) and Braine (2010) have developed the analysis of native speakerism. In Japan, for example, there are a number of private English language schools whose main sales point is solely English instruction from all native instructors.

Although Holliday (2005) stated that native English teachers (NETs) are often presented as the paragons of both the English language and English language teaching methodology, it may not be always true in Japan. Both “native speaker only” and “Japanese only” English teacher job advertisements are often seen in Japan. Instead of clear favouritism, it could be said that rather, different roles are expected of NETs and Japanese local English teachers (LETs). Despite several studies having been conducted with the participants of schools under the Ministry of Education, Culture, Sports, Science and Technology (MEXT)’s control, there is less focus on schools providing western academic environments outside of MEXT influence. The first time students experience Western academic environment is vital, yet it bears asking if management’s estimation matched the roles students expect from schools. Therefore, with focus on the difference between what NET and LET are expected to be, this research examined what type of help and support students expected to receive from teachers.

Previous Literature

Davies (2003) defined “nativeness” with the following four factors: birth, culture, fluency, and idioms as shown in Figure 1. Although the word “native” is defined based on these interrelated factors, the word “non-native” seemed to exist simply as the direct opposite of “native.” Being that diametric opposite of native, non-native English teachers (NNETs) have accordingly been less successful with salary, career, and prejudice compared to NETs (Braine: 2010).

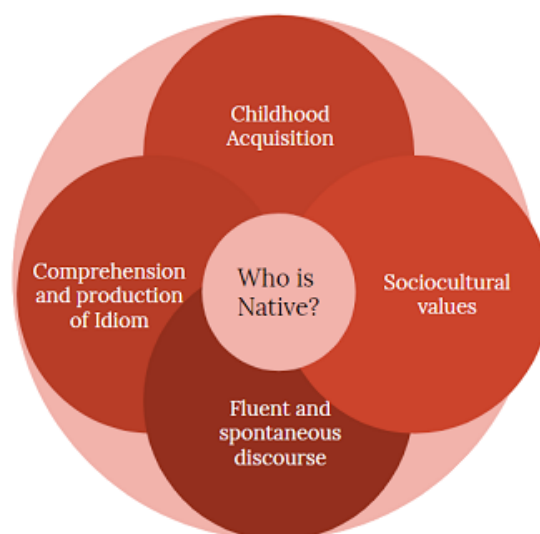


Figure 1: Davies’s (2003) definition of nativeness.

Researchers such as Kubota (2001) and Holliday (2005) identified that these gaps caused by the idea of native-speakerism are commonplace in not only teaching contexts but also literature or training, regardless of the specific culture. The attempts to classify the world in terms of English has been developed by dedicated scholars such as Phillipson's (1992) Centre and Periphery, and Kachru's (1992) Inner circle, Outer circle and Expanding circle.

In Japan, this superiority of NETs from English-speaking countries over NNET in Japan is often recognized in the wider English education industry. Such dichotomy of NET and NNET has allowed Japanese English teachers to be categorized as NNETs rather than LETs. However, it is not always true that LETs in Japan are bewildered and grustrated because they can only hold less successful positions than NETs. Today, a number of company websites and job boards post jobs whose requirements include "Japanese only" in equal number to those containing "native English speakers only." Typically, LETs in Japan are allocated classes for qualification preparation such as Eiken Exam and TOEIC exam, university entrance exam preparation, and learners at a beginner level. This may support the proposition that there are different, not unequal, expectations. However, comparing with studies of Native-speakerism focusing on the situations surrounding teachers, less studies have been published focusing on the students' expectations.

According to MEXT, the number of Japanese students completing their studies abroad dropped from a peak of 82,945 in 2004 to 57,501 in 2011⁽ⁱ⁾. Yet, English-speaking countries are still the main destinations. Although the number of Japanese students studying abroad has stopped continually increasing, the number of language schools in Japan is still growing and recognized as a huge market, with market size reaching 0.8 billion yen⁽ⁱⁱ⁾. It can be said that in-country language preparation courses have become a popular option today. Most of these language schools are targeting learners with variegated aims and goals such as business communication, travel conversation, reading as a hobby, and preparation for English exams. These courses allow Japanese students to acquire not only English but also academic skills before they actually progress onto foreign universities. While study abroad requires various preparation in terms of language and cultural adjustment, the number of studies focusing on study abroad preparation for Japanese students are still limited.

Research Questions

In order to reduce this imbalance of studies, the following questions were designed to further the research within this field.

1. How do students in study abroad preparation courses perceive their NET and LET?
2. How do those perceptions connect to their performance?

Methodology

30 students (13 males and 17 females) aged between 17 and 60 were investigated. They all belonged to study abroad college in Tokyo. One of the groups were pre-intermediate students who were in IELTS preparation for a single term. The other group contained upper-intermediate level students who were in a pre-session course for UK universities. Both groups were taught by the same NET twice a week for three

months. Those NETs were all from Britain. All of the students had already applied for postgraduate course in the UK and some of them had received conditional offers which required the improvement of their English. It may suggest that students were generally motivated to brush up their English. Both groups were prepared for the style of discussion with Socratic seminar style teaching, and moderation practice.

After three months of instruction, an anonymous questionnaire was conducted to access students expectations of NET and LET respectively. It was designed as a likert-scale questionnaire of closed questions (see Figure 2) and open-ended comments. The instruction was given in the class and participants were asked to answer in the class.

I think Native English Language Teacher helped me improve my... *

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Listening Skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reading Skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speaking Skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing Skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Test-taking Skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grammar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vocabulary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attitude toward English	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attitude toward Class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-study Skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2: Questionnaire of closed questions regarding to NET.

Results

Likert scale scores were analyzed to identify divergences in the results, which shows how students' expectations differ according to proficiency levels and teachers' nativeness.

As Table 1 shows, for example, in lower-intermediate group, the average positive feedback for LET instruction was higher than NET among most items, while the

result was the opposite with upper-intermediate groups. The highest score of NET instruction was speaking in both lower and upper intermediate groups. That of LET instruction was attitude toward class for lower group and test-taking skill for upper group. It is possible to claim that upper-intermediate students appreciate native instruction but the score will decrease in lower-intermediate classes.

Table 1.
Result of Questionnaire: "I think NET/LT helped to improve the following skill."
(5: Strongly Agree, 4: Agree, 3: Neither Agree nor Disagree, 2: Disagree, 1: Strongly Disagree)

ITEMS	NET (Lower)	NET (Upper)	LET (Lower)	LET (Upper)
Listening	4.38	4.59	4.38	3.24
Reading	3.69	3.59	4.38	3.47
Speaking	4.46	4.82	4.38	3.06
Writing	4.00	4.41	4.00	3.53
Test-taking	3.38	3.53	4.38	4.06
Grammar	3.54	3.82	4.15	3.82
Vocabulary	3.85	4.18	4.00	3.24
Attitude toward English	4.31	4.71	4.54	3.47
Attitude toward Class	4.15	4.12	4.62	3.53
Self-study skills	4.08	3.41	4.38	3.47

The biggest gap between NET and LET in each group was test-taking skill in lower group (NET:3.38, LET:4.38) and speaking skill in upper group (NET: 4.82, LET:3.06). The biggest gap between lower group and upper group for NET was self-study skills (Lower: 4.08, Upper: 3.41) and for LET was listening (Lower: 4.38, Upper: 3.24)

Almost all students submitted the form by writing questions they would like to ask NET and LET respectively. Participants' questions were then categorized according to the framework based on Celce-Murcia, Dörnyei, and Thurrell's (1995) communicative language abilities, including discourse competence, linguistic competence, actional competence, sociocultural competence, and strategic competence. However, some gave comments which could not be categorized into the existing framework such as relating to emotions. The most popular type of questions were related to linguistic competence for both NET and LET. Although the second most popular category was sociocultural competence for NET, it was strategic competence for LET. Examples are shown on Table 2.

Table 2.
Result of the questionnaire: open-ended comment
(L): Lower intermediate course, (U): Upper intermediate course

Student	Question to NET [sic]
Student A (L)	(NET) How to write and speak in appropriate English. (LET) How to study English as a Non-Native English Language Speaker.
Student B (L)	(NET) natural phrases way of saying (LET) strategy and common mistakes which Japanese people likely to make.
Student C (L)	(NET) Do British like Japanese people? (LET) When did you start learning English?
Student D (U)	(NET) I want them to improve my speaking and writing skills. (LET) I want them to teach grammar and different points from Japanese to English.
Student E (U)	(NET) The common mistake words which sound unnatural for native speakers even though the words seem correct on the dictionary. (LET) What was the most difficult things you faced to in studying English?
Student F (U)	(NET) my pronunciation is typical Japanese. how much would you care? (LET) tell me things I need to live in Britain

These results may suggest that NET were supposed to play a role of proofreader and also representatives of the community which students aim to join, regardless of their proficiency level. On the other hand, questions to LETs may suggest that they recognize LETs as models who share the same language and cultural background so can share English learning strategies. Questions for LETs were rather asking advice or seeking insider knowledge as a former English learner. Although LETs also received questions related to sociocultural competence, it was more about the experience of how they integrated themselves into that community and asked to share their experience, which were quite different from questions to NET in the same category.

Conclusion

This research suggested that the gaps of the situation between NET and LET may not always be based on inequality, but on different expectations. Returning to the research question, it could be said that students in study abroad preparation courses expect different roles from NET and LET and these expectation tendencies differ by proficiency level. Although questionnaire results of closed questions may allow teachers to acquire immediately comprehensible responses from students, it is also true that open-ended section enabled deepening of the analysis. The findings seem to indicate that the collaboration between NET and LET can provide more comprehensive and effective scaffolding. As in- country preparation courses continue

to grow, hopefully these categories will provide some assistance to teachers planning a culturally sensitive, motivating and challenging combination of NET and LET teachers. More and more studies should be conducted.

Footnotes

(i) Cited from http://www.mext.go.jp/b_menu/houdou/26/08/attach/1350731.htm
(accessed April 2019)

(ii) Cited from <https://www.yano.co.jp/press/download.php/001720> (accessed April 2019)

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Journeying with Communities: Theoretical Reflections From the Community Integration as Complex and Integrative Strategy for Teaching, Research and Community Development

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Abstract

Teaching and serving in a university setting is very challenging and yet very substantial. The role of faculty members is not merely teaching alone inside the classroom. There is a call to be an agent for social transformation. To be able to respond from this call, faculty members must be committed and equipped with knowledge, skills and values to be able to balance the role for teaching, research and service for the communities. These venues are not really totally separated from each other. In fact, they must be considered a packaged-venue to deliver the learning, knowledge generation and formation. The author's experiences for seventeen (17) years of serving the University of Santo Tomas through teaching, research and, community development, it is proven that these are complex and yet integrative for the full process of learning and serving. In fact, this kind of process really enriched the author's experiences for the integrative formation of students in terms of knowledge generation and serving the communities toward development. Partner communities had strongly benefits in the different processes. This paper generally described the journey of the author that impacted his personal and professional development gained from the different processes and experiences in community integration as complex and integrative strategy together with the different stakeholders involved:

- The immediate and substantial university departments/offices where the author is directly connected;
- The students as service learners and, partner researchers for development and empowerment and;
- The partner communities as substantial stakeholders for development and empowerment.

Keywords: Community Integration; Integrative Strategy; Teaching/Facilitation; Research; Community Development

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I. Introduction

Teaching and serving in a university setting is very challenging and yet very substantial. The role of faculty members is not merely teaching alone inside the classroom. Among the faculty members in the university, there is a call and challenge to be an agent for social transformation. To be able to respond from this call and challenge, faculty members must be committed and equipped with knowledge, skills and values to be able to balance the role for teaching, research and service for the communities. These roles are not really totally separated from each other. In fact, they must be considered a packaged-role to deliver the learning, knowledge generation, formation and service to the communities and society at large.

The author's experiences for seventeen (17) years of serving the University of Santo Tomas through teaching, research and, community development and service has proven that these are part of complex and yet integrative full process of learning and serving. In fact, this kind of process really enriched the author's experiences for the integrative formation of students in terms of knowledge generation and serving the communities. Also, communities who are considered partners for community development and empowerment strongly benefits in the different processes. All stakeholders, in fact, have gained so much from all the processes of teaching, research and service. This three-pronged education mission is a total-packaged social arm of educational institutions, like UST, for social transformation engagement.

This paper generally describe the gained processes and learning from the experiences of community integration as integrative method of teaching, research and community development with all the stakeholders involved:

- The author as faculty, researcher and university community development facilitator;
- The immediate and substantial university departments/offices where the author is directly connected;
- The students as learners, researcher and servers for community development and empowerment and;
- The partner communities as substantial stakeholder for community development and empowerment.

The objectives of this research are the following:

General objective:

Develop theoretical reflections on the community integration as complex and integrative strategy for teaching, research and community development.

Specific objectives:

1. Lay down the development of mechanisms and opportunities of integrative strategy of teaching, research and community development based from the engagements and experience of the author;
2. Share the learning of the students, specifically the Bachelor of Arts in Sociology students, who underwent in their major courses and program in general;

3. Reap the gains and impacts of the community integration to the communities and to community development;
4. Come-up with recommendations on how to put forward the integrative method of teaching, research and community development.

Theoretical framework/literature review

Based from many literatures across many disciplines, integrative strategy or approach in education or teaching is tapping and developing many means that are creative and facilitative to be able to deliver and enrich the learning process and output of the learners. It goes beyond from the traditional approach and making way for liberating process of learning of the students and so, even with the teachers/professors who are facilitators in nature.

In this case, the paper will try to describe the process of learning and service process of the different stakeholders: faculty (author), students and, partner communities. The author of this paper, for seventeen (17) years, is a faculty member of the Department of Sociology and at the same time, a program staff-member and became assistant director of the University of Santo Tomas (UST) SIMBAHAYAN Community Development Office (community development and advocacy arm of UST). Students are mainly coming from the BA Major in Sociology of UST. The partner communities are mainly partner communities of the university and its different academic units in terms of its community development program.

The author as a faculty member of the Department of Sociology is tapping the approach of developing active engagement through the critical eye enhanced by sociological imagination and applying theories and concepts to one's experiences in the community, field or any sectors or groups in the society (Mills, 1959&2000; Freire, 1970&2005; Biklen, 1983; Alipao, 2002; Alipao, 2008). The author, prior to teaching in the university, has substantial years of deeper engagement in social actions and advocacies. The author is a faculty who is an advocate for social change, development and empowerment. The life of the author can be related to the literatures that teaching is a subversive activity and always cultivating non-traditional culture of learning (Postman & Weingartner, 1969 and 1971; Thomas & Brown, 2009)

The students-learners are directly engaged and working with the poor, deprived, oppressed, exploited and, marginalized sectors or groups to study stereotypes, social inequality, and complexity of social realities (Ashworth, et.al., 2010; Dolgon&Baker, 2011), especially from and for the partner communities of UST in line with its community development program (Cruz, et.al., 2011; www.ust.edu.ph). Also, environmental and disaster risk reduction and management are concerns and needs that the community development program has deeper considerations and had actively responded to by the students and the university as a whole (Alipao, 2008; www.ust.edu.ph). Though the learning through teaching, researching and serving the communities are academic requirements and endeavors in nature, it stand as alternative and countervailing-structure as a distinct model, approaches and methods of pedagogy and learning (Freire, 1970&2005; DeFiore, et.al., 2005; Office of Community Engagement and Service. 2012; Diller, 2011; Dolgon&Baker, 2011).

On the other side, there are communities who are struggling are the concrete and real stage of development. The call for development must be measured in the grassroots level, in the midst of the life of people. Communities, either from its traditional sense like peoples who are in a specific physical and geographical locations or other forms of relationships among group of individuals, relationships that often crisscross and reinforce to one, sectoral and, individuals in multiple attachments (<https://en.oxforddictionaries.com/definition/community>). Community development is an applied social science discipline, a development strategy and development program was influential to the different societal stakeholders to pursue development and empowerment (Manalili, 1991, 2012, 2017). Many educational institutions, like UST, adopted the perspective and strategy of community development since 2001 until to the present as its expression in community engagement.

Communities as partners of academic institutions in the pursuit of development in many angles of human and social development are ideal spaces for learning and developing students (<https://digitalcommons.unomaha.edu>). In fact, community leaders and members are also considered as formators and facilitators for/of learning of students.

Thus, journey with communities thru genuine community integration is a service learning, in many expressions and processes, is one of the most vital and rewarding pedagogical tools that can be maximized that allows the students-learners, teachers-facilitators and communities to make real contribution for the development and empowerment of communities and to the larger society, using the knowledge and resources of sociology, community development and facilitative engagement processes (Mills, 1959&2000; Freire, 1970&2005; Biklen, 1983; Alipao, 2002; Alipao, 2008; DeFiore, et.al., 2005; Office of Community Engagement and Service, 2012).

Methods/analysis

This research had been conducted through personal narratives (but presented in third person in this case) because of the maximization of direct experiences of the author-researcher in attending his multi-roles in the university as a faculty, researcher and community development facilitator (<https://atlasti.com/narrative-research/>).

The research used and tapped different data collection methods:

Documents review: Reviewed the documents such as syllabi where the features and vital aspects of the two courses are stated (such as course objectives, contents, methods, strategies, requirements, expected outputs, and others). Concrete outputs of students-learners (such as program reports, research outputs, thesis in several academic years, theoretical reflections, and other outputs) were also re-read, reviewed, analyzed.

Field and personal notes on the practice of doing community development program in the university.

Thematic analysis: Through the information and data from the documents, vital features such as learning, insights, and theoretical reflections were gathered and

synthesized the highlights.

Theorizing: The author-researcher had theorized in terms of integrative strategy in teaching, intertwining with the research and community development engagements. Also, it reflects on the courses offerings, approaches, strategies, engagement models, and challenges.

II. Conclusions

This paper generally describe the gained processes and learning from the experiences of community integration as integrative strategy of teaching, research and community development with all the stakeholders involved:

- The author as faculty, researcher and university community development facilitator;
- The immediate and substantial university departments/offices where the author is directly connected;
- The students as learners, researcher and servers for community development and empowerment and;
- The partner communities as substantial stakeholder for community development and empowerment.

Through the support of different methods, results and discussion are the following points:

1. Author's prior experiences (1991 to 2002) before he entered in the academe (UST), he worked in the social action and advocacy of a certain diocese, networks of peoples, sectoral and community organizations, non-government organization (NGOs), churches and, advocates where he developed (personally and professionally) and exposed himself within complex realities and engagement in many ways and levels. In that development engagement, teaching (community education, trainings, facilitation and the likes), research and community development and organizing are integral component of socio-pastoral development work.

2. The author entered in the university in 2002. The author's experience for 17 years in the university had led him to intertwine the connections of teaching, research and community development. He entered in the university as a community development facilitator (program staff) of a newly formed UST Office for Community Development. The author assigned and initiated direct community organizing with indigenous peoples and communities (Ayta) in the municipality of Bamban (province of Tarlac, Central Luzon Region, Philippines). This was part of the whole plan to implement community development program with liberating and empowering dimension. This was also an expression to prove in the university that there were other strategies and means in working with communities.

3. After several months, the author became faculty member of the Department of Sociology where he handled several major Sociology courses and general sociology. Since sociology is a discipline very closed to communities, experiences of the author in community exposures and integrations became substantial method of the different major and general sociology courses he handled and thought.

4. The author continuous to serve in UST Office for Community Development (from 2002 until 2012) and UST Simbahayan Community Development Office (UST SIMBAHAYAN) (from 2012 until to the present) while holding a position of being a faculty member of the Department of Sociology (from 2002 until to the present). In January 2015, the author was appointed as the Assistant Director of UST SIMBAHAYAN. He is currently holding the said position.

As part of the UST SIMBAHAYAN, he directly supervise and assist student organizations in conceptualizing, developing and implementing community development projects in the different partner communities and institutions of the university. He also take lead the office to ensure that there is a proper establishment of partner communities from opening and developing partnership, strengthening partnership and phasing/turn-over of partnership. He is responsible in maintaining and sustaining the organization of the partner communities and their *Samahang Kamanlalakbay*, UST's partner communities' organization (with central and community based-units). Over-all, just like with the mandate of the UST SIMBAHAYAN, the author stand as advocate of community development engagement in the university.

5. The author, as faculty member, developed the intertwining of teaching, research and community development engagement in several expressions. The students were beneficial in these processes. These are the following:

5.1. Teaching and facilitating the sociology major courses were conducted with concrete examples, cases and studies aligned to the theories, concepts and realities being discussed.

5.2. Students were being exposed to the concrete social realities through the following approaches:

a. Conduct of personal/group simple researches on social realities, problems and concerns (community investigation in their own community or preferred community or sector);

b. Interactions with partner community leaders who were visiting the university in several occasions and activities;

c. Attendance and participations in different fora/symposia, social mobilizations, conferences and advocacy activities within and outside the university; and

d. Community exposures (5 to 7 days) in selected or preferred communities or sectors. Substantial numbers of community exposures and the research outputs were valuable in the establishment of community profile, community situational analysis and program development;

5.3. Different social and sociological researches were being conducted and developed in different levels and through different methods (qualitative, quantitative, descriptive, evaluative, exploratory, case studies, phenomenology and others).

5.4. Many theses were conducted and delivered with the topics or themes under the community development or community engagement. Most of the theses were conducted in the partner communities of the university with the intention and objective of supporting the partner communities through researches (social or sociological analysis of the community situation; evaluation of community programs of the university or particular academic units; evaluation of community programs in the partner communities; explore possible programs and policies for development).

6. The author pioneered in teaching Service Learning Courses (Theory and Application) from School Years 2012 to 2016. This has been shared already during the Second International Conference on Service-Learning (December 2016).

7. Through tapping and maximizing integrative method, several policies were developed:

7.1. Coordination of and between different major courses agreed to implement one community exposure covering the different courses' objectives;

7.2. Community exposure and integration needs adequate wholistic preparations before the implementation;

7.3. Community exposure and integration is a good approach in exposing the sociology students to the social realities that are helpful in understanding the following:

- a. Different sociological theories and concepts;
- b. Understanding themselves as human persons;
- c. Understanding the larger society and world and;
- d. Continue to understand and quest for social transformation.

8. The author also engaging in research from an informal to formal means:

8.1. From School Years 2002 to 2013 and School Year 2015 to 2017, the author engaged in research informally. Meaning, researches output were conducted outside the different research centers of the university; and

8.2. School Years 2013-2014, 2017-2018 and 2018-2019, the author engaged in research formally. Meaning, researches output were conducted under the research center of the university.

Though there were informal and formal affiliations in terms of doing research, the objective of knowledge generation were utilized in teaching and serving the communities and partner communities.

9. Particularly for the partner communities as hosts or venues of community integration of sociology students and as main recipient of community engagement of the university, they have gained several outputs:

9.1. They have established community profile, situational analysis and program development studies;

9.2. They established closer link to the university because of deeper understanding of community needs and situations and led to the establishment of community development programs; and

9.3. They have deeper understanding of their situations and to their respective community/sectoral organizations.

10. There were several common problems encountered in the processes of community integration and how they were handled:

10.1. The students have different understanding on “what is and how is” community integration (community excursion; adventurism; “community visitation only”; or genuine concept of living and understanding with the people and community). There were orientations and courses’ preparations before the community integration;

10.2. There were students who created “troubles” in the community. The students were accompanied by faculty members in the communities for continuous guidance and supervision. Policies were cleared and laid down to the students and parents/guardians before the integration;

10.3. Faculty advisers cannot always accompany their advisees in the field or community. Close coordination with the communities before, during and after the theses process were substantial in ensuring the safety of the students and their theses outputs; and

10.4. There were strict policies and requirements of the Commission on Higher Education (CHED) and university in terms of off-campus activities. There were instances that community integration or exposures did not push thru due to non-compliance or lack of requirements. The department is very strict in implementing the off-campus. This has been seriously implemented and followed by the department in the last four (4) semesters.

11. There were general opportunities and threats for the BA Sociology program in general and community integration in particular:

11.1. The new or first year college BA Major in Sociology students were the first graduates of Senior High School system can be considered opportunities toward better teaching sociology. But this can also be problematic because they are under the new curriculum of sociology. This batch has continuously experiencing as the pilot of new educational system. Community integration must be put in good phasing;

11.2. Generation of this new batch of students who are exposed to modern technology and social media must be encouraged to tap and balance their resources with sense of community, humility and, solidarity with communities; and

11.3. There is an opportunity to popularize and revitalize the discipline of sociology in the midst of neo-liberal economic policies and culture. The course must be felt by the students with convictions and know how to put in place in relation to larger society.

Contributions to theory and practice

Based from the reflections and narratives laid-down in this paper, teaching sociology with integration of research and community engagement and development has proven its non-traditional approach and liberating process for the students and communities’ learning and empowerment.

The author (faculty member) is vital in the facilitation of liberating processes of learning and serving. Deeper understanding and living the principles and processes of learning and serving are equally vital to the output. All possible resources and opportunities to teach or to facilitate, to generate knowledge and to serve are must for the agenda of serving and learning. Substantial exposure to the liberating and subversive processes is vital for the facilitators of learning to become the same. “Walk the talk” as the saying goes must be felt.

Theories and concepts are vital but these can be sharpened by the direct practice, facilitation and, witnessing the processes of community integration as a way of teaching, research and community development. Based from the reflections, all stakeholders have equally learned and served in the process.

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Resources:

- “A New Culture of Learning: Cultivating the Imagination for a World of Constant Change” by Thomas, D. & Brown, J.S. 2009:
<http://www.newcultureoflearning.com/newcultureoflearning.pdf>
- “Definition of Community”: <https://en.oxforddictionaries.com/definition/community>

¹ The Continuous Emergence: Trends and Patterns of Community Development: A Case Study in Rural Communities

“Developing Partnerships Through Service Learning Programs”:
<https://digitalcommons.unomaha.edu/cgi/viewcontent.cgi?article=1020&context=slicepartnerships>

“Making Service Meaningful: A Guide to Reflection” by Office of Community Engagement and Service, 2012:
<http://www.oregoncampuscompact.org/uploads/1/3/0/4/13042698/linfieldreflectionhandbook-2.docx.pdf>

“What is Narrative Research?”: <https://atlasti.com/narrative-research/>

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