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# The Impact of Interactive E-Learning Pedagogy in the Core Content of Cultural Dimensions Across Curriculum

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### **Abstract**

This study aims to analyze the impact of interactive e-learning pedagogy in understanding the relevance of cultural dimensions across curriculum in the Higher Education Institutions. This interactive e-learning pedagogy refers to the different cultural dimension videos, images, and other interactive elements included in the core content of the lessons particularly in the professional education subjects. The research method used in this study is theoretical and grounded theory design. Then content and thematic analysis was used in analyzing the data gathered. The participants were the fifty pre-service students from the College of Education, Mindanao State University-Iligan Institute of Technology, Philippines during the school year 2015-2016. Based from the findings of the study, learners are fully engaged and motivated to learn once it has high quality and meaningful content, integrate visual components. Another findings emphasize the boost knowledge retention rates which offer learners the opportunity to gauge their progress and summarize the content they have learned. Emotional responses also help to acquire and retain new information skills. Including videos that may elicit an emotional response or images that may allow them to personally relate to the subject are keys to interactive experiences. Encourage group collaboration which develops learners to communicate with one another entered around asynchronous learning. Finally, an interactive eLearning pedagogy includes a variety of different multimedia elements and is aesthetically appealing to be more interactive than one that relies upon solely text content. In conclusion, interactive eLearning pedagogy has great impact in the core content of cultural dimensions across curriculum.

Keywords: Cultural, Interactive, E-Learning Pedagogy

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### Introduction

This study aimed to analyze the impact of interactive e-learning pedagogy in understanding the relevance of cultural dimensions across curriculum in the Higher Education Institutions. This interactive e-learning pedagogy refers to the different cultural dimension videos, images, and other interactive elements included in the core content of the lessons particularly in the professional education subjects. Specifically, this qualitative research study also aimed to analyze and contextualize various phenomenological experiences and perspectives of diverse culture in social dimensions as a tool in getting into globalization and internationalization of Higher Education Institutions in the ASEAN Framework scenario because culture has so many meanings and uses in higher education research that this variety may seem frustrating to a reader who is not familiar with the traditions of cultural studies (Valimaa, 2008).

### **Statement of Objective**

The aim of this study was to generate a theory on the impact of interactive eLearning pedagogy in the core content of cultural dimensions across curriculum.

### **Literature Review**

Valimaa (2008) argues that "Culture has so many meanings and uses in higher education research that this variety may seem frustrating to a reader who is not familiar with the traditions of cultural studies". This implies that pre-service education students who will be the future teachers, need to familiarize the content of cultural studies in higher education curriculum. It is very important to know the concept of cultural dimensions across curriculum because this will be the basis of what pedagogy fits to the types of learners.

Furthermore, Marginson & Van der Wende (2007) strongly emphasize that "in global knowledge economies, higher education institutions are more important than ever as mediums for a wide range of cross-border relationships and continuous global flows of people, information, knowledge, technologies, products and financial capital. Even as they share in the reinvention of the world around them, higher education institutions, and the policies that produce and support them, are also being reinvented". This means that higher education institutions have a great role in globalization through the use of technology in the teaching and learning process. Meaning, through the use of e-learning pedagogy in higher education curriculum can help in learning the cultural context of the different cultures in the global arena.

Indeed, Serradell-López, Lara-Navarra & Casado-Lumbreras (2012) explain that "Higher education institutions are crucial in the present. Universities play a role that varies with time and evolves with society. Globalization is changing the world and affecting higher education institutions in all their intrinsic characteristics: personnel, programs, infrastructures and students". Thus, there should be interactive e-learning pedagogy to be used across curriculum.

In addition, Otten (2010) "provides an orientation for setting up diversity activities and diversity plans aimed at intercultural learning and presents the theoretical and

conceptual framework of an understanding of intercultural learning". Hence, there must an integration of cultural dimensions content through interactive e-learning pedagogy.

According to Waldner, Nemetz, & Steinberger (2008) "the trend towards more didactics in eLearning and the increased usage of new media makes the design and development of courses increasingly complex". The ideas of Wladner et al. have emphasized that e-learning instructional design with the core content of cultural dimensions helps the learners in their thorough understanding about cultural diversity. It is supported by Stojanovic, Staab & Rudi (2001) "eLearning is fast, relevant and just-in-time learning grown from the learning requirements of the new, dynamically changing, distributed business world". Santos (2008) "Dynamic support in adaptive inclusive educational systems depends on properly managing the adaptation in the eLearning life cycle by combining design and runtime adaptations and making a pervasive usage of standards along the eLearning life cycle". Ahdell & Andresen (2001) "Interactivity, flexibility, competition, reality, usability and drama elements are all features that will create engagement for the user of games and simulations in eLearning".

In addition, Loy (2014) stipulates that "eLearning has matured from the basics of lecture capture into sophisticated, interactive learning activities for students". So, the theory of constructivism, progressivism and pragmatism should be used as guide in content and pedagogy of teaching the learners particularly in the higher education institutions. Sanders & Udoka (2010) explain that "effectiveness and efficiency of eLearning, therefore, has to address a variety of issues, including the role of eLearning in knowledge and learning, its contribution to competent performance, its relationship to organizational transformation, and strategies for embedding it into other forms of electronic interaction". Hence, the curriculum needs interdisciplinary content knowledge with culturally responsive pedagogy.

Moreover, Monahan, McArdle & Bertolotto (2008) emphasize that "with the advent of the Internet however, e-learning has evolved and the term is now most commonly used to refer to online courses. A multitude of systems are now available to manage and deliver learning content online. While these have proved popular, they are often single-user learning environments which provide little in the way of interaction or stimulation for the student". This implies that interactive e-learning pedagogy is needed in diverse classrooms

Similarly, Singh & Hardaker (2014) argue that "levels of eLearning adoption would be higher if strategic managers recognized the social dimensions of eLearning innovation and diffusion, such as: academic and professional goals, interests and needs; technology interests; patterns of work; sources of support; and social networks". This means that the 21st century skills such as creative, innovative, collaborative, communicative and digital, critical literacy are needed in the designing interactive e-learning pedagogy by integrating the core content of cultural dimensions across curriculum.

In fact, Garcia-Robles, Blat, Sayago, Griffiths, Casado & Martinez (2004) "have been developed to support the creation of reusable and pedagogically neutral assessment scenarios and content, as stated by the IMS Global Learning Consortium". Punnoose

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(2012) "eLearning is not just a technology acceptance decision but also involves cognition, this study extended its search beyond the normal technology acceptance variables into variables that could affect the cognition of an individual due to his or her unique characteristics".

IAttwell (2007) "believes that we are coming to realize that we cannot simply reproduce previous forms of learning, the classroom or the university, embodied in software. Instead, we have to look at the new opportunities for learning afforded by emerging technologies. Social software offers the opportunity to narrow the divide between producers and consumers".

Ellis, Jarkey, Mahony, Peat, & Sheely (2007) "case-study reveals the complexity of quality improvement strategies, which (mainly due to the fact that eLearning complements the face-to-face learning experience) require a relational and embedded approach. Key principles for managing eLearning development and evaluation for campus-based universities are abstracted from the case-study and offered as a guide to universities who face similar challenges Research limitations/implications — Although not all aspects of the case-study can be applied to other contexts, the key principles of the proposed management model are likely to apply to other campus-based universities which share the same focus on integrating eLearning in sustainable ways but also wish to foreground quality assurance issues".

Edwards & Finger (2007) "Following an introduction to ICT and sport management, and discussion of eLearning and sport management, new eLearning roles are explored through presenting hyperpedagogy which extends concepts of poststructural theory into digital pedagogies. Research on hypertext and poststructuralism and the relationship between cultural studies, technology and popular culture has led to the assembly of theories of hyperpedagogy that seek a more informed and critical engagement with technology".

Conlan & Wade (2004) "usability and effectiveness of using the multi-model, metadata-driven approach for producing rich adaptive eLearning solutions that remain content and domain independent. Through this independence, the eLearning services developed can utilize many pedagogical approaches and a variety of models to produce a wide range of highly flexible solutions".

Docherty, Hoy, Topp & Trinder (2005) "Using eLearning supports students' learning within a simulated environment. Learning was facilitated through network communications and reflection on video performances of self and others".

Nagunwa & Lwoga (2012) "A successful implementation of eLearning requires a strategic approach which should be embedded by the university management, academic staff and students. The approach should at least take into account significant issues including pedagogy, ICT infrastructure, appropriate technologies, human resources, eLearning policy, training of faculty and students, integration of eLearning and information literacy into university's curricula and partnerships".

Stanisavljevic, Nikolic, Tartalja & Milutinovic (2015) "classification that should help understanding key aspects of multimedia application in eLearning tools. The classification tries to cover important aspects of multimedia application in eLearning

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tools: communication channels and exchange of different types of contents throughout the channels, understanding in communication, and the ways of object manipulation in the user-tool interaction"

Lantz & Brage (2006)"by reflecting on the theoretical and practical implications of applying the extended Kuhlthau's model, as practice has shown that this approach is useful for pedagogical developmental work, including curriculum development in general, and specifically for information literacy programmes".

Lam, McNaught, Lee, Jack & Chan, (2014) "revealed that while students of different disciplines did not vary a great deal in their daily usage of technology, there were differences in their level of confidence in using technology. The use of technology for teaching and learning also differed across disciplines".

Catarci, De Giovanni, Gabrielli, Kimani, Stephen & Mirabella (2008)"describe how a user-centered design process was applied to develop a method and set of guidelines for didactical experts to scaffold their creation of accessible eLearning content, based on a more sound approach to accessibility".

Irvine (2010) "culturally relevant pedagogy means simply acknowledging ethnic holidays, including popular culture in the curriculum or adopting colloquial speech. In this article, the author emphasizes that using knowledge of students' cultural backgrounds in instruction helps to bridge the cultural gap".

Attwell (2007) "starts by looking at the changing face of education and goes on to consider the different ways in which the so-called net generation is using technology for learning. It goes on to consider some of the pressures for change in the present education systems".

Steen (2008)"designing successful eLearning is part art and part science, involving the use of learning and training theory and an understanding of the knowledge and/or skills to be taught"

### **Method Used**

The research method used in this study is theoretical and empirical design because theories from literature reviews and the students' reaction as well as reflection has been analyzed as the basis of the findings and results of this study. Then content and thematic analysis is being used in analyzing the data gathered. The participants of this study are the fifty pre-service students from the College of Education, Mindanao State University-Iligan Institute of Technology, Philippines during the school year 2015-2016.

### **Research Design**

The design of the study was carried out according to the tenets of grounded theory. The design of a grounded theory is flexible and determined by the phenomenon under study. Qualitative data was utilized to develop a grounded theory that described the impact of interactive eLearning pedagogy in the core content of cultural dimensions across curriculum. The dearth of literature in the Impact of Interactive eLearning

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Pedagogy in the Core Content of Cultural Dimensions Across Curriculum led to the selection of an inductive methodology. This approach is a type of factor-searching study in which concepts emerge to describe a social process. Data collecting, coding and analyzing occurred jointly.

### **Research Environment**

The study was conducted at the College of Education, Mindanao State University-Iligan Institute of Technology, Iligan City, Northern Mindanao, Philippines.

### **Research Informants**

The respondents of the study were fifty (50)pre-service education students with diverse cultures from the College of Education, MSU-IIT. They were students who have already taken all professional education subjects. They were interviewed regarding their knowledge, feelings and beliefs about the impact of Interactive eLearning Pedagogy in the Core Content of Cultural Dimensions Across Curriculum.

### **Data Gathering**

In-depth interview averaging 60 minutes in length was conducted. Interviews were held in the classroom. Written informed consent was secured from the chairpersons of the four departments namely: Department of Science and Mathematics, Department of Physical Education, Department of Technology Teacher Education and Department of Professional Education. Written consent to audiotape interviewers was obtained. The interviews were documented through extensive field notes. An interview guide consisting of open-ended questions and associated probes was used to facilitate the interview process with each subject. The guide is not used as a structured questionnaire, rather it served as a reminder to the researcher to explore various issues if they were not spontaneously addressed. Reflective field notes documenting the researcher's own responses to the interviews and the overall research process were recorded in a field journal.

### **Data Analysis Plan**

Interview transcripts were coded using the "open substantive" coding in which the data were examined to identify the substance of what the data actually represent. Data were continually coded, compared and recorded until patterns or categories begin to emerge. The initial level concept that emerged from the substantive coding were transferred to a computer-based word processing program with sort capabilities. Similar initial level concepts from multiple transcripts were grouped together and/or combined with other concepts. Patterns and categories emerged as the coded data. Emerging theoretical idea was preserved through written memos. These theoretical memos are critical in refining conceptual relationships and in eventually developing integrated theoretical framework.

### **Theory Generation Process**

Grounded theory is a general research method (and thus is not owned by any one school or discipline); which guides one on matters of data collection and details

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rigorous procedures for data analysis. Quantitative data or qualitative data of any type e.g. video, images, text, observations; spoken word etc. can be utilized. This is a research tool which helps the researcher discover and make patterns and structures in the area of interest through the process of constant comparison (http://goo.gl/l3vw3T). Grounded Theory is presented here as a method of choice as it is detailed, rigorous, and systematic, yet it also permits flexibility and freedom. Grounded Theory offers many benefits to research in Information Systems as it is suitable for the investigation of complex multifaceted phenomena. It is also well equipped to explore socially related issues. Despite existing criticism, it is a rigorous and methodical research approach capable of broadening the perceptions of those in the research community (Jones & Alony, 2011).

### Results and Discussion of Preliminary Study for Theory Development

The results of the study for the development of theory are depicted in the demographic profile of participants and the responses of the informants about impact of interactive e-learning pedagogy in understanding the relevance of cultural dimensions across curriculum in the Higher Education Institutions.

Demographic Information. Table 1 showed the profile of fifty (50) pre-service college of education students as respondents of the study. Age range for the students are from 15-19 years old, race & ethnicity, gender, and language use at home. All pre-service college education students twenty pre-service CED students are female and five students are male. All of them have already taken their professional education subjects.

Participant	Race & Ethnic	Gender	Age	Language	CED-
	Groups		Range	Used at Home	Department
P1	Cebuano	F	17	Bisaya	DTTE
P2	Cebuano	F	17	Bisaya	DTTE
P3	Cebuano	F	17	Bisaya	DTTE
P4	Cebuano	F	17	Bisaya	DTTE
P5	Butuanon	F	17	Butuanon	DTTE
P6	Subanon	M	17	Subanon	DSME
P7	Iranun	M	18	Maranao	DSME
P8	Zamboangueño	F	16	Chavacano	DSME
P9	Surigaonon	M	17	Surigaonon	DSME
P10	Boholano	F	17	Bisaya	DPE
P11	Maguindanao	F	17	Maguindanaon	DPE
P12	Maranao	F	18	Maranao	DPE
P13	Maranao	F	18	Maranao	DPE
P14	Tagalog	M	17	Tagalog	DTTE
P15	Cebuano	F	17	Bisaya	DSME
P16	Cebuano	F	18	Bisaya	DPRE
P17	Tagalog	F	18	Tagalog	DPRE
P18	Maranao	F	18	Maranao	DPRE
P19	Maranao	F	18	Maranao	DPRE
P20	Cebuano	M	18	Bisaya	DPRE
P21	Boholano	F	18	Bisaya	DPRE
P22	Cebuano	F	18	Bisaya	DPRE

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P23	Cebuano	M	18	Bisaya	DPRE
P24	Cebuano	M	18	Bisaya	DSME
P25	Cebuano	F	17	Bisaya	DSME
P26	Boholano	F	17	Bisaya	DPE
P27	Cebuano	F	17	Bisaya	DPE
P28	Cebuano	F	17	Bisaya	DTTE
P29	Cebuano	M	17	Bisaya	DSME
P30	Cebuano	M	17	Bisaya	DTTE
P31	Cebuano	F	18	Bisaya	DPE
P32	Cebuano	F	18	Bisaya	DPE
P33	Cebuano	F	18	Bisaya	DPRE
P34	Maranao	M	18	Maranao	DSME
P35	Maranao	M	18	Maranao	DSME
P36	Cebuano	F	18	Bisaya	DPE
P37	Cebuano	F	18	Bisaya	DPRE
P38	Cebuano	F	18	Bisaya	DPE
P39	Cebuano	F	18	Bisaya	DSME
P40	Cebuano	F	18	Bisaya	DSME
P41	Cebuano	M	18	Bisaya	DPE
P42	Cebuano	F	19	Bisaya	DPE
P43	Cebuano	M	19	Bisaya	DTTE
P44	Maranao	F	19	Maranao	DTTE
P45	Maranao	F	18	Maranao	DSME
P46	Cebuano	F	18	Bisaya	DSME
P47	Cebuano	M	18	Bisaya	DPRE
P48	Cebuano	M	17	Bisaya	DPRE
P49	Cebuano	F	17	Bisaya	DPRE
P50	Cebuano	F	18	Bisaya	DPRE

Pre-service CED Students(Participants) – Views, Feelings, knowledge of interactive e-learning pedagogy and the relevance of cultural dimensions across curriculum in the Higher Education Institutions.

The informants shared their views, feelings, knowledge of interactive e-learning pedagogy and the relevance of cultural dimensions across curriculum in the Higher Education Institutions. The different statements were compared, coded and categorized. Patterns were made from their responses. Learners are fully engaged and motivated to learn once it has high quality and meaningful content, integrate visual components it means the topic is more eye-catching that encourages learners, reality-based eLearning scenarios it means Integrating real life examples and problems into their eLearning activities which give them chance to draw how knowledge acquired can be applied outside of the learning environment.

- P1 "Pre-service students have a need for effective training. Thus, the curriculum should have good training for effective eLearning to meet those needs".
- P2 "As one of the pre-service students, I feel that the teacher education curriculum should emphasize the use of instructional designers as pedagogical experts for eLearning activities within institutions of higher education."

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- P3 "For me, it is very important to learn as much designing and developing effective instructional design across the disciplines"
- P4" Effective instruction would be enhanced through the combination of content and pedagogy with the emphasis of cultural dimensions in education
- P5 "There is a need for pre-service education students to fully understand the concept of culturally relevant pedagogy."
- P6 "Culturally relevant pedagogy with the integration of e-learning is very useful in attaining effective teaching in culturally diverse classrooms"
- P7 "Students tend to appreciate culturally relevant pedagogy once there is e-learning using video of the different cultures. Through this type of teaching, learners with different cultures are engaged and motivated".
- P8 "Culturally relevant pedagogy means simply acknowledging ethnic holidays, including popular culture in the curriculum or adopting colloquial speech."
- P9 "Being a future teacher, it is very important to know the learners' cultural backgrounds as the basis of using content and pedagogy in the teaching and learning process".
- P10 "In the content and pedagogy, e-learning is the best metacognitive strategy in discussing the importance of cultural dimension across curriculum particularly for the multiculturalism aspect".
- P11" e-learning helps the teachers and students in facilitating the core content of cultural dimensions across curriculum"
- P12" The use of e-learning is relevant in honing the minds or cognitive aspect of every student particularly the learners with disabilities".
- P13" In learning the core content of cultural dimensions across curriculum, elearning strategy with scaffolding approach can help the indigenous people".
- P14" e-Learning pedagogy with core content of cultural dimensions is very useful for the learners with different cultures".
- P15 "e-learning Web 2.0 technology emphasizing content of cultural dimensions fits to the learner-centered learning environment".
- P16"e-learning strategy approach by discussing about cultures of the different people is inspires and motivates the learners to learn the core content of cultural dimensions across the curriculum".
- P17" e-learning Web 2.0 encourages people to interact and to share information".

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- P18 " e-Learning Web 2.0 explains and translates into interactive strategy of teaching."
- P19 "e-learning using a video of the core content of cultural dimensions is the best method of teaching."
- P20 "Using (YouTube) in interactive e-learning pedagogy leads to critical literacy."
- P21 "Interactive e-learning pedagogy in core content of cultural dimensions of education helps learners in analyzing the concepts and essence of multicultural education".
- P21 "Using videos about cultures of different people in interactive e-learning activity serves as motivational collaborative activity which relates to constructivism theory."
- P22" e-learning pedagogy is very useful on interdisciplinary differences of the learners in higher education institutions".
- P23" Interactive e-learning pedagogy using video of indigenous people helps students of different disciplines and learning styles."
- P24" Interactive e-learning video on cultural dimensions across disciplines for teaching and learning also differed across disciplines have more experiential facilitating activities."
- P25" e-learning pedagogy is very useful strategy in teaching learners with different cultures."
- P26 "Adoption of e-learning pedagogy gives positive impact in teaching and learning process."
- P27" Using interactive e-learning video can help other stakeholders like parents, teachers and other members in the community".
- P28" In educational technology subject, creating video about cultural dimensions generates creative, innovative, collaborative and critical thinking skills for the 21st century learners."
- P29 "In designing and creating interactive e-learning pedagogy using video featuring cultural dimensions in education will help in drawing concepts and implications.
- P30" Multimedia application in eLearning tools can improve the comprehension skills of the learners."
- P31" Interactive eLearning video can help improve communication skills."
- P32" Interactive e-learning pedagogy using video inside the classroom can inspire the learners."

- P33 "Interactive e-learning video about multiculturalism is a great strategy in analyzing the global trends in getting into internationalization."
- P34" In developing and designing an interactive eLearning pedagogy is a new tool to implement competency-based curricula for higher education institutions of learning."
- P35" Using interactive e-learning pedagogy video about the cultural dimensions supports the higher education curriculum in getting into globalization".
- P35" Interactive e-learning pedagogy is very relevant in the core content of cultural dimensions across curriculum"
- P36" Interactive eLearning can enhance ubiquity, equity and quality in higher education of learning in the development of appropriate skills for the 21st century learners."
- P37"Interactive e-learning pedagogy is also use as innovative and emerging technology which is relevant to learning environments.
- P38"A successful implementation of eLearning requires a strategic approach which should be embedded by the university management, academic staff and students.
- P39" Integration of eLearning pedagogy can help in improving information literacy into university's curricula and partnerships".
- P40" Using eLearning pedagogy video in the core content of cultural dimensions support students' learning within a simulated environment".
- P41" Interactive e-learning pedagogy with school's philosophy and core content of cultural dimensions across curriculum is also useful in project based learning(PBL).
- P42" Interactive e-learning pedagogy in the core content of cultural dimensions is a solution to a student-centered problem based approach to the acquisition 21st century skills that used high quality learning objects embedded within the objectives of the lessons."
- P43" Interactive e-learning pedagogy using video can encourage pre-service education students to explore, analyze the best facilitating network communications and reflection while watching on video performances of different contents in cultural dimensions of education".
- P44" eLearning techniques can help pre-service education students acquire 21st century skills in the safety of a simulated environment within the core content of cultural dimensions across curriculum."
- P45" Interactive e-learning video about multicultural education in the core content of cultural dimensions, is also very useful for critical thinking analysis."

P46" Using video in interactive e-learning pedagogy with core content in cultural dimensions can encourage group collaboration which develops learners to communicate with one another entered around asynchronous learning".

P47 "Interactive e-learning pedagogy can help learners to fully engage and understand the core content of cultural dimensions of education."

P48 "Interactive e-learning pedagogy using video can help learners in their emotional responses to acquire and retain new information or skills."

P49" Interactive eLearning can utilize many pedagogical approaches and a variety of models to produce a wide range of highly flexible solutions.

P50" Interactive e-learning pedagogy gives benefits to learners to boost knowledge retention rates"

### **Categorizing, Coding and Themes**

Four themes which emerged from the responses of the participants are:

Theme 1: Learners are fully engaged and motivated to learn once it has high quality and meaningful content.

Theme 2: Integration of visual components in discussing the topic is more eyecatching that encourages learners, reality-based eLearning scenarios.

Theme 3: Interactive e-learning pedagogy can boost knowledge retention rates which offer learners the opportunity to gauge their progress and summarize the content they have learned.

Theme 4: e-learning videos may elicit an emotional response or images that may allow learners to personally relate to the subject are keys to interactive experiences.

### **Hypotheses Derived from the Results:**

After looking into the patterns and categorizing items, I was able to formulate the following hypotheses on the impact of interactive eLearning pedagogy in the core content of cultural dimensions across curriculum. Analyzing the responses of the preservice education students in the guide questions through the face to face interviews, hypotheses were derived.

Hypothesis 1: If learners are fully engaged and motivated to learn, it is because of the high quality and meaningful content of the cultural dimensions across curriculum.

Proposition 1: The core content of cultural dimensions can motivate learners in analyzing the different cultures.

Hypothesis 2: If the Integration of visual components in discussing the topic is more eye-catching that encourages learners, reality-based eLearning scenarios are effective pedagogy in the higher education institutions.

Proposition 2: Integration of e-learning pedagogy in the core content of cultural dimensions is very important in the teaching and learning across curriculum.

Hypothesis 3: If Interactive e-learning pedagogy can boost knowledge retention rates, it offers learners the opportunity to gauge their progress and summarize the content they have learned.

Proposition 3: Interactive e-learning pedagogy can boost knowledge retention rates.

Hypothesis 4: If e-learning videos may elicit an emotional response or images it may also allow learners to personally relate to the subjects which are keys to interactive experiences.

Proposition 4: e-learning videos about the core content of cultural dimensions may elicit an emotional response or images through interactive experiences.

### **Generated Grounded Theory:**

Interactive e-learning pedagogy is an effective interdisciplinary instructional design for the higher education institutions across the globalized world curriculum.

### Findings and discussions

Based from the findings of the study learners are fully engaged and motivated to learn once it has high quality and meaningful content, integrate visual components it means the topic is more eye-catching that encourages learners, reality-based eLearning scenarios it means Integrating real life examples and problems into their eLearning activities which give them chance to draw how knowledge acquired can be applied outside of the learning environment. Another findings emphasize the boost knowledge retention rates which offer learners the opportunity to gauge their progress and summarize the content they have learned, emotional responses can also help learners to better acquire and retain new information or skills. Including videos that may elicit an emotional response or images that may allow them to personally relate to the subject are keys to interactive experiences. Encourage group collaboration which develops learners to communicate with one another entered around asynchronous learning. Finally, an interactive eLearning pedagogy includes a variety of different multimedia elements and is aesthetically appealing to be more interactive than one that relies upon solely text content.

### Conclusion

In conclusion, interactive eLearning pedagogy has great impact in the core content of cultural dimensions across curriculum. Culturally relevant pedagogy through interactive e-learning instructional design is an effective teaching method in culturally diverse classrooms.

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### Using Web 2.0 and Corpus Technology to Enhance Vocabulary Acquisition

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### **Abstract**

Undergraduate students are exposed to discipline-specific lexis and concepts, particularly when studying in a second language. Current research suggests that most students find it difficult to fully comprehend academic reading material because they lack the requisite vocabulary, i.e., 5,000 to 8,000 word families are required for achieving 95% to 98% comprehension, respectively. Thus, in order to enhance vocabulary acquisition and, ultimately, improve knowledge of complex discipline specific vocabulary, this study evaluated the use of the *Memrise* application as a selfdirected learning tool. The study was conducted in an Arab higher education institution where undergraduate students studied IT in English. By using the Memrise application in conjunction with a discipline-specific key word corpus, it was anticipated that this intervention would improve vocabulary acquisition with minimal use of classroom teaching time. Results indicated that when students engaged with the learning tool there was a noticeable improvement in vocabulary knowledge for those who used the application on a regular basis. Overall, the study has implications for teachers, as well as learners, as the *Memrise* application is an adaptable and freely available mobile learning tool for developing vocabulary knowledge.

Keywords: data-driven learning; vocabulary self-collection strategy; vocabulary learning; teaching with mobile learning applications

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### Introduction

The ability to read academic texts in English is one of the most challenging issues facing second language learners and, when coupled with subject—specific vocabulary, studying at English-medium institutions (EMI) can be challenging for many of the Emirati students who have previously only studied in Arabic-medium schools. Therefore, many federal EMI's in the UAE require students who have not achieved an International English Language Testing System (IELTS) score of 5.0 to attend a pre-baccalaureate program that focuses on English academic literacy and language skills.

Reading proficiency is assessed throughout these academic English courses and students are expected to have achieved a satisfactory level of academic literacy skills that will allow them to cope with the English language textbooks and the discipline-specific material encountered in their baccalaureate studies. At first glance, most students do cope and have the literacy skills to meet subject requirements. However, informal feedback from many of the content faculty suggests that students do struggle with the complex texts and subject-specific vocabulary they encounter in class. This situation stimulated several discussions within the college and prompted further investigation.

A short survey was conducted with the content faculty, asking them to identify the language difficulties their students faced in class and what strategies they used to cope with these problems. Most responses indicated that many students did, indeed, face language difficulties, particularly with the complex vocabulary they were required to learn and the ability comprehend course textbooks. Furthermore, several faculty felt that it was not their place to cater for these difficulties and that additional language support should be provided. (Internal College of Technological Innovation's Language Task Force Survey, January 2014). This initial lack of language support for content courses led to the development of a variety of research projects to look at strategies for enhancing students' academic literacy skills.

The focus of this research project was to improve vocabulary acquisition. It was hypothesized that by using contemporary text mining techniques to extract key vocabulary and by improving vocabulary acquisition through MALL (Mobile Assisted Language Learning) strategies, we will be able to reduce the difficulties faced by ESL students when studying difficult concepts and lexis in their content courses and help them develop what Vollmer calls:

".... 'conceptual literacy' and 'discourse competence'. The first of these terms can be defined as the ability to think clearly with the help of language, whereas the second means to apply linguistic abilities acquired for the purpose of communicating clearly about relevant topics and thematic structures." (Vollmer, 2006, p.7)

In section 2 of this paper, the literature review will address the issue of developing vocabulary knowledge. Section 3 will discuss the methodology used to develop the vocabulary and, finally, Section 4 of the paper will conclude with a discussion of the results and future implications for this pilot project.

### **Background**

Current research has demonstrated that there is a clear link between word knowledge and the ability to comprehend texts. This relationship was examined by (Nation, 2006) and more recently by (Laufer and Ravenhorst-Kalovski, 2010) who not only suggested that increased vocabulary knowledge could lead to an improvement in reading comprehension, but also proposed two thresholds for text coverage and comprehension. This showed that for a student to understand 98% of a text, knowledge of 8,000 word families is required and a knowledge of 4,000 to 5,000 word families for 95% coverage.

Studies cited by (Cobb,2015) suggest that the first 2,000 most frequent words, coupled with the 570 word families in the Academic Word List (AWL), can bring the coverage of an academic text up to approximately 90%. The students in this pilot course were tested using the (Meara and Milton, 2003) X Lex vocabulary levels test and had an average vocabulary level of 3,500 to 4,000 words. To increase comprehension to the minimum coverage of 95% recommended above, an intervention that will increase the students' word knowledge of 4,000 to 5,000 word families will be required.

This awareness of the importance of academic vocabulary is thus deemed necessary for students to study successfully in university. Consequently, it is paramount that the content faculty be made aware of interventions that could enhance their students' comprehension of academic texts. However, as the faculty survey above revealed, many content teachers do not have the time or inclination to engage in strategies to improve their students' text comprehension. Instead, many rely on basic glossaries available in the course textbooks and assume that the students will make use of these. To rectify this situation, an intervention framework based on the Vocabulary Self-Collection Strategy (VSS+), (Haggard, 1982; and 1986, p. 204; Wolsey, Smetana and Grisham, 2015), was created. A pilot study was implemented (Dowswell, 2016), and the results were positive for those students who completed the project, however, after much reflection, it was decided to revise the framework as the VSS+ wiki activities were very labour intensive. It was at this point that the *Memrise* application was chosen as a replacement for the course vocabulary wiki.

# What is Mobile Assisted Language Learning (MALL) and why was the Memrise application selected?

As previously mentioned, a computer-based intervention using a class wiki was implemented. The wiki could be easily accessed by the students on many different devices, thus, allowing them to collaborate and update the course glossary by means of the class wiki if they had Internet access. The construct behind the VSS+ wiki strategy; the Involvement Load Hypothesis (ILH) (Laufer and Hulstijn, 2001), also ensured that the students who participated retained the vocabulary they processed for longer. As they hypothesized; words processed with greater learner involvement are retained longer than those processed with a lower involvement load. The construct, labeled 'task-induced involvement', incorporated the cognitive components of 'Search' and 'Evaluation' and the motivational component of 'Need', so as long as there is a high level of engagement for each of the components, learning will take place.

There was now, however, a need to employ a more user-friendly framework that still retained the advantages of the VSS wiki framework and the ILH. As a result, the *Memrise* application (https://www.*Memrise*.com/about/) was selected. This application is basically an electronic flash card with many additional features such as; algorithms that make a note of lexis with which the students have difficulty. It can be easily personalized, with audio and pictorial additions, and even translations can be added.

Although it does not completely follow the process of task-induced involvement, when students are researching the word for uploading to *Memrise*, they are using the "Need" "Search" and "Evaluation" components. The students also have the opportunity to work online, or offline, and individually, or collaboratively, to create electronic course glossaries. The other rationale for choosing *Memrise*, was that the UAE has one of the highest adoption rates in the world for "smart devices" (GfK Consumer Index, 2016). All the students in this study had access to a smart mobile device and the *Memrise* application.

## What are the criteria for vocabulary selection and how were the key words selected?

The current debate on the benefits of rich vocabulary instruction (Nagy and Townsend, 2012) as opposed to "genuine academic reading for the readers' own purposes" (Krashen, 2012, p. 233) has prompted educators to explore what intervention would be more successful with ESL students. However, evidence provided by (Smith, 2001) showed that Arab learners find vocabulary acquisition extremely challenging, primarily because a limited number of words in English are borrowed from Arabic. Furthermore, the Arab teaching pedagogy is traditionally based on rote learning and, in most situations, there is minimal engagement in extensive reading activities. Based on this evidence, the present study employed 'rich' vocabulary instruction strategies in the style of the *Memrise* application, as these would be deemed more useful for Arab ESL students.

Having decided on a new method of intervention, a corpus of academic words specific to the pilot Information Technology course, IT in Global and Local Cultures, was used again. The use of corpora in language teaching and learning, sometimes referred to as 'data-driven learning', a model created by (Johns, 1990) (as cited in O'Keeffe, & McCarthy, 2010), has greatly simplified the process of analyzing language and enabled the creation of frequency lists based on the course textbook. The corpus was easily created using the SketchEngine application (Kilgarriff, Rychly, Smrz, & Tugwell, 2004). Once the lists were created and analyzed, the keywords were chosen based on the following criteria: the relevance to subject, (discipline specific words), the academic word list, (general academic words), and, finally, the frequency level as per the Vocab Profiler (Cobb, 2015). The rationale for this is based on the (Hiebert and Lubliner, 2008) study on academic vocabulary instruction. This suggests that academic words can be categorized into two distinctive areas: general and disciplinespecific. General words are used across disciplines, whereas discipline-specific words tend to be used only in particular subject areas. It was decided to include both types, as learning discipline-specific words does not always guarantee full comprehension of discipline-specific texts.

### Methodology

### Research design

The aim of this research was to develop and apply a framework for the teaching and learning of content-specific vocabulary. It employed a quasi-experimental research design to test the impact of the *Memrise* application and compare the results against a control group who received normal instruction. The participants were randomly selected based on their classroom placement. The study explored the following research questions:

- 1. Is there a significant difference between the MALL (Mobil Assisted Language Learning) intervention group and the control group that received traditional vocabulary instruction strategies?
- 2. What are the IT students' perceptions of learning academic vocabulary with the *Memrise* application?

### The Intervention

### **Participants**

A total of 11 male and 42 female university students majoring in Information Technology at an EMI university in the UAE were asked to participate in the study. The students, all ESL learners with Arabic as their first language, ranged in age from 20-30 years old. A control group of 20 female students followed the traditional course of instruction. The intervention group consisted of two intact groups: one female class of 22 students and one male class of 11 students who had the option of using the *Memrise* application to reinforce vocabulary encountered in class. Of the students participating in the intervention group, 24 of the 33 students completed a pre- and post-vocabulary knowledge (VKS) test and 33 completed the questionnaire. From the control group, only 8 students completed the pre- and post-VKS test.

The intervention took place over a period of twelve weeks or six teaching units. The students in the intervention group were instructed on the use of the *Memrise* application as an autonomous learning tool. After reading the text and discussing the major concepts in class, the students who had access to the *Memrise* application could access the specific *Memrise* course (CIT 305) that contained the lexis for each new topic covered in the course. The intervention students also had the opportunity to add to the *Memrise* entries as they saw fit. As an incentive, a small percentage of the final course grade was awarded for participation based on the score on the leaderboard.

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Picture 1. Screenshot of Memrise Course Leaderboard and Vocabulary Item



Picture 2. Screenshot of Memrise Vocabulary Item

### **Data Collection Instruments & Procedures**

All students taking the course were asked to complete a vocabulary knowledge test. The aim of the test was to establish which of the 130 corpus keywords were known by both groups of students. Additionally, at the end of the study, a questionnaire was used with the intervention group to assess the students' perceptions on the use of the *Memrise* application as an autonomous learning tool.

The vocabulary test used was an adapted version of the Vocabulary Knowledge Scale (Paribakht and Wesche,1997) which is a test of students' knowledge of discipline specific and academic vocabulary and was based on 130 prominent key words, extracted from the discipline specific corpus. The students in this study indicated their level of recognition of the words by selecting one of the following four options:

- a) I have never seen this word before;
- b) I have seen or heard of this word before;
- c) I think I can define this word;
- d) I am confident I can define this word.

The test was completed by 24 students from the intervention group and 8 students from the control group.

The questionnaire was comprised of a total of 7 statements. Participants in the intervention group were asked to rate each statement on a 5-point Likert scale (Agree, Strongly Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree). The questionnaire was administered at the end of the 12-week intervention and it was completed by 33 students.

### **Results & Discussion**

### **Pre- and Post-Test Comparisons**

The first research question sought to investigate the effect of vocabulary instruction using the *Memrise* application with the intervention group and to compare the results with a control group who had received traditional vocabulary instruction.

To investigate the effect of the *Memrise* application on vocabulary comprehension, a repeated measure ANOVA was used to compare between the mean scores of a pretest and those of a post-test given to each group. The vocabulary used in the pre-tests and post-tests was specific to the vocabulary clusters.

For the vocabulary set, a pre-test and a post-test were given. An ANOVA test analyzed in SPSS showed a significant difference between the two tests. The means of the two tests are shown in the table below:

**Table 1. Descriptive Statistics** 

	Mean	Std. Deviation	N
Post 1 Categories	.7917	.58823	24
Pre 1 Categories	2.8333	1.00722	24

The statistical test revealed a main effect between the two tests F(1, 23) = 79.458. We applied the Greeenhouse-Geisser correction as the Greeenhouse-Geisser estimate

of sphericity ( $\varepsilon = .79$ )

**Table 2. Tests of Within- Subjects Effects** 

Measure: Measure 1									
Source		Type III Sum od Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent Parameter	Observed Power a
Test1	Sphercity Assumed	50.021	1	50.021	79.458	.000	.776	79.458	1.000
	Greenhouse- Geisser	50.021	1.000	50.021	79.458	.000	.776	79.458	1.000
	Huynh- Feldt	50.021	1.000	50.021	79.458	.000	.776	79.458	1.000
	Lower- bound	50.021	1.000	50.021	79.458	.000	.776	79.458	1.000
Error(test1)	Sphercity Assumed	14.479	23	.630					
	Greenhouse- Geisser	14.479	23.000	.630					
	Huynh- Feldt	14.479	23.000	.630					
	Lower- bound	14.479	23.000	.630					

a. Computed using alpha = .05

Pairwise comparisons were conducted to parse out the discrepancies between pre-test and post-tests. These comparisons showed that the participants performed significantly better when tested after the end of the first vocabulary intervention.

Each subsequent set of vocabulary words followed the same pattern (a pretest, an intervention – *Memrise* – followed by a post-test) and a similar method for data analysis. The second set of vocabulary words showed a significance difference. However, the results of these indicated an opposite effect. The students performed better in the pre-test than they did in the post-test. When tested, the third set of vocabulary did not show a significant difference between the pre-test and post-test with a p value of .83. The fourth and final test showed a significant difference between the pre-test and post-test with a p value of .002.

There are several reasons why this data was inconsistent. For one, the VKS is a self-reporting test and students may not fully understand the importance of answering accurately. They also may not have encountered this type of test before as self-reporting tests are not frequently used in this context. Therefore, students may have needed more time to become accustomed to the value of self-reporting for both teachers and learners.

## **Questionnaire**

The second research question sought to discover what the intervention group thought about the *Memrise* application as a means of learning vocabulary. A questionnaire was used asking the participants in the intervention group to rate a total of 7 statements on a 5-point Likert scale. The results of the questionnaire are shown in Table 3.

Table 3. Questionnaire results (n=33).

Sta	tement	SD	D	N	A	SA
1.	Memrise has been useful for vocabulary learning.	7	1	8	10	7
2	Memrise is a useful tool to practice new course	7	3	3	11	9
2.	vocabulary.					
<b>3.</b>	Memrise has given me more exposure to new vocabulary	6	1	7	10	9
<b>4.</b> I think my motivation to the subject has now increased.		6	2	5	16	4
The <i>Memrise</i> Application has improved the sense of		5	5	9	12	2
3.	community in the class.					
<b>6.</b> <i>Memrise</i> is easy to launch and navigate.		6	2	3	13	7
7.	7. <i>Memrise</i> motivates me to study vocabulary more often. 5 3 6 14 5			5		
Note: SD= Strongly Disagree; D=Disagree; N=Neutral; A=Agree; SA=Strongly						
Ag	Agree					

The feedback gathered from the questionnaire suggested that:

- Just over 50% of the students in the intervention group found that the *Memrise* application was useful for vocabulary learning.
- While 60.6% felt that *Memrise* was a useful tool for practicing new vocabulary.
- A further 19 out of 33 students felt that *Memrise* provided them with more exposure to new vocabulary.
- Just over 60% of the students felt that their motivation increased, however, only 42% felt that it improved their sense of community in class.
- In terms of ease of use, just over 60% of the students found the application easy to launch and navigate.
- Finally, approximately 57% of students stated that *Memrise* motivated them to study vocabulary more often.

The above data would suggest that the *Memrise* application was quite useful as a vocabulary learning tool in that it provided students with the opportunity to learn vocabulary anywhere and at any time. It also provided the opportunity for them to collaborate and compete. However, as the data revealed, only 37% of the students used the application on a regular basis which was far less than expected considering that the application was interactive and not just a memorization device. Possible reasons for such a low take-up of the application could be; the very small grade incentive awarded for usage, the use of more conventional methods for learning vocabulary and, finally, the limited amount of time spent training students on the use of the application. In the future, it would be advisable to employ the application as a course glossary, created with the vocabulary discussed in class. The bulk loading

utility could be easily utilized after students added difficult vocabulary to a common Google spreadsheet.

#### Conclusion

The main purpose of the current study was to determine the effectiveness of the mobile learning application *Memrise*, as a means of enhancing the acquisition of content-specific vocabulary by undergraduate Arab students studying at an EMI in the UAE. Each of the research questions sought to determine the level of effectiveness of this intervention. Although the results from the first research question were not conclusive, in that students performed significantly better with respect to specific vocabulary sets than they did with others, this could be for various reasons. For example, the students self-reported their knowledge of the vocabulary words so it could be possible that they had actually seen or had not seen words and had falsely reported their responses.

The questionnaire results indicated that students who used the application found the tool to be a useful method by which to learn new vocabulary. Not all students, however, found the application engaging even though it streamlines the process of vocabulary acquisition. In a future study, it might be worth investigating the reasons for this lack of engagement in greater depth. It would also be interesting to recruit more students to do a direct comparison between paper-based and computer-based vocabulary learning strategies and the long term retention of content-specific vocabulary.

The present study has implications for both teachers and learners as the *Memrise* application could be easily adapted by content-specific teachers as a method for developing their students' vocabulary knowledge and concepts in their specialized courses. With the help of this free and readily available tool, the framework described in this paper, could be adapted to enable learners to apply many of the 21<sup>st</sup> Century learning skills such as collaborative and autonomous learning. Social networking devises such as mobile phones are now so prominent that students have the opportunity to interact with applications such as *Memrise* anywhere and at any time. These devises can also prove to be highly motivating as it takes vocabularly acquisition to a different level, many features of the application foster collobaration and interaction on a regular basis, thus improving linguistic skills. The *Memrise* website is a repository for hundreds of topics and it is relatively easy to create vocabulary lists for specific topics.

At this point, it is useful to identify some of the factors that could have a bearing on future studies. These are an analysis of the reading text, the development of the corpus and the selection of the key words in context. This can be achieved with the assistance of the free online analytical tools provided by www.usingenglish.com. This website hosts a variety of tools that is freely available for all to use. Samples of core materials (care should be taken that there is no copyright violation) can be easily uploaded and analyzed for everything from readability levels to key words in context, thus making the creation of your specific *Memrise* course straightforward for nonlanguage specialists. For future research, it would be beneficial to triangulate the results with additional reliable vocabulary comprehension instruments that support the

self-reporting. This could lead to a validation of self-reporting vocabulary tools in this context.

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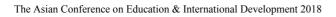
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Official Conference Proceedings

# Using an Informatics Course to Support an Herbal Medicine Course for Learning Herbs with Volatile Oil

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#### **Abstract**

Phytochemistry is the one of subjects for pharmacy students. The subject is linking about herbs and its chemical compounds which contain pharmacological activities. The contents of phytochemistry are describing the structures of the large number of secondary metabolites found in plants, the functions of these compounds in human, plant biology and environment, and the biosynthesis of these compounds. In the academic year 2016, the third year pharmacy students, who planned to learn phytochemistry on the topic of volatile oil, were assigned to search and gather herbal information about 29 herbs containing volatile oil. This assignment was a part of an informatics course, namely, Health Informatics. The objectives of the assignment were to prepare the students' informatics skills and review their basic knowledge about aromatic herbs for the phytochemistry lesson. To accomplish the goals, the Knowledge Unifying Initiator for Herbal Information (a version for pharmacy students, KUIHerbRx) was used as a tool for collecting the students' opinions. Furthermore, we analyzed the input opinions given by the students. The results of analysis showed the students' interests, responsibility and ability in collecting reliable herbal information. The completed students' assignments exceeded the teachers' expectation in term of the number of contributed opinions. The most interesting herb was Dill (Anethum graveolens L.). The highest number of opinions given by one student was 33 opinions. The most interested topic was medicinal indication. This work offers the method of using an informatics course for improving informatics skills and preparing for phytochemistry lessons in the future.

Keywords: Informatics, Phytochemistry, pharmacy school, medicinal herbs, volatile oil

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#### Introduction

Informatics is one the most important skills in the 21<sup>st</sup> century for everyone, including healthcare professionals. Healthcare professionals use information technology increasingly (Garde, Harrison, Huque, & Hovenga, 2006). Informatics competencies for healthcare professionals have become crucial due to the increasing presence of technologies in the workforce environment. Incompetent informatics skills affect the healthcare professionals' ability to perform optimum responsibilities. For this reason, the informatics education for healthcare professionals should be managed to the curriculum sufficiently. Pharmacists are one of healthcare professionals who contact with the patients. The knowledge about patients, medications, disease states, and the medication-use process are necessary to pharmacists. Pharmacists are expected to update their knowledge and provide the trusted information to patients. For finding the up to date and reliable information, informatics and information technology play a pivotal role to support the pharmacists' work. The pharmacy informatics were defined as "the scientific field that utilizes a systems approach to medication-related data and information including its acquisition, storage, analysis, and dissemination --in the delivery of optimal medication-related patient care and health outcomes." (Fox, Karcher, Flynn, & Mitchell, 2008). The knowledge and skills about information technology and informatics are needed to incorporate into the pharmacy students' curriculum.

Herbal medicine is increasing in popularity worldwide (Verma & Singh, 2008). Pharmacists directly responsible to serve knowledge about herbal medicine to patients, such as proper uses of herbal medicines and interaction with other pharmaceutical products. Pharmacy students need basic knowledge of herbal medicine, phytochemistry and pharmaceutical uses of herbs. The knowledge involved herbal medicine has been provided to the pharmacy students. The schools of pharmacy have a responsibility to offer the related knowledge in herbal medicines to pharmacy students.

The Faculty of Pharmacy, Silpakorn University's curriculum was designed the courses involving in both informatics and herbal medicine, the detail of each course were explained below. To prepare the students' informatics skills and review their basic knowledge about aromatic herbs for the phytochemistry lesson in near future. The results from the assignment given in Health Informatics course were analyzed. This work offers the method of using an informatics course for improving informatics skills and preparing for phytochemistry lessons in the future.

# **Informatics Course for Pharmacy Students**

Due to the information technology play dramatically role in health professional. Pharmacists are expected to have informatics abilities. The informatics courses for pharmacy students in the Faculty of Pharmacy, Silpakorn University's curriculum were designed, one for the third-year students called "Health Informatics". The contents of Health Informatics course are involved in basic principles of health informatics; informatics skills; comparing and contrasting health information from different disciplines; concepts of how health information is stored, organized, retrieved and used; applications of basic health information in hospitals, clinics, public health settings, pharmaceutical industries and government units. The basic informatics skills for pharmacy students are to search and gather the reliable information using

information technology, to evaluate the obtained information, to share data and collaborate with other members in the same class and to create the report or presentation. The pharmacy students learned and practiced the informatics skills from the course.

# **Herbal Medicine Courses for Pharmacy Students**

In Thailand, the herbal usage has increased sharply since the government policy. The pharmacists also should have knowledge of herbs and herbal products. The Botany and Phytochemistry courses were included in the undergraduate pharmacy's curriculum from Faculty of Pharmacy, Silpakorn University. The Botany course was designed for the second-year pharmacy students. About the Phytochemistry courses were divided into 2 subjects, named Pharmacognosy I and Pharmacognosy II. Pharmacognosy I was set for the third-year pharmacy students and Pharmacognosy II for the fourth-year students. The laboratory courses of these 2 subjects were paralleled with the lecture courses. The contents in Pharmacognosy I consisted of Phytochemistry, the chemical groups of natural compounds such as Alkaloids, Terpenoids, Flavonoids, Anthraquinone glycosides, Volatile oils and related substances and so on. In each topic, the pharmacy students have to learn about natural sources, chemical constituents, physico-chemical properties, biosynthesis pathways, extraction methods, pharmacological activities, methods for quality assurance, important products on the market. While the contents of Pharmacognosy II contain the knowledge for quality control and quality assurance for herbal raw materials and herbal products.

## **Experimental Designs and Tools**

We designed the assignment in the Health Informatics course to practice the students' informatics skills and to prepare the knowledge for further phytochemistry class to the third-year pharmacy students. The volatile oils and related substances topic in Pharmacognosy I course was used as an experiment. The 158 third-year pharmacy students who enrolled in the Health Informatics course and planned to learn phytochemistry on the topic of volatile oil, were assigned to search and gather herbal information about 29 herbs containing volatile oil. Each student was responsibility at least one herb for finding reliable information about each herb in Thai language. To accomplish the goals, the Knowledge Unifying Initiator for Herbal Information or KUIHerb (a version for pharmacy students, KUIHerbRx) was used as a tool for collecting the students' opinions (Lertnattee, & Chomya, 2014). KUIHerb is a webbased tool using for Knowledge Management (KM) to exchange herbal information between the users who have experience in herbal medicine. The web-based technology is a potential tool to support collaborative learning (Liaw, Chen, & Huang, 2008). The topics provided to the students is indications, precautions, extra-information and herb names in local or other languages. All information should be had the references. Additionally, the photos of the herbs and the products containing the herb should be taken by the students themselves. In case of they could not find the real herbs or products, the link of websites containing the herbs photos or product photos were added. The students could participate the other students' opinions by voting to support the contributed opinions. The completed assignments had to finish in 2 weeks later and the reports were sent to the teachers via electronic mail. Furthermore, we analyzed the input opinions given by the students. The results were shown in next topic.

#### **Results and Discussion**

The input opinions given by the students were analyzed. The results showed the total number of contributed opinions including votes given by the students was 1058. The most interesting topic for the students was herb medicinal indications, 247 opinions and then the herb names, 218 opinions, respectively. While the minimum number of input opinion was the herb images topic, 9 opinions and then the product images, 11 opinions were contributed. The low number of contributed opinions on these two topics showed the students could not take the herbal and product photos by themselves. One problem was the students could not find the real herbs or real products to take photos. The number of votes was 106, showed the students shared the obtained information and would like to participate in other members' opinions. The number of contributed opinions on each topic was shown in Table 1.

Table 1: The number of contributed opinions given by the students in each topic.

Topic	Number of opinions
Indications	247
Precautions	61
Extra-information	94
Herb names	218
References	190
Herb images	9
Herbal product images	11
Links	122
Votes	106
Total	1058

To evaluate the students' responsibilities, each student had to log in using the given password to add the opinions or vote into the KUIHerbRx2017. The number of contributed opinions of each student were analyzed. The result showed the highest number of opinions given by one student was 33 opinions. To observe the students' interesting along the 29 aromatic herbs given, the input opinions in all topics of each herb were examined. The most interesting herb for students was Dill (Anethum graveolens L.) due to 92 contributed opinions were given. The aromatic herb which lowest input opinions was Holy Basil (Ocimum tenuiflorum L.), with 13 input opinions. Figure 1 showed the photos of Dill from external links from KUIHerbRx2017.

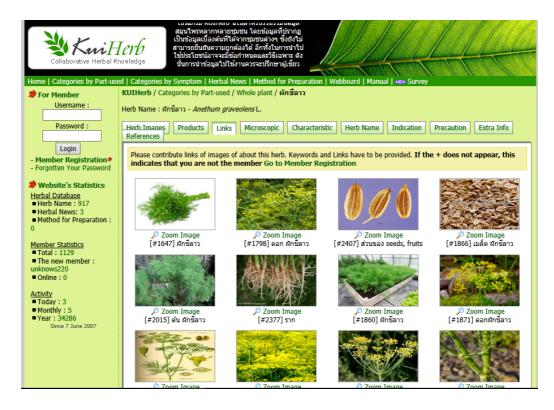


Figure 1: The Links of Dill (Anethum graveolens L.) from KUIHerbRx2017.

We evaluated the students' abilities, the contents of input opinions were checked. The results showed the students had abilities to search reliable information and then evaluate the obtained information and gather the data. The reliability of the contributed opinions was evaluated by the related input opinions in the reference topic. The input opinions in the reference topic were 190 opinions, while each reference opinion could be referring to many contributed opinions on other topics. Figure 2 showed the input opinions in the medicinal indications topic of Dill from KUIHerbRx2017. The number in parentheses at the end of each opinion refer to the reference opinions in the reference topic as shown in Figure 3.

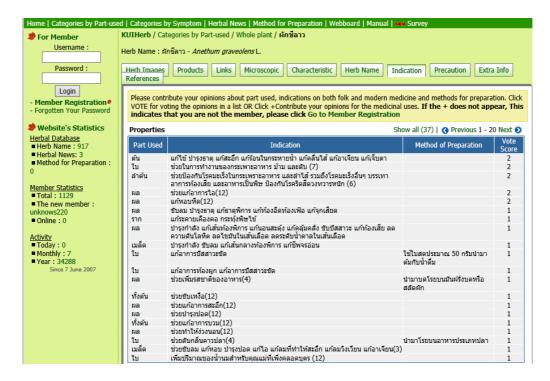


Figure 2: The contributed indications of Dill (Anethum graveolens L.) from KUIHerbRx2017.

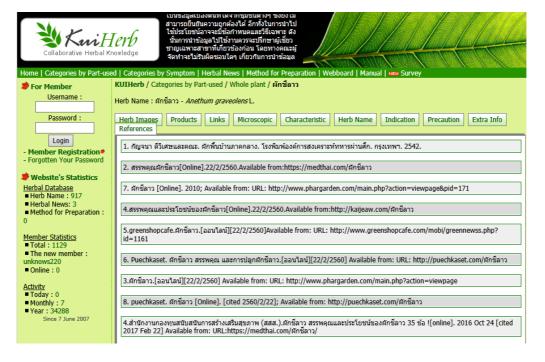


Figure 3: The contributed references of Dill (Anethum graveolens L.) from KUIHerbRx2017.

The results showed the assignment given in the Health Informatics course could fulfill the purpose of the work to practice the pharmacy students' informatics skills and to review the basic knowledge of medicinal herb for the near future phytochemistry course. The completed students' assignments exceeded the teachers' expectation in term of the number of contributed opinions.

#### Conclusion

From the results, the assignment given in the Health Informatics course could prepare the students' informatics skills. The students' ability in searching and gathering the reliable herbal information was shown in the results. Moreover, the students' responsibility could be evaluated. The assignment also showed the students' interest involved in aromatic herbs. Furthermore, the assignment also supported herbal medicine course for learning herbs with volatile oil. The students, who learned Botany course in the second-year, could review their knowledge about herbal medicines and ready for future learning in phytochemistry lesson. The data given by students were checked for finding the students' weak points and misleading to correct them in the phytochemistry course. The assignment was given to the students in the Health Informatics course also supported self-learning to the students. This work offers the method of using an informatics course for improving informatics skills and preparing for phytochemistry lessons in the future.

# Acknowledgments

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# Integration of Teaching and Learning ICT Literacy and Herbal Information in the 21st Century

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#### **Abstract**

In the 21st century, Information and Communication Technology (ICT) acts as an important role to support learning of the core content. In Doctor of Pharmacy curriculum at Silpakorn University, ICT literacy and core content about herbal information were integrated to support learning herbal medicine. Several tools were introduced to collect and applied herbal information. To design and implement an herb database, the Relational Database Management System (RDBMS) was taught. Microsoft Office Access was used as a tool to create an herb database. The concept of normalization, tables, relationship, queries, forms and reports were educated. In Knowledge Management (KM), the process of transfer tacit knowledge to explicit knowledge and the reverse process were introduced. Students could find herbal information from reliable sources and put it into the Knowledge Unifying Initiator for Herbal Information (a version for pharmacy students, KUIHerbRx). The concept of an electronic book (e-book) was introduced to students. A set of tools were suggested to use for creating an e-book and publishing it to the e-book library. Herbal information was used as a sample to construct an e-book. The concept of Infographic could be applied for disseminating of herbal information. The graphic representation was successful to make audience easy to understand herbal monographs. These tools were used in practice classes in both informatics and herbal medicine courses. Students gained twofold from the integration, i.e., the knowledge including skills in ICT literacy and herbal information.

Keywords: Information and Communication Technology, Herbal Information, Pharmacy, Integration, Informatics.

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#### Introduction

In the 21st century, only competency in professional courses in a curriculum is not sufficient for providing excellent services. Several competencies have to be included in a curriculum. The Information and Communication Technology (ICT), changes the global. There is a significant economic relevance of using ICT for the quality health care (Saranummi, 2005). Health professionals, including a pharmacist are needed who are well-educated in health informatics. To improve skills in informatics for pharmacy students, a set of health informatics courses are prepared (Steckler, Brownlee, Urick, & Farley, 2017). This set of informatics courses involves the study, design, and implementation of information as well as information systems in pharmacy. In the pharmacy curriculum of Silpakorn University, core competencies of informatics for all pharmacy students are implemented in two courses, i.e., Basic Computer Applications in Pharmaceutical Sciences, and Health Informatics. These two courses are both lecture and laboratory classes and set for the second, and third year students, respectively. Several informatics skills are introduced to students, e.g., managing, searching, evaluating, and disseminating of health information. Health data, information, and knowledge can be originated from several sources such as patients, medicines, laboratory tests. For medicines, these may be both modern and traditional medicines. Herbal data, information, and knowledge are commonly applied in traditional medicines. In this paper, several topics in ICT are designed to integrate with herbal data, information, and knowledge. Students should gain twofold, i.e., ICT literacies and ways to apply these knowledge and skills for finding, managing and disseminating herbal data, information, and knowledge. This paper is organized as follows. In section 2, topics for supporting herbal medicine are given. In section 3, ICT tools for integrating with knowledge in herbal medicine are presented. Section 4 provides the results from using tools for teaching and learning. Finally, conclusion and future work of this paper are described in the last section.

# **Topics for Supporting Herbal Medicine**

Several topics are taught in informatics courses, i.e., basic foundation of information technology, computer hardware and software, using Internet browsers to finding reliable pharmaceutical and health data, applying office software to solve pharmacy-related problems. Statistical knowledge and skills are introduced to students. The concept of disseminating and using software for publishing health information are provided. In addition, professional software is also set to teach pharmacy students. Various problems in health can be used as examples. In this paper, three topics were selected to integrate with knowledge of herbal medicine, i.e., data and information management, knowledge management, and information dissemination. Details of these topics are described as follows.

# **Data and Information Management.**

This topic introduces concept of data and information to students. This is an important topic for modernized pharmacy education (Breeden & Clauson, 2016). Relational model of the database is usually used as a common model for teaching. In practice class, data of herbs are used for teaching and learning. The concept of normalization of database tables is given. Skills of implementing data into a database and processing data to information are also advised in practice class. Pharmacists are usually assigned

to manage and/or analyze data in a database. For example, in a hospital, data about medicinal usage are usually analyze to improve clinical and economical outcome.

# **Knowledge Management (KM).**

The KM is the cycle of transfer tacit knowledge from experienced persons to explicit knowledge and reload this knowledge into other persons to make them ready to work efficiently. This topic is usually concerned in pharmacy education, especially in higher education (Watcharadamrongkun, 2012). In the practice class, students transfer their knowledge of some medicinal plants and exchange with other students.

#### Information Dissemination.

Pharmacists should prepare information about medicines (including herbal medicines) as well as provide reliable information to other healthcare professionals, patients, and related persons (McClung, & Archer, 2014). Information may formal documents in working places or online documents on the Internet.

## ICT Tools for Integrating with Knowledge in Herbal Medicine

To train pharmacy students have informatics skills on the three topics, some ICT tools are used. We will describe a set of tools for each topic in informatics courses.

# Tools for Data and Information Management.

A desktop Relational Database Management System (RDBMS) which is important for data gathering, management and analysis (Pardo, Miller, & Chiulli, 2017), is selected to teach students. The concept of normalization of database tables is introduced in the lecture class and will be implemented in the laboratory class. Students have basic knowledge in herbal medicine, e.g., plant anatomy and physiology, taxonomy, and clinical application of herbal medicine. In this topic of learning, students should be able to transform their knowledge in herbal medicine into a relational database model. Common attributes about herbs should be assigned into attributes in tables. Students are able to input data of medicinal plants into a database. Moreover, basic analyzing and finding information they would like to know, will be given.

## Tools for knowledge management.

A specific Web-based tool namely, KUIHerbRx, is used for learning and teaching knowledge management for herbal medicine (Lertnattee, Chomya, Rodtook, Methasate, & Lueviphan, 2017). With this tool, each student can contribute his/her knowledge about medicinal plants. Students can fulfill information of herbs. Evidence-based information should be contributed into the KUIHerbRx. Images of herbs and their products can be uploaded to the system. Students should take photographs by themselves and use a set of software to prepare images for uploading. Information about herbs will be shared among students.

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#### Tools for information dissemination.

In this topic, two sets of tools are used. The first set is for creating an e-book. The other set is applied for constructing an infographic page. For a simple e-book, the concepts of select topics, create text about herbal information, prepare a set of images, are introduced. Using a word processor to create contents of a book. To make it easy to access, the table of content should be included in a book. The ways to export the document to the pdf format are also suggested. The concept of infographic, which presents information and knowledge in the form of visual graphic representation, is valuable in health care (Turck, Silva, Tremblay, & Sachse, 2014). This topic is included in informatics courses. Herbal monograph of each medicinal plant is presented in one page. Various tools are used for creating infographic page, e.g., piktochart, maps, and time series. Methods to upload and/or publish these documents into a website are also taken into account.

## **Results from Using Tools for Teaching and Learning**

Examples of results from using tools for teaching and learning are described here. We used results from the 3rd pharmacy students in the academic year of 2017.

# Tools for Data and Information Management.

The Microsoft Office Access was used as a main tool for data and information management. The concept of normalization was introduced in the lecture class. Two examples were explained in the lecture class, i.e., databases of a commercial company and an herb database. The herb database was also used in a practice class. Students were trained to create tables, relationship among tables, create forms for inputting herb data, and create report for a set of data we would like to print out. Moreover, building queries for analyzing herb data was also emphasized. Examples of using Microsoft Office Access to create an herb database were shown in Figure 1 and Figure 2.

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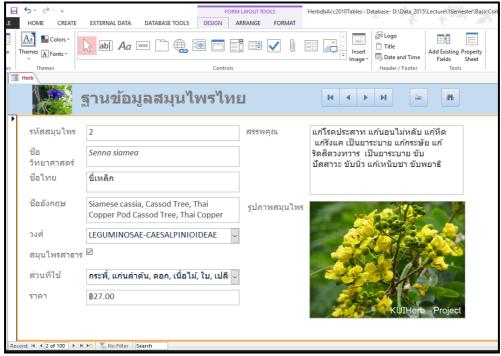


Figure 1: Design and implementing an herbal database.

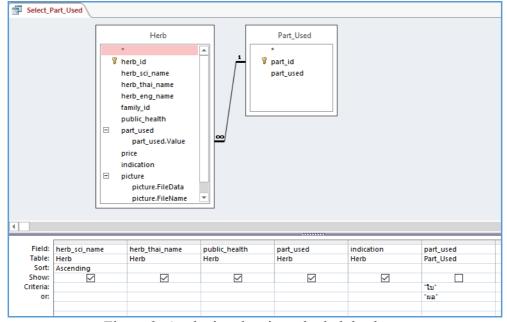


Figure 2: Analyzing data in an herbal database.

# Tools for Knowledge Management.

The KUIHerbRx2017 was used for collecting and sharing herbal information and knowledge. Students should finding reliable herbal information. Several topics of herbal information were assigned to students, e.g., herb images (Figure 3), herb names (Figure 4), herb indications, precautions, toxicity, and additional information. Moreover, information and knowledge which students contribute to the system should be evidence-based information. Note that students were able to provide multi-lingual herb names. References used for each opinion should be provided.



Figure 3: Links to images in KUIHerbRx2017.



Figure 4: Links to images in KUIHerbRx2017.

#### **Tools for Information Dissemination.**

We taught students to use Microsoft Office Word to prepare contents of herbs. The tables of contents and hyperlink were included in a book. The example of content in the book is shown in Figure 5. When the book was finished, ways to publish the book to the e-book library were also advised. For infographic, several tools were used to create a page that described an herbal monograph. Students were suggested to used images and beautiful background to create an attractive page. The example of an herbal monograph was shown in Figure 6.



Figure 5: An example of pages in an e-book.

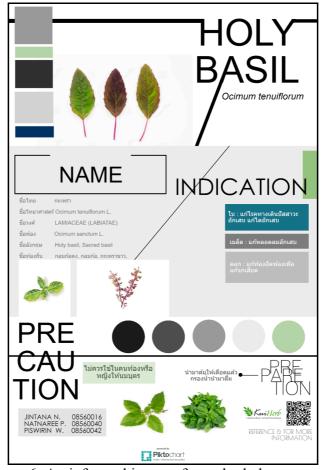


Figure 6: An infographic page for an herbal monograph.

# **Conclusion and Future Work**

In this paper, integration of ICT and herbal information were proposed to support pharmacy students, Silpakorn University. Several tools were introduced to create, manage, analyze, and publish herbal data, information including knowledge. For data and information management, the desktop RDBMS, was used as a tool to implement an herb database. The concept of normalization and skills in using this tool were educated. For knowledge management, the cycle of transferring knowledge between tacit knowledge and explicit knowledge was introduced. Students could transfer and exchange their reliable herbal information and knowledge in the KUIHerbRx. The concept of information dissemination was also taken into account. A set of tools for creating a simple e-book and infographic pages were introduced to students. Herbal data and information were used as examples. Methods for publishing a book or Web pages were given. Students gained twofold from the integration. Knowledge including skills in ICT literacy which could be applied to health data and information. In addition, student would be familiar with herbal data and information. Therefore, students could finding and managing herbal data and information which may be considered as supporting learning herbal medicine. In this work, only medicinal herbs were focused. Products from medicinal herbs will be concerned in our future work.

## **Acknowledgments**

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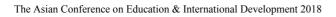
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Official Conference Proceedings

# Differences among Generational Groups of Teachers in a Public School District in Their Practice of 21st Century Teaching-Learning Skills

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#### **Abstract**

This study explores the differences in the 21st century teaching and learning skills practices among generational groups of teachers in a public school district in the Philippines. It was conducted to find if there is any significant difference in the perceptions between and among generational groups of teachers in terms of their overall application of 21st century teaching and learning skills. Included in this study are eight key components commonly referred to by experts and practitioners in the field, namely: critical thinking, collaboration, communication, creativity and innovation, self-direction, global connections, local connections, and the use of technology.

Results revealed significant differences between the boomers (1946-1964) and the generation Y (1981-1995) teacher-respondents in terms of their overall 21st century teaching and learning skills, particularly in their 1) critical thinking skills, 2) creativity and innovation skills, and in 3) establishing global connections. Based on the results, boomers used the 21st century teaching and learning skills more profoundly than the younger teachers. Findings also showed that boomers perceived their practice of 21st century teaching skills to a very great extent. No significant differences among the generational groups of teachers were found among the rest of the skills under study, namely: 1) collaboration, 2) communication, 3) self-direction, 4) local connections, and 5) the use of technology.

Keywords: 21st century skills, generational groups of teachers, Department of Education Philippines, teaching and learning skills, K to 12 classroom



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#### Introduction

The teaching and learning process in the field of education continues to take huge leaps of changes throughout the years. Few decades ago, students learned without the help of technology that is present today. In the past, students have had to rely mostly on their teachers, their books and their social circles in learning their lessons; today, students indulge themselves in the vast world of internet, the ease of online communication, and the highly technological gadgets that make a lot of tasks easier. With these circumstances in mind, the challenge is to make the current education system adaptable, relevant, innovative, and precise to meet the needs of tomorrow's nation builders. There is a great demand for 21st century shift, yet there is a gap where educators are hanging on to the traditional viewpoint of schools, and others who are looking at 21st century education and preparing kids for the digital world (Yarrington as cited by Henebery, 2015). This statement echoes the concern of this study. Generational groups of teachers might have varied interpretations of the value of 21st century education.

In response to this challenge, the Department of Education (DepEd) implemented in gradual stages the Republic Act 10533, or the Enhanced Basic Education Act, more popularly known as K-12 Law which supported the kind of education that uses the appropriate and timely pedagogical approaches for 21st century learners. A new K-12 curriculum was formulated which revolved around 21st century demands and expectations. Six years after the law was passed, it might be safe to say that all Philippine schools, especially the public sector, strictly adhered to the focus on 21st century skills in teaching and learning. However, as reported in newspapers and denounced in street rallies, problems in the implementation of this law continue to hound many schools all over the country despite the frequent monitoring activities of the DepEd management. One way of responding to this call of transforming the education system is through a research that helps provide useful information for varied aspects of implementation.

This study explored into how 21st century skills in teaching and learning are operationalized in the classroom. Educators are concerned about reinventing teaching and learning in view of 21st century expectations. This brings to the fore, a question as to how teachers of varied age groups view such skills and how they practice it in the classroom. A list of 21st century skills is usually mentioned in education and futuristic articles. For this reason, key components of 21st century skills have been narrowed down, 8 of which are also the focus of the study by Hixson, Ravitz & Whisman (2012) entitled, "Survey for Measuring 21st Century Teaching and Learning: West Virginia 21st Century Teaching and Learning Survey." The eight key components under study include: 1) critical thinking, 2) collaboration, 3) communication, 4) creativity and innovation, 5) self-direction, 6) global connections, 7) local connections, and 8) the use of technology.

This study aimed to determine: (1) any significant difference among the generational groups of teachers in terms of their overall 21st century teaching and learning skills; (2) any significant difference between and among the generational groups of teachers in terms of their perceptions and practice of the eight selected key components of 21st century teaching and learning skills (Hixson, Ravitz & Whisman, 2012), namely: a) critical thinking, b) collaboration, c) communication, d) creativity and innovation, e)

self-direction, f) global connections, g) local connections, and h) the use of technology; and (3) the extent of how each generational group perceive their practice of the 21st century teaching and learning skills under study.

This study is limited to a randomly selected stratified sample of one hundred (100) public elementary school teachers in the District of Indang, Cavite who responded online to the preliminary selection process. The study focused on how they perceived their teaching practices demonstrating specific 21st century teaching and learning skills, limited to eight (8) identified key components, namely: 1) critical thinking, 2) collaboration, 3) communication, 4) creativity and innovation, 5) self-direction, 6) global connections, 7) local connections, and 8) the use of technology. This study was conducted from February to May 2017. Responses were gathered through online survey. The results and findings cannot be used to generalize the 21st century teaching and learning skills among the generational groups of teachers from other school districts, nor from the private sector, as these are specific to a particular school district in the public sector.

## **Review of Related Literature**

Various authors have defined generational groups of people throughout history. Lancaster and Stillman (as cited by Reeves & Oh, 2007) categorized 4 generations of people, namely: traditionalists (1900-1945), baby boomers (1946-1964), generation Xers (1965-1980), and millennials (1981-1999). Oblinger and Oblinger (as cited by Reeves & Oh, 2007) created another classification, namely: matures (< 1946), baby boomers (1947-1964), gen-Xers (1965-1980), and gen-Yers (1981-1995). Tapscott (as cited by Reeves & Oh, 2007) named 3 cohorts of generation, namely: baby boom generation (1946-1964), generation X (1965-1975), and digital generation (1976-2000). It is evident that there is a lack of consistency among the labels of age groups, although most experts have argued that they are shaped by history rather than by chronological dates (Reeves & Oh, 2007). The common thread though is that groups are divided according to common characteristics.

Sladek and Grabinger (2014) created the most detailed description of the generational groups according to 7 distinct generational characteristics. Table 1 shows these different generational groups and their characteristics.

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Table 1
The different generational groups and their characteristics (Sladek & Grabinger, 2014)

	Boomers	Gen X	Gen Y	Gen Z
Birth Years	1946-1964	1965-1981	1982-1995	1996-2009
Other names	Me Generation Love Generation The Gray Ceiling	Slackers MTV Generation	Millenials Echo Boomers Trophy Generation	The iGeneration Generation C (Connected) Digital Natives
Characteristics	Hardworking, Loyal, Confident, Cynical, Competitive	Anti-authority, Highly individualistic, Self- reliant, Family focused	Confident, Digital thinkers, Sense of entitlement, Needy	Realistic, Creative, Hyper- connected
Why they are the way they are	The wealthiest, healthiest, largest generation of their time. Raised to pursue their dreams	Children of workaholics and divorce; the arrival of cable television and computers. Raised to be self sufficient	Micro-managed by their parents, technology, always rewarded for participation. Raised to be high achievers	Raised in a culture of fear, mobile technology, helicopter parents, social media
Communication styles	Prefer detailed dialogue in person or via phone. Appreciate meetings, Believe no news is good news.	Prefer close, concise communication - not over- explaining clichés' or corporate jargon. Prefer email	Prefer frequent feedback and problem solving via technology instead of phone calls or meetings	Prefer visual communication via technology instead of inperson meetings.
Problems they are facing now	Dwindling retirement funds job dislocation, rising health care, cost of inadequate health care coverage	Debt, caring for young children and aging parents, balancing life and career stuck in middle management	Debt, unemployment difficulty transitioning from college career negative stereotypes, being taken seriously	Finding an identity, lack of job opportunities, being taken seriously
Flaws	Have been there, done that attitude not always "open" to new ideas	Have difficulty committing, tend to have a "wait and see" approach	Have short attention spans and high demands and asks, "what's in it for me"	Need for structure, over- confident in their knowledge, lack interpersonal skills

To be able to fully implement the needed shift to the 21st century teaching and learning competencies, educators must first look into the underlying issues that would become a stumbling stone in implementing the educational reforms. One of the important issues that need to be addressed immediately is the generation gap between teachers and their students. Van Damme (2014) emphasized the importance of the connection of teachers and their students in terms of understanding the behavior, issues, culture, and values of the latter to effectively engage them in high-quality teaching and interactive learning. However, he also pointed out the difficulty of connecting both parties in the case that the age gap between the teacher and the students is more than 35 years. This gap could be linked to attitudes and expectations that come along with the people born within a certain generation as defined by the confluence of macro forces that drives change at an extraordinary magnitude and pace (Tulgan, 2017).

The trend of the increasing gap between the generations of teachers and students could lead to more serious issues in education. Unfortunately, this gap continues to increase as the percentage of younger teachers (< 50 years old) has not yet surpassed the percentage of the older ones (>50 years old) (Organization for Economic Cooperation and Development [OECD], 2014). According to their report, the average age of the male primary school teacher arose from 42.9 years old in 2000 to 43.2 years old in 2011. For the female primary school teachers, their average age rose from 42.3 to 43.3 years old in the years 2000 and 2011 respectively (OECD, 2014). Although this report is limited to OECD countries, this pattern of increase in the mean age of primary school teachers was also evident in other international studies conducted in the past years. In 2009, the average age of primary school teachers went up to 46.59 years old (UNESCO as cited by Albert, 2013) from 45.8 years old in 1999 (Siniscalco, 2002).

As expected, this huge chasm of generations between the teachers and students created some issues. In the United States, it was reported that boomers, who comprised 33% of the population of US teachers, felt that they are forced towards the uncomfortable technology environment that further resulted to dissatisfaction in both the teachers and the students (Carroll as cited by Blackboard, 2008).

Aside from the generation gap between and among the teachers, the pervasive presence of technology also causes a generation gap between the students and teachers. Results of a recent study encouraged teachers to engage students in the use of technology, explore, and participate in collaborative groups, interact with others and make connections to real world experiences. They are also encouraged to use technology as instructional method in teaching (Lisenbee, 2016).

Another study concluded that understanding the intergenerational diversity and structuring educational experiences to meet the needs and predilections of this new generation will result in working together toward the common goal of the institution (Moreno-Walton, Brunett, Akhtar & DeBlieux, 2009). It is mentioned in this study the observed differences of generation X and generation Y such as:

"Comparisons between generation X and generation Y yield important differences in attitudes toward authority, lifestyle preferences, and social

values. Members of generation Y demonstrate high expectations for their own performance but also place high demands on their work environment, requiring a more individualized approach to their professional growth and mentorship. Although members of gen Y are described as optimistic, they insist on prompt solutions to problems, making them more challenging to motivate and manage in the work place." (Moreno-Walton et al., 2009, p. 20)

The urgent need to respond to the timely challenges of the 21st century (e.g. globalization, technology, migration, international competition, changing markets, and transnational environmental and political challenges) makes it very crucial to develop a set of teaching and learning skills that will help the students to survive in their life, work, and citizenry (Research and Development [RAND] Corporation, 2012). Unfortunately, aside from the challenges that are now being experienced in society, experts are predicting more revolutionary changes and challenges to rise in the future (Ontario Principals Council, 2014). Given these issues, education needs to play the most significant role to prepare the students for the future. Hence, schools should start rethinking the knowledge and skills that students need for their success as well as the educational strategies and systems required for the students to achieve them (RAND Corporation, 2012).

Mastery of the key subjects and 21st century themes is vital for all students in the 21<sup>st</sup> century (Partnership for 21st Century Skills [P21], 2011). The 21st century interdisciplinary themes, such as global awareness, financial, economic, business and entrepreneurial literacy, civic literacy, health literacy, and environmental literacy, are also needed to promote a higher level of understanding of the academic content among the students (P21, 2011). In addition to the content knowledge in key subject areas, it is also important that the students learn the 21st century skills. The key 21st century skills according to the P21 Framework (2009) are learning and innovation, critical thinking and problem solving, communication and collaboration, information, media and technology, life and career skills, and productivity and accountability).

## Methodology

# Respondents

Two-hundred thirty-six (N=236) public elementary school teachers in the District of Indang, Division of Cavite, Department of Education were asked to provide their birth dates online to identify the generations to which they belonged. From this list, 46 Boomers, 137 generation X, and 53 generation Y teachers were identified. No teacher was identified under generation Z. Originally, 146 respondents (28 Boomers, 85 generation X, and 33 generation Y) were selected through stratified random sampling; however, only 100 out of 146 target respondents (21 Boomers, 55 generation X, and 24 generation Y) participated. Table 2 shows the population and sample size of the public elementary school teachers in the District of Indang as of April 2017.

Table 2
Population and sample size of the public elementary school teachers in the District of Indang (as of April 2017)

Generation of Teachers	Population	Sample Size
Boomers (1946-1964)	46	21
Generation X (1965-1981)	137	55
Generation Y (1982-1995)	53	24
Total	236	100

*Note*: The sample characteristics are not far from the population characteristics. (Confidence level = 95 %, confidence interval = 7.8)

# Data Gathering Instrument

The level of practice of the 21st century teaching and learning skills were measured using the Survey for Measuring 21st Century Teaching and Learning (Hixson, Ravitz & Whisman, 2012). Permission to use the survey for this study was obtained from Dr. Ravitz. Hixson and colleagues (2012) reported excellent reliability (std. alpha > .90, inter-item correlations > .58); support for content validity based on the review of existing frameworks and measures (Shear, Novais, Means, Gallagher, & Langworthy, 2010; The William and Flora Hewlett Foundation, 2010 as cited in Hixson, Ravitz & Whisman, 2012); and the support for concurrent validity.

The survey instrument intended to measure 8 selected components of the 21st century teaching and learning skills, namely: 1) critical thinking, 2) collaboration, 3) communication, 4) creativity and innovation, 5) self-direction, 6) global connections, 7) local connections, and 8) use of technology as a tool for learning. Each component covered a section of the online survey. For each component, a definition was provided, followed by a set of practices related to each component, and a set of measures on the perceptions of the respondent relative to their application of the above-mentioned key components.

This instrument used the Likert scale, in which 5 was the highest, and 1 was the lowest. The response choices for the set of 21st century teaching and learning practices and their corresponding scores in the Likert scale were as follows: "almost never" = 1 point; "a few times a semester" = 2 points; "1-3 times per month" = 3 points; "1-3 times per week" = 4 points; and "almost daily" = 5 points. In the perceptions on the teaching of each component, the response choices and their corresponding choices in the Likert scale were: "not really" = 1 point; "to a minor extent" = 2 points; "to a moderate extent" = 3 points; to a great extent" = 4 points; and "to a very great extent" = 5 points.

## Data Gathering Procedures

Permission to conduct the survey was secured from the District Office of Indang (Appendix B). The link for the online survey form was sent to all principals through the District Office. Two weeks were given to the respondents to complete the survey.

# Data Analysis Procedure

The scores obtained in each component were tabulated for each generational group. To determine if there is any significant difference among the generational groups, the

mean scores were computed and tested using Analysis of Variance (ANOVA) and Least Significant Difference (LSD). To describe the mean scores for the over-all perception on the practice of 21st century teaching and learning skills, the following range of means was used (Table 3).

Table 3
Range of means and description

Range of Means	Extent of Practice
4.20 - 5.00	very great extent
3.40 - 4.19	great extent
2.60-3.39	moderate extent
1.80-2.59	some extent
1.00-1.79	no extent

## Results

The mean scores on the practice and perceptions of the different generational groups of teachers on the 21<sup>st</sup> century teaching and learning skills are presented in Tables 4 to 11. The overall statistics is presented in Table 12.

## Critical Thinking Skills

The mean scores on the practice and perceptions among the generational groups of teachers in terms of the critical thinking skills component are shown in Table 4.

Table 4

Mean scores on the practice and perceptions in critical thinking skills among the generational groups of teachers

Generational Groups of Teachers	Mean scores	
Boomers (1946-1964)	4.51 <sup>a</sup>	
Generation X (1965-1981)	$4.07^{\mathrm{b}}$	
Generation Y (1981-1995)	$3.94^{\mathrm{b}}$	

*Note*: Mean scores having different superscripts are significantly different (P>0.05).

Findings revealed that boomers have taught critical thinking skills to a greater extent than the rest. This could be attributed to the great deal of knowledge, and wisdom gained by Boomers from more experience in their use of critical thinking processes, which they naturally bring further to the classroom (Koloc, n.d.; Speakeasy Communications Consulting, 2015). The younger generations of teachers probably had less experience in their use of these skills.

Generations X and Y were not significantly different from each other in terms of critical thinking skills. This can be attributed to the similar attitudes of generations X and Y (Crofts, Cuervo, Wyn, Woodman, Reade, Cahill & Furlong, 2016), in which their perceptions on their teaching practices and teaching perspectives largely depend on. Further, Hopkins (2012) cited that both of these generations lack critical skills despite their immense talent.

## Collaboration Skills

The mean scores on the practice and perceptions among the generational groups of teachers in terms of their collaboration skills are shown in Table 5.

Table 5
Mean scores on the practice and perceptions in collaboration skills among the generational groups of teachers

Generational Groups of Teachers	Mean scores
Boomers (1946-1964)	4.60
Generation X (1965-1981)	4.37
Generation Y (1981-1995)	4.24

*Note*: Mean scores obtained are not significantly different from each other at 5 % significance level.

Findings showed that in terms of teaching collaboration skills in the classroom, the generational groups did not have any significant differences among each other. Tolbize (2008) found that boomers and generation Xers have similar characteristics in terms of collaborative attitudes. This finding contradicts the results of the study of Giang (2013), who concluded that boomers rank lowest among the generation groups when it comes to collaboration, while generation X ranks the highest.

## Communication Skills

The mean scores of the practice and perceptions among the generational groups of teachers in terms of the communication skills are shown in Table 6.

Table 6
Mean scores on the practice and perceptions in communication skills among the generational groups of teachers

Generational Groups of Teachers	Mean scores
Boomers (1946-1964)	4.33
Generation X (1965-1981)	4.10
Generation Y (1981-1995)	4.00

*Note*: Mean scores obtained are not significantly different from each other at 5 % significance level.

In terms of communication skills, boomers, generation X, and generation Y teachers showed to have similar mean scores. This result contradicts the findings of Zhou (2011), who asserted that generation Y are more communication-oriented than the generations before because the previous generations are less creative and entrepreneurial. Another study that counters the finding is conducted by Harber (2011) who has posited that boomers and generation Xers have better communication skills than those of generation Y.

# Creativity and Innovation Skills

The mean scores of the practice and perceptions among the generational groups of teachers in terms of the creativity and innovation skills are shown in Table 7.

Table 7
Mean scores on the practice and perceptions in creativity and innovation skills among the generational groups of teachers

Generational Groups of Teachers	Mean scores	
Boomers (1946-1964)	$4.48^{a}$	
Generation X (1965-1981)	$4.16^{ab}$	
Generation Y (1981-1995)	3.86 <sup>b</sup>	

*Note*: Mean scores having different superscripts are significantly different (P>0.05).

Results showed that boomers have higher creativity and innovation skills than generation Y. Generation X showed similarities with both the boomers and generation Y in terms of the above-mentioned skills. Contrastingly, Zhou (2011) concluded that boomers and generation X are less creative than generation Y. Moreover, another study by Workfront (2015), found that generation Y is perceived as most creative among the generation cohorts.

## Self-direction Skills

The mean scores on the perceptions among the generational groups of teachers in terms of the self-direction skills are shown in Table 8.

Table 8

Mean scores on the practice and perceptions in the self-direction skills among the generational groups of teachers

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Generational Groups of Teachers	Means	
Boomers (1946-1964)	4.09	
Generation X (1965-1981)	3.88	
Generation Y (1981-1995)	4.07	

*Note*: Mean scores obtained are not significantly different from each other at 5 % significance level.

Findings revealed that boomers, generation X, and generation Y teachers have similar self-direction skills. However, results of the study by Salesforce (as cited by Investopedia, n.d.) have indicated that generation X are more self-directed than the Baby Boomers. Another study countered the findings that generation X has higher self-direction skills than generation Y as found in Ivanova & Smrikarov (2009).

## Global Connections

The mean scores of the perceptions among the generational groups of teachers in terms of the global connection are shown in Table 9.

Table 9

Mean scores on the practice and perceptions in the global connections among the generational groups of teachers

Generational Groups of Teachers	Mean scores
Boomers (1946-1964)	$3.76^{a}$
Generation X (1965-1981)	$3.35^{ab}$
Generation Y (1981-1995)	2.96 <sup>b</sup>

*Note*: Mean scores having different superscripts are significantly different (P>0.05).

Boomers showed higher global connection skills than generation Y. This could be because of vast knowledge of boomers gained from longer years of teaching and reading more books, which they have brought to the classroom as compared to those who belonged in the younger generation (Koloc, n.d.). This finding, however contradicts the American Management Association (2017) and Gutfreud (as cited by Asghar, 2014), who wrote that generation Y is the first global-centric generation and hence, more global than its predecessors, having come of age during the rapid growth of the internet.

## Local Connections

The mean scores of the perceptions among the generational groups of teachers in terms of local connections are shown in Table 10.

Table 10
Mean scores of the perceptions in the local connections among the generational groups of teachers

Generational Groups of Teachers	Means	
Boomers (1946-1964)	4.14	
Generation X (1965-1981)	3.87	
Generation Y (1981-1995)	3.67	

*Note*: Mean scores obtained are not significantly different from each other at 5 % significance level.

No significant difference was found among the generational groups in terms of local connections. This finding does not support previous researches in this area. The Corporation for National and Community Service (2015) reported differences in the level of local connections in the form of civic engagement among generational groups. This organization asserted that generation X have the highest level of local connections among the group, while generation Y have the lowest.

## Using Technology as Tool for Learning

The mean scores on the practice and perceptions in using technology as a tool for learning are shown in Table 11.

Table 11

Mean scores on the practice and perceptions among the generational groups of teachers in terms of their use of technology

Generational Groups of Teachers	Mean scores	
Boomers (1946-1964)	3.94	
Generation X (1965-1981)	3.74	
Generation Y (1981-1995)	3.59	

*Note*: Mean scores obtained are not significantly different from each other at 5 % significance level.

The analysis did not reveal any significant difference among the generational groups in terms of the use of technology in the classroom as tool for learning. This contradicts the findings of the International Education Advisory Board (n.d.). They found that boomers generally hold to tradition, generation X adapts to technologies easily, and generation Y accepts and adapts to the new technology.

## Overall Results on 21st Century Teaching and Learning Skills

The mean scores on the practice and perceptions of the different generational groups of teachers on the 21st century teaching and learning skills are presented on Table 12.

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Table 12

Mean scores on the practice and perceptions in the overall 21st century teaching and learning skills among the generational groups of teachers

Generational Groups of Teachers	Mean scores	
Boomers (1946-1964)	4.23 <sup>a</sup>	
Generation X (1965-1981)	3.94 <sup>ab</sup>	
Generation Y (1981-1995)	$3.79^{b}$	

*Note*: Mean Scores having different superscripts are significantly different (P>0.05).

Results showed that boomers have higher perception and practice of the 21st century teaching and learning skills as compared with generation Y. This can be attributed to the rich experience, expertise, and knowledge gained by the boomers from decades of teaching students (Koloc, n.d.; Capital Ideas, 2016; Auvin, 2017). Furthermore, boomers have more stable resources to support the 21st century skills development in the classroom (Value Options, n.d.). Generations X and Y yielded similar results, which coincide with the study of Crofts et al. (2016). According to them, both generations have more similarities than differences in a way that they have almost the same attitudes, goals, and priorities.

# Extent of Practice of the 21st Century Skills

The mean scores and level of perceptions of the generational groups are presented in Table 13. The level of perceptions was gauged using Table 3 as guide.

Table 13

Extent of practice and perceptions among the generational groups of teachers in terms of their extent of practice

Generational Groups of Teachers	Mean scores	Extent of practice
Boomers (1946-1964)	4.23	Very great extent
Generation X (1965-1981)	3.94	Great extent
Generation Y (1981-1995)	3.79	Great extent

It was evident that boomers had practiced the 21st century teaching and learning skills to a greater extent than did generations X and Y. This shows that despite the misconceptions that boomers are resistant to change, a component vital to the development of the 21st century skills (Dukes, 2016), they still extend more effort in teaching these skills to their students. The great deal of knowledge, and wisdom gained from more experience have contributed to the results (Koloc, n.d.; Speakeasy Communications Consulting, 2015), although their younger counterparts, generations X and Y, were also commendable in terms of practicing the 21st century teaching and learning skills to a great extent.

#### Conclusion

Based on the findings in the study, boomers have greater skills in extending the 21st century skills to their classroom than generations X and Y. Older groups of teachers (boomers), both in age and in length of service, are presumed to lack 21st century skills and the capacity to practice the same in their classrooms, yet results of this study belie this presumption. Boomers are veteran teachers who have the experience and ability to cope with new changes in 21st century demands and as required by the K-12 Law. Further, veteran teachers may not have the expertise to use technology in the classroom, but they have the expertise to utilize certain 21st century skills earned

from years of experience. Hence, generational differences in chronological age are not a hindrance to the implementation of educational innovations and the teaching and learning skills that support 21st century expectations.

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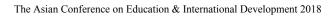
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# Utilizing Life Orientations Method in Education to Develop Soft Skills and Organizational Development among Graduating Students for Career Readiness and Job Preparedness

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The Asian Conference on Education & International Development 2018 Official Conference Proceedings

#### **Abstract**

Values are the foundation of all our thinking and behavior. We grow up in a home that is characterized by values ("bad" values are also values). No matter in what kind of traditional or modern form of family we grow up, we are shaped by it. In addition, peer groups "determine" what we consider important and what we are to think and do, and play an important role in shaping our values. With these values came Life Orientations Method (LIFO) where the leadership style of an individual is being applied in the workplace learning experience and environment. The LIFO Styles also describe behavioral preferences, not competencies. Participants are not labeled, judged, or limited by their survey results. Labeling someone with a personality type can become an excuse for substandard performance. ("I'm no good at that. I'm just not that type of person.") In LIFO Training, differences in behavior are described quantitatively, not qualitatively. There is no reference to good or bad, right or wrong, strong or weak. Qualitative or categorical judgments often lead to oppositional thinking— "my way" vs. "your way"— which can promote conflict, impede teamwork, and make people less willing to change their behavior. The leadership styles are Supporting Giving, Controlling Taking, Adapting Dealing and Conserving Holding. Students who are graduating are encouraged to undergo LIFO training. The study revealed that before LIFO training, the students' leadership styles are neutral and all of which revealed are Controlling Taking after LIFO training. Soft skills are also included in the study and to become ready to venture into the real world, the relationship between leadership styles and soft skills are interrelated. Ten soft skills were identified variables in the study. These are team building, interpersonal communication, leadership development, problem solving, change management, strategic planning, performance appraisal, time management, diversity training, and executive coaching.

Keywords: Life Orientation, Training and Professional Development, Soft Skills Training

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#### Introduction

Life Orientations (LIFO) Method is a method that helps individuals, teams, and organizations improve communication skills, productivity, and results by working more effectively together. The method supports people to value and manage their strengths and those of others in order to achieve greater satisfaction and better outcomes. It takes advantage of people's strengths to create high performing organizations that deliver results and creates an exchange between people where they celebrate their differences so that they all feel comfortable and do well together.

In a study conducted by the Student Development Office of Jose Rizal University, it has shown that the students need to improve their soft skills. Data for this study were gathered with the use of LIFO Orientation Test and Soft Skills Questionnaire. Collected data were statistically analyzed with the use of percentage, weighted mean, and t-test.

A proposed program was designed for the graduating students. LIFO evolved to Life Dynamics Systems Thinking where the 9As are used. These are ascribe, analyze and accept, acquire and assess, activate and apply, aspire and associate. This approach leads to the understanding on how people work, how they receive information, and how they deliver information. The goal is to get the community of learners talking, providing feedback to each other, and working together to understand their differences in order to make the most of not only their behavior, but also around them. This helps in identifying the individual's personal strengths, values and goals. In this scenario, education leads to a holistic approach encompassing psychological, social, intellectual and emotional aspects of knowledge, learning, application and sustainability towards organizational and quality solutions in education, training and development.

In LIFO workshops, participants practice new skills that enhance productivity, communication, and teamwork, and they work together to develop practical action plans to use these skills to attack immediate, real-world problems.

Mixed methods are being used. A proposed program was designed for the graduating students. LIFO evolved to Life Dynamics Systems Thinking where the 9As are used. These are ascribe, analyze and accept, acquire and assess, activate and apply, aspire and associate. This approach leads to the understanding on how people work, how they receive information, and how they deliver information. The goal is to get the community of learners talking, providing feedback to each other, and working together to understand their differences in order to make the most of not only their behavior, but also around them. This helps in identifying the individual's personal strengths, values and goals. In this scenario, adult education leads to a holistic approach encompassing psychological, social, intellectual and emotional aspects of knowledge, learning, application and sustainability towards organizational and quality solutions in education, training and development. Data for this study were gathered with the use of LIFO Orientation Test and Soft Skills Questionnaire. Collected data were statistically analyzed with the use of percentage, weighted mean, and T test.

The primary method of inquiry that was used in this study is a questionnaire that is being outlined as the Life Orientation Leadership Style Survey. It is a questionnaire that contains seventy two (72) items about leadership traits. It entails 4 point-Likert

type scale ranging from 4 to 1. These points indicate the degree of severity according to which ending is most like you (4) and the least like you (1).

Another questionnaire as outlined contains thirty (30) items covering soft skills e.g. team building, interpersonal communication, leadership development, problem solving, change management, strategic planning, performance appraisal, time management, diversity training, and executive coaching. The respondents also needed to identify demographic elements such as age, gender, year-level and course. It entails a 5 point- Likert scale ranging from 0 to 4. From 0 (low) to 4 (very high)

#### Conclusion

Based on the findings of the study, it has been discovered that after the Life Orientations Training, the graduating students belong to the leadership orientation of Controlling Taking. Most students are in favor of excellence in the workplace. Most students are controlling taking because they believe that there is a need to manage their subordinates to be able to demand courtesy and respect. In addition, as training progresses, the true behavior of a Filipino student greatly manifests in his/her attitudes, behavior and personality profile that is having a controlling taking leadership style is positive and not negative. LIFO training respects individual differences and that strengths are given importance in all aspects. All of an individual's characteristics are strengths. The graduating students learn to behave towards each other in ways which seem best to satisfy different psychological and physiological needs for self fulfillment. This behaviour pattern becomes our natural or 'preferred' orientation toward other people. This preferred orientation represents the source of strengths which, when we are able to understand and develop them, can be even more productive in satisfying our needs. The combination of behavioural orientations which make up our behavioural style is not however, infallible is satisfying our needs. When our strengths are carried to excess they can be counterproductive. They become in fact, our weaknesses. There are costs to excessive use of our strengths, but we usually start by refusing to recognize them. This tendency for our strengths to be used in excess becomes most counterproductive as our environment is affected by conditions of stress and of conflict. Through the LIFO model, we can unlock ourselves from styles of behaviour which frustrate our basic goal of self-fulfillment. With the goal of improving individual and team performance, LIFO - program does not stop with explanations or diagnostics, or promote dead-end labelling of people. Instead, participants practice proven techniques that change behaviour and they develop practical action plans for applying these new techniques on the job. LIFO is the official language in training and development among the students of Jose Rizal University. With LIFO and LSDT, graduating students have created uniformity in terms of translating behaviors into words and actions as these are manifested in their training abilities and capabilities where there is consistency, relevance, regularity, and constancy.

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# Examining the Academic Writing Practices of Higher Education in Papua New Guinea: The Need for Using Appropriate Educational Resources

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#### **Abstract**

The current global trend in education paves way for new and improved means of academic writing practices in higher education, with which most of the higher education institutions in Papua New Guinea (PNG) are struggling to measure up. This comparative case study of a public and a private (mission) university in PNG examines the concerns and challenges that they encounter to support their academic writing practices. Multiple sources of data were obtained through semi-structured interviews, non-participatory observations and documentation searches. In the study, a total of twelve students, four tutors, four lecturers, and five academic administrators were interviewed after they were identified and recruited through a process of stratified sampling. Four tutorial groups of which, two from each participating university were observed. Data were also collected from policy documents which relate to the academic writing practices of the two universities. The data were analysed using a combination of data analyses methods which include interactive model of data analysis, activity system of data analysis, thematic analysis and NVivo research tool as informed by an activity theory, which anticipates that for a system to produce a desired outcome, it needs inputs from all the actors in the system. The findings suggest that the public university seems to struggle more to meet its academic needs compared to the private university. Academic writing practices of the two universities vary depending on the availability and provision of their online educational resources like 'Moodle,' multimedia, databases, Wi-Fi and other supports such as expertise and educational facilities.

Keywords: Academic writing, activity system, educational resources



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#### Introduction

Papua New Guinea (PNG) is one of the Melanesian countries in the Pacific region. It has an estimated population of 8 million with different ethnic groups. The country has three official languages (Tok Pisin<sup>1</sup>, Hiri Motu<sup>2</sup> & English), and 840 living indigenous languages (Simons & Fennig, 2018), which is twelve percent (12%) of the world's languages, more than any other single country (Lewis, 2009 & Volker, 2015). Thus, students and educators<sup>3</sup> are either bilinguals, trilinguals or multilinguals. That is, in every classroom, there are individuals who know or speak more than one language. Because of this complex discourse environment that PNG offers (Pickford, 2014), it makes academic writing practices in higher education more challenging when students apply the English language. This calls for mediation from all key actors within individual institution's activity system<sup>4</sup> to contribute meaningfully in terms of educational resources and other tools to achieve desired outcome of their academic writing practices.

This report presents part of the findings from a comparative case study done at two universities in PNG. To protect the identities of the participating universities, they are labelled as University A and University B. The data are from one of the four themes of this study which is educational resources. The educational resources include infrastructure development, curriculum and other educational materials, educational equipment, online educational resources, and teaching staff. The report begins with a brief literature review, followed by research methodology, findings and discussions with a conclusion.

#### Literature review

This study is underpinned by activity theory. The activity theory or system "is a cross-disciplinary theoretical framework that stems from the works of 18th century classical German philosophers Kant and Hegel, dialectical materialism of Marx, and psychological works of Vygotsky" (Bertelsen & Bodker, 2003; Roth & Lee, 2007, cited in Sam, 2012, p.84). It is based on the idea that human activities take place in cultural contexts. They are mediated by language and other symbol systems and can be best understood when investigated in their historical development (John-Steiner & Mahn, 1996). In support of the activity theory, the notion of activity system model was introduced. Engestrom (1987) came up with the concept of activity system model which uses a triangular framework to illustrate how the activity system works in a more applicable and meaningful context. Mwanza (2001) further articulates that the activity system model incorporates subjects, objects, and community components. It also includes mediators of human activity, namely: tools, rules and division of labour. All the components in the activity system framework are meant to support each other

<sup>&</sup>lt;sup>1</sup>Tok Pisin is a lingua franca spoken by Papua New Guineans. It is also referred to as Melanesian Pidgin (Gerry, 2010). It can also be labelled as Melanesian Pidgin English, New Guinea Pidgin or Neo-Melanesian. Tok Pisin is the official name of the language since 1981(Schulte-Schmale & Naujoks, 2008).

<sup>&</sup>lt;sup>2</sup>Hiri Motu is an official language mostly spoken by the Papuans (people of Papua) within the Southern region of PNG.

<sup>&</sup>lt;sup>3</sup>Educators refer to lecturers, tutors, academic administrators, or teaching (academic) staff in this study. <sup>4</sup>Activity system or theory describes how effectively and successfully language learners in a joint activity interact to learn and use English in academic writing tasks (Mwanza, 2001 & Doecke & Kostogriz, 2003).

in a collaborative manner to produce the desired outcome, as shown in the following diagram.

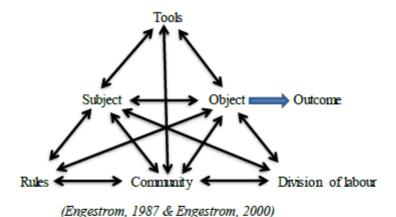


Figure 1: Key components of the activity system

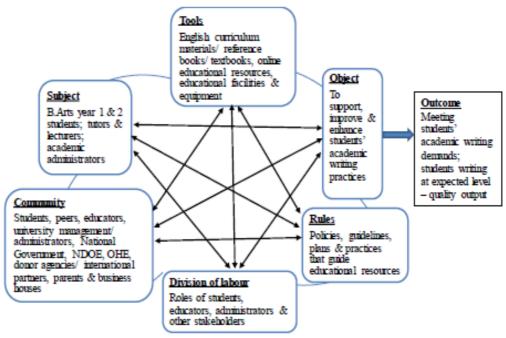
The activity system model presents the relationships that exist amongst the different players (tools, subject, rules, community, division of labour and object). The *subject* in the model is the individual or groups of individuals involved in the activity (Yamagata-Lynch, 2010). It is further stated that "the *object* is the goal or motive of the activity" (Yamagata-Lynch (p.2). *Tool* or instrument, as Engestrom (2000) stated, is the other component of the activity system model. It refers to "social others and the artefacts that can act as resources for the subject in the activity" (Yamagata-Lynch, 2010, p.2). Furthermore, rules or regulations refer to norms that circumscribe the activity (Zurita & Nussbaum, 2007). Additionally, the *community* in the activity framework is the environment, other activity systems and people that share the same object (Sam, 2012). Further, division of labour denotes the "separation of duties allowed for specialization of roles and tasks, increasing the quality of the outcome" (Baran & Cagiltay, 2010, p.159). The connections and interactions of all these actors affect the *outcome* which is the result of the activity (Yamagata-Lynch, 2010). Hence, all the actors are required to interact meaningfully within a system to produce a desired outcome.

Consistent with the theoretical framework of activity system, this study identifies how PNG tertiary students can participate effectively in academic writing practices. This can be done through well-defined sociocultural activity<sup>5</sup> and language and literacy activity <sup>6</sup> (Duff, 2002 & 2007), and disciplinary-based<sup>7</sup> academic writing activity (Starfield, 2007) with support from other elements like educators, peers, teaching and learning pedagogies, curriculum materials, educational resources and so on as illustrated in an extended version of the activity system model in the next diagram.

<sup>&</sup>lt;sup>5</sup>Sociocultural activity refers to an activity that involves human interaction with their culture and environment (Duff, 2002).

<sup>&</sup>lt;sup>6</sup>Language and literacy activity refers to an activity that involves reading and writing using the target language or medium of instruction (Duff, 2007).

<sup>&</sup>lt;sup>7</sup>Disciplinary-based involves writing using specialized vocabulary and concepts within specific disciplines (Starfield, 2007).



(An extended version of activity system adapted from Engestrom, 1987 & Engestrom, 2000)

Figure 2: Using activity system framework to facilitate academic writing practices at higher education institutions in PNG

The diagram shows how different actors within the activity systems of University A and B supposed to interact to produce expected outcome in their academic writing practices. The subjects and members of the community are expected to execute their respective roles based on appropriate rules. They also need the necessary tools to mediate students' academic writing practices so that the objective of academic writing is achieved. These key actors would then, determine the outcome that is to meet students' academic writing demands, ensure students write at expected level, and produce quality output. However, there is no guarantee that there will always be agreements between the actors. That is, there are possibilities of disagreements and contradictions to exist in the activity system. Some of the examples are highlighted in the findings and discussion section.

# Research methodology

Case study research design is employed as a naturalistic inquiry and qualitative method in this study. It focuses on "understanding the dynamics present within single settings" (Huberman & Miles, 2002, p.8). The study incorporated comparative case study to investigate and address the issues underpinning academic writing activity by studying and comparing two cases. That is, its goal is to discover contrasts, similarities, or patterns across the cases being studied (Campbell, 2010). The cases of these study are University A and University B. University A is a public institution with an estimated student population of 4700 and about 300 teaching staff. For University B, it is a private (mission) institution with an estimated student population of 1600 and more than 100 teaching staff at their main campus. "The cases are normally studied in depth in order to provide an understanding of individuals' experiences, issues, insights, developmental pathways, or performance within a particular linguistic, social, or educational context" (Duff, 2014, p.233). The units of analyses for this case study include multiple cases. That is, it is a multisite study that

involved multiple sources of information obtained from interviews, observations and documentations (Creswell, 2013). Semi-structured interviews were conducted with six B. Arts year one and six B. Arts year two students, four tutors and four lecturers, and five academic administrators<sup>8</sup>. Non-participatory observations were also conducted with two B. Arts year one and two B. Arts year two tutorials. Additionally, documentation searches were also conducted whereby students' essays and curriculum materials were obtained. More so, some paper-based and online policy documents were accessed.

The analyses of data are informed by Miles and Huberman's interactive model of data analysis; activity theory and thematic analysis. To obtain a more accurate and clear data analyses and displaying of the findings, NVivo research tool was also used together with the other data analyses tools. This computer assisted qualitative data analysis software (CAQDAS) is aiding the researcher in his search for an accurate and transparent picture of the data whilst also providing an audit of the data analysis process as a whole (Welsh, 2002). All the analyzed data are kept in the NVivo files that are only accessed by the researcher and are used for the purpose of this study.

# Findings & discussions

This report presents data for the theme educational resources. The data are discussed under five subsections which include: infrastructure development, curriculum and other educational materials, educational equipment, online educational resources, and teaching staff. The data revealed that there are similarities, contradictions and differences that exist within each participating university's activity system and between the universities which are highlighted and discussed here.

# **Infrastructures**

In tertiary education institutions, infrastructures like classrooms, computer laboratories, libraries and other facilities are very important tools as part of the activity system that facilitate academic writing practices. According to the student interviewees at University A, there are many students enrolled in 2016 with influx of first year students. One of them reiterates, "The spaces in the computer laboratories, library and lecture rooms are full so when some of us see that we don't have spaces, we pull back, so we miss opportunities" (Year 1 Student 3, 25/10/2016: 1pm). The data imply that there is shortage of educational facilities at University A which are important tools in the University's activity framework. Therefore, with the increased students' intake, it affects their learning opportunities. Moreover, the participating tutors and lecturers expressed that infrastructures of University A have to be expanded. In agreement with the tutors and lecturers, an academic administrator mentioned that University A is growing and therefore it is expanding in terms of programs and courses. As new programs are developed and offered, they also expect increase in student admissions. The interviewee further elaborates, "Those changes have implications for resources including staffing and, teaching and learning facilities like the classrooms, multi-media, and other equipment and materials that aid teaching and learning" (Academic Administrator 1, 01/11/2016: 10am). These data imply that

<sup>&</sup>lt;sup>8</sup>Academic administrators in this study refer to those administrators who perform their administrative duties and teach courses at tertiary education institutions.

the more the University increases its admissions, it has implications on its existing educational resources.

In comparison with University B, a student states, "All our teaching and learning facilities are up to the standard expected" (Year 2 Student 5, 17/03/2017: 10am). This data informs that there is appreciation from the students on the accessibility of various educational resources at University B. Also, the educators expressed that there are not many concerns on the provisions of infrastructures which include classroom and boarding facilities because they have appropriate student numbers to manage, which are somewhat different to what is experienced in University A. Nevertheless, one of the Academic Administrators indicates, "We are constructing new buildings so in the future, we will try to increase the number of students" (Academic Administrator 1, 15/03/2017: 9am). These data suggest that University B is enrolling students based on the availability of its facilities. Further, the University is currently managing its existing facilities and has the potential to upgrade and expand its infrastructures and increase its students' enrolments.

#### Curriculum and other educational materials

Tertiary education institutions need adequate curriculum and other educational materials to run their programs and courses which are important elements in the activity system. The student interviewees from University A indicated that their library has insufficient books and other reading materials, and most of the ones that are available are outdated. One student mentioned that when lecturers give them assignments to write, they expect them to cite recently published literatures. The student further states, "But, how can we find latest literatures when we have mostly outdated materials in the library? So, that affects our work and study" (Year 2 Student 2, 26/10/2016: 11am). Evidently, academic libraries are required to offer up-to-date and reliable information in a useful form for the needs of studies, learning, teaching, research, and education of people (Seppänen & Laitinen, 2017). Additionally, the participating educators also agreed that they need updated resource materials and reference books. These data are consistent with Dumbrigue, Moxley and Najor-Durack (2013) who stated that meeting the needs of students and educators and helping them to overcome the issues or challenges they face, require the creation of support systems that integrate the resources students and educators need to move on in their education successfully. However, this is not passably happening at University A Therefore, it is a huge impediment for a growing University that strives for academic excellence as stipulated in its vision statement.

Whereas for University B, a student stated that the library facility is great where he can easily access latest readings and reference materials. However, according to the participating educators, the University has introduced a paperless policy in which they are minimizing the use of paper and maximizing the use of computers and other equipment to facilitate their academic activities. Despite the paperless policy, a lecturer highlights that, "in the last couple of years, we have gone paperless, but I think we still need to buy important books" (Lecturer 2, 15/03/2017: 1pm). These data show that there is contradiction between the key actors in University B's activity system, whether to strictly observe the paperless policy or to also allow the use of paper-based literatures. However, based on the need analysis, it is appropriate for the University to provide important paper-based literatures for students and staff to use

although most of the educational materials are online.

# Educational equipment

It is an ongoing challenge for University A to provide the necessary educational equipment that are needed. The student interviewees stated that computers are scarce, and they are not fully utilizing what is available. A student affirmed that computers in the computer laboratories are limited because there are many students to use, and students are rushing for computers on a first-come, first-serve basis. Another student suggested that the University has to minimize students' intake so that students who are already there can fully utilize whatever resources that are available. One of them reiterates, "The University Administration must have some restrictions in taking new students into the University. They must take in students according to the budget given by the government and the resources that are available at the University" (Year 1 Student 3, 25/10/2016: 1pm). These data indicate that influx of students has detrimental effects on existing educational equipment and facilities, which seems to be a policy issue. Additionally, such failure within the University's activity system does affect the outcomes of its academic writing practices.

The participating tutors and lecturers also agreed with the students. They indicated that up-to-date educational equipment and materials are needed at University A. One of them said that whiteboards in the classrooms are old and they need replacements. This is in support of the findings from the tutorial observations. It was noted that the tutors wrote some brief notes on whiteboards, but the notes were unclear because of the poor quality of the whiteboards. Furthermore, the participating academic administrators highlighted that there is lack of multimedia in the classrooms. They suggested that it will be helpful if most or all classrooms are equipped with projectors, laptops and new whiteboards. As noticed in the University's Corporate Plan 2013 – 2017 and the University's Strategic Plan 2013 – 2017, part of the focus area looks at equipping certain classrooms with latest high tech fit out to provide robust teaching and learning effectiveness. This is not fully achieved as shown in this study.

The experiences of University A are somewhat different to University B. The students from University B indicated that due to their paperless policy, they use desktop computers and laptops. Further, as noticed in the tutorial observations, multimedia in the form of projectors, laptops and whiteboards was used to facilitate the educational activities. This practice is consistent with Gunawardhana and Palaniappan (2016), who elaborate that multimedia is a form of technology which is used as a teaching tool these days. Thus, all tertiary education institutions in PNG are encouraged to embrace this change as part of the tools in their activity systems to facilitate their academic writing practices.

#### Online educational resources

One of the vital educational resources at higher education institutions is online educational resources. The students at University A emphasized that they search for information in the Internet, but the Internet service provided is poor and there is no active Wi-Fi on campus to access information for their assignments on their personal devices like smart phones and laptops. A student states, "The Internet is slow, and Wi-Fi is not working" (Year 2 Student 2, 26/10/2016: 11am). According to another

student, sometimes they use their own money to pay for data to access the Internet on their smart phones or to pay to access information for their assignments at internet cafés. The PNG University Review Report (May 2010) challenges these data. The Report explains that high quality telecommunications and modern systems of communication are essential for high university performance, and for keeping up with international thought and teaching. The Review Report data is consistent with Rena (2011, p.361) who mentioned that "higher education has been significantly impacted by globalization but institutions in PNG need to go further in making structural changes in response to it." This indicates that higher education institutions in PNG must adapt to the rapid growth of modernization and technology in the 21<sup>st</sup> century in order to provide the necessary supports to students in their academic endeavours.

Additionally, the tutors and lecturers agreed with their students that the Internet service is poor and most of the rooms do not have multimedia, which are their greatest needs. There were also other concerns raised in the interviews. One tutor elaborates, "Students accessing information on the students' server is another area that the administration has to look into to improve it because we don't have the resources to photocopy lecture notes and handouts for students" (Tutor 2, 24/10/2016: 11am). In addition, the participating academic administrators elaborated that the Internet and Wi-Fi service at the University should be readily made available to staff members and students. Smale and Regalado (2017) support that students need reliable Wi-Fi on campus, continued access to computer laboratories, increased access to charging and printing, robust training, timely support, and mobile-friendly academic software. These are relevant tools which are part of the University's activity system that aid students' academic practices which University A does not have any excuses to circumvent them.

Another major concern for University A is, accessing online databases. For higher learning institutions, their libraries act as repository or a storehouse of data where online information like electronic journals and other resources are kept (Gouhar, 2017). However, for University A, online database is a worrying factor. As one of the academic administrators confirms, "Database is really a need here. Our library does not have reliable links to databases, so we are unable to access online journals and other literatures" (Academic Administrator 2, 01/11/2016: 2pm). The participating academic administrators indicated that it is the responsibility of the current University Management to upgrade and increase the educational resources to contribute to students' academic writing success.

The concerns of online educational resources at University A are different from what is noticed at University B. According to the students at University B, they have sufficient information to write their assignments, and able to use online services like search engines, databases and Moodle, and discuss via online forums. A student states, "We have students' issued laptops with free Internet access 24/7 on campus so we can do our work" (Year 2 Student 4, 17/03/2017: 9am). Another student emphasized that most of the time, they do group discussions when forums are opened in the Moodle. This e-learning platform, which belongs to an e-learning category called LMS (Learning Management System) or CMS (Course Management System) makes learning more effective and efficient (Jackson, 2017; & Hosokawa & Watanabe, 2018). Another participating student states that through submitting

assignments using 'turn it in,' (in the Moodle) it also checks for plagiarism. These data suggest that Moodle and other online educational applications are readily available at University B in which they play crucial roles in students' academic practices and success.

In addition, the library at University B provides a conducive online learning environment. This is in line with one of the online graduate attribute policies of the University which states that graduates should have experienced the use of archives and libraries, and the application of a range of computer software, particularly software appropriate to their disciplinary area, and established receptiveness to the expanding opportunities for electronic technology. Additionally, the participating educators elaborated that they use Moodle to facilitate their educational activities. An educator states, "Moodle makes it different because you have this virtual cyber learning environment where you have to share all these PDF documents and share video and all these" (Tutor 1, 13/03/2017: 12pm). These data suggest that the use of Moodle and other technologies as tools in the University's activity system support both students and educators to effectively engage in their educational practices. This also supports Kuteeva (2017), who states that the development of modern or digital technologies like the Internet contributes to various innovative practices. So, with the availability of reliable and effective Internet service at University B, students and staff have the advantage to advance in their academic writing practices.

# Teaching staff

There is also demand for engaging additional educators at University A. Two students indicated that there is need to employ more Associate Professors and Professors in various disciplines. As one explained, "I want highly trained and qualified people like Professors to teach me so that I want to learn the best" (Year 2 Student 1, 26/10/2016: 9am). Another student supports, "We also need Professors who are very well grounded in their field to teach us. We don't want tutors to lecture us" (Year 2 Student 3, 26/10/2016: 1pm). These responses imply that there are tutors lecturing when in fact, they supposed to be running tutorials. However, tutors are lecturing because there are inadequate specialized lecturers, Associate Professors and Professors at University A. Apparently, if the tutors are not lecturing then, who else is going to do the job? Hence, this is a huge challenge for the University Management. According to the University's Corporate Plan 2013 – 2017 and the University's Strategic Plan 2013 - 2017, part of its key focus area looks at constant appraisal of staff to ensure high calibre academics are available to provide quality teaching and learning. Unfortunately, the data suggest that the University Management has not been seriously responding to that policy which is a major concern.

The tutors and lecturers also mentioned that more specialized and highly qualified educators are needed at University A. As one of them states, "We also need highly qualified and skilled staff like Professors in all the disciplines to assist us in our courses and programs" (Lecturer 2, 24/10/2016: 3pm). Additionally, the tutors and lecturers expressed that the University Management should review all the changes that are taking place by creating more positions, bringing in more specialized and qualified educators. These are genuine concerns because universities are about writing

and that specialist forms of academic literacy<sup>9</sup> are central to everything they do (Hyland, 2013). Therefore, for successful 'disciplinary-based' (Starfield, 2007) academic writing to occur and to meet the expected outcome of this writing, it requires expert input from disciplinary-based teaching staff. That is, specialized educators who can teach the specialized contents of their courses or units and guide their students to learn and master the specialized vocabulary and concepts in their disciplines and use them correctly in their academic writing activity.

The academic administrators also admitted that staffing is a big issue. They emphasized that there is a huge increase in student numbers recently which has implications on resources. They highlighted that there is more workload for staff, and lack of quality teaching and marking done. The academic administrators agreed that there is demand for more Associate Professors and Professors to be employed to develop and run courses and programs at University A. One of them expressed that the University Management has to find money and fund more positions because if they want quality students to graduate from the University, then they need quality staff. These data suggest that the consequence of employing Associate Professors and Professors is to maximize the quality of education, courses and programs at University A. The findings correspond with the policies in the University's Corporate Plan 2013 – 2017 and the University's Strategic Plan 2013 – 2017. Part of the mission statement declares that the University aims to transform lives through its highly skilled and experienced staff and inspirational graduates. Additionally, one of the University's core values is to promote excellence in teaching. Therefore, it is crucial for the University Management to respond to these policies with support from all actors within the University's activity system.

Comparing the data from University A with University B, there are some mixed views from participants from University B concerning teaching staff. According to two students, their Departments have enough teaching staff to teach each unit whereas two other students indicated that they still need some additional teaching staff to share the workload of the current lecturers. Furthermore, three students emphasized that they also need specialized lecturers to teach them academic writing because the specialists will spot their weaknesses and strengths in academic writing more accurately and in greater detail and will know exactly how to address their specific academic writing needs. Another states, "I think if some additional staff can come and assist in the units, it will be ok because of the increased number of students. They will then, have enough time to attend to us individually" (Year 1 Student 2, 21/03/2017: 10am). However, five students anticipated that student number is manageable, and their lecturers do find time to communicate with each of them. As noticed here, there are inconsistencies exist in the data. With these mixed responses from students, it is proper to reassess the level of supports that they receive from their current educators. If the educators are not meeting their individual academic needs, then it will require the University Management to engage additional educators to share workloads.

The educators also felt that they need additional personnel to assist them. One of them said that last semester she taught four units and now she is teaching three. She explains, "But three units is still quite a lot. Four units is huge. So, in addition to all our tasks, a lot of people are overloaded" (Tutor 2, 14/03/2017: 11am). Another

<sup>&</sup>lt;sup>9</sup> Academic literacy involves reading and writing with theoretical mindset (Hyland, 2013).

interviewee adds, "If we want to set up a centre or offer some services, the University needs to adequately provide specialized staff to run or teach the curriculum" (Tutor 1, 13/03/2017: 12pm). The academic administrators also shared the similar sentiments. They emphasized that they have specialists at University B who are over-committed or overworked therefore they still require additional qualified educators to assist them. One of them elaborates, "We have recommended to the University Management to employ new specialized staff to assist us develop our programs. But it is taking slow progress and we don't know when we will have additional staff to help us" (Academic Administrator 1, 15/03/2017: 9am). However, he says, "One of the issues to get more qualified staff is that more pay package, that is beyond our capacity. It is an issue of financial resources, which is a problem" (Academic Administrator 1, 15/03/2017: 9am). These data suggest that University B does not have the financial capacity which is one of the vital tools that is affecting its activity system to employ additional educators, though there is current demand.

#### Conclusion

The findings revealed that educational resources like infrastructure development, curriculum and other educational materials, educational equipment, online educational resources, and teaching staff are important players in the activity systems of higher education institutions. However, for this study, the findings suggest that University A seems to struggle more to meet its academic writing needs in terms of the provision and availability of its educational resources compared to University B. Drawing from these findings, the higher education institutions in PNG are encouraged to upgrade their existing educational resources and include new ones to improve the quality of their academic writing practices and to produce expected outcomes. Further, actors in the activity systems of higher education institutions in PNG can elicit from the findings to address the challenges students and educators encounter by supporting them to successfully engage in their academic writing practices.

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# A Study on the Influence of Technology Hands-on Curriculum on the Technology Attitude and Programming Attitude in Senior High School

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#### **Abstract**

The study was aimed to explore the influence of technology hands-on curriculum on the technology attitude and programming attitude. The study sample consisted of forty two 16-year-old students from one K10 class in Taiwan. A 12-week (24h in total) preand post-test quasi-experimental study was designed. In the class we used the Arduino microcontroller, let students learn how to control the Arduino and design their final homework. All the course materials were placed in the school eclass network teaching platform (http://eclass.tcgs.tc.edu.tw). Students could log on to the network teaching platform at any time to view the materials and discuss with their partners. During the experimental period, we randomly selected students did the semi-structured interview to record their learning experience. The main statistic procedures employed for analyzing experimental data and testing the research hypotheses were Paired t-test. The result of this study: (1)The technology hands-on curriculum has a positive effect on students' technology attitude and programming attitude. (2)In the technology hands-on curriculum, students' technology attitude has a positive effect on students' programming attitude.(3) Data of semi-structured interview by qualitative analysis indicate that Hands-on Curriculum can generate students' motivation and interest to learn technology.

Keywords: Technology Hands-On Curriculum, Technology Attitude, Programming Attitude



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#### Introduction

Taiwan believes that the content of technology education curriculum lies in the cultivation of concepts of technology. By operating the technology process, it is possible to deduce and understand the development of technology and hope that it can actually operate technology products and cultivate practical experience in the course. The topics of Taiwan's technology education curriculum mostly fall on the aspects of life technology (Yu-Sban Chang, Kuang-Chao Yu, Pei-Ru Hsiao, 2010). The technology curriculum is based on two subjects: Information Technology and Life Technology to implement curriculum concepts and goals. The basic concept of life technology curriculum is based on "Doing, Using, Thinking ". Develop students' ability to do practical work, the ability to use technology products, and the ability to design and critique technology. Teaching technology should be conducted in the form of problem solving or thematic production. Encourage students to conduct autonomous and exploratory learning so as to implement the curriculum concepts of "Design and Implementation" and " Computational Thinking ". Students apply various creative thinking methods in the formation of concepts, selection of materials, and processing techniques, and actually solve the tasks and problems delivered by teachers. This learning process is very difficult to do with other courses, and this is exactly the specialties of life technology courses (Yih-Hsien Chu, 2006). If we can make good use of practical courses in life technology and guide student with well-designed teaching materials, we will effectively develop students' abilities. So this study will effectively use Arduino online courses, and combined with eClass network teaching platform features, conducted a 12-week (24 lessons) technology Hands-on Curriculum. To understand the impact of technology hands-on curriculum on the technology attitude and programming attitude.

# A. Technology Hands-on Curriculum

Technology education is a diversified curriculum, as an indispensable curriculum for people. Technology can lead people to a more advanced and convenient society. Therefore, the implementation of the technology education curriculum should not be neglected (Yu-Sban Chang et al., 2010). The technology curriculum is based on two subjects: Information Technology and Life Technology to implement curriculum concepts and goals. To help students understand the connection between science and engineering by strengthening the link between knowledge in different disciplines. Therefore, through the establishment of technology, the connotation of technology and engineering into the field of technology curriculum. To strengthen students' hands-on and interdisciplinary skills, such as science, technology, engineering, mathematics(STEM). Cultivate students' computational thinking, technological design and creative capabilities, and establish attitudes towards the technological society. Students apply various creative thinking methods in the formation of concepts, selection of materials, and processing techniques, and actually solve the tasks and problems delivered by teachers. This learning process is very difficult to do with other curriculums. and this is exactly the specialties of life technology curriculum(Yih-Hsien Chu, 2006).

Life technology belong to the hands-on curriculum in basic national compulsory education. Through the implementation of activities in the curriculum, teachers can develop students in metalworking, carpentry, circuit design skills. Instruct students to

understand the structure and planning of design and production. There are many similarities with the maker movement in such curricula. The basic concept of life technology curriculum is based on "Doing, Using, Thinking". Develop students' ability to do practical work, the ability to use technology products, and the ability to design and critique technology. Teaching technology should be conducted in the form of problem solving or thematic production. Encourage students to conduct autonomous and exploratory learning so as to implement the curriculum concepts of "Design and Implementation" and "Computational Thinking".

Yi-Hsin Chang (2016) studied through problem-based learning on a given website (Web-PBL), so that the impact on their learning attitude, problem-solving ability, and learning effectiveness on the science and technology fields is observed. Research result with implementation of the web-PBL program, the students' learning attitude on the science and technology is promoted with significance, particularly in the category of learning motivation, indicating that the students are holding a positive and active attitude on the web-PBL when they are engaged in the program. Mei-Hui Lu, Hsi-Yu Ching (2011) was discussing feasibility that applies Computer Aided Drawing (CAD) technique to elementary technology education course. The findings are the study has achieved better learning effects of CAD instruction in technology education course. Besides, the effects have inspired better learning motives.

Tai, Yu-Te, Ray, and Jia-Ling (2016) explored the influence of flipped teaching on students' learning achievement in living technology hands-on curriculum. Significant differences were found between the experimental groups and the control group in terms of students' learning achievement in living technology hands-on curriculum, technology attitude, cooperative learning attitude and course satisfaction.

Therefore, the technology hands-on curriculum of this study aims to cultivate students' hands-on capabilities. User Arduino microcontroller and C programming language design a series of hands-on curriculum. Expect to enhance students' technology attitude and programming attitude by this curriculum.

# B. Technology Attitude

The attitude generally refers to the coordinated, organized, and habitual internal psychological response that an individual holds for anything. This complex psychological process is a collection of thoughts, emotions, and actions that are triggered by the things (Chun-Hsing Chang, Kuo-Shu Yang,1998). Chang-Wen Chen (2004), Eagly & Chailen (1993) Attitude is a tendency for a person to make a positive or negative response to something, a person, a situation, or an event. Min-Tung,Lin (2006) Attitude refers to an abstract internal reaction of individuals to people, things, and objects. It manifests itself in external attitudes. Its connotation includes three parts: cognition, affection, and behavior. Gibson, Ivancevich, and Donnelly (2000) Stimuli can affect attitudes, and attitudes can be expressed specifically through the expression of personal preferences, the expression of beliefs, or the expression of actions. A positive attitude can be obtained through learning, and it is a persistent mental paradox. Developing a positive attitude is a part of school education that cannot be ignored.

The goals of technology education curriculum in various countries have been gradually changed from the manual exegesis emphasized in traditional craft courses to the development of students' technological literacy. It is also the three aspects of knowledge, skills, and attitudes of technology. In other words, besides attaching importance to scientific and technological know-how technology skills, how to guide students to have a correct technology attitude and to strengthen the training of relevant scientific and technological attitudes is an important aspect of the technology education curriculum. "Technology Attitude" refers to a person's tendency to cognize, affect, and act on information on technology. The cognitive part is the individual's belief in technology and technology issues. The emotional part is the inner feeling of the individual on the topics of technology. In the part of the behavior is the actual action shown by the individual on the issues of science, technology and technology (Min-Tung,Lin, 2006).

Jenkins (2006) pointed out that students like to work with new technologies. Students mention that it is interesting to work with new technologies, and technology is beneficial and important to society, medical training and life. Hsu, I-Ying (2012) aimed to discuss how the Living Technology Curriculum, containing the history of technology and science/ technology/ society (STS) materials, influenced students' technological literacy and attitude toward technology. The conclusions were as follows: (1) parents' occupations, the gender issue and academic performance affected students' performance in technological literacy and attitude toward technology; (2) content in the history of technology can enhance students' technological literacy and attitude toward technology; (3) students' attitude toward technology and academic achievement have positive influence on their performance in technological literacy. Tseng, Chang, Lou, and Chen (2013) pointed out students recognized the importance of STEM in the science and engineering disciplines; they mentioned in interview that the possession of professional science knowledge is useful to their future career and that technology may improve our lives and society, making the world a more convenient and efficient place. In conclusion, combining PjBL with STEM can increase effectiveness, generate meaningful learning and influence student attitudes in future career pursuit. Students are positive towards combining PiBL with STEM. Wendell and Rogers (2013) pointed out suggest that engineering design-based science curriculum units may support elementary students' science content knowledge, while helping students learn to design, construct, and test solutions to engineering problems. Because students using either curriculum had similarly positive attitudes toward science, our research suggests that the benefit of engineering design for science learning cannot be attributed simply to the positive science attitudes that may result from the use of novel materials or methods.

From the above research on technology attitude, we can see that students have a greater interest in technology (Jenkins, 2006). Hands-on activities such as PjBL through Life technology curriculum or STEM can improve students' technology attitudes (Tseng et al., 2013; Wendell & Rogers, 2013; Hsu, I-Ying, 2012). The attitude of technology has a positive effect on technological literacy (Hsu, I-Ying, 2012).

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#### C. Programming Attitude

Computer programming is perceived as an important competence aiding in the development of higher-order thinking skills such as problem solving, creative thinking, logical reasoning, systematic experimentation and the like (Akcaoglu, 2014; Baytak & Land, 2011; Korkmaz, 2012; Lau & Yuen, 2009). Programming is an important lesson, but students often face learning obstacles due to abstract programming concepts. Computer programming is mostly perceived as a difficult course by the students (Askar & Davenport, 2009; Baser, 2013). Programming is a cognitive activity that requires plausible reasoning skills. It can cultivate students' ability to think high and make inferences in the process of learning. Cooper pointed out that it is difficult for beginners to understand the logical concepts (such as selection structures, loops, etc.) and data types (such as arrays) of program abstraction, because there are few real life examples to promote students' understanding in the introductory courses of programming (Cooper, Dann, & Pausch, 2003). Beaubouef and MasonAfter (2005) pointed out most students have studied a semester program, they still stay on grammar learning. It is difficult to apply the acquired program knowledge to plan the program. Although teachers explain the abstract idea of the program in the classroom, the programming teaching is often based on static teaching methods. It is difficult for learners to understand the operation and structure of the program (Hooper et al., 2007). The fact that computer programming is perceived as a difficult course results in the fact that they develop mostly negative attitudes regarding programming (Baser, 2013). Negative attitude regarding programming has a negative effect on the success of students. Hence, the studies finding out that such factors as negative perception, motivation and especially low level of attitude can negative effect on learning computer programming take attention(Anastasiadou & Karakos, 2011; Hawi, 2010; Korkmaz & Altun, 2013). The studies show that there is a significant relation between the accomplishment of tasks in the computer environment and the attitudes of students towards computer technology (Baser, 2013; Korkmaz & Altun, 2013).

Yu-Te Wang, Yuan-Tai Chen, Ling-Huei Tseng (2012) studied was to understand the effectiveness of robot programming courses in programming language course for female high school students. The main findings of this study were that there were no significant differences in students' programming achievement between experimental group and control group. Students' programming attitude of the experimental group was significantly different to the experimental group. Data of semi-structured interview by qualitative analysis indicate that robot programming courses can generate students' motivation and interest. Yu-Tzu, Liao (2011) developed two kinds of game-oriented teaching material with Greenfoot for programming concepts learning, and examined the effects of two kinds of game-oriented teaching material on high school sophomores' performance in programming learning, students' attitudes toward programming learning, and students' self-efficacy. Both groups of student attitude survey indicated that the majority of student had positive attitudes toward using the game-oriented teaching material to learn programming concepts.

HSU, TING-YU (2016) pointed out programming is an important lesson, but students often face learning obstacles due to abstract programming concepts. It is revealed in the research that the effects are better on senior high students' learning performances, self-confidence and abstract thinking ability in teaching programming for

experimental group than control group; besides, in interviews after class, students generally looked Scratch as an easy way to learn and it did arouse their interests, whereas fChart was more complicated to use but easier for them to observe the operation of the programming. Gençtürk and Korucu (2017) concluded that students receiving education within the experimental group are more successful. When analysing their attitudes towards programming languages, it is concluded that attitudes of students in experimental group are more positive than that of those in control group.

From the above research on programming attitudes, we can see that programming is an important course, but due to abstract programming concepts, students often face learning disabilities. The fact that computer programming is perceived as a difficult course results in the fact that they develop mostly negative attitudes regarding programming (Baser, 2013). Negative attitude regarding programming has a negative effect on the success of students. Hence, the studies finding out that such factors as negative perception, motivation and especially low level of attitude can make negative effect on learning computer programming take the attention(Anastasiadou & Karakos, 2011; Hawi, 2010; Korkmaz & Altun, 2013). The studies show that there is a significant relation between the accomplishment of tasks in the computer environment and the attitudes of students towards computer technology (Baser, 2013; Korkmaz & Altun, 2013). Learning programming through robots, games, etc. is more able to understand the role of programs and is more conducive to student motivation and interesting (Yu-Te Wang et al., 2012; Yu-Tzu, Liao, 2011).

# Research methods

#### A. Samples

Unit	Subject	Description	Electronic parts	Programing	Time
1	Introduction Arduino and Arduino IDE	Arduino basic control instructions Arduino IDE's operation interface		Arduino IDE C basic grammar	100 minutes
2	Arduino IDE programing	Arduino IDE programing	LED, resistance	variable, function, loop	100 minutes
3	LED Marquee	Use Arduino control 5 LEDs and produce different flickering effects	LED, resistance	variable, flow control, function, loop	100 minutes
4	Adjustable LED's brightness	Use Arduino's PWM pin and use variable resistance to adjust led's brightness	LED, variable resistance	variable, flow control, function, loop	100 minutes
5	Messaging	Computer and Arduino transfer data each other		variable, flow control, function, loop	100 minutes
6	Photoresistor night light (Homework 1)	Use photoresistor and LED design a night light	LED, photoresistor	variable, flow control, function, loop	200 minutes
7	Motor application	Use Arduino to control DC motor and Servo motor	DC motor, Servo motor	variable, flow control, function, loop	100 minutes
8	Bluetooth remote control car(Homework 2)	Use Arduino and Bluetooth module to design a Bluetooth remote control car	DC motor, Bluetooth module, L293 expansion board	variable, function, loop	400 minutes

The study sample consisted of forty two 16-year-old students from one K10 class in Taichung city of Taiwan. Two students form one group and the whole class is divided into 20 groups.

# B. Technology hands-on curriculum

The technology hands-on curriculum of this research is mainly based on the ability to cultivate students' hands-on skills. The current popular Arduino microcontroller is the main feature, and the C program language is used to design a series of hands-on applications for life (Table 1). The curriculum was placed in the school's eclass network platform (http://eclass.tcgs.tc.edu.tw).

#### Table 1 Technology Hands-on curriculum

#### C. Research tools

# 1. Technology scale

The technology attitude scale was compiled by Tai et al. (2016). The technology attitude scale of this study is divided into following five sub-scales: Technology career, Technology interest, Technology problem, The importance of technology and Technological difficulties. The Cronbach  $\alpha$  of whole scale and each sub-scale are shown as follows: the Cronbach  $\alpha$  of Technology career is 0.91; Technology interest is 0.76; Technology problem is 0.91; The importance of technology is 0.76; Technological difficulties is 0.86; and the Cronbach  $\alpha$  of whole scale is 0.91.

# 2. Programming scale

The programming attitude scale was compiled by Tai, D. W. S., Liang-Chu Lai (2016). The programming attitude scale is divided into following five sub-scales: usefulness, confidence, preference, anxiety, and course requirements. The Cronbach  $\alpha$  of whole scale and each sub-scale are shown as follows: the Cronbach  $\alpha$  of preference is 0.80; usefulness is 0.71; confidence is 0.75; anxiety is 0.83; course requirement is 0.82; and the Cronbach  $\alpha$  of whole scale is 0.90.

#### 3. Qualitative data collection and analysis

This study use qualitative data research procedure reference from Ya-Chu Yang, Hsiao-Lin Tuan (2015) and Sung-Pei Chien, Hsin-Kai Wu(2008). Qualitative data analysis to analyze the open questionnaire after the completion of two Hands-on homework. Qualitative data is coded according to the purpose of research. The contents of the code list (Table 2) cover the course satisfaction and technology attitude. The number of open questionnaires for the hands-on units in this study, homework1 has 40 questionnaires, and homework has 40 questionnaires. Firstly, the researcher analyzes the open questionnaire, then to co-analysts. Analytical results are discussed and confirmed multiple times.

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Table 2 Qualitative data encoding table

Item	Code number	Definition	Description		
	1-1	Students feel diverse in the content of the course. The textbooks can assist in the completion of homework.	The student mentioned that the course is rich in content, and that watching the teaching video or the teacher's textbooks can help the team complete the homework		
course	1-2	Satisfied teacher content, feedback quality and timely assistance	Students feel that teachers can provide advice and guidance at the right time and respond to the problems encountered		
satisfaction	1-3	Students feel that the course makes them self-growth	Due to the relationship of this course, students feel that they have increased their confidence in their scientific knowledge and hands-on skills.		
	1-4	Students look forward to the next hands-on curriculum	Students find the course very interesting and are looking forward to the next hands-on curriculum		
	2-1	Have confidence in technology	Students mentioned that through this course, they feel more confident in technology and hands-on		
technology attitude	2-2	Like programming or technology implementations	Students like programming and hands-on implementations, and they mention that technology is very interesting		
	2-3	Ability to apply technology to everyday life or generate interest in technology	Students can apply what they have learned in daily life to daily life, or actively observe technology-related products in daily life.		
	2-4	Demonstrate technology-related career planning	Students would like to study in related science and technology departments or would like to work in the field of technology.		

#### Research results

A. The Impact of Technological Hands-on Curriculums on Technology Attitude and Programming Attitude

This study want to understand the impact of technological hands-on curriculum on technology attitudes and programming attitudes. Use paired t-test to examine the difference between on technology attitudes and programming attitudes after the 12-week technology hands-on curriculum. The paired t-test results of the pretest and posttest of the technology attitudes scale and programming attitudes scale are shown in Table 2 and Table 3 below. According to the results on Table3, there were have significant differences between the pretest and posttest results of total scale, technology career and technology interest on the technology attitude scale. According to the results on Table4, there were have significant differences between the pretest and posttest results of all sub-scales and total scale.

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Table 3 The Paired t-test on the technology attitude scale

sub-scale	Pretest		Posttest		+	
sub-scale	Mean	Std	Mean	Std	ι	
Technology career	28.21	5.63	30.08	4.63	2.79**	
Technology interest	15.00	2.67	16.05	2.45	2.78**	
Technology problem	32.44	5.83	33.00	5.20	.89	
The importance of technology	17.67	2.40	18.13	2.08	1.42	
Technological difficulties	14.85	3.38	15.44	2.70	1.47	
Total scale	108.15	14.86	112.69	11.99	3.53**	

N=39;\*p<.05,\*\*p<.01,\*\*\*p<.001

Table 4 The Paired t-test on the programming attitude scale

gub goolo	Pretest		Posttest		4	
sub-scale	Mean	Std	Mean	Std	ι	
preference	20.64	4.93	22.87	4.61	3.25**	
usefulness	23.87	3.09	28.03	4.65	6.36***	
confidence	15.82	4.56	17.33	3.95	2.58*	
anxiety	13.46	3.02	15.64	3.41	4.12***	
course requirements	18.87	3.50	20.79	3.90	3.16**	
Total scale	92.67	16.41	104.67	17.92	5.24***	

N=39;\*p<.05,\*\*p<.01,\*\*\*p<.001

# B. The influence of technology attitude on programming attitude in technology hands-on curriculum

This study to understand the influence of technological attitude on programming attitude in the technology hands-on curriculum. Use independent t-test to examine the difference on the programming attitude between the technology attitude scale pretest high group and low group. According to the results on Table 5, the technology attitude scale high group's average score is 113.00 on the programming attitude scale. T low group's average score is 94.94. T independent t-test is 3.597\*\*. The results show the student's programming attitude score in the technology attitude scale high group is better than the low group. From the above results, the technology attitude in the technology hands-on curriculum does affect the programming attitude.

Table 5 independent t-test

	Group	People	M	SD	t	p
Technology	HIGH	21	113.00	11.62	3.597**	<.01
Attitude Pretest	LOW	18	94.94	19.31		

N=39;\*p<.05,\*\*p<.01,\*\*\*p<.001

# C. Qualitative data analysis

This study was based on an open questionnaire qualitative data analysis. According to the results on Table 6, 96.25% of students mentioned that they are satisfied with the technology hands-on curriculum. In the course satisfaction item, 25% students feel diverse in the content of the course. The textbooks can assist in the completion of homework. 15% students satisfied teacher content, feedback quality and timely assistance. 40% students feel that the course makes them self-growth. 16.25%

students look forward to the next hands-on curriculum. This curriculum leads student to understand the function of Arduino. And the content of the technology hands-on curriculum is very close to life. Students can successfully make interesting and practical devices through the guidance of this curriculum. Student think the curriculum is very challenging and interesting.

Table 6 Hands-on qualitative data times table

Item	Code number	Definition	Time	% (Time/80)	Total	% (Total /80)
	1-1	Students feel diverse in the content of the course. The textbooks can assist in the completion of homework.	20	25%		
course	1-2	Satisfied teacher content, feedback quality and timely assistance	12	15%	77	96.25%
satisfaction	1-3	Students feel that the course makes them self-growth	32	40%		
	1-4	Students look forward to the next hands-on curriculum	13	16.25%	-	
	2-1	Have confidence in technology	43	53.75%	_	_
	2-2	Like programming or technology implementations	25	31.25%		
technology attitude	2-3	Ability to apply technology to everyday life or generate interest in technology	7	8.75%	79	98.75%
	2-4	Demonstrate technology-related career planning	4	5%		

<sup>\* 40</sup> students, everyone write two open questionnaires

In addition to technology attitude, 98.75% of students mentioned their views on technology. 53.75% student have confidence in technology. 31.25% student like programming or technology implementations. 8.75% student ability to apply technology to everyday life or generate interest in technology. 5% student demonstrate technology-related career planning. After participated in technology hands-on curriculum, student feel very satisfied after completing the homework. And then find out about their interest in programming. This shows that this course can stimulate students' interest in technology, and then improve students' technology attitude.

# **Conclusion and suggestion**

#### A. Conclusion

1. The technology hands-on curriculum has a positive effect on students' technology attitude and programming attitude.

This Study used paired t-test to examine the difference between on technology attitudes and programming attitudes after the 12-week technology hands-on curriculum. According to the results, there were have significant differences between technology attitude and programming attitude after technology hands-on curriculum. And from the student's qualitative information can also be found after participated in

technology hands-on curriculum, student feel very satisfied after completing the homework. And then find out about their interest in programming. This shows that this course can stimulate students' interest in technology, and then improve students' technology attitude. The results of this study are the same as many studies. Students like to participate in technology work, students mentioned that it is interesting to work with new technology. And technology are beneficial and important to society, medical training and life. Students' attitudes in engineering and technology increase slightly after participating in technology activities (Jenkins, 2006; Tseng et al., 2013). Through technology hands-on curriculums, students can not only practically use STEM knowledge, but also can actively engage in STEM integration concepts in the topic of technology implementation.

2. In the technology hands-on curriculum, students' technology attitude has a positive effect on students' programming attitude.

This study used independent t-test to examine the difference on the programming attitude between the technology attitude scale pretest high group and low group. The results show the student's programming attitude score in the technology attitude scale high group is better than the low group. From the above results, the technology attitude in the technology hands-on curriculum does affect the programming attitude. The results of this study are the same as many studies. Students feel unfamiliar with programming. However, after hands-on curriculum, they can understand the use of programming. Learning the programming through hands-on curriculums such as robotics and Arduino can better understand the role of the program and can be more conducive to student motivation and interest. It can influencing students' programming (Gençtürk & Korucu, 2017; Yu-Te Wang et al., 2012).

3. Data of semi-structured interview by qualitative analysis indicate that Hands-on Curriculum can generate students' motivation and interest to learn technology.

According to the qualitative data of students shows that technology hands-on curriculums can really enhance students' motivation and interest in learning technology. This course leads student to understand the function of Arduino. And the content of the technology hands-on curriculum is very close to life. Students can successfully make interesting and practical devices through the guidance of this course. Student think the course is very challenging and interesting. The results of this study are the same as many studies. Completion of the tasks in the programming course has a significant relationship with the student's programming attitude (Baser, 2013; Korkmaz & Altun, 2013). Through technology hands-on courses, students' technology attitudes have improved significantly. Especially in the part of learning motivation, the promotion is most obvious, which can motivate the students' motivation and interest in learning technology (Tai et al., 2016; Mei-Hui Lu et al., 2011; Yi-Hsin Chang, 2016). Learning programming through robots, games, etc. is more able to understand the role of programs and is more conducive to student motivation and interesting (Yu-Te Wang et al., 2012; Yu-Tzu, Liao, 2011).

# B. Suggestion

This study was only experimental teaching in senior high schools in Taiwan, but also experimental teaching in only one class due to school scheduling factors. The study

found that technology hands-on curriculum significantly improved students' attitude in science and technology and programming attitude. Suggest that can increase the experiment class and control group in future. In addition, the experimental teaching materials placed in advance online teaching platform, it is suggested that different teaching strategies (such as flip teaching, cooperative learning) to explore different teaching strategies in technology hands-on curriculum for technology attitude and programming attitude.

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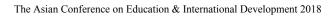
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Official Conference Proceedings

# Cushioning Teacher Bullying: An Exploratory Study Towards Establishing Support Mechanism

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### **Abstract**

Exploratory Sequential Mixed Methods was used in carrying out this research work since Teacher Bullying (TB) is not yet explored in the Philippines. In the first phase, a narrative inquiry was administered to extract significant experiences of teachers in terms of "bullying forms" and its "effects" on their teaching performance and wellbeing, as well as their perceived "interventions" that can address the issue. The data gathered were utilized in building an instrument for the second phase. Consequently, Exploratory Factor Analysis was employed to uncover "factors of TB", and Multiple Response Analysis to determine "common effects of TB" and "needed interventions on TB". Twenty forms of teacher bullying were identified and were grouped into four factors, namely, Work Performance - Related Bullying, Interpersonal Dimension -Related Bullying, Psychosocial Dimension - Related Bullying and Classroom Management - Related Bullying. The common effects of teacher bullying on performance are "lost focus", "demotivated" and "unachieved targets" while common effects of teacher bullying on well-being include "low morale", "loss of confidence" and "sleeping disorder". Results further showed that interventions needed are "increase awareness", "engage stakeholders" and "develop personal habits". Ultimately, the "support mechanism" developed to address teacher bullying have the following components: prevention, intervention, and monitoring and evaluation (PRIME) wherein each component represents set of actions. This study confirmed that there are dimensions of teacher bullying which are unique in each school, thus, the support mechanisms to be implemented must be school-based and managed by a created committee in school which would be responsible to perform relevant tasks.

Keywords: Exploratory sequential mixed methods, Support mechanism, Teacher bullying



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### Introduction

In the past few years, bullying has been one of the most talked-about issues in schools not only in the Philippines but more so in other countries, thus, it has received increased attention even up to this date. In addressing the issue, schools have instituted interventions like placing harder and clearer rules against bullying, forming clubs and organizations in schools to address bullying, and taking legal actions against students who have bullied other students (The Bullied Teacher, 2013). But these school initiatives are directly focused on just one kind of bullying: Student Bullying.

In schools, especially in the Philippines, there is another kind of bullying that is often neglected and goes unreported; a problem that silently proliferates and occurs most often than most people realize. It is called Teacher Bullying.

Bullying toward teachers has been a recognized problem already in other countries. But sad to say, very little research has been done on this subject (De Wet, 2010). And most of these researches are concentrated not on arriving at prevention and intervention programs that can address the problem but rather on finding the significant relationship of teacher bullying to other teaching variables such as self-efficacy beliefs (Ozkilic, 2014) and classroom management (Allen, 2010); identifying forms of bullying experienced by teachers (Kauppi and Porhola, 2012); and determining the effects of bullying to teachers' well-being (Benefield, 2004; De Wet and Jacobs, 2006; De Wet, 2010); to name a few.

In the Philippines, it is very safe to note that teacher bullying is an under-recognized problem since no research has been conducted on this subject. Teachers themselves do not even bother to care if certain acts toward them from people in school can already be considered bullying. Based on informal and initial talks of the researcher of this study to teachers in the field, in the Island Garden City of Samal, almost all of them have limited conceptual understanding and awareness of teacher bullying.

Among the problems encountered by teachers in relation to teacher bullying are: Unreported cases of TB, Reported TBs are neglected by authority, Reported TBs are not addressed or little is done, Teachers remain powerless in the face of TB, Teachers have nowhere to turn to, TB is under-recognised, Limited understanding and awareness of TB, and Teachers silently suffer the torment of their students (The Bullied Teacher, 2013).

It must be emphasized that the well-being of teachers has a central role in any school community (Kauppi and Porhola, 2012). It can be assumed that teachers who feel comfortable in their position and are content with their working conditions have a better chance to succeed in supporting the work of their students.

Considerably, the experience of being bullied at work is known to have a detrimental effect on victim's health and well-being (Mattiesen and Eirnarsen, 2004). It has been discovered that bullying and violence have negative effects on the quality of teachers' work performance (De Wet, 2010).

If Teacher Bullying (TB) is empirically found to be detrimental in the delivery of quality performance from the teachers, then it must be taken seriously and appropriate actions must be done. Thus, this study was thought out by the researcher to explore the subject initially (here in the Philippines) in order to determine if there could be substantial results and evidences that would warrant the problem to be acknowledged and regarded in the workplace. If so, then addressing the problem should be prioritized, and there could be no better way to do it than laying down mechanisms that could fill in the gaps between the existence of teacher bullying and the protection that teachers deserve.

The researcher's main objective was to come up with a support mechanism on teacher bullying that teachers can resort into should there be any concern regarding them being bullied. This mechanism would serve as protection for teachers that would give them relief on incidents and circumstances connected to teacher bullying. But before arriving at a mechanism, the study identified first the forms, factors and effects of teacher bullying prevalent in the Philippines, as well as the interventions which are mostly needed, timely and relevant in the country's setting. All these information would provide a good background on teacher bullying in the Philippine context.

Generally, Exploratory Sequential Mixed Methods of research was used in this study. In this method, the researcher began with a qualitative research phase and explored the views of participants (Creswell, 2013). The data gathered were then analyzed and the information were used to build into a second, quantitative phase. Because the researcher wanted to build an instrument that best fits the sample under study, identify appropriate instruments to use in the follow-up quantitative phase, and to specify variables for a follow-up quantitative study (Creswell, 2013), the exploratory sequential mixed methods is the most appropriate approach in carrying out this research work.

In the qualitative phase, the method employed was phenomenology. The researcher's assumption was that there exist a true essence of the experiences (Vanderstoep and Johnston, 2009) of teachers relative to bullying in the workplace. How the teachers experience bullying and how they construct meaning of these experiences are what this research is focused on. Hence, phenomenology was eyed by the researcher as the best method in carrying out the qualitative phase of this study.

Further, Narrative Inquiry was the tool used in the data collection in the qualitative phase. This is the tool used because the researcher wanted to collect stories from select respondents on their experiences on teacher bullying and consequently use them in identifying common themes that could be used in the next steps of the research. The researcher's idea is consistent to what McAdams (1996) stressed that narrative inquiry is a particular way of collecting data, that is, asking people to tell stories and applying to the data obtained; and to the definition of Polkinghorne (1988) that narrative inquiry is the process of making story, the cognitive structure of the story or the result of the process.

On the other hand, in the quantitative phase of the study, survey was administered since it is the best way to collect a large amount of data from a large number of people in a short amount of time (Vanderstoep and Johnston, 2009). At this point of the research, the researcher did a face-to-face interview with 200 respondents using a

survey questionnaire as the guide in carrying out the data collection. Face-to-face interview, and not any other survey method, was chosen because the researcher understands the vagueness of the topic. It was much expected that identified respondents would experience difficulty in understanding some items in the questionnaire or even the concept itself of teacher bullying. Thus, the presence of the researcher while doing the survey was much needed to address these concerns.

As shown in the analytical framework of the study (Figure 1), the variable SMTB (Support Mechanism on Teacher Bullying) is the main output of this research. This was realized after synthesizing results generated from (a) quantitative inquiries on the variables FATB (Factors of Teacher Bullying), CETB (Common Effects of Teacher Bullying) and NITB (Needed Interventions on Teacher Bullying); (b) textual analysis of the literatures on the factors, effects and interventions of teacher bullying; with (c) existing policies and programs of the government particularly of the Department of Education

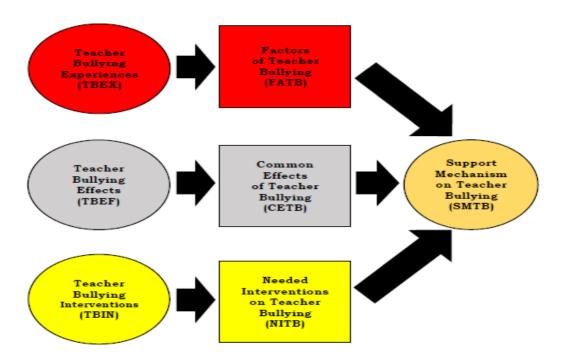


Figure 1. Analytical Framework of the Study

FATB, CETB and NITB were generated out of qualitative inquiries on the variables TBEX (Teacher Bullying Experiences), TBEF (Teacher Bullying Effects) and TBIN (Teacher Bullying Interventions), respectively. Select respondents of the study were subjected to Narrative Inquiry to identify TBEX, TBEF and TBIN, and the themes that emerged were the basis in coming up with a measurement tool that was used in the survey phase, thereafter, identifying the variable FATB using Exploratory Factor Analysis, and the variables CETB and NITB using Multiple Response Analysis.

As to sampling technique, purposive sampling was used. Presented in table 1 is the summary of the samples for both qualitative and quantitative phases. Eight (8) teachers (4 from elementary and 4 from secondary) were chosen purposively who met these criteria: 5 years and above teaching experience, identified by co-workers to be knowledgeable of the history and experiences of the school, and identified by co-workers as persons who possess honesty, integrity and trustworthiness. On the other hand, the ratio 10:1 for EFA as suggested by Ho (2014) was the basis in determining the number of respondents in the quantitative phase of the study. Thus in the survey, 200 samples of public school teachers in IGaCoS Division were the subjects.

Research	Number of	Gender		Position		Level Taught	
Phase	Respondents	Male	Female	High	Low	Elem	Sec
Qualitative	8	4	4	4	4	4	4
Quantitative	200	43	157	72	128	100	100

**Table 1.** Profile Summary of the Research Respondents

To reiterate, the study had three phases: qualitative, quantitative and synthesis (Figure 2). Narrative inquiry was employed in order to extract from select respondents the forms of bullying experienced by teachers in the workplace. Also in the same narrative inquiry, effects of teacher bullying as perceived by the respondents, and interventions on teacher bullying that they deemed appropriate in their school setting were also extracted from them. Thereafter, coding, identifying themes and extracting meaning were done which constitute the thematic analysis of the qualitative phase.

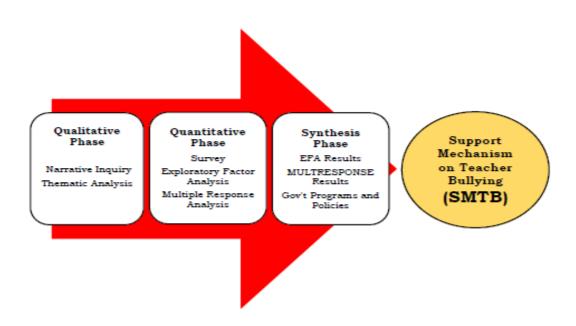


Figure 2. Flow of the Study

The quantitative phase started with a survey which made use of the questionnaire made by the researcher using the themes extracted from the qualitative phase. After the survey, the responses of the respondents on the area Factors of Teacher Bullying was subjected to Exploratory Factor Analysis to extract the factors that would determine teacher bullying. Consequently, the responses of the respondents on the area Effects of Teacher Bullying and Interventions on Teacher Bullying were analyzed through Multiple Response Analysis in order to identify the common effects and the interventions mostly needed on the basis of the entire group of responses.

Finally, connecting existing policies and programs of the Department of Education on teacher protection with the emerging factors or themes generated through EFA and MULT RESPONSE, constituted the synthesis phase of this study. The researcher, to the best of his knowledge and ability, synthesized these factors to arrive at an effective, timely and relevant system of support that could address teacher bullying. Thus, the main output, Support Mechanism on Teacher Bullying, was developed.

## **Conclusions**

From the narratives of the eight participants in the qualitative phase, the researcher exhausted 20 forms of teacher bullying, some can be found on the results of related studies abroad and some are new. Mostly, those new forms of TB are non-aggressive behaviors but rather uncontrollable events in the workplace that were classified by the respondents as forms of TB since it stressed, upset and hurt them in the workplace. These "are unruly students", "rude and disrespectful behaviors", "delayed reports", "misunderstanding", "humiliating and embarrassing moments", "unfair treatment", "unnecessary work", "indifferent parents", "mimicking", "inattentive students", "rejected in the workplace", "communication gaps", "overlapping of tasks", "thrown with fabricated issues", "doubted of capability", "threatened through harsh words", "teased or laughed at", "name calling", "denied of the support needed", and "bashed in social media". Consequently, these 20 forms were used in the survey and EFA was employed to determine their grouping. Four groups or factors emerged. These are Work Performance – Related Bullying, Interpersonal Dimension – Related Bullying, Psychosocial Dimension - Related Bullying and Classroom Management - Related Bullying (Figure 3). Results obtained were true and relevant, and were confirmed through employing the survey phase and subjecting data gathered to EFA and Reliability Test (Cronbach's Alpha). A cronbach's alpha of .903 in all 20 items/forms of TB used in the survey was more than enough to say that reliability of the results was achieved

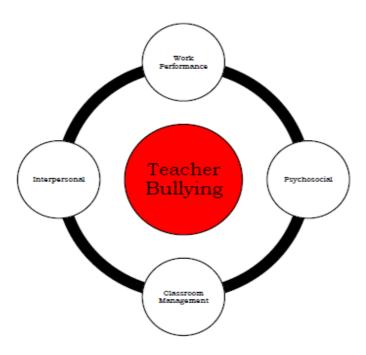


Figure 3. Dimensions of Teacher Bullying

Further, 10 effects of teacher bullying was eyed by the researcher through thematic analysis as they were commonly mentioned by the respondents in their narratives. Five of these are effects on their teaching performance, namely, "absenteeism", "lost focus", "demotivated", "unachieved targets", and "reduction in job effort"; and the other five on their well-being, namely, "sick", "sleeping disorder", "low morale", "loss of confidence" and "triggered existing health problems". These effects were prelisted in the survey form and respondents were asked to nominate 3 out of 5 in both categories. Accordingly, the data gathered were subjected to Multiple Response Analysis and the top 3 effects in each category came out. For their teaching performance, the top 3 effects are "lost focus", "demotivated" and "unachieved targets". On the other hand, the top 3 effects on their well-being are "low morale", "loss of confidence" and "sleeping disorder".

Furthermore, there were 7 interventions perceived by the respondents in the Narrative Inquiry as timely, relevant and effective in addressing teacher bullying. These are "develop personal habits that can counter stress", "integrate teacher bullying in the curriculum", "increase awareness on teacher bullying", "create a committee or support group", "engage learners, teachers, administrator and stakeholders in making rules, policies and plans", "have the pupils, parents and stakeholders know their rights and responsibilities" and "provide team-building and other related activities to teachers". These 7 interventions were also prelisted in the survey questionnaire and respondents were asked to nominate 3 out of 7. Data gathered were subjected to Multiple Response Analysis and the top 3 that emerged are the following: "increase awareness on teacher bullying", "engage learners, teachers, administrator and stakeholders in making rules, policies and plans" and "develop personal habits that can counter stress".

As to the effects (TBEF and CETB) and interventions (TBIN and NITB), results found were substantial and are almost found in related studies. It somehow gave the researcher the idea that bullying forms can be unique in every locale of the study but

effects and interventions can be universal and can only vary on the extent, breadth and depth.

Finally, having all the significant results at hand, careful synthesis was done in order to arrive at an effective, timely and relevant support mechanism. There are 3 variables that were used in the synthesis: Factors of Teacher Bullying (FATB), Common Effects of Teacher Bullying (CETB) and Needed Interventions on Teacher Bullying (NITB). These variables were generated after employing Exploratory Factor Analysis and Multiple Response Analysis. It was found out that results of these statistical analyses have a good connection to one another and they can be also linked to the existing programs and policies of the government especially of the Department of Education, which made it easy for the researcher to conceptualize the support mechanism. Table 2 presents these links.

Ultimately, PRIME (Figure 4) was achieved. It is an acronym that stands for Prevention (Mechanism 1), Intervention (Mechanism 2), and Monitoring and Evaluation (Mechanism 3). These 3 mechanisms constitute the final output of this study, the Support Mechanism on Teacher Bullying (SMTB). Each of these mechanisms has a system of actions that are achieved after careful synthesis of the findings of the study.

**Table 2.** Established Links on the Results of the Study

EFA Results on Factors of TB	MULTRESPONSE Results on Common Effects of TB	MULTRESPONSE Results on Needed Interventions on TB	Gov't Programs and Policies	Area of Connections/ Links	
Work Performance – Related Bullying	<ul> <li>Low morale</li> <li>Loss of confidence</li> <li>Demotivated</li> <li>Unachieved targets</li> </ul>	Develop personal habits that can counter stress	<ul> <li>DepEd In-Service Trainings</li> <li>Teacher Induction Program</li> <li>House Bill 5735</li> </ul>	Developing one's personality and attitudes to improve the delivery of performance in the workplace	
Psychosocial Dimension – Related Bullying	<ul> <li>Low morale</li> <li>Loss of confidence</li> <li>Sleeping disorders</li> <li>Demotivated</li> </ul>	<ul> <li>Increase         awareness on         teacher bullying</li> <li>Engage         stakeholders in         making         programs,         policies and         plans</li> </ul>	<ul> <li>DepEd In-Service Trainings</li> <li>Republic Act 10627</li> <li>House Bill 5735</li> <li>Magna Carta for Teachers</li> </ul>	Establishing social awareness among stakeholders on teacher bullying to understand the phenomenon and to take part in developing a bullying-free environment in school	
Interpersonal Dimension – Related Bullying	<ul> <li>Low morale</li> <li>Loss of confidence</li> <li>Sleeping disorders</li> <li>Demotivated</li> </ul>	<ul> <li>Develop personal habits that can counter stress</li> <li>Provide teambuilding and other related activities</li> </ul>	<ul> <li>DepEd In-Service Trainings</li> <li>House Bill 5735</li> <li>Republic Act 4670</li> </ul>	Developing good relationships in the workplace to create a healthy organizational culture	
Classroom Management –	<ul><li>Lost focus</li><li>Demotivated</li></ul>	• Engage stakeholders in	• Republic Act 10627	Creating a committee in school	

Related Bullying	•	Unachieved targets Low morale Loss of confidence	•	making programs, policies and plans Have stakeholders know their rights and responsibilities	• House Bill 5735	that looks closely on issues on teacher bullying and is responsible in making teacher bullying policies, programs and plans towards a bullying- free classroom and school
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The acronym PRIME was thought of by the researcher to represent the mechanisms in order to have an easy recall. PRIME would serve as fillers for the gap that blocks the way to provide the protection that teachers need against teacher bullying.

Each of the three mechanisms has its system of actions that can help in cushioning or probably suppressing teacher bullying. Figures 5 to 7 show the frameworks of each mechanism and present the system of actions that schools can implement.

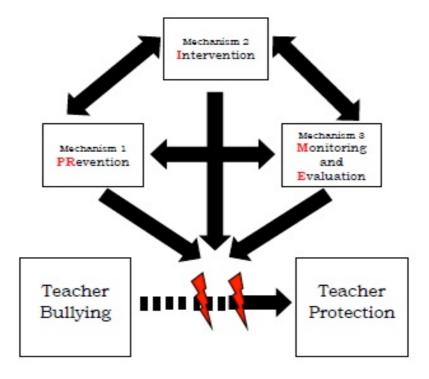


Figure 4. Framework of the Support Mechanism on Teacher Bullying

Mechanism 1 (Figure 5) is all about preventive measures that are intended to avoid the occurrence of teacher bullying in the workplace. Professor Dan Olweus' Comprehensive program on bullying (as cited in California Department of Education, 2003) suggests that programs on bullying must not only focus on intervention methods but must incorporate the concept of prevention strategies.

One of the prevention strategies is to increase awareness on teacher bullying in the workplace. In the quantitative phase of this study this strategy was chosen by the respondents as the most needed strategy that can address teacher bullying. It came

out to be the mostly needed because it cannot be denied that teacher bullying is an under-recognized problem in the workplace. To increase the level of awareness, schools can provide symposia, assemblies and other relevant activities to all stakeholders of the school.

Developing a safe school environment can also be a good prevention strategy. Olweus (as cited in California Department of Education, 2003) likens a safe school environment to a home which is characterized by warmth and positive interest.

Another preventive measure is to develop a school-based bullying prevention program. There are prevention strategies that might not be applicable to other schools. So, each school must develop their own. This can be done by constantly assessing and referring to reports made in the Monitoring and Evaluation (SMTB Mechanism 3). In addition, in developing own prevention programs, school administrator, teachers, students and parents must play as partners (California Department of Education, 2003) together with other representatives from different sectors in the community.

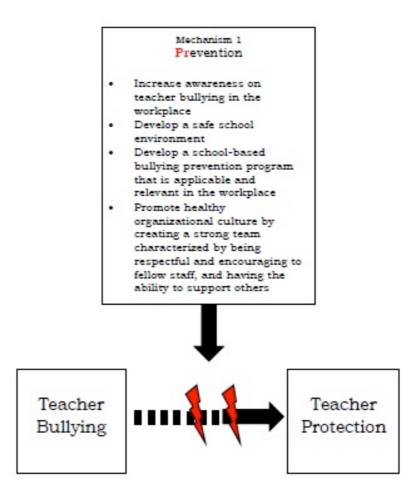


Figure 5. Framework of SMTB Mechanism 1

Lastly, schools must promote a healthy organizational culture in order to prevent teacher bullying. Bradshaw and Figiel (2012) in their report made for the National Education Association (NEA) in the US, stressed that creating a strong team would

lead to have a healthy organizational culture. This is characterized by being respectful and encouraging to fellow staff.

The second mechanism (Figure 6) highlights interventions that can address teacher bullying. One of these is to engage internal and external stakeholders in making clear classroom and school rules, policies, programs and plans in line with teacher bullying. This strategy has actually come out to be one of the most relevant interventions in the survey. Doing this would also address another concern from the respondents that everybody in school especially the students and the parents should know their rights and responsibilities. So if they are engaged in making the rules and policies in the school, especially on teacher bullying, their rights will be brought out and their responsibilities will be emphasized.

Teachers need to have relevant trainings/seminars in order to easily counter the prevalence of teacher bullying in the workplace. Seminars on personality development and countering stress could be of great help in maintaining composure and confidence in trying times. Moreover, classroom management and student discipline are also areas that teachers must be trained on. Representative Antonio L. Tinio, in his bill, Student Discipline and Teacher Protection Act, suggested that the government must institutionalize measures governing student discipline and mechanisms for classroom management. The bill is actually concerned with heavy burden of teachers aggravated by the lack of institutional support in the form of standards in classroom management, training on these standards and effective methods of instilling student discipline.

Another very important intervention is to create a committee in school that will look closely on the issues of teacher bullying. This committee can be called Anti-Teacher Bullying Committee which is responsible for creating prevention programs, providing activities that can increase awareness on teacher bullying, administering monitoring and evaluation and other relevant tasks.

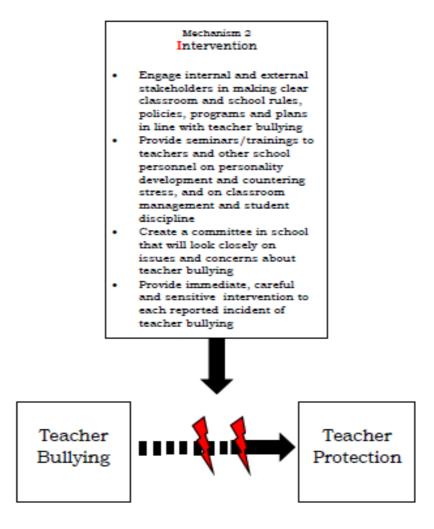


Figure 6. Framework of SMTB Mechanism 2

Schools must also provide immediate, careful and sensitive intervention to every reported bullying incident. Sense of urgency must be developed and observed so that the problem will not get worse.

There are growing pressures on organizations or schools to be more responsive to the demands of internal and external stakeholders for greater development effectiveness including strategic ways on addressing current issues like teacher bullying. As these demands have increased there is a great need for enhanced results-based monitoring and evaluation (M & E) of policies, programs and projects (Kuzek and Rist, 2004), averring that M & E is a powerful management tool to improve the way organizations achieve results and create a good performance feedback systems, hence, this third mechanism (Figure 7). This plays a very important role to ensure sustainability and to maintain relevance and appropriateness of actions to undertake. This would be a very important undertaking since it is one of the significant findings in this study that policies, programs, plans and activities relative to teacher bullying must be school-based. This is because there could be unique features of bullying in every school.

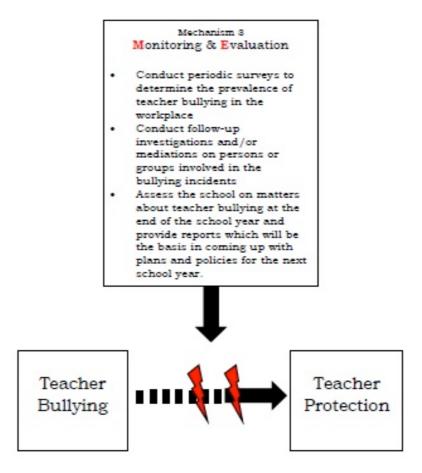


Figure 7. Framework of SMTB Mechanism 3

Among the relevant strategies are conducting periodic surveys on the prevalence of teacher bullying, conducting follow-ups to addressed incidents of teacher bullying and assessing the school on matters about teacher bullying in order to provide timely and reliable reports which will be the basis for future actions.

In summary, teachers of today undoubtedly deal with so much challenges in their work. And the presence of bullying in the workplace adds up to the growing problems that teachers encounter. Though it appears to be nothing, as most people see it, teacher bullying is a serious problem that needs to be addressed. The results of this study affirmed that yes, teacher bullying is there in the workplace and that it really poses ill effects on the teaching performance and well-being of teachers. However, as this research is concerned, there can be doable ways in order to cushion or possibly suppress teacher bullying. It is just a matter of how serious we would be and the government most especially, in putting into actions the recommendations that this study wants to suggest.

What is more compelling and satisfying throughout this entire research work is the realization of the main output, the Support Mechanism on Teacher Bullying. The researcher, with so much conviction, is very confident that having this blueprint of mechanisms (PRIME) that can address teacher bullying, awakens the education sector of the prevalence of teacher bullying in the workplace and guides them as to how it can be cushioned or suppressed.

It is about time to engage in paradigm shift (Kuhn, 1962) as regards to teacher bullying. From being silenced and ignored to being exposed and regarded, teacher bullying in the Philippines is now on its way to be acknowledged in the workplace, something that anybody should never be happy about but something that everybody should accept and realize that yes, teacher bullying is there.

The Philippine government has provided laws and policies that intend to provide protection for teachers. For one, as early as 1966, the Magna Carta for Teachers or the Republic Act 4670 was implemented in order to protect the rights of the teachers. While some of the provisions in this act are still applicable in the modern times, there is really a need to revisit, assess and evaluate, and/or may be improve them, and/or add provisions that could somehow address also the new emerging problems that teachers of today face.

Similarly, Republic Act 10627 or the Anti-Bullying Act of 2013, needs also to be modified. This act requires all schools, elementary and secondary, to adopt policies to prevent and address the acts of bullying in their institutions. However, these are only directed to student bullying. If it could be possible to amend this and include teacher bullying in the provisions of this act, it could really be beneficial to teachers.

Recently, a house bill was proposed by ACT (Alliance of Concerned Teachers) Representative, Antonio L. Tinio, called Student Discipline and Teacher Protection Act. This is an act institutionalizing measures governing student discipline and mechanisms for classroom management, establishing support for public school teachers and school personnel and providing for their protection. This can really be a good act to be implemented by the government since it caters timely needs of teachers as well as students. Thus, it is strongly recommended that this bill be put into law as soon as possible.

In the school-level, it is also very important to craft and implement policies on teacher bullying. These policies must be school-based addressing unique features and dimensions of teacher bullying as experienced by the teachers in that particular school.

PRIME is strongly recommended to be implemented in every school. One of the important features of PRIME is being school-based. It acknowledges the fact that there can be features of teacher bullying that are unique in every school. That is why it strongly emphasizes the creation of a committee in school which can be called Anti-Bullying Committee which consists of representatives from all sectors, internal and external, that are associated with the school and its operation. This committee is responsible to look closely on issues relative to teacher bullying. It is tasked to perform actions stipulated in PRIME with strong emphasis on the assessment or evaluation of matters on teacher bullying in the school, preferably at the end of every school year, which will be the basis in creating school-based policies, programs and plans in the following school year.

In addition, since teaching is a profession that requires the ability to be responsive to new demands and changing needs, teachers must be provided with timely and relevant trainings. This is important in increasing their confidence and competence which in turn help them identify and respond properly to the demands and challenges in the

workplace. For DepEd programs like the Teacher Induction Program provided for newly hired teachers and other in-service trainings, these must be sustained but should include in the topics of discussion bullying and other contemporary issues which are undoubtedly affecting the delivery of quality performance from the teachers.

This study is the first empirical report, in the Philippines, of the actual experiences of teachers on teacher bullying and its effects on their teaching performance and wellbeing. Although the researcher has begun to illuminate the problem, there is a great need still to explore more the basic features and dimensions of teacher bullying to provide robust baseline information on teacher bullying in the country. The need to explore more on the coping skills of victimized teachers, in-depth descriptions on bullying forms, thorough exploration on the effects of teacher bullying, and investigation on the relationship between classroom management practices and teacher bullying, are much recommended. It would also be of great significance if the intersection of variables, say gender and position, be explored in future studies on teacher bullying because there could somehow be substantial information that can be generated from doing such action. Additionally, a pure qualitative study which would really focus on individual interesting stories would be a smart thing to do to address circumstances and context of teacher bullying. This can be best explained by The Chaos Theory of Bullying by Sullivan et al., (2003) which states that while statistical results may give us trends of events, they can never predict who will bully and how, and cannot identify who will be a victim and why.

Should this research study be replicated, the researcher strongly suggests that Exploratory Sequential Mixed Methods still be used in carrying out the study since teacher bullying needs to be explored more especially in the Philippines where it is less-recognized. The country needs more exploratory studies like this to widen and enrich the knowledge of the Filipinos on matters and features of teacher bullying. As to the methods in both qualitative and quantitative phases, it would be better if other methods be employed depending on the discretion of the researcher. However, it would be better if replicate studies will be more specific as to the source of bullying experiences of teachers. There should be separate studies on bullying towards teachers by students, bullying towards teachers by co-workers and so on. In this way, more reliable and more reflective results could be generated.

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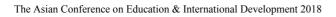
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Official Conference Proceedings

# Black Students in China Identity, Environment and Institutions in the Individual's Perception of Racial Encounters

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The Asian Conference on Education & International Development 2018 Official Conference Proceedings

## **Abstract**

In recent years, American study abroad and scholarship programs have profoundly targeted the Black demographic, a group largely underrepresented amongst the study abroad community. Researchers have contributed a wealth of understanding about the personal and professional benefits of study abroad, and how to make these benefits more accessible to Black students. However, a general lack of understanding of the perceptions of racial encounters amongst the Black study abroad population, and the specific variables that shape these perceptions, pose a problem both for administrators and recruitment efforts for study abroad. This study, focused on Black American students who have studied in China, identifies three lenses, identity, institution, and environment, that allow us to better describe the student's process of interpreting racial encounters while abroad. Results found that of these three factors, identity and environment were equally significant to the student's understanding of racial encounters in China, while institution held little to no significance. Students' lack of confidence in and connection to their study abroad institutions cause them to place larger weight on their identity and the study abroad environment, while the institution remains a passive entity. This information raises a host of questions about the role of the study abroad institution in the minority student's unique experiences abroad, and to what extent they can adapt to better serve an increasingly diverse study abroad population. Further research is suggested to measure the effectiveness of study abroad programs in creating an optimal environment for diverse cohorts of students.

Keywords: study abroad, race, racial discrimination, racial perception, Black American students, China, identity, institution

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# **Introduction: The Realities of Study Abroad**

Study abroad is becoming an increasingly vital topic in higher education. In exploring the tangible benefits of studying abroad, conversations concerning making these benefits accessible to underrepresented groups have also emerged in recent decades. Research in both the international relations and education communities has begun to challenge traditional sentiments and "universal agreements that study abroad experiences are valuable and enriching" (Hembroff and Rusz, 1993, p. 1). Two current goals among study abroad researchers are 1) to understand the nature of benefits produced in the home and host country during the study abroad experience, and 2) to measure, discuss, and improve the participation of minorities (Penn and Tanner, 2009).

This study refers to the term study abroad using the same definition as the term "International Educational Exchange," defined by the Forum on Education Abroad:

The migration of students (secondary, undergraduate, graduate, postgraduate) and scholars between educational institutions in different countries. A narrower usage of the term "exchange" refers to reciprocal agreements that allow students, faculty, or staff to spend a specified period of time at institutional partners of their home institutions. (McCauslin, 2015)

This definition incorporates any study abroad program which takes a student out of the context of their home institution and places them in an institution away from their home country, with the purpose of introducing them to the culture and customs of the country in which they are studying. In this study, I explore particular study abroad programs individually and their specific functions in students' learning experiences. These functions differ based on each institution's pedagogical approach, which I discuss in the following section.

## The Constructivist Framework and International Education

International education, like any form of education, necessitates a conversation about goals for, and approaches to, learning. A unique element of study abroad is that it incorporates the process of encountering and interpreting different perspectives than one's own into the learning experience (McLaughlin, 2006). This serves to bridge a noticeable gap between traditional education practices and pedagogies that prioritize cognitive development and critical thinking (Duffy and Jonassen, 1992). Constructivism is a particularly useful social science theory that can explain the cognitive growth students experience during study abroad, for reasons I explore in this section.

In scholarly discussion of international relations, rationalism and interpretivism are two social science paradigms that have traditionally occupied opposite poles. Rationalism, which encompasses theories such as realism, neorealism, liberalism, and neoliberalism, is mostly "empowered by positivist and exclusively materialist philosophies of science" (Adler, 1997, p. 321). In particular, realists and neorealists take a methodical approach to international relations, and suppose that states' actions are predictable, rational, and reliant on external forces (Adler, 1997). These "external forces" are critical to an understanding of realism and neorealism. According to these ideologies, pressures such as the pursuit of power, security, and access to

natural resources drive states to behave in a manner that supports their best interests (Adler, 1997). Conversely, interpretivist frameworks, including postmodernists, poststructuralists and the many branches of critical theory, contest the nature of these external forces and challenge the objectivity of their effects on states' behavior (Adler, 1997). These frameworks give credence to the many differing realities that individuals experience, which have a tangible effect on the motivations of individuals, and by extension the motivations of states (Adler, 1997).

Constructivism is a paradigm of international relations that assumes that "the manner in which the material world shapes and is shaped by human action and interaction depends on dynamic normative and epistemic interpretations of the material world" (Adler, 1997, p. 322). The constructivist can answer the question of the existence of external forces in the international realm; these forces do indeed exist as a result of collective understandings between groups of individuals, which become solidified and reinforced over time (Adler, 1997). However, the constructivist places emphasis on the argument that these forces are simply ideas to which individuals attach significance, and these ideas can vary according to an individual's social context, values, beliefs, norms, and so on (Adler, 1997).

Another important contribution that constructivism has provided to our collective understanding of international relations is the idea that not only do individuals' interpretations of external forces vary, but that these interpretations can potentially change over time (Adler, 1997). While constructivism acknowledges the idea that individuals can be influenced by external forces, the paradigm also assumes that individuals are capable of changing the amount of significance they attach to these ideas, in essence reconstructing their understanding of the world (Adler, 1997). As such, individuals can mutually influence and change these external forces themselves (Adler, 1997). Linking ideas of socio-cognitive development with empirical social science theory, constructivism interprets the rigid elements of rationalist theories as more fluid (Adler, 1997).

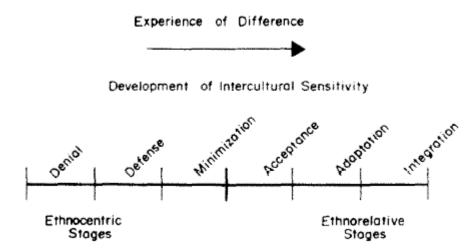


Figure 1- "Developmental Model of Intercultural Sensitivity." (Bennett, 1986)

One can make a strong connection between the topic of cognitive development in constructivist theory and in study abroad literature. Milton J. Bennett, a scholar on intercultural communication and sociology at the Intercultural Development Research Institute, is responsible for creating the

Developmental Model of Intercultural Sensitivity (DMIS). It provides a language and framework for understanding how individuals undergo the process of acculturation (Bennett, 1986). The DMIS and many subsequent studies hypothesize that, through the appropriate amount of time and exposure to different cultures, an individual can create, restructure, or completely destroy the schema that organize our understanding of the world (Bennett, 1986). This statement reflects the language of constructivist theory, and demonstrates the constructivist notion that schema can in fact be changed over time. The DMIS attempts to clearly delineate the particular stages of an individual's cognitive adaptation to unfamiliar concepts, which may support the constructivist argument by providing specific, identifiable phases in the restructuring process of one's understanding of the world.

Another element that constructivism and study abroad share is the often optimistic, progressive interpretation of an individual's cognitive transformations. Both concepts suggest that the interaction of conflicting norms can be a positive, even synergistic experience. Fosnot and Perry (1996) describe constructivism as a "psychological theory of learning." In their article, they compare constructivism to a wide variety of theories such as behaviorism and maturationism, which contribute to an overall understanding of the process of learning (Fosnot and Perry, 1996). To them, the cognitive restructuring that occurs in constructivist theory resembles the basic course of human evolution, and the ability for humans to adapt to constantly changing interpretations of the world is, in and of itself, development (Fosnot and Perry, 1996). One can see a similar sentiment from the DMIS, which incorporates "Adaptation" as one of its more advanced stages of acculturation, and organizes the process of acculturation along a spectrum defined as "Development of Intercultural Sensitivity" (Bennett, 1986).

This optimistic sentiment also lies at the core of study abroad, and brings clarity to why it may be an attractive investment for both home and host country. Study abroad, using education as a conduit, can introduce students to the experience of acculturation in a manner that non-immersive cultural study cannot. It also tests the assumptions of constructivism by bringing students into an environment that causes them to drastically reassess their internal understanding of the world. Of course, these benefits are disproportionate to people of different races, genders, religions, sexualities, etc. The uneven terrain of study abroad is becoming an increasingly salient topic, one that is central to this study. In this study, I apply constructivist theory to explain the racial normative conflicts that occur in the study abroad context.

# **Main Topic**

Racial minorities in the US experience tangible differences when compared to their White counterparts not only in their educational experiences at higher institutions at home (Hurtado, 1992; Cabrera et al., 1999; Smith, Allen, & Danley, 2007), but they also have a radically different experience than their White counterparts while studying abroad (Talburt & Stewart, 1999; Evans, 2009; Brux & Fry, 2010). Though many believe that diversity would undeniably improve study abroad institutions by introducing more perspectives, therefore increasing the potential for intercultural understanding, I argue that the belief that diversity leads to linear growth is a dangerous one. Racial norms, defined in this study as "understandings of the stratification of race," differ from person to person and from culture to culture. The interaction of these racial norms in study abroad have not been adequately discussed in literature, and I intend

to highlight the nuances and difficulties that arise in study abroad institutions when conflicts of racial norms are introduced.

The central question of this study is as follows: how do Black students perceive racial encounters while studying abroad in China? In this study, I define racial encounter as "any situation which directly causes one to become aware of one's race, and its relationship to other individuals or one's surroundings." Racial encounters have particular importance in the study abroad experience. As mentioned earlier, study abroad literature and constructivist theory alike often depict the interaction of norms and restructuring of cognitive schema as positive. One can see the nuances that complicate this viewpoint when one considers the interplay of racial norms. In the context of this study, I utilize racial encounters as identifiable instances in which racial norms present themselves in the student's consciousness. This study seeks to critically evaluate the so-called benefits of diversity in study abroad by exploring the reality of the interaction of racial norms, and how race exposes the disparities and inequalities of international education.

I examine racial encounters using a model I have created called "The Three Levels of Normative Analysis." The three levels are identity, institution, and environment. Each level has a specific definition for the purposes of this study. Identity refers to "anything that defines one's individuality, e.g. your race, sexuality, gender, personality, etc.." It represents the different interpretations of racial norms amongst different individuals. Institution means "the study abroad program itself, its administrators/staff, housing arrangements and any accommodations provided by the program." It incorporates the reach of the study abroad program within a foreign country, and the racial norms it establishes within this reach. The institution level in particular must meet a specific set of criteria in this study: each study abroad program must have a relationship to a US-based university or organization, a focus on academic and linguistic goals, and a housing arrangement provided directly via the program's resources. Finally, environment means "one's study abroad location"— in the context of this study, it refers to China at large and the racial norms it encompasses. The environment is the larger cultural background that the study abroad student experiences, which takes on particular importance when its racial norms and those of the study abroad student are incongruent.

This model is loosely based on the concept of the three "images of analysis," introduced by Kenneth Waltz in his 1959 novel, Man, the State, and War (Waltz, 1959). The first image of analysis can be described as either individuals or human nature; this lens focuses on the elements of human beings that may or may not make war an inevitability (Waltz, 1959). The second image of analysis is the state, which refers to governing bodies that dictate the legislative and societal boundaries upon which groups of people agree (Waltz, 1959). The third image is the international system, or the unordered interaction of all of the states in their individual pursuits for power, resources, and security (Waltz, 1959).

While Waltz uses these images to speculate on the causes of war, this study's focus on the individual, institution, and environment seeks to determine which of these elements are the most prominent in the student's understanding of their study abroad experience. The definition of these three levels parallel Waltz' three images. The individual, like the first image, accounts for the variability in each person and their specific ways of understanding and interpreting the world. Both the institution and the second image refer to deliberately constructed establishments, the

agendas of which are often, but not always, determined by the best interest of its constituents. Finally, the third image is similar to the environment level as it reflects the larger context under which the second and first images function, and the unpredictable nature of this context. In the following section, I will discuss each of these levels of norms in depth, and how students relate to them during their time abroad. In order to do so thoroughly, I have chosen to analyze a case study for a specific group of study abroad students: Black/African-American students studying in China.

### Conclusion

The Three Levels of Normative Analysis used in this study, identity, institution, and environment, provide a clearer picture for how Black students in study abroad interpret racial encounters. From the data, identity and environment are often associated with racial encounters, while institution is rarely associated with them at all. The racial encounters themselves widely vary, but there are evident trends in how students interpret the different encounters similarly. In this section, I will discuss each of the Levels in depth, consider their implications, and make specific policy suggestions for institutions, which will result in more positive and productive study abroad experiences for Black students.

The process of collecting information in this study took the form of structured interviews and online surveys. The total number of interviews and surveys administered was 16, and the total number of racial encounters was 66. The questionnaire portion of the interview or survey asks students to recount 6-10 racial encounters, rating them overall on a 0-100 scale (0 being extremely negative, and 100 being extremely positive). Then, the student is asked to consider how much they associate each of the Three Levels of Normative Analysis with each experience, and rate the association on a 0-100 scale (0 being no association, 100 being a great deal of association). After collecting this information, I clean the raw data using Excel, and import the cleaned data to Stata. Then, turning questionnaire information into numerical or categorical data, I perform a series of analyses such as correlations, regressions, and plot graphs with lines of best fit.

# **Identity**

Many of the racial encounters provided were strongly associated with the identity level. Out of the 66 encounters, 58 of them were rated 50 and higher for its association with identity, and 22 of the encounters were given a rating of 100. In 41 of the 66 racial encounters, identity had the largest relative rating of all three levels. Given that the mean rating for identity for all 66 encounters was 76.7, one can assume that identity played a large role in how Black students interpreted their racial encounters in China.

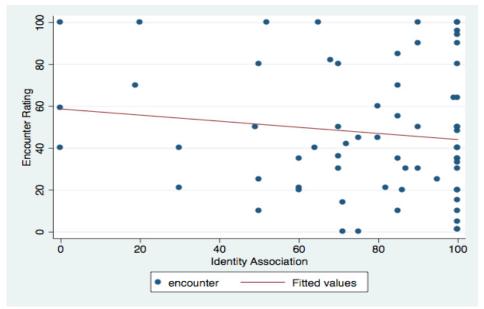


Figure 2- A scatterplot of encounters; x axis= identity association, y axis= positive/negative rating.

The scatter plot in Fig. 7 measures each encounter's identity rating in the x axis, and the encounter's positive/negative rating in the y axis. The higher the encounter's identity rating, the further along the x axis it is located; similarly, the more positive the encounter, the higher on the y axis it is plotted. By running a correlation between the two variables however, I discovered that there was in fact a weak, but negative relationship between the two variables (r= -0.13). A regression analysis between these two variables showed a similar coefficient of -0.15, but with a p-value of 0.3. From both these analyses we can see that there might be a slight relationship between how much students associate an encounter with identity and how negatively they perceive the encounter, but the statistical evidence for this claim is not strong.

# **Deconstructing Identity Abroad**

It is necessary to analyze, as the study abroad institution, how identity will be dealt with in the study abroad context. In China, it may initially seem as if foregoing one's individuality may be the best way to ease into an immersive experience. In many ways, this approach is not necessarily wrong. It assumes that the ultimate objective of the student's experience is to achieve a level of acculturation, and to step outside of oneself and one's understanding of the world out of respect for and better understanding of a foreign culture. In these examples, however, we can see that not only can shedding one's identity be impossible for some students, but it can also stifle the opportunity for realistic and meaningful exchange.

Of course, different students will have different relationships to their own identities, and students interpret their individuality in their home country differently than they might in an abroad context. It is largely up to the student to determine how much they are willing to engage with the construction and deconstruction of their own identity while abroad, and in their home country as well. Study abroad is an opportunity for students to learn more about themselves in an environment that challenges their essential understanding of who they are. In the case of this

study, the students' Blackness, their personalities, habits, levels of comfort and discomfort, and even their sexuality were in a constant state of formation. In this sense, one half of answering the question of "how important is identity in study abroad" comes from the student themselves. However, another half of this legwork comes from the study abroad institution.

The power of the institution is illuminated by Harper (2009) in the following quotation, and echoed by Sweeney (2014):

...Questions concerning effort must be shifted from the individual student to her or his institution. Effective educators avoid asking, what's wrong with these students, why aren't they getting engaged? Instead, they aggressively explore the institution's shortcomings and ponder how faculty members and administrators could alter their practices to distribute the benefits of engagement more equitably. Accepting institutional responsibility for minority student engagement and success is the first step to race-conscious educational practice. (p. 41)

As was evident in the racial encounters where students took the opportunity to teach Chinese people about their Blackness and what it meant to them, intercultural exchange is most beneficial when both parties are engaging and sharing bits of their identity. It is the task of the study abroad institution to provide both opportunities to do so, and an encouraging environment to frame these exchanges in positive ways.

#### Environment

Environment is a level that is, similarly to identity, commonly associated with racial encounters. Of the 66 racial encounters provided, 57 of them were given an environment rating of above 50, 13 were given a rating of 100, and only two were given a rating of 0. Clearly, environment is likely to factor into a student's perception of a racial encounter, and it also may dictate how a student chooses to interpret that racial encounter.

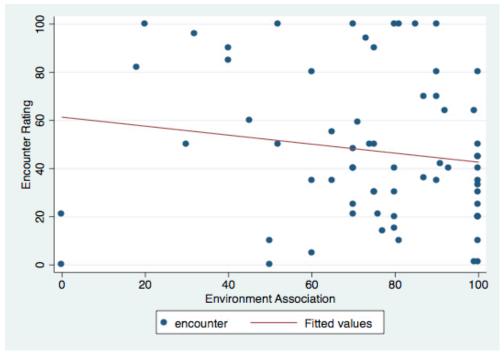


Figure 3- A scatterplot of encounters; x axis= environment association, y axis= positive/negative rating.

Most of the encounters on this graph aggregate closer to 100 on the x axis, and the relationship between the two variables seem to be a slightly negative trend. A correlation analysis produces a coefficient of -0.15, and a regression analysis gives a similar coefficient of -0.18; however the P value is not statistically significant (0.22). One could argue that the more an encounter is associated with environment, the more negatively the student perceives that event, but there is not much statistical evidence to support this claim.

### **Contexts and Conflicts**

While it may seem obvious why the environment of China has a huge impact on perceptions of racial encounters, it should not take the place of deliberate and thoughtful understanding of racial relations within the country. The fact that China has had limited contact with the West throughout its history does not fully and completely explain why a certain racial encounter might've happened. Encounters vary based on generation, city, educational and socioeconomic level, and other factors of the opposite party in a racial encounter. Simply attributing an experience to being in China precludes the student from understanding the depth of the encounter, and doing so runs the risk of creating rigid schema for the entirety of Chinese society.

In order to prevent this from happening, institutions should again take a more active role in students' experiences and their understanding of the environment. In the case of taking pictures, institutions could make students aware of why Chinese locals may want a picture, why they may ask in certain cases and not ask in others, and what having a picture of a Black person may mean to them. In another example, when Black students were asked if (or told that) they were from Africa, it is not sufficient to leave this encounter uninterpreted by the institution. The institution could discuss China's history with Africa, the existence of African students in China (even

before formal US-China education exchanges), their treatment, the construction of African expatriate districts in cities such as Guangzhou, and so on. This way, students may make more sense of the encounters, and attribute them to more nuanced historical narratives within China.

### Institution

Students did not often associate racial encounters with their study abroad institution. Of the 66 racial encounters provided, 30 of them were given an institution rating of 0, and only 19 of them were given a rating above 50. Nine of these 19 encounters were positive, and 10 were negative. The fact that institution had a noticeably low average rating of 26.7, and that the 75th percentile of institution ratings was only a rating of 50, one can see a clear absence of the institution in students' perception of racial encounters.

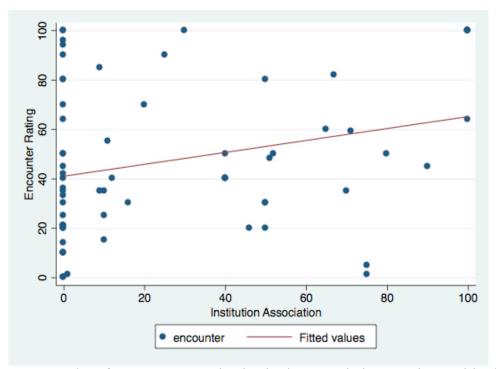


Figure 4- A scatterplot of encounters; x axis= institution association, y axis= positive/negative rating.

This plot shows an aggregation of racial encounters closer to 0 on the x axis. There is a positive correlation between the institution variable and the positive/negative rating (r= 0.27). A regression between these two variables produces a similar coefficient of 0.24, with a statistically significant p-value of 0.03. The line of best fit also reflects this positive trend between these two variables. These analyses suggest that the more the student associated encounters with their institution, the more positively students perceive the encounter. Considering the number of encounters given an institution rating of zero, however, this information does not necessarily point to a reliable trend.

# **Playing Its Hand**

Study abroad institutions have a wide variety of tools at their disposal that can enrich the intercultural experience of both study abroad students and individuals in the study abroad environment. In the case of racial encounters, they can apply the same model they use to promote acculturation in order to facilitate the interaction of differing racial norms. Institutions have the choice of doing so more actively, through their curriculum and the activities they promote in exchange with Chinese natives, or more subtly through the values it promotes. For instance, if a student experiences a difficult negative racial encounter, the study abroad institution can make it known that it supports the student and is willing to hear them as with any other difficulty in adjusting.

Though it is significantly more difficult to extend this rhetoric to the surrounding environment, the study abroad institution can maintain, within the reaches of its power, a setting of intolerance for racial discrimination. In this way, the study abroad institution can facilitate or mitigate racial encounters for Black students, regardless of the source. The active engagement with and acknowledgement of racial norms would be ideal not only for the Black students participating in these study abroad programs, but for the institutions as well. Harper (2009) offers further insight on this symbiotic effect:

Critical race theorists posit that Whites who endeavor to improve the status and conditions of racial minorities rarely do so without first identifying the personal costs and gains associated with such efforts (Delgado and Stefancic, 2001). Thus, it is important to make clear how majority persons will benefit from their work with and on behalf of minorities. Not well documented in the higher education literature are the educational profits conferred to individual faculty and predominantly White institutions when racial minority students are engaged in an assortment of high-impact activities. (p. 44)

By facing topics of race head-on, study abroad institutions would ultimately benefit, as they would discover the needs and sentiments of the minority students they seek to serve. Doing so would uncover discussions and interactions that would encourage the constructive exchange of racial norms, which should be an imperative of study abroad programs that recognize the importance of cognitive growth and transformation.

## **Proposed Solutions**

To discuss solutions concerning study abroad institutions and their involvement in racial encounters, I refer to the "field course experiential learning model," which has three steps: "1) pre-trip preparation, 2) trip experience, and 3) post-trip synthesis" (McLaughlin, 2006, p. 66). These three steps in the student's study abroad experience "facilitates critical thinking and illustrates the scientific process—inquiry—in action" (McLaughlin 2006, p. 66). By establishing a pre-trip relationship with students that involves a discussion of race, monitoring the racial experiences and comfort or discomfort of students during their time abroad, and following up with students to play an active role in their effort to process the racial encounters they've experienced, study abroad institutions can provide genuine and lasting support to students for whom race is an inextricable factor of their participation in study abroad. The following

initiatives are targeted towards the study abroad institution, and they seek to initiate this consistent interaction between the institution and either the individual students or the larger context of the study abroad environment.

## **Determine racial/normative positioning.**

Just as the study abroad institution should make an effort to increase participation rates among minority students, it should also make efforts to engage deliberately with its own racial and normative positioning. This should happen in the interim period between study abroad cohorts, in most cases in the summer between school years. This initiative should also precede the "pretrip preparation" step of the field course experiential learning model, as the institution's process of determining its positioning should occur independently of the institution's interaction with individual students. This level of preemptive engagement with racial norms would demonstrate that the study abroad institution is competent in managing racial encounters when they might happen.

## Set realistic advancement goals for students.

Practices such as "shedding one's identity" and "becoming Chinese" is not a possibility for individuals whose identities are central to their study abroad experience. As such, study abroad institutions should abandon rubrics for individual growth and advancement that hold complete acculturation as an objective. Instead, institutions should adapt measures of cognitive advancement to each individual student. In similar ways, study abroad programs with participants from many different home institutions adapt to fit students' disparate linguistic, academic, and social capabilities. Study abroad institutions should regard racial norms and the extent to which one can acculturate to them as a variable of the individual student. Ideally, institutions would only push students to acculturate to slightly past their levels of comfort, while not putting in jeopardy the significance they attach to their own identities.

# **Incorporate discussions of race.**

Study abroad institutions suffer by ignoring or bypassing discussions of racial norms. As was evident in this study, racial norms differ not only between cultures, but also between individuals of the same culture. In the same way that the prevalence of racial discussions indicates the overall tolerance and heterogeneity of higher institutions of learning at home, study abroad institutions should also take advantage of opportunities to highlight the diversity within and outside of the institution itself. The normalization of these discussions will give validity to the experience of minority students, and engage majority students in necessary conversations as well.

## Address the Identity-Environment exchange.

It should no longer be the case that cognitive development with the interaction of norms only happens to the student. In a majority of a student's set of racial encounters abroad, the opposite party is a member of the society in which the student is studying abroad. Institutions should not shy away from these interactions simply because they are more difficult to monitor under the

auspices of the program. When students are left to interpret racial encounters without the involvement of the study abroad institution, not only is the burden of processing the event on the student alone, but their ability to process the event may itself be misguided. Institutions can play an active role in acknowledging and managing these exchanges of racial norms between the student and the surrounding community in three ways: 1) incorporating a discussions of the racial norms of the environment in the institution's curriculum, allowing students to better understand and process their interactions, 2) providing students with a comfortable setting in which they can discuss these racial encounters with administration or faculty, and 3) deliberately creating situations in which students are engaging with the surrounding community, including race in the process of cultural exchange. These three strategies will help to shift the onus of racial encounters off of the student and produce more meaningful exchanges, benefitting the environment and institution as well.

### Facilitate further interactions.

Expanding on the third strategy listed in the previous paragraph, institutions benefit by creating intentional spaces for the exchange of norms. These spaces may manifest in the form of "cultural exchange organizations," or groups of students from both the study abroad institution and the surrounding community that discuss the differences and similarities between the two cultures. These organizations may arrange specific events such as food exchange parties, movie screenings, speech contests and roundtables, and other activities that promote direct ideological engagement between students of the home and host societies. In order to improve experiences for minority students, these interactions would hold racial norms as an essential element.

## Provide post-trip support for students.

After students have completed their sojourn, the institution can continue to utilize interactions with students to continue to improve the program. By encouraging minority students to share their experiences, their disappointments and hopes for the institution regarding racial norms, institutions involve students in the continual improvement of the institution itself and its ability to manage racial encounters. Furthermore, the students' experiences will serve as trial-and-error to better inform the decisions of the institution in the future, and cohorts that follow.

## Acknowledgements

This thesis comes at a difficult time in America's fight for Black lives and human rights in general. I cannot show enough gratitude to those who helped me. Professor Elizabeth Remick, my primary thesis advisor, was the foremost influence on my decision to see this thesis to completion. I would also like to thank the other members of my thesis committee, Professor Erin Seaton and Professor Xueping Zhong, as well as those who guided me throughout my research, including Professor Richard Eichenberg, Jessica Pfeffer, and Professor Jill Weinberg, all of whom gave my initially obscure ideas direction and force. My interviews and discussions with my research participants revitalized my efforts toward this research, and I thank you sincerely for sharing your experiences with me. Finally, to my parents, family members, and others who have given me constant support in accomplishing my most difficult undertaking yet: thank you so much.

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Official Conference Proceedings

## Computer-Based Test and Paper-Based Test as English Language Assessment in Indonesian Junior High Schools

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Asian Conference on Education & International Development 2018 Official Conference Proceedings

#### **Abstract**

This paper explains and critiques the implementation of CBT (Computer-Based Test) and PBT (Paper-Based Test) as English language assessment in Indonesian Junior High Schools. The policy analysis was done by scrutinising two regulations of Badan Nasional Standar Pendidikan (Indonesian Bureau of Standardised Education): BSNP: 0075/SDAR/BSNP/XII/2016 about the contents of National Examination, and BSNP: 0043/P/BSNP/2017 about the national examination procedures. The comparison to the validity and reliability of English language assessment was also done based on the implementation in 2017. There are some findings: 1) The regulation reduced the highstakes of national examination; 2) 4,2 million examinees did two different administration procedures in the examination: 11,096 schools (1,349,744 students) used CBT, while 2,855,633 students in 45,092 schools used PBT; 3) Sixty percent of 11,096 schools could do CBT independently whereas the others should take test on other schools, 4) The content and construct validity of the English testing was challenged by the fact that the listening and speaking skills were not assessed in both CBT and PBT, the use of multiple choice could not accommodate students' higherorder thinking, and the educational gaps among Indonesian regions; 5) The reliability of this assessment was also reduced due to the different forms of administration. technological barriers, and test schedules causing different psychological impact on the test takers; 6) Although there were limitations of these policies implementation, the Indonesian government was optimistic to increase the quality and quantity of CBT use in the national examination to improve the accountability of Indonesian education.

Keywords: Computer-Based Test, Paper-Based Test, Indonesian English Examination, English Language Assessment



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#### Introduction

English is a foreign language mandatory taught in Indonesia. To ensure that the educational quality in Indonesia is improved, the government conducts the national examination annually (Idrus, 2012), in which students' English competency is also assessed. The type of examination is considered summative assessment because is done at the end of the course to know how good or how bad the students' achievement is compared to the expected learning outcomes (Brady & Kennedy, 2012). Although the common response to test is mostly negative (Lamprianou & Athanasou, 2009); the importance of knowing the students' learning, the needs of society and economy, as well as the public funding to education enforce the necessity of education' accountability (Brookhart, 2011). This article will explain about the implementation of English examination in junior high schools based on the demography of test takers, the issue related to the validity and reliability of Computer-Based Test and Paper-Based test used as the media of examination, and the recommendation for better implementation in the future.

## **Demography of Test Takers**

In implementing the national examination, the ministry of education and culture in Indonesia has a department called Badan Standar Nasional Pendidikan (Indonesian Bureau of Standardised Education), that focuses on the standardised education. The implementation of national examination is based on two regulations 0075/SDAR/BSNP/XII/2016 about the contents of National Examination, and BSNP: 0043/P/BSNP/2017 about the national examination procedures. These regulations have some impacts on the implementation: compared to the previous national examination, the current examination is less high-stakes; and there are two types of media used in test administration (Computer-Based Test and Paper-Based test). High stakes mean that the result determines the students' future, such as 'fail' or 'pass' (Plake, 2011), less high stake meaning that the current examination is not the only factor to make the students graduate because the other factors such as schools' achievement and portfolios are considered (Nugroho, (2017). Demographically, in 2017 there are 20% of schools with 1,349,744 students used Computer-Based Test (CBT), and 68% of school with 2,855,633 students did the exam in Paper-Based Test (Pengembangan, 2017).

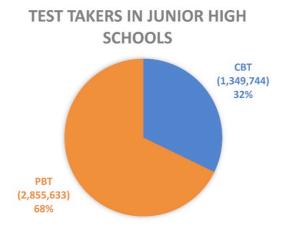


Figure 1. The percentage of test takers in junior high schools

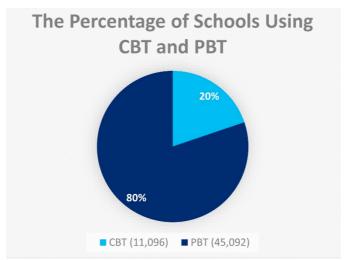


Figure 2. The percentage of schools using the CBT and PBT

The figure 3 below illustrates the spread of CBT in some areas in Indonesia. It could be seen that most the area covered with blue ink are Java island, Sumatera island has some blue spots, while the other island have significantly fewer spots. It indicates that the is significant difference in the administration of national examination.



Figure 3. The spread of CBT for junior high school (source: Pengembangan, 2017)

## Validity

"Educational achievement can be defined as the extent to which specified objectives are accomplished by individual students" (Payne, 1974, p. 29). In assessing students' achievement, it is very important to have valid and reliable measurement. Validity refers to how accurate the assessment reflects learning objectives being assessed (Brady & Kennedy, 2009). Among different types of validity, the construct validity and content validity will be discussed in this article.

## **Construct Validity**

Construct validity is related to the fairness, relevance, and meaning of the assessment to provide accurate information (Brady & Kennedy, 2009). It relates to "Who, what, and how are we testing? What system will we use to score it?" (O'Sullivan & Weir, 2011, p. 23). Since construct validity brings the meaning of assessment psychologically (Lyman, 1978), the assessment should not favour one group of people over the others. Assessment should be fair meaning that it gives equal opportunity to the candidate to demonstrate their abilities (Isaacs, Zara, Herbert, Coombs, & Smith, 2013). However, the standardized test does not measure creativity and unfairly treat a group over another (Lyman, 1978; Gordon, & Rajagopalan, 2016).

Hadi (2014) states that national examination is not suitable to evaluate education in Indonesian. Although the passing grade of English is low (score 55 or 28 correct answers of 50 questions), the different conditions between metropolitan cities and remote area challenge the construct validity. It is undeniable that there is a big educational gap among areas in Indonesia, such as the availability of teachers, the school facilities, and the access to have information (Vito, Krisnani, & Resnawaty, 2015). These gaps, consequently raises the protests not only from students and teachers in rural areas, but also from educational experts. The government should be more thoughtful in the policy of national examination (Muntholi'ah, 2013).

## **Content Validity**

Content validity relates to how well the measurement links to the curriculum (Brady & Kennedy, 2009). The items of English examination are 50 multiple choices assessing reading and writing. This type of test is considered the most efficient compared to other forms although there are some limitations. Multiple choice has many advantages such as broader content, quick and objective marking, but restricted in written form and ineffective for problem solving (Brady & Kennedy, 2009). "Multiple choice items are efficient and reliably scored, measure many cognitive characteristics validly, but difficult to measure higher order thinking and easier to cheat "(Geisinger, 2011, p. 241).

To comprehend reading, vocabulary and background knowledge are essential (Kane, 2011; Unruh, 2017). It enables children to associate words and context of topics (Blachowisz & Fisher, 2010; Vacca et al., 2012; Winch, Johnston, March, Ljungdahl, & Holliday, 2014). Therefore, word comprehension influences language comprehension (Gustafson, Samuelsson, Johansson, & Wallmann, 2013). Thus, vocabulary significantly influences comprehension; the more words students know, the easier for them to comprehend (Bayetto, 2013, 2014).

The figure 4. below is the example of English question in 2016, it is testing students' vocabulary in biology, specifically about the description of adult butterflies. By doing this question, it expected that the students can connect their prior knowledge to choose correct vocabularies and complete the paragraph. In question number 41, the students should choose a word that closely related to *nectar*. The clue that can help them is the next sentence that *adult butterflies* cannot chew solids. The correct answer would be (d) "liquids". However, the question number 42 is more difficult to know what "proboscis" is. In writing the test, the items should meet the leaning outcomes

and be free from irrelevant materials (Brady & Kennedy, 2009). It should be noted that English has many kinds of genres, but the items made should consider that the focus should be more about assessing the skill in English, not about natural science.

## For questions 41 to 43 choose the correct words to complete the text below.

Adult butterflies can only feed on ... (41), usually nectar. Their mouth parts are modified to enable them to drink, but they cannot chew solids. A proboscis, which functions ... (42) a drinking straw, stays curled up under the butterfly's chin until it finds a source of nectar or other liquid nutrition. It then opens the long, tubular structure and ... (43) up the nectar.

- 41. A. fruits
  - B. mud
  - C. leaves
  - D. liquids

Figure 4. Completing the paragraph (Pendidikan, 2016)

Another example of testing vocabulary is by choosing correct synonym based on the text. In the figure 5, it is expected that the students know the best word that have the closed meaning. The students that are familiar with this expression can answer this type of question.

27. "..., I change my mind." (Paragraph 2)

The underlined word is closest in meaning to ....

- A. decision
- B. ambition
- C. thought
- D. suggestion

Figure 5. Completing the paragraph (Pendidikan, 2016)

Another skill tested is the students should make an inference from the statement given. In the figure 6, the students should connect the phrase such as *high goals*, *ideas*, *inspires*, *the year ahead*, with the options provided. The possible 'correct' answer would be *keep on success in the future*.

50. "May the high goals and ideals which led to this special honour continue to inspire you in the years ahead."

We can infer from this statement that the writer hopes Davish ....

- A. stay humble and calm
- B. always be happy
- C. keep on success in the future
- D. be a better person

Figure 6. Making inference Completing the paragraph (Balitbang, 2017)

Academic language contexts are typically assessed through "measures of reading and writing ability" (Romhild & Bovaird, 2011, p. 61). It could be seen that the test items are academic but not socially contextual because there is no speaking and listening. Further, Darling-Hammond, Ancess and Falk (1995, as cited in Brady & Kennedy, 2009) state that the standardized testing requires single correct answer, emphasizes teacher focus more on teaching to do the test, and narrowly promote the view of curriculum. In multiple choice, the students have limitation to choose only one 'correct' answer, while there would be possibility that they may have different ideas in interpreting the text.

Another aspect in content validity is the cognitive domains. The test items are based on cognitive domain although it does not guarantee that all test takers do the test by thinking critically. *Knowledge* emphasises the remembering (recall, ideas, material, or phenomena); *application* requires comprehension to apply the knowledge; *analysis* emphasises the breakdown of conveying the meaning and making the conclusion (Bloom, 1994). Nevertheless, the national examination influences English teaching practices in Indonesia are more about passing the standard or examination rather than supporting the higher order thinking (Saukah & Cahyono, 2015). Hawanti (2011, as cited in Zein, 2017, p. 57) also states that test-oriented learning limits the English teaching to focus on doing the test rather than communicative competence. Therefore, the content of English examination should be more emphasized to assess both academic and communication and should be motivate positively in the teaching and learning process.

## Reliability

While validity refers to the extent the test to measure the intended objective. Reliability refers to the extent of consistently measure performance (Brady & Kennedy, 2012). However, "a test may be highly reliable without being able to do any specific task well" (Lyman, 1978, p. 7), because high reliability is important but may not be sufficient for good validity. The assessment is considered reliable if there are repetition of the same test, the equivalent forms of a test, comparable parts of a test, and item data (Payne, 1974).

There are "intrinsic problems in converting a paper-and-pencil test to a CBT" because of the production and administration (Stout, 2002, p. 103). Before the implementation of Computer-Based Test, there is only one type of test administration (paper-based test), meaning that all students do the same method. The introduction of new media (CBT) influences the reliability because testing conditions can make a great deal of differences in test results (Lyman, 1978). The paper-based is less secure in the distribution and scoring, less efficient, but has less problem in technology. Computer-based test can prevent cheating, disadvantages are the slow network, the electricity problem, and the login problem (Harmiyuni & Sailan, 2016). While paper-based is conducted once a day, computer-based is done three times because there are more students than the number of computers. In doing CBT, students should wait for hours to do the test and it causes their psychological aspects. Another problem is some problem electricity, internet connectivity. The different types of administration also bring more gap among schools and areas. For example, among 54 schools in Kendari, only 10 that can use CBT. There are 3.285 students do paper test (Putsanra, 2017).

Related to this problem, the government has commitment to increase the number of CBT in the future.

## Recommendation

The national examination has improved to use more advanced technology in test administration. To improve the construct validity, the content validity, and reliability, the educational gaps should be minimized. The government should improve the quality of English language education especially in rural areas by increasing the number of teachers, provide more accessible access to information, and develop educational infrastructure. Not only that, the government should also emphasize more on developing listening and speaking skills in the examination because the purposes of learning language are both academic and communication. Since the computer-based test needs more technical support, the government should ensure that electricity, internet connection, and the availability of computers are sufficient for all test takers.

#### Conclusion

The English national examination has the problem with construct validity due to the wide educational gap among areas, while the content validity shows that the test items only assess the reading and writing. Two kinds of administration also have impact in the reliability that makes the gap between metropolitan areas and rural areas become more obvious. The improvement in the future is highly needed, not only to support the learning outcomes, but also to bring fairness and equity in education.

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## Vocational Curriculum for Learners with Special Educational Needs

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#### **Abstract**

This study primarily aimed to find the difference in the level of functioning in Pizza Making Program of the High School Learners with special needs in terms of Cognitive Skills, Functional Skills, Behavioral Skills and Daily Life Skills. Majority of the high school students with special educational needs in the pre-evaluation rarely observed and practiced level of functioning in terms of Cognitive, Functional, Behavioral, and Daily Life Skills. Majority of the high school learners with special educational needs in the post evaluation sometimes observed and practiced level of functioning in terms of Cognitive Skills; Functional Skills; Behavioral Skills; and Acquisition of Daily Life Skills. This shows that after exposure to a certain program, learners have high potentials of improving. There was a significant difference in the pre-test and post-test in the four skills Cognitive, Functional, Behavioral, and Daily Life Skills. This indicates that utilizing the program and giving more constant exposure to it would help the learner with special educational needs the highest level of functioning which is always observing and practicing the skills needed in pizza making. The teachers or facilitators also need to use up to date, practical and relevant strategies that would make the pizza making program easier and enjoyable. With the utilization of state of the art facilities and strategies, learners would be more encouraged, motivated and trainable. Results of the pre and post evaluation should be carefully analyzed by the pizza making program teachers to address the strengths and weaknesses of the learners.



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Pizza Making Skills. This refers to the ability of the learners with special needs to perform activities related to pizza making.

Transitional Activity. This refers to the activity/program given to children with special needs which intention is to prepare them for employment. In this study, the transitional activity is pizza making.

Vocational Preparedness. This refers to the readiness of the learners with special needs to vocational program such as pizza making.

## Introduction

In the past three decades, children with special needs are considered invincible persons of the society (Burtner, 2017). Often times, they are overlooked, cast with pity and considered embarrassment to their family because their physical or mental incapability. They are also often regarded to be persons with less social significance due their incapability and unnoticed contribution to the economy (Burtner, 2017). But things have changed. Given applicable learning interventions, conducive environment to learn and applicable learning procedure, children with special needs can be trained to perform task they need in their everyday lives. They can be trained to take care of themselves, do simple household chores and do vocational skills such as cooking and weaving.

When their interest is tapped, they can even showcase talents in arts such as painting and photography. These abilities cannot be underscored unless activities related to the discovery and development of skills of interest is implemented. On a documentary featured by Real Time aired by GMA 7 on January 25, 2015, the importance of conducting activities such as photography workshop for children with autism is stressed by Bellete Vizcocho, parent and member of the Autism society of the Philippines in Baguio City. She mentioned that without identifying what special children can do, such as those with autism, parents of these children would not also know the children's ability.

This explains that exposure of children with special needs to activities that will showcase their abilities to be a more productive citizen, especially those that will provide economic productivity like vocational programs is one of the ways to improve their quality of life.

One of the fears of parents of children with special needs is to leave their children behind helpless and dependent in all their needs. The thought of leaving behind a child who cannot take care of himself and cannot provide for himself financially are part of these fears. That is why schools that provide curriculum for children with special needs include transitional programs for these children. These transitional programs include vocational programs such as weaving, food tending which include pizza making.

Transitional program or programs and activities given to children with special needs after high school like vocational programs is mandated by the Philippine government to schools that offer educational curriculum to children with special needs. This is in line with the implementation of K to 12 Curriculum (RA 10533).

In the implementation of K to 12 Curriculum, children with special needs are not exempted to be trained after they finish junior high school or grade 10. They should also be given grade 11 a program that will equip them to be ready to work or be productive economically. This is also termed as transitional program in the curriculum given to children with special needs.

Children with special needs have limitations when it comes to performing tasks unlike persons without special conditions. Although they have limitations, they can be trained to do tasks and be skilled to perform these tasks through positive interventions. There are even companies that support children with special needs through trainings and employment. Children with special needs' ability to organize items, perform motor skills and work with patterns makes pizza making vocational skills a good choice of transitional activity for these kinds of learners.

This prompted the researcher to determine the progress of children exposed to pizza making as a vocational program for learners with special needs.

## **Conclusions**

The study revealed the following significant findings:

- 1. Pre-evaluation levels of functioning of respondent high school learners with special needs in terms of: Cognitive Skills; Functional Skills; and Acquisition of Daily Life Skills.
  - 1.1 The mean score and the standard deviation of the respondents in the preevaluation in terms of Cognitive Skills imply that rarely observed and practiced. It means that if learners are not yet exposed to a certain program or situation, their cognitive skills are not obviously being practiced and observed yet.
  - 1.2 The mean score and standard deviation in the functional skills before the learners where exposed in the pizza making program imply that functional skills are not rarely observed and practiced. It is an indication that learners with special needs would only observe and practice these skills if already exposed or experienced.
  - 1.3 The mean score and the standard deviation of the respondents in the preevaluation in terms of Behavioral skills indicates that learners rarely observed and practiced it. Hence, it means, unless they are exposed to the program, their behavioral skills would be observed and practiced as well.
  - 1.4 The mean score and the standard deviation of the respondents in the preevaluation in terms of Acquisition of daily life skills indicates to be rarely observed and practice. It implies that if they are not exposed to the program yet, students with special needs would rarely observe or practice acquiring daily life skills.
  - 1.5 The findings in the pre evaluation support the study of Inciong (2011) where it was stated that learners with special needs require repetition and hand-on training for the skills to be developed. In the same manner,

students with special needs from Montessori De San Juan need to be exposed first to activities so the cognitive, functional, behavioral and acquisition of daily life will be observed and practiced often.

- 2. Post-evaluation levels of functioning of respondent high school learners with special needs in terms of: Cognitive Skills; Functional Skills; and Acquisition of Daily Life Skills.
  - 2.1 The mean score and standard deviation of the respondents in the post evaluation in terms of Cognitive Skills is sometimes observed and practiced. It means that they performed better individually after being exposed to the pizza making program. The learners' cognitive skills would be further improved if constant activities will be provided to the learners.
  - 2.2 The mean scores and standard deviation of the respondents in the post evaluation in terms of Functional skills is sometimes observed and practiced. Hence, after being exposed to the program, learners with special needs have had better improvement in terms of the functional skills.
  - 2.3 The mean score and standard deviation of the respondents in the post evaluation in terms of Behavioral skills indicates that students sometimes observed and practiced the skills. The noticeable improvement could be based to the fact that they were already exposed to the program. So constant exposure would be enriched their behavioral skills.
  - 2.4 The mean score and standard deviation of the respondents in the post evaluation in terms of Acquisition of daily life skills is sometimes observed and practiced. This is an indication of better performance or improvement after the program was introduced and implemented. Thus, it could be improved if more exposure and time would be provided to the learners. Other supplemental activities could also be helpful.
  - 2.5 The findings in the post evaluation support the study of Quijano (2011) where in the program provided to the learner with special needs encourage them to be more productive in their daily living. Cognitive, functional, behavioral and acquisition of daily life skills of the learners with special needs would definitely improve as long as learners are constantly exposed to the program and other related activities.
- 3. Significance Difference in the Pre-test and Post Test of the respondent high school learners with special educational needs when exposed in Pizza Making Program in terms of: Cognitive Skills; Functional Skills; Behavioral Skills; and Acquisition of Daily Life Skills.
  - 3.1 There is a significant difference observed in the pre-evaluation and post evaluation levels of functioning under Cognitive Skills. This finding implies that cognitive skills of the learners with special needs could be

- improved as they are more exposed to the program and supplemental activities.
- 3.2 There is a significant difference inferred in the pre-evaluation and post evaluation levels of functioning under Functional Skills. This finding implies that functional skills of the learners with special needs could be enhanced if they are constantly exposed and be given more time and exposure to the program and other supplemental activities.
- 3.3 There is a significant difference noted in the pre-evaluation and post evaluation levels of functioning under Behavioral Skills. This finding indicates that behavioral skills of the learners with special needs could be further improved by constant exposure to the program and other
- 3.4 related activities accompanied by close monitoring and well-equipped teachers.
- 3.5 There is a significant difference noted in the pre-evaluation and post evaluation levels of functioning under Acquisition of Daily Life Skills. This finding indicates that student with special needs would improve in terms of acquiring daily life skills. They only need to be exposed to the program constantly or be given additional activities related to the program.

Based on the significant findings of the study, the following conclusions were made:

- 1. Majority of the high school students with special educational needs in the pre-evaluation rarely observed and practiced level of functioning in terms of: Cognitive Skills; Functional Skills; Behavioral Skills; and Acquisition of Daily Life Skills.
- 2. Majority of the high school learners with special educational needs in the post evaluation sometimes observed and practiced level of functioning in terms of Cognitive Skills; Functional Skills; Behavioral Skills; and Acquisition of Daily Life Skills. This shows that after exposure to a certain program, learners have high potentials of getting improved or enhanced.
- 3. There was a significant difference in the pre-test and post-test in the four skills: Cognitive; Functional; Behavioral; and Acquisition of daily life. This indicates that utilizing the program and giving more constant exposure to it would help the learner with special educational needs the highest level of functioning which is always observing and practicing the skills needed in pizza making program.
- 4. These were the problems that high school learners with special needs encountered while engaged in pizza making program:
  - 4.1. Limited time for preparing the pizza dough
  - 4.2. Pizza dough was not made perfectly

- 4.3. Time-consuming
- 4.4. Oven cannot be used by students without assistance of a teacher
- 4.5. Pizza got easily burnt because of over using the oven
- 4.6. Lots of ingredients got wasted during the training for pizza making
- 4.7. Students always wait for instructions
- 4.8. Students tend to lose focus from the task
- 4.9. Some students have the tendency to munch on the topping even before the pizza is prepared
- 4.10. Some students don't like to try pizza that they made
- 4.11. During the announcement of the selling of pizza, not all students were able to speak in the different classrooms confidently.

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## ASEAN Community: Development, Challenge and Change for Thai Higher Education Sector

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#### **Abstract**

The emergence of ASEAN has changed and inspired ideas and expectations for Southeast Asian countries in many ways. As small or developing countries, the members of ASEAN need to be together for stronger in the global context. The collaboration and coordination between member countries are frequently mentioned in several aspects, including higher education (HE), in order for developing the region. An important concept announced by ASEAN concerns more attempts to promote higher degree of collaboration among HE sectors within the region. In Thailand, the HE sector was officially founded with the establishment of the first university in 1917. It could be considered as one of the very first HE sectors in the region. At present, there are approximately 160 higher education institutions (HEIs) across the country. Although the number of HEIs in Thailand has increased, the quality of them seems relatively questionable, especially at international level. In comparison to HEIs of other countries in the region such as Singapore, Thai HEIs always receive lower ranks in world rankings more and more. This difference could probably be a crucial challenge for Thai HE sector in order to successfully collaborate or coordinate many tasks with other HEIs from those member countries. Therefore, in my perspective, it is necessary to increasingly pay more attention to Thai HE sector in some aspects, particularly international language aspect, in order to adapt to the rapid changes within the region these days.

Keywords: ASEAN, Higher education, Thailand



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#### Introduction

According to the development of modern technologies such as information and communication technology (ICT) and transportation technology, the world seems to be reduced and smaller. People can communicate and transport rapidly and conveniently and also they can trade goods and other things better than before. However, people also have to compete to each other in several ways at global scale unprecedentedly. The small countries to some extent have unavoidable disadvantages in terms of international competitions; thus, the ideas of union have occurred in some regions, particularly Europe and Southeast Asia.

Particularly, Association of Southeast Asian Nations (ASEAN), which has approximately 630 million population (Aseanstats, 2017), is the third biggest population in the world and a crucial choice to reckon for any potential kinds of collaboration worldwide. Additionally, the GDP per capita of ASEAN is about 4,030 USD (Aseanstats, 2017). The above information might imply that this region has a pivotal role to play at global scale and might be one of the most important players in the near future.

## The Emergence of ASEAN

According to the geographic location that is located in between India and China, the Southeast Asian region has been being a crucial gateway for traders and pilgrims travelling between these two civilizations since the ancient days. Therefore, this region has another name, called Indo-China. Nowadays, the ASEAN community, comprised of ten countries, covers the area about 4.5 millions square kilometers (Aseanstats, 2017) including both in the mainland and islands. Due to the increasing political and economic competition worldwide, the Southeast Asian nations seemed to realize several challenges as an individual small country and commenced the notion of establishing a regional integration.

At Saranrom Palace in Bangkok, the formal establishment of ASEAN, called Bangkok Declaration, was signed on 8<sup>th</sup> August 1967 by five representatives of country members, including Adam Malik of Indonesia, Tun Abdul Razak of Malaysia, Narciso R. Ramos of the Philippines, S. Rajaratnam of Singapore and Thanat Khoman of Thailand (ASEAN, 2018b; Ministry of Foreign Affairs, 2018). Earlier in 1967, Thanat Khoman, the Minister of Foreign Affairs of Thailand at that time, invited his counterparts from other four countries to an informal meeting at Bang Saen district in Chonburi, which probably led to an agreement of ASEAN's inception in Bangkok thereafter (Ministry of Foreign Affairs, 2018). The declaration aims and purposes to promote collaboration and assistance of common interest in economic, social, cultural, agricultural and industrial, scientific and transport aspects, as well as standard of living of the people in ASEAN (Ministry of Foreign Affairs, 2018). After that, five more countries joined ASEAN: Brunei Darussalam in 1984, Vietnam in 1995, Laos and Myanmar in the same year 1997, and Cambodia in 1999 (Office of the Education Council, 2013).

The ASEAN member countries, in 1992, established the ASEAN Free Trade Area (AFTA) to increase trade, investment and reduce tax among the members (Office of the Education Council, 2013). Later, the leaders of ASEAN member countries signed

the Bali Concord II, in 2003, for creating the ASEAN Community by 2020 (Office of the Education Council, 2013). The ASEAN Community has 3 main pillars including: (1) ASEAN Political Security Community (APSC); (2) ASEAN Economic Community (AEC); (3) ASEAN Socio-Cultural Community (ASCC) (Office of the Education Council, 2013).

However, it is believed that the establishment of ASEAN was probably influenced by the European Union, which had been launched earlier. Since early 1950s, many countries in Europe attempted to set up regional integration (Cameron, 2010). Constantly, the European Union has been developed and become the best model for other regional integrations worldwide such as African Union (AU), Gulf Cooperation Council (GCC) and also ASEAN (Cameron, 2010). Having said that, there is some difference between EU and ASEAN, which is, for example, an attempt to use the same currency. In ASEAN, the member countries remain using their own currencies and it is still unclear about merging them together at this moment. This probably implies that the EU and ASEAN might have different purposes from their integrations. In my perspective, to some extent, the EU might aim to merge the European countries into one large country as similar as the US, whereas the ASEAN might just prefer to stick together slightly closer than before, in order to have more benefits from economic, political and socio-cultural aspects. Although the objectives of these two regional integrations might be slightly different, the ASEAN frequently sends delegations to EU in order to observe important experience as a model (Cameron, 2010). Particularly, in this article, the education issues which is in the socio-cultural pillar will be discussed in the following sections.

## **Education Cooperation and Development of ASEAN Community**

Since the beginning of establishment, ASEAN has paid attention to education via social and cultural aspects. It started from Bangkok Declaration in 1967 that the education cooperation was mentioned in the item four which is "to provide assistance to each other in the form of training and research facilities in the educational, professional, technical and administrative spheres" (ASEAN, 2016). Moreover, ASEAN has one of the three main pillars named, ASEAN Socio-Cultural Community (ASCC), which relates to promote educational cooperation among ASEAN member countries (Office of the Education Council, 2013).

Later in 1992, the 4<sup>th</sup> ASEAN Summit required the member states to help "hasten the solidarity and development of a regional identity through the promotion of human resource development so as to further strengthen the existing network of leading universities and institutions of higher learning in the region (ASEAN University Network, 2018b)".

Thereafter, this notion brought the establishment of the ASEAN University Network (AUN) in 1995 (AUN, 2018b). The AUN arranges activities and programmes to boost and support higher education cooperation and development to increase regional collaboration in accomplishing world standards. The present activities can be divided into five categories: (1) Youth Mobility, (2) Academic Collaboration, (3) Standards, Mechanisms, Systems and Policies of Higher Education Collaboration, (4) Courses and Programmes Development and (5) Regional and Global Policy Platforms (AUN,

2018b). Furthermore, The main focuses of AUN are based on those mentioned by ASEAN to support regional cooperation including: (1) to improve the current network of cooperation between universities in ASEAN and further; (2) to encourage collaborative research, study and educational programmes in the crucial areas mentioned by ASEAN; (3) to encourage cooperation and unity between academics and researchers in ASEAN member countries; and (4) to work as the policy-oriented organization in higher education in the ASEAN region (AUN, 2018b).

In 2009, the Cha-am Hua Hin declaration, which emphasizes on strengthening cooperation on education for developing human resources, indicates the roles of education into three main pillars, including: (1) political and security, (2) economic, and (3) socio-cultural (ASEAN, 2018a). In terms of the political and security aspect, the declaration aims: to promote understanding and appreciation of the ASEAN Charter; to emphasize on the principles of democracy and respect for human right; to realize the different cultures; and to create a school leader's network (ASEAN, 2018a).

For the economic pillar, the declaration aims: to create national skills framework that corresponds and support an ASEAN skills recognition framework; to facilitate better mobility of students and skill workers within the region; to create an ASEAN competency-based occupational standard focused on supporting the development of ASEAN human resources for the needs of industries; and to support the creation of a common standard of competencies for vocational and secondary education for benchmarking based on mutual recognition (ASEAN, 2018a).

Thirdly, in terms of the socio-cultural aspect, the declaration aims: to create a common content on ASEAN for schools including in teacher training and teaching; to provide courses on ASEAN arts and cultures at university level; to provide ASEAN languages as choices for foreign language subjects at school level; to support regional outreach programs emphasized on raising ASEAN awareness amongst the youth; to facilitate broader access of rural communities to quality education; to support lifelong learning in ASEAN member nations according to the Education for All (EFA); to create an ASEAN educational research convention to facilitate collaborative research and development within ASEAN; and to approve that ASEAN member nations should share their resources and establish a regional education development fund (ASEAN, 2018a).

## **Higher Education Sectors of ASEAN Country Members**

This part explains general information and details about higher education of each member state of ASEAN by using data from UniRank, an international higher education directory and search engine (UniRank, 2018a). The UniRank includes only the higher education institutions (HEIs) that are recognized by local governments and offered four year undergraduate programs or higher degrees (UniRank, 2018a). Each country is alphabetically presented as follow.

#### Brunei Darussalam

The first member country is Brunei Darussalam, located at the north-west coast of the island of Borneo. The ASEAN approved Brunei to be a member in 1984. The country size is 5,765 square kilometers, which accommodates about 417,000 population (Aseanstats, 2017). In 2016, the GDP of Brunei was 11,206 million USD. Although the country is not the largest, the adult literacy rate of Brunei is the highest in ASEAN at 97.6% in 2014 (Aseanstats, 2018).

At present, there are overall five HEIs in Brunei (UniRank, 2018b). The only university in Brunei that is a member of AUN, is Universiti Brunei Darussalam (ASEAN University Network, 2018a). According to the QS world ranking 2018, the highest ranking university of Brunei is also the Universiti Brunei Darussalam, which is at 349<sup>th</sup> of the world ranking (QS Top University, 2018).

#### Cambodia

The second country of this list is Cambodia, which is situated in the Indochinese peninsula, and bordered by neighbor countries such as Lao PDR, Thailand and Vietnam. One of the countries with long history, since Khmer Empire, became the newest member of ASEAN in 1999. In terms of size and population, the country covers 181,035 square kilometers and about 15 million population in 2016 (Aseanstats, 2017). Moreover, the Cambodia's GDP was 19,194 million USD at the same year (Aseanstats, 2017). And, the adult literacy of Cambodia was at 78.1% in 2014 (Aseanstats, 2018).

In Cambodia, there are now fifty two HEIs in total (UniRank, 2018b). And, two member universities of AUN from Cambodia are (1) Royal University of Phnom Penh and (2) Royal University of Law and Economics (ASEAN University Network, 2018a). None of universities in Cambodia has been ranked in the QS world ranking 2018, but there is one university in the QS data that is Zaman University (QS Top University, 2018).

## Indonesia

One of the first five member countries of ASEAN is Indonesia. As the largest country of ASEAN, the size of Indonesia is about 1.9 million square kilometers and the population is around 260 million (Aseanstats, 2017), which makes this country the largest Muslim population in the world (BBC, 2018). Furthermore, the country also has the largest economy in ASEAN according to the GDP at approximately 931,000 million USD in 2016 (Aseanstats, 2017). The rate of adult literacy of Indonesia was at 95.9% in 2014 (Aseanstats, 2018).

There are 581 HEIs in Indonesia, which is the largest amount of HEIs in ASEAN member countries (UniRank, 2018b). The AUN has four member HEIs from Indonesia including: (1) Institut Teknologi Bandung, (2) Universitas Airlangga, (3) Universitas Gadjah Mada, (4) Universitas Indonesia (ASEAN University Network, 2018a). The highest ranking university of Indonesia in QS world ranking 2018 is the Universitas Indonesia, which is at 277<sup>th</sup> in the world ranking (QS Top University, 2018).

#### Lao PDR

The next country is Lao PDR, which is a landlocked country in Indochinese peninsula, among by Cambodia, Myanmar, Thailand, Viet Nam and China. Although the GDP of Lao is only 15,903 million USD (Aseanstats, 2017), this country has become one of the fastest growing countries in economy as well as a crucial energy exporter. The area of Lao PDR covers around 236,800 square kilometers, which accommodates about 6.6 million population (Aseanstats, 2017). In terms of the adult literacy rate, Lao has 79% in 2014 (Aseanstats, 2018).

According to UniRank, there is only one university in Lao PDR that is National University of Laos, established in 1995 (UniRank, 2018b). Thus, this only Laotian university is a member of the AUN (ASEAN University Network, 2018a).

## Malaysia

Another country of the first five ASEAN members is Malaysia, which has two regions separated by the South China Sea. In terms of the size and population, this country covers 331,388 square kilometers and the population is about 31 million (Aseanstats, 2017). As one of the most advanced countries in ASEAN, Malaysia has GDP about 299,632 million USD (Aseanstats, 2017). However, the adult literacy rate of Malaysia was excluded from the source of data used in this article.

In total, Malaysia has forty five HEIs according to the UniRank (UniRank, 2018b). However, there are five HEIs of Malaysia that are members of the AUN including: (1) Universiti Kebangsaan Malaysia, (2) Universiti Malaya, (3) Universiti Putra Malasia, (4) Universiti Sains Malaysia, and (5) Universiti Utara Malaysia (ASEAN University Network, 2018a). According to the QS world ranking 2018, the highest ranking university of Malaysia is the Universiti Malaya at 114<sup>th</sup> in the world ranking (QS Top University, 2018).

## Myanmar

The next country is Myanmar, also known as Burma, which is the largest country in the mainland Southeast Asia and the second largest country in ASEAN. The country is bordered by Bangladesh, China, India, Lao PDR and Thailand. Myanmar covers 676,576 square kilometer area and the population is about 53 million people (Aseanstats, 2017). In terms of the GDP and literacy, this country has 68,636 million USD in 2016 (Aseanstats, 2017) and the adult literacy rate was at 95.1% in 2014 (Aseanstats, 2018).

There are all 82 HEIs in Myanmar (UniRank, 2018b). Three of them are members of the AUN including: (1) University of Mandalay, (2) University of Yangon, and (3) Yangon University of Economics (ASEAN University Network, 2018a).

## **Philippines**

Another first five members of ASEAN is the Philippines, which consists of more than 7,000 islands, located between the South China Sea and the Pacific Ocean. The size of the Philippines is about 300,000 square kilometers, which accommodates about 103

million population (Aseanstats, 2017). In terms of economy and literacy, the country has GDP at 311,453 million USD in 2016 (Aseanstats, 2017) and the adult literacy rate was at 90.2% in 2014 (Aseanstats, 2018).

Overall, the Philippines has 230 HEIs according to the UniRank (UniRank, 2018b). Moreover, three of them are members of the AUN: (1) Ateneo de Manila University, (2) De La Salle University, (3) University of the Philippines (ASEAN University Network, 2018a). The highest ranking university of the Philippines is the University of Philippines at 367<sup>th</sup> of the world ranking (QS Top University, 2018).

## **Singapore**

One of the first five country members of ASEAN is Singapore. As a mighty small country, Singapore is an island country, which is situated next to the furthest South of Indochinese peninsula, covering 719 square kilometers and the country has about 5.6 million population (Aseanstats, 2017). In total, Singapore has GDP at 296,977 million USD; however, this country has the highest rate of GDP per capita in ASEAN at 52,963 USD (Aseanstats, 2017). And, the adult literacy of Singapore was at 96.7% in 2014 (Aseanstats, 2018).

In Singapore, there are five HEIs in total (UniRank, 2018b) and three of them are members of the AUN, which are (1) Nanyang Technological University, (2) National University of Singapore, and (3) Singapore Management University (ASEAN University Network, 2018a). Recently, the Singapore HEIs have been very successful in world university rankings. According to the QS world ranking 2018, the highest ranking university of Singapore is the Nanyang Technological University at 11<sup>th</sup> in the world ranking (QS Top University, 2018). Moreover, the second highest university of Singapore is the National University of Singapore, which is almost high as the highest university, at 15<sup>th</sup> in the world ranking (QS Top University, 2018).

## **Thailand**

Next, another first five country member is Thailand, which is located in the middle of Indochinese peninsula and bordered by Cambodia, Lao PDR, Malaysia and Myanmar. Thailand's territory covers 513,120 square kilometers and the population is about 67 million people (Aseanstats, 2017). In terms of economy and literacy, the country has GDP at 407,048 million USD in 2016 (Aseanstats, 2017) and the adult literacy rate was at 96.1% in 2014 (Aseanstats, 2018).

Thailand has 125 HEIs in total (UniRank, 2018b). There are five member universities of the AUN from Thailand, including: (1) Burapha University, (2) Chiang Mai University, (3) Chulalongkorn University, (4) Mahidol University, and (5) Prince of Songkla University (ASEAN University Network, 2018a). In the QS world ranking 2018, Chulalongkorn University is the highest ranking university at 245<sup>th</sup> of the world ranking (QS Top University, 2018).

#### Vietnam

The last country of this list is alphabetically Vietnam, which is situated at the rightmost of Indochinese peninsula and next to three countries: Cambodia, China and

Lao PDR. The territory of Vietnam covers 331,231 square kilometers which accommodates approximately 92 million population (Aseanstats, 2017). Vietnam is one of the most rapid grown countries in economy and has GDP at 198,196 million USD in 2016 (Aseanstats, 2017). And, the adult literacy rate of Vietnam is 94.7% in 2014 (Aseanstats, 2018).

In total, Vietnam has 65 HEIs according to the UniRank (UniRank, 2018b). Furthermore, the AUN has three member universities from Vietnam, including: (1) Can Tho University; (2) Vietnam National University, Hanoi; and (3) Vietnam National University, Ho Chi Minh City (ASEAN University Network, 2018a). Although Vietnam HEIs are excluded from the QS world ranking 2018, but there are twelve HEIs of Vietnam in the QS database (QS Top University, 2018).

## Development, Challenge and change of Thai Higher education

According to those agreements from the declarations, particularly the Cha-am Hua Hin in 2009, the Ministry of Education in Thailand developed five new policies including (Chanbanchong, Thongthew, Boonsombuti, & Sangnapabowo, 2015):

- (1) improvement of appreciation and understanding of the ASEAN community, with more focus on the principles of democracy, respect for human right, and peace-oriented value in the school curriculum;
- (2) human resource development with the essential skills to meet the requirements of industries, free trade, and skilled labour mobility;
- (3) setting up ASEAN competency-based occupational standards to promote the mobility of ASEAN school leaders, teachers, and students;
- (4) preparing free flowing education to facilitate the AEC and promoting regional programmes to support ASEAN awareness between the youth;
- (5) and encouraging young volunteers to promote the learning centers in countryside and between indigenous people.

As can be seen, these policies aim to develop several aspects of education sectors in Thailand from school level to university level. In my opinion, for the first two policies, Thai education sector is capable of applying them immediately; however, the third and fourth policies are relatively problematic due to the language barrier. Having said that, the occupational standards and the free flow education will improve the mobility of workforce and academics across the region and develop the regional economy and education rapidly.

Moreover, as mentioned earlier, AUN aims to encourage higher education cooperation and development, which can enhance the regional prosperity by exchanging students, university staff and information from research. Particularly, the academic collaboration and higher education institution collaboration have high possibility to rapidly develop the higher education sectors within the region. However, it might be challenging for Thai context due to the language obstacle once again. It could be argued that many Thai academic staff can communicate in English, but it is not the case for the rest staff in general. Furthermore, it would be even more problematic for Thai higher education if AUN in the near future decided to follow the Bologna process of the EU. The Bologna process creates compatible academic degree standards and quality assurance standards across Europe, for example: a European

Credit Transfer System, in order to provide more mobility for students and academic staff throughout Europe (European University Association, 2018).

In addition, another challenge aspect for Thai higher education is the university league tables, which have increasing impact on Thai higher education institutions. The league tables continuously show that the performance of Thai higher education institutions needs to be adjusted if the institutions would like to climb up the ranks. It could be argued that the university league tables are unable to totally represent the genuine quality of the universities, nonetheless they have more impact on the students and the people in general. For Thai higher education institutions, in my experience, they often have less points in terms of research and internationalization. Once again, the obstacle probably relates to language barrier of Thai people in order to cooperate to international context.

Therefore, in my perspective, the language issue in Thai context really needs to be seriously consider as soon as possible. For example, in terms of English language skills, Thailand is ranked fifty-third by the English Proficiency Index, which is categorized as a low proficiency level (English Proficiency Index, 2018). However, the discussion about improving and using English in the Thai context usually ends up with sentences such as: "It is not our mother language why we have to worry". However, at this moment, it might be unable to say that anymore because the ASEAN officially indicated that English is the medium language for communicate in ASEAN. Thus, Thai people have to consider studying English more practical and effective than ever before. Moreover, some studies have found that using international language is one of the most important issues for Thai higher education to improve in order to develop the quality of the sector (Thupa-ang, 2015).

Notwithstanding, the Ministry of Education (MOE) seems to realize about this international language issue and attempts to find the ways to improve English in all educational levels. For instance, in basic education level, the MOE launched a policy that the schools should add more teaching and learning time for English language. Meanwhile, in higher education level, the MOE suggested that the universities should try to find their own ways or systems in order to improve international language ability for the students. Therefore, some Thai higher education institutions have already responded to this language issue. For example, Suan Dusit University (SDU) has announced that the new students in 2017 must have TOEIC 500 marks in order to graduate from the university. In my view, this is a reasonable example for a quick response to resolve the language problem. As a mid-table university of Thailand, SDU inevitably needs more well-known organization to prove the language ability of the students rather than creates an own new system. Although it remains unclear for the result of this resolution and costs more budget to do so, the university has tried to deal with a long term problem of Thai people, the international language barrier. Having said that, there might be some countries that can use better English than Thailand, but they are still lacks of development. In those cases, they might have distinct factors that need to be study further individually. Nevertheless, in Thai context, the more practical solutions and changes for resolving the language issue remain unclear and need more careful consideration and collaboration from all stakeholders

#### Conclusion

ASEAN community has brought many advantages in several ways for the Southeast Asian region and its people including: political, economic and socio-cultural aspects. However, in order to well participate and collaborate to each other, people in this region need an international language, which is English for ASEAN, to communicate properly. Especially, in Thai higher education, English becomes increasingly crucial. For instance, the English speaking students can search information for doing their essays via large amount of websites written in English on the internet, but most Thai students can only search relevant information via limited websites written in Thai. Furthermore, there are also many Thai academics, who have limited international language skills and are unable to properly communicate and collaborate with academics from other countries. These examples imply how different quality of education could be among these two kind of people.

In conclusion, therefore, a crucial challenge for Thai higher education is English language ability. And, in my perspective, if Thai people can improve their English skills, the competitiveness of the country and the region will be raised. Moreover, the collaboration among the ASEAN member countries will be more effective and bring more benefit for people worldwide to some extent.

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# Nobel Authors in the Literature Classroom: 2017 Laureate Kazuo Ishiguro and the Case for Conscious Empathy

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#### **Abstract**

Many years before the Swedish Academy honored Japanese-born, British-educated writer Kazuo Ishiguro with the 2017 Nobel Prize in Literature for his resilient works about the human spirit, the author highlighted in his work the necessity for exploring and improving the human condition. I have published on Ishiguro and his works for over 20 years, and I interviewed Ishiguro twice (2000 & 2006). I can attest to Ishiguro's ability to motivate empathy in his fiction, in order to broaden intercultural understanding and communication. We may discover in literary fiction ways to explore our human condition, recognize suffering, and find ways to be allies to one another in times of change and instability. I advocate for the teaching of Nobel authors in the literature classroom—particularly focusing on Japanese-origin laureates such as Ishiguro, Oe Kenzaburo, and Kawabata Yasunari for this paper. I will discuss how their books create wider communities of kinship and induct readers to bear witness to human experiences through literature. Indeed, these laureates fulfill Alfred Nobel's legacy that literature can bestow the greatest benefit to mankind.

Keywords: Nobel in Literature, Japanese Laureates, Empathy, Kawabata, Oe, Ishiguro



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## **Introduction: The Terms of the Nobel Prize in Literature**

In his will, Alfred Nobel bequeathed money for five annual prizes, including one for literature. The 1895 document stipulated that the laureate in literature would be honored for "the most outstanding work in an ideal direction" and that this exceptional lifetime's work should bestow "the greatest benefit to mankind" (Nobelprize.org). Critic Kjell Espmark (2001) explains that regarding the literature prize for the century to follow, the Swedish Academy grappled with exactly what Nobel meant by "an ideal direction" and what would constitute the "greatest benefit on mankind" (Nobelprize.org). I hope to indicate what some of these benefits might entail by focusing on the lifetime achievement of 2017 laureate Ishiguro.

Espmark identifies several distinct phases in the history of the literature prize, including "A Lofty and Sound Idealism" (1901 to approximately 1914) and "A Policy of Neutrality" (The Great War period) in the first couple of decades. This was followed by authors contributing to "The Great Style" in the 1920s, those of "Universal Interest" in the 1930s, and "The Pioneers" spanning the next four decades to 1977. "Attention to Unknown Masters" covered less than a decade (1977-1985), and it appears that since 1985, Nobel laureates have shared in presenting "The Literature of the Whole World."

## Japanese-origin Laureates: Kawabata, Oe, and Ishiguro

My paper highlights Japanese-origin authors. Kawabata Yasunari won the prize in 1968 and was the first Eastern-world author to do so, prompting the Academy to acknowledge the challenges of selecting non-Western authors for their long and short lists. In 1968, Kawabata was honored "for his narrative mastery, which with great sensibility expresses the essence of the Japanese mind" (Nobelprize.org). Indeed, Kawabata answered the Academy's praise of his national contributions to world literature with his Nobel lecture that was translated as "Japan, the Beautiful and Myself." Kawabata's award fits under Espmark's category of "The Pioneers" and certainly marks the Academy's incipient interest in literatures beyond the Eurocentric scope.

In 1994, another Japanese origin author, Oe Kenzaburo, was honored as an author "who with poetic force creates an imagined world, where life and myth condense to form a disconcerting picture of the human predicament today" (Nobelprize.org). Like the Academy's praise for Kawabata's formal literary achievements, the focus here is on Oe's poetical imagination and its impact upon world events. However, we notice that the praise for Kawabata may have been Orientalist in tone, while that for Oe is boldly in favor of the "disconcerting picture" of human experiences.

Not surprisingly, Oe's Nobel lecture is an inversion of Kawabata's as well. Titled "Japan, The Ambiguous, and Myself," Oe's lecture highlighted the radical transformation of Japan in the post Second World War period and the profound impact of personal events that "condense to form" his highly wrought literature. Michiko Niikuni Wilson (2007) indicates that Oe "is one of the most impassioned voices of conscience countering the country's minimalist cultural tradition that puts imagery and aesthetics of silence above social and political concerns" (Nobelprize.org).

If Kawabata and Oe are paired as contrasts in terms of their literary aesthetics for historical or national representations, then Kazuo Ishiguro's 2017 prize may be seen as a synthesis of concerns shared by all of the Japanese-origin authors. Wilson's assessment of Oe—as an "impassioned voice of conscience"—reflects a legacy equally embraced by Ishiguro.

Many years before the Swedish Academy honored this Japanese-born, British-educated writer for his resilient works about the human spirit, Ishiguro (2008) said, "I feel I am part of that generation for whom making something good out of your life, morally good, was a very conscious thing" (Bigsby, p. 21). The Academy (2017) presented the award to Ishiguro "who, in novels of great emotional force, has uncovered the abyss beneath our illusory sense of connection with the world" (Nobelprize.org).

## The Case for Conscious Empathy Cultivated by the Laureates

In Kawabata's lecture, the focus is on what Oe (1994) later called "extremely esoteric poems in Japanese," including one that Kawabata identified as "a poem of warm, deep, delicate compassion, a poem that has in it the deep quiet of the Japanese spirit." (Nobelprize.org). Indeed, Oe's own delicate denunciation of Kawabata's choice is highlighted in the 1994 laureate's sense that many worthy literary works are those in which the "whole world was then engulfed by waves of horror" (ibid). Oe unabashedly remarks on "the inhuman atrocities committed by Japanese military forces in Asian countries" (ibid) in a determination to confront Japan's imperial past with its national ambitions and destructions.

Despite these tonal differences in their Nobel speeches, Kawabata and Oe bring attention to how literature can—in Nobel's criteria—bestow the greatest benefit on mankind. To make the case, I would like to focus on the critical achievement of Ishiguro's work. In particular, I have spent over 20 years writing about Ishiguro's life and work, and I can attest to Ishiguro's ability to create in his fiction characters and situations that teach readers how to broaden intercultural understanding and communication.

We may discover in literary fiction ways to explore our human condition, recognize suffering, and find ways to be allies to one another in times of change and instability. I advocate for the teaching of Nobel authors in the literature classroom. I will then discuss how Ishiguro's books create wider communities of kinship and induct readers to bear witness to human experiences through literature.

First, recent research in cognitive and literary studies indicates that reading literature is beneficial for intellectual growth and cultivation of compassion. In his article on empathy and literature, Jonathan Gottschall (2012) states: "Fiction enhances our ability to understand other people; it promotes a deep morality that cuts across religious and political creeds." Gottschall also refers to research by psychologist Dan Johnson who finds that "[r]eading narrative fiction allows one to learn about our social world and as a result fosters [empathetic] growth and prosocial behavior" (qtd. in Gottschall).

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David Comer Kidd and Emanuele Castano (2013) are scientists who explored how reading literary fiction can increase our emotional capability and cognition: "Just as in real life, the worlds of literary fiction are replete with complicated individuals whose inner lives are rarely easily discerned but warrant exploration" (p. 379).

Julianne Chiaet (2013) notes that reading literary fiction teaches readers how to focus on characterization, the story, and the situation. These literary skills aid in understanding "the psychology of characters and their relationships . . . [thereby prompting] readers to imagine the characters' introspective dialogues." Characterization gives us authentic portrayals of people in familiar or alienating situations, while the story and situation provide the historical and geographical contexts for characters to inhabit and relate to self and others.

In teaching literary fiction for more than two decades at an urban university in the United States, I have witnessed the profound effects of literature upon my students. Readers of literary fiction examine the world in the book and contrast it with their own; they judge the efficacy of choices under the conditions found in the stories; they become engaged and responsible for their interpretations; and importantly, they consciously become custodians of the knowledge gained from literature by sharing the ideas in the book with others in discussions and in their written interpretations.

The literature by Nobel authors is especially valuable for introducing students to what literary critic Matthew Arnold (1869) identified as a purpose of literary instruction: we should seek to provide our students with "the best, which has been thought and said in the world." Nobel laureates, by virtue of their lifetime achievements, certainly meet these criteria.

I therefore advocate for literature teachers who conscientiously guide students towards empathy in their reading of great works of literature. Readers want to frame and understand current events; they are driven by a desire for knowledge of history, and for ways of addressing a fearsome future. Studying literature—and particularly, literary works by Nobel laureates---is inherently rewarding and can help readers identify with and explore the ideas and experiences of other people from all over the world. Ultimately, empathy is tied to a reader's emotional response to issues most relevant to their own lives.

As Ishiguro (2017) said in his Nobel lecture, "Stories can entertain, sometimes teach or argue a point. But for me the essential thing is that they communicate feelings. That they appeal to what we share as human beings across our borders and divides" (Nobelprize.org). I would like to discuss how Ishiguro's lifetime work is the kind of literature we should teach in our classes.

## Kazuo Ishiguro, 2017 Laureate in Literature

Contemporary author Murakami Haruki is Japan's most popular author, and he notes (2009): "Ishiguro is like a painter working on an immense painting. The massive, sprawling sort of painting that might cover the ceiling or walls of a cathedral. It is lonely work, which involves huge amounts of time, and vast stores of energy. A lifetime job. Every few years, he completes a section of this painting and shows it to us" (p. viii).

The first novel, A Pale View of Hills (1982) has widowed Etsuko now living in England as she narrates a time right after the bombing of Nagasaki. Mourning the suicide of her first daughter, Japanese-born Keiko, Etsuko finds a way to tell her anguished story through the lives of another woman and her mysterious daughter from the post-war period.

The second novel, An Artist of the Floating World (1987) has an elderly widower Masuji Ono reflecting on his career as an artist, as a painter in fact. He unwittingly reveals how his pre-war, pro-nationalistic paintings may now jeopardize his daughter's marriage prospects a few years after the defeat of Japan in the Second World War.

The third, *The Remains of the Day* (1989) is Ishiguro's best-known and beloved novel. Winner of the prestigious Booker Prize, it tells the story of an ageing butler named Stevens who simultaneously regrets and feels ashamed of his life's commitment to a fascist loyalist named Lord Darlington between the world wars.

Ishiguro (2008) said of these works written in his 20s and 30s: "In the first three novels, I was rewriting the same thing. I was on the same piece of territory, and each time I was refining what I wanted to say. [These novels were] about how somebody wasted his life in terms of his career. It's about well-meaning but misguided efforts to lead a good life" (Wong & Crummett, p. 208).

The Unconsoled (1995) represents Ishiguro's most radical departure to date from what many had regarded as the understated, eloquent, and even tranquil early narratives. The musician Ryder is found in disarray and defies the laws of physics in many of his meanderings around the unnamed European city. Called "Kafkaesque" by critics, this novel's explorations tested the limits of Ishiguro's artistic development. Ishiguro (2008) said, "I was really interested in figuring out this kind of dream writing and a 'dream grammar'" (Wong and Crummett, p. 209).

When We Were Orphans (2000) is about a renowned London detective named Christopher who tries to solve the mysterious disappearance of his parents from when he was a child. Ishiguro returned to some of his realist modes, but the novel's many nightmarish episodes also cast it as one of the saddest of all his novels. Ishiguro said (2001), "Perhaps there is something about Christopher discovering that here's a man who thought he was fighting evil, and then he comes to discover that he benefitted from this evil" (Wong and Crummett, p. 185).

Never Let Me Go (2005) ushered in a new generation of Ishiguro readers who followed the dystopic world of Kathy H. and her friends growing up in their beloved and fabled school called Hailsham. Musician Stacey Kent said, "This book broke my heart and left me raw for weeks" (Jacques). Ishiguro (2008) said, "Although it's a story about mortality, I wanted it to be a quite positive story" (Wong and Crummett, p. 220).

Ishiguro on his only short story collection to date, *Nocturnes*: "I feel I made a natural evolution from writing songs to novels [and here] you get five of what seem like totally separate pieces of music but they go together" (Aitkenhead, 2009). More than desiring to be a writer, Ishiguro's first artistic endeavor was playing music.

Ishiguro returned to my home city of Denver in 2015 (his prior visit was in 1995) to read from *The Buried Giant* at our university campus. The story is set in pre-Medieval times and has an elderly couple leave their village in search of their son. There are knights, pixies, a dragon, and some combative monks in a monastery. Ishiguro (2015) wondered about his latest: "Will readers follow me into this? Will they understand what I'm trying to do, or will they be prejudiced against the surface elements?" (Alter).

Now, I would like to summarize a critical review of Ishiguro's work to show that it supports the Nobel prize assessment for how his books bestow the greatest benefit to mankind.

Sebastian Groes and Barry Lewis (2011) identify an important element they call Ishiguro's "ethics of empathy" as his ability to "make us care about the world, about other people, about ourselves" (p. 2). And they comment, "What is also distinctive about reading Ishiguro's work is that it creates the sense that we are absorbed into a wider community that crosses geographical and linguistics barriers to stretch across the globe and through time" (p. 2).

Ishiguro's contemporary, Murakami Haruki remarked (2009): "In all my years of reading Ishiguro, he has never disappointed me or left me doubting him. All I feel is deep admiration for the infallible skill with which he has piled all these different worlds on top of one another" (p. viii).

## **Conclusion**

After the Swedish Academy announced the 2017 Literature Prize to Ishiguro, the United States newspaper, *The Wall Street Journal*, asked me to comment and I observed: "Ishiguro's lifetime work is significant for its mastery of narrative voice and deeply emotional subjects such as healing from the atomic bombing of Nagasaki, remorse for serving fascist loyalists, and futile fights against industrialists that control human lives. Ishiguro's ability to evoke empathy is unparalleled in contemporary fiction" (Gamerman and Gross, 2017).

The online news source, *The Conversation*, asked me to write an article, "The 'inevitable sadness' of Kazuo Ishiguro's Fiction" and I highlighted Ishiguro's conscious empathy in all of his fiction: "Ishiguro is a gracious guardian of humanity. He is a fine curator of emotions and a skilled storyteller. We don't know how many more books Ishiguro will publish. But we can be certain that in his literary explorations he will remain undaunted" (Wong, 2017).

We can look forward to new literature laureates from all over the world who will bring their insights and urge readers towards more empathetic connections with one another.

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# A Study on the Mutual Similarity between Japanese and Chinese for Simultaneous Learning

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#### **Abstract**

This study investigated the graphic resemblance of Chinese ideograms between Japanese and Chinese by creating a database of 1078 kanji (Chinese ideograms in Japanese) extracted from the two volumes of the Japanese grammar textbook, Minna no Nihongo (Second Edition, French version, 2013[I], 2015[II]) used in our faculty. It also applied the levels of language proficiency tests: Japanese-Language Proficiency Test (henceforth JLPT) and Chinese Proficiency Test (henceforth HSK). The aim of establishing the database was (1) to encourage students who study Japanese and Chinese simultaneously to learn kanji and Chinese characters by realizing the commonality and resemblance in shape and, (2) to provide with an elaborated list of Chinese ideograms that are most used in Japanese and Chinese. Firstly, the database showed that the textbook comprehensively covered the number of kanji, which included 100% of the kanji in Levels 4 and 5 of JLPT as well as 70% in Levels 1 and 2 and 60% in Level 3 of HSK. Secondly, it was found that 71% of the ideograms are identical, albeit with slight variations, between the two languages. This high rate of graphic resemblance will clearly help them reduce the fear of interference of learning these two East Asian languages simultaneously. For the further study, however, an analysis of phonetic and semantic resemblance, particularly false friends, should be required.

Keywords: Asian languages, Japanese, Chinese, logographic, simultaneous learning



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#### Introduction

Japanese and Chinese study programs were initially part of the Department of Mediterranean, Slavonic and Oriental Languages and Literatures at the University of Geneva. In 2011, they became independent after the creation of the Department of East Asian Studies with full programs in Japanese and Chinese studies and a partial program in Korean studies. They are now recognized as some of the most comprehensive East Asian study programs in the French-speaking world.

The Department follows the Bologna system, meaning that the BA curriculum can be completed in three years and the MA curriculum in two additional years. The faculty also accepts Ph.D. students. Although most courses are taught in French, students are expected to have a good command of Japanese and Chinese at the BA advanced level and, more particularly, at the MA level when they start the program. The department provides a full-fledged polyvalent program that enables graduates to explore manifold fields in Japanology and Sinology, from ancient classics to Internet literature<sup>1</sup>.

Another characteristic of the programs is that students choose two majors for the bachelor's degree. Many of them take two Asian languages as their primary subjects because of their interest toward East Asian languages. According to a survey of 92 students on the programs conducted in 2012<sup>2</sup>, students experienced difficulties in simultaneously learning Japanese and Chinese without any prior knowledge of them, although this has not precluded a number of students from choosing Japanese and Chinese as their main subjects even today (on average, about 20 % of the students choose Japanese and Chinese from 2010 to 2016).

One of the difficulties, for students, in learning these two languages at the same time is the complexity of Chinese ideograms used both in Japanese and Chinese. For example, Chinese ideograms used in Japanese are called kanji and some of them are different in shape, meaning and pronunciation from the simplified Chinese characters. This is because the Japanese method of simplification is different from the one in China (Yoshida, 2014, p.19). This may cause great confusion for the simultaneous learners, particularly complete beginners, and disturbs their learning of ideograms. Therefore, this study aims to support such students' effective learning by building a database which identifies the commonalities and differences between kanji and Chinese characters. The database consists of all 1078 kanji appearing in the two volumes of the Japanese grammar textbook, which the faculty adopts for instruction.

Furthermore, the database also applies the levels of Japanese-Language Proficiency Tests (JLPT in Japanese *Nihongo Nôryoku Shiken*)<sup>3</sup> and Chinese Proficiency Test (HSK in Chinese *Hanyu Shuiping Kaoshi*)<sup>4</sup> in order to meet the current needs of the students who wish to acquire the certificates of these exams. Along with the increase of the candidates, it is considered as necessary to apply the the levels of these tests into our database.

<sup>&</sup>lt;sup>1</sup> Berger C., & Obataya Y. (2014), p.150 (partially modified).

<sup>&</sup>lt;sup>2</sup> Berger C., & Obataya Y. (2014).

<sup>&</sup>lt;sup>3</sup> The JLPT consists of five levels from JLPT N5, the easiest, to JLPT N1, the most difficult.

<sup>&</sup>lt;sup>4</sup> The HSK consists of six levels from HSK1, the easiest, to HSK6, the most difficult.

It is hoped that this study may be useful not only for our students, but also for simultaneous Japanese and Chinese learners in non-kanji areas. For instance, it can be effective for beginner Chinese learners who have prior knowledge of Japanese<sup>5</sup>.

### **Previous studies**

There are a few existing studies on the similarities between Japanese and Chinese words and characters. Although the overview of the preceding studies is well explained in Yamada (2015) and Yoshida (2015), the latest research is Matsushita et al. (2017). They created an open-access database consisting of more than 10,000 parallel words found in these two languages, available online for anyone to download. The main characteristic of this study is that this database is considered to be the latest and largest in the field of comparative research on Japanese and Chinese languages.

Due to the characteristic of the gigantic database, the data utilized in Matsushita at al. (2017) covers broad types of sources: the data does not focus on the pedagogical sources such as textbooks and language proficiency tests. In this study, I attempted to establish a database by using one of the most popular Japanese language textbooks, *Minna no Nihongo* 1 and 2, for data references. It is widely used by various schools and universities all over the world and has already been translated into 15 languages. Several European universities use Volume 1 for the first-year and Volume 2 for the second-year college curricula. The latest editions were recently published: the first volume of the French version was printed in 2013 and the second volume in 2015. Furthermore, the new evaluation criteria of Japanese and Chinese language proficiency tests, JLPT (renewed in 2010) and HSK (renewed in 2009) are also applied in the database.

Another difference between Matsushita et al. (2017) and this research is the target of data. Whereas the former focuses on "parallel words" in terms of semantic correspondence, the latter highlights "parallel characters" in terms of visual resemblance<sup>6</sup>.

Another previous research related to this study is Berger & Obataya (2012; 2014) concerning the survey analysis of 92 students on Japanese and Chinese studies programs including the simultaneous language learning. According to the results, only eleven student participants were complete beginners who had no knowledge of either one of the languages they chose for major subjects. 47% of the participants preferred to focus on only one foreign language. This shows the students' struggle of learning two unfamiliar languages at the same time, although it is almost impossible to solve it due to the pedagogical system of the university in having to select two majors. Considering the results from the previous research, this study aims to create an effective learning material for students who must study Japanese and Chinese simultaneously.

<sup>&</sup>lt;sup>5</sup> For this study, the author took the HSK exams and passed HSK 6 – the highest level in China as of 2014.

<sup>&</sup>lt;sup>6</sup> My database also includes semantic comparison between Japanese and Chinese although it is out of focus in this study.

## Points of data analysis

Two points need to be clarified for this study. Firstly, it analyzes only the similarities between kanji (Chinese ideograms in Japanese) and Simplified Chinese characters and does not include Traditional Chinese characters. Although the latter type is still used in Taiwan, the former type of characters has been the official type in the mainland China since 1964. While some Traditional Chinese characters are identical with kanji, they are not included in our database this time because; (1) Simplified Chinese characters are considered as "official" in China and, (2) it is too hard for students in the introductory level to learn Traditional Chinese characters<sup>7</sup>.

Secondly, the Japanese textbooks on which the database is based are written in the *Kyôkasho-tai* (literally "textbook style") font. This font is very similar to the kanji taught in the classroom in Japan: kanji in the handwritten form. Handwritten kanji is not always the same as typographical fonts used on the Internet, such as the *Gothic-tai* or *Minchô-tai*.

## **Creating a Database**

The number of kanji from *Minna no Nihongo*, a total of 1078, includes not only the ones in the main sections but also in the section called "Information" at the end of each chapter. This can be compared to the total number of kanji required to acquire for Japanese primary school students (1006) before entering junior high school<sup>8</sup>.

<sup>&</sup>lt;sup>7</sup> It would be possible to improve the usability of database by adding only the correspondence between Traditional Chinese characters and kanji by categorizing in color for further study.

<sup>&</sup>lt;sup>8</sup> Cf. the site of JYL (Japanese for Young Learners) Project (http://www.kodomo-kotoba.info/booklet/basicsearch booklet 04 05.html).

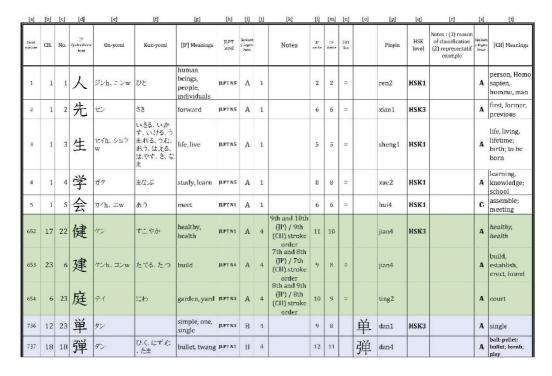


Figure 1: Example of the database

The database consists of 20 components, [a] to [t] (see Figure 1), as follows;

- [a]: serial numbers (1-1078)
- [b]: chapters of *Minna no Nihongo* I (CH.1-25) and II (CH.26-50)
- [c]: serial numbers in [b].
- [d]: kanji on *Kyôkasho-tai* font.
- [e]: on'yomi (Chinese reading)
- [f]: kun'yomi (Japanese reading)<sup>10</sup>
- [g]: basic meanings of kanji in English<sup>11</sup>
- [h]: JLPT levels<sup>12</sup>
- [i]: categories of visual resemblance between kanji and Chinese characters
- [i]: sub-categories
- [k]: additional information of the sub-categories
- [1]: the number of strokes of kanji
- [m]: the number of strokes of Chinese character
- [n]: kanji from the list in the guideline of Japanese teaching in the public junior high school in China (marked with  $[\circ]$ ) and kanji with visual difference (marked with  $[\circ^*]$ )
- [o]: Chinese characters on Simsun font
- [p]: Hanyu Pinyin (Official romanization system) of the Chinese characters

<sup>&</sup>lt;sup>9</sup> These Chinese sources of pronunciation of Japanese kanji are described by 'h', 'w', and 't'. 'h' indicates *Kan-on* ('Han sound'); 'w', *Go-on* ('sound from the Wu region'); 't', *Tô-on* ('Tang sound').

<sup>&</sup>lt;sup>10</sup> The column [e] and [f] contain only *Jô-on* and *Jô-kun* (*on-* and *kun-*reading in common use). These reading are determined by reference to a dictionary, *Shin Kango rin* (Second Edition, Taishûkan-shoten, 2011-2012).

<sup>&</sup>lt;sup>11</sup> For this information, I reference the Jisho.org.website.

<sup>&</sup>lt;sup>12</sup> For this level, I reference the Jisho.org website.

- [q]: HSK levels
- [r]: notes on (1) the reason of classification and (2) the representative example
- [s]: categories of semantic resemblance between kanji and Chinese characters<sup>13</sup>
- [t]: basic meanings of a Chinese character in English 14

The basic information of kanji and their JLPT levels<sup>15</sup> are included from columns [a] to [h], and [l] in the database whereas the one of Chinese characters is in the columns [m], [o], [p] and [t]. The HSK levels are specified in the column [q] according to the first four levels: HSK 1 to 4. A list established by my colleague, Professor Berger, based on the official Chinese character list of HSK (2013 version) has been used for this study.

Column [n] shows the visual difference between Japanese and Chinese cited from another list, published in the guideline of Japanese teaching in the public junior high school in China<sup>16</sup>. This guideline contains a list of 511 Japanese kanji in common use (pp.63-78). The kanji in this list corresponding to the ones in our database are described by  $[\circ]$  in column [n]. Additionally, this list draws a reader's attention to the cases where the shape of the Japanese kanji and the Chinese character are different. If a kanji is visually different from the Chinese character in the list, it is marked with  $[\circ^*]$  in our database.

The columns [r] and [s] indicate a provisional analysis of the semantic similarity between two languages <sup>13</sup> for further study.

For this information, I reference several sites like http://zidian.aies.cn/ (Xinhua cidian), http://www.ichacha.net/ and https://cjjc.weblio.jp/ (Weblio Japanese-Chinese, Chinese - Japanese dictionary).

<sup>&</sup>lt;sup>15</sup> JLPT has two different lists; a word and a kanji list. For this study, the kanji list was used.

<sup>&</sup>lt;sup>16</sup> Basic education department of Ministry of Education in China (Eds.). (2002).

# Categorization of Kanji According to the Visual Resemblance

The breakdown of the database indicates that the textbooks contain 100% of the kanji in Levels 4 and 5 of JLPT. Looking at HSK levels, it is found that 70% of them in Level 1, 73% in Level 2 and 60% in Level 3 are also included in these textbooks (see Table 1). This clearly proves the effectiveness of the Japanese textbooks for simultaneous learners of Japanese and Chinese who wish to challenge JLPT and HSK exams if they realize the similarities between kanji and Chinese characters.

Table 1: The Number of kanji covered in the textbooks (I and II)

	I+II		
JLPT N5	79	/79	100%
JLPT N4	167	/167	100%
JLPT N3	316	/357	89%
JLPT N2	243	/367	66%
JLPT N1	250	/1232	20%
More	23		
	1078		

	I+II		
HSK1	120	/171	70%
HSK2	122	/168	73%
HSK3	176	/296	60%
HSK4	242		
More	433		

The whole 1078 kanji in the database have been divided into four categories, that is, A, B, C, and NS (abbreviation of "Not Similar") (see Table 2). Category A signifies that a kanji is completely identical to a Chinese character whereas Category B represents the identification with slight variations. In Category C, a kanji and a Chinese character are significantly different in shape, although there are some patterns to recognizing the commonality between them. The last category, NS, has no resemblance.

Table 2: Four categories of kanji in the database

B: Identic (with slight variations)	113
C: Identifiable	224
NS: Quite different	84
	1078

# Category A (657 kanji: 61% of the total number of kanji in the database)

In Category A, consisting of four sub-categories, there are 657 kanji that shared resemblance with Chinese characters, corresponding to 61% of this database. Among them, 17 Chinese characters had the same shape, although the number of strokes in each differed. The representative parts of characters are the radical "kozatohen ( $\beta$ )" (a "small village" radical on the left) (A2) and the radical "fozato (fozato)" (a "large village" radical on the right) (A3). These radicals are written by three strokes in Japan but two strokes in China. The sub-category A4 groups some other cases such as "fozato" (fozato) (foza

## Category B (113 kanji: 10% of the total number of kanji in the database)

113 kanji classified into Category B are mostly the same in shape with slight variations. This category has five sub-categories (B1-5). B1 includes eight kanji whose parts are different between Japanese and Chinese. For example, Figure 2 shows the different direction of one stroke in a radical called "takekanmuri", a "bamboo" radical.

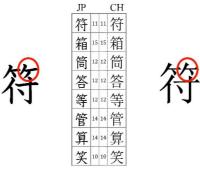


Figure 2: B1 (8 kanji)

Figure 3 shows B2 containing 44 kanji. Here, even if the number of strokes is the same, the shape is slightly different. For instance, the central vertical line of the eleventh kanji exceeds downward in Chinese.



Figure 3: B2 (extract of 44 kanji)

In B3, including five kanji, the beginning of a stroke order is different (see Figure 4). The first stroke of the first kanji starts from left to right whereas the stroke order of the same character in Chinese is right to left.



Figure 4: B3 (5 kanji)

The rest of the kanji in Category B were classified into the sub-categories of B4 and 5 according to the number of strokes. B4 groups the kanji whose number of strokes is more than the one in Chinese characters. For instance, in the Figure 5, one dot is less in the Chinese counterpart.



Figure 5: B4 (extract of 31 kanji)

The sub-category B5, on the contrary, includes the kanji whose number of strokes is less than in Chinese characters. For instance, in the third pair of counterparts in Figure 6, one more dot on the upper right is added in the Chinese character.



Figure 6: B5 (extract of 17 kanji)

Category B accounts for 10% of the database. This means that the total number of kanji in Categories A and B occupy 71% of the whole. The similarity observed in these two categories would be easy for beginners from non-kanji using countries to recognize, even if they have no previous experience of learning Chinese ideograms. Such dominance of visual resemblance between kanji and Chinese characters surely helps them study Chinese ideograms without confusion when learning two languages simultaneously.

## Category C (224 kanji: 21% of the total number of kanji in the database)

Category C contains mainly 15 classifications of Simplified Chinese characters that have significant differences from Japanese kanji. Even if they are quite different in shape, when one understands certain patterns of simplification in Chinese characters, it is immediately visible that the pairs of characters are in the relation of a variant. Since this category occupies 21% of the database, it would be important to thoroughly teach the frequently occurring patterns of simplification; that is, 12 patterns from subcategories C1 to C12.

C1 (see Figure 7) and C2 (see Figure 8) feature Simplified Chinese characters that are made by omitting a part (or parts) of an original character. C2 is a special case of C1 where one Chinese character includes the meaning of plural Japanese kanji by simplification<sup>17</sup>.



Figure 7: C1 (extract of 28 kanji)

<sup>&</sup>lt;sup>17</sup> I added in this fig. two kanji (6<sup>th</sup> and 8<sup>th</sup>) classified in other categories to highlight the ambiguity of Chinese characters in this sub-category.



Figure 8: C2 (7 kanji)

From C3 to C12 (see Figures 9 and 10), there are cases where only a radical or a fragment of a character is simplified and categorized by the same type, like "*itohen* (糸) (a 'thread' radical on the left in C3)", "*kai* or *kaihen* (貝) (a 'shell' radical in C4)", "*ôgai* (頁) (a 'big shell' radical in C5)" or "*gonben* (言) (a 'speak' radical on the left in C6)".

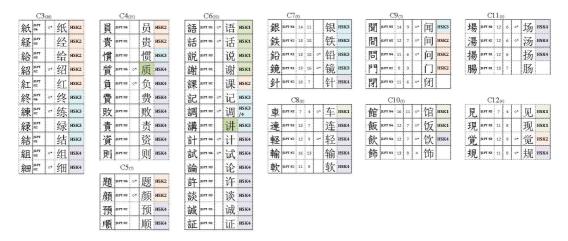


Figure 9: C3-C12 (extract of 118 kanji; C3 = 26, C4 = 25, C5 = 7, C6 = 22, C7 = 9, C8 = 8, C9 = 7, C10 = 5, C11 = 5, C12 = 4 kanji)

C13 includes other patterns that cannot be organized into any of the other subcategories (see Figure 10). I extracted cases with the same number of strokes for both Japanese and Chinese characters for C14, and for C15, instances where the number of strokes in Japanese are less than Chinese (see Figure 11). Due to simplification, Chinese characters usually use fewer strokes than most Japanese kanji. However, in the six characters in C15, Chinese characters feature more strokes than their Japanese counterparts.



Figure 10: C13 (extract of 58 kanji)

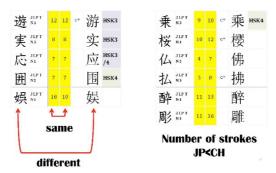


Figure 11: C14 (5 kanji) and C15 (6 kanji)

# Category NS (80 kanji: 7% of the total number of kanji in the database)

Category NS, consisting of seven sub-categories, contains two Japanese original characters (NS1, see Figure 12). In this category, there are numerous cases of differences between Japanese kanji and Chinese characters, like in the sub-category NS2 (Figure 12), making it difficult for beginners to detect variant relation at a glance. Some characters could be paired (NS4, see Figure 13 at the right column) but it was difficult to find other effective types of pairs. Therefore, they were classified by the difference in the number of strokes (NS3, see Figure 13 at the left column).



Figure 12: NS 1 and 2



Figure 13: NS3 and 4 (extract of 29 kanji)

## Pedagogical effectiveness of the database by using the levels of JLPT and HSK

This study also applied the levels of two language proficiency tests, JLPT and HSK. The purpose of this application was to identify the order of priority of each character for supporting students' effective learning of Chinese ideograms that frequently appear in both Japanese and Chinese as well as for the preparation of these exams. In Figure 14, characters are organized in order of priority by using (1) HSK levels, (2) JLPT levels, and (3) a kanji list established in the guidelines for Japanese teaching in Chinese public junior high schools<sup>18</sup>. When choosing representative examples, I omitted Chinese ideograms whose levels of difficulty are higher than Level 4 of HSK for pedagogical reason. This means that the characters at a higher position in this figure are more frequent thus, more important for students in learning these two languages. This makes it more efficient for them to learn two types of Chinese ideograms (kanji and Chinese characters) from the list in a top-to-bottom order. It also encourages them to effectively and practically learn Chinese ideograms for the exams due to the fact that the list is ordered according to the JLPT and HSK levels.

<sup>&</sup>lt;sup>18</sup> Cf. previous note 11.

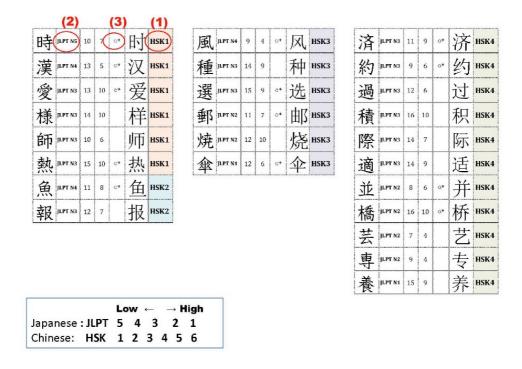


Figure 14: A list of kanji in order of priority for learning

#### Conclusion

To conclude, this study established a database by applying JLPT and HSK levels to successfully create a compact study material that students can use for efficient and effective learning of Chinese and Japanese simultaneously. A series of patterns extracted from the database would be easy to remember, one page at a time. It also makes learners less afraid of confusing kanji and Chinese characters by providing them with a detailed list of Chinese ideograms that are common to both languages.

This study should be supported by further analysis of semantic and phonetic resemblance (especially, analysis of false friends). Although I have already conducted a provisional analysis in this aspect with this database, it is found that the semantic domain is more complex than the formal domain. It is, therefore, necessary to further enhance the accuracy of the classification method that is based on similarity.

Apart from the initial goal of supporting our students, the database may be beneficial for other types of language learners, such as students who are complete beginners in Chinese with some knowledge of Japanese language. It could also pave the way to the creation of a handbook about the Chinese ideograms that are most frequently used in both Japanese and Chinese.

Although it has been proven that the database in this study could be the useful material for students who learn two different East Asian languages simultaneously, it is still necessary to reconsider the role of language teachers in this Internet era of accelerated change. In cyberspace, we have access to comprehensive information, such as the database of kanji and Chinese characters introduced in this paper. Facing information overload, however; it may be difficult to identify the useful and important data in relation to the purposes of learning these languages. The role of teachers,

therefore, should be to help students obtain the useful data extracted from gigantic data and to instruct them on how to practically and effectively use it in their learning.

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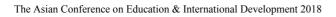
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# The Implementation of Peer Instruction in Mathematics and Physics Lectures

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#### **Abstract**

Peer Instruction (PI) is getting much more attention as one of the interactive teachinglearning methods. There are many practical reports of PI in physics, but in mathematics, there are few. Multiple-choice conceptual question, "concept test" is a key part of PI. As a trial, we made over one hundred concept tests in mathematics, and delivered PI lectures in mathematics as well as in physics at the university. The subjects were calculus I, calculus II, linear algebra I, linear algebra II, probability statistics, and introductory physics. From first semester in the 2016 academic year to first semester in the 2017 academic year, total number of PI lectures in mathematics was 29 and that in physics was 4. Also, we conducted the quantitative survey for the students before and after PI lectures. As a result, the favorable rating for physics of the students increased from 49 % to 69 %, and the rating for mathematics increased from 49 % to 61 % in physics. Unfavorable rating for physics of the students decreased to 12 %, and the rating for mathematics decreased to 8 %. We collected the data of clickers before and after peer discussion as we consider the histogram of clickers' responses for the concept test helps the teacher to check the level of students' understanding. It is important for us to analyze which unit or concept the students are good at or not, because such data give us a great hint to improve our lectures and the concept tests.

Keywords: Peer Instruction, Concept Test, Mathematics, Physics, Interactive Teaching-Learning Methods, Clicker



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#### Introduction

In Peer Instruction (PI) lecture (Mazur E. 1997), a teacher gives a multiple-choice conceptual question, "concept test" to the students, and the students immediately respond the concept test by using audience response system, "clicker". After responses, all the students discuss the reasons why they chose their answers with each other for a few minutes. By repetition of such as "peer discussions", students not only absorb knowledge but also learn to think about their concepts more deeply, and thus the abilities of logical thinking will be nourished inside them. Moreover, PI lecture helps teacher to check whole students' understanding level with a histogram of their responses provided by clickers, and it helps the teacher to deliver a lecture adjusting to the students' understanding level efficiently. Also PI lecture has an advantage that one teacher suffices to deliver a lecture even if the students' number is beyond 100. Although there are many cases of delivering PI lectures in physics (Kudo T. 2017), there are not many examples in mathematics. Therefore, we had to make the concept tests for delivering a PI lecture in mathematics. As a trial, we made over one hundred tests, and delivered PI lectures in mathematics as well as in physics at the university. In the paper, we show the examples of concept tests in mathematics and the variation in the accuracy rate before and after peer discussions in PI lectures in mathematics and physics.

# **Implementation of Peer Instruction**

We delivered PI lectures in mathematics and physics at our university from first semester in the 2016 academic year to first semester in the 2017 academic year. Total number of PI lectures was 29 in mathematics, and it was 4 in physics. The subjects were calculus I (Yamaoka H. 2018), calculus II, linear algebra I, linear algebra II, probability statistics (Taniguchi T. 2017; Taniguchi T. 2018), and introductory physics (Kudo T.).

The procedures for delivering a PI lecture are follows:

- (1) Teacher gives concept test to students in the lecture.
- (2) Students response the concept test by using clickers.
- (3) Histogram of students' responses provided by clickers is displayed on the screen.
- (4) All the students discuss their responses with each other for a few minutes.
- (5) Students response the concept test by using clickers, again.
- (6) Teacher provides correct answer to the concept test and adds the explanation.

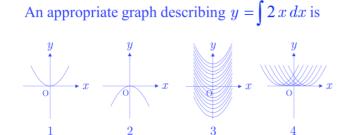
The key part of PI is the concept test for a peer discussion. We tried making the concept tests so as to lead accuracy rate of the students to achieve from 50% to 70% before having the peer discussion to make efficient and effective discussion. Thus, we made the concept tests intentionally to lead the students to choose wrong answers. If the accuracy rate on the tests before peer discussion is too low, the accuracy rate after discussion is hardly increased. In that case, the peer discussion becomes not effective. If the accuracy rate before the discussion is too high, peer discussion becomes almost unnecessary. When the students could not conduct an active discussion, a randomly selected student acted as facilitator for each group discussion. The facilitator has a role to ask the other students the numbers for the responses they chose and the reasons why they chose them, and to lead the other students to communicate with each other

smoothly in the group. By rotating the facilitator role each time, even the student who is not accustomed to having a group discussion became less hesitant to speak gradually.

It is noted that after delivering a lecture using black board and PowerPoint, the teacher walks around the class to check how the students are practicing problems. All that time, the teacher answers questions from the students, and the students themselves teach each other the solutions.

# **Concept Tests in Mathematics**

We show the examples of concept tests in mathematics and the variations in accuracy rates provided by the students using clickers before and after peer discussion.

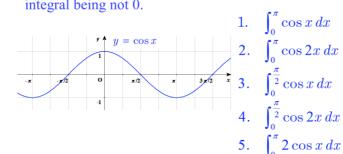


Number	Before	After
	discussion	discussion
1	32%	5%
2	14%	0%
3	45%	95%
4	9%	0%

Figure 1: Concept test in calculus lecture and the students' response rates

Figures 1 and 2 show the examples of concept tests in calculus lecture. In figs 1-4, the right- hand tables show the students' response rates of using clickers before and after peer discussion where the accuracy rates are shown in bold. Figure 1 shows the concept test in indefinite integral. The number of the solutions for indefinite integral is infinite, and thus the correct answer is number 3. To get the correct answer, it is needed for the students to understand the distinction between indefinite integral and definite integral, and to image these graphs of solutions. The accuracy rates before and after peer discussion were 45 % and 95 %, respectively. The rate of the students chose wrong answer (answer choice 1) was 32 % before discussion, and it decreased to 5 % after the discussion. Here the teacher did not interrupt in peer discussion.

Choose a number that describes the value of definite integral being not 0.



Number	Before	After
	discussion	discussion
1	19%	4%
2	11%	2%
3	<b>57%</b>	91%
4	11%	2%
5	2%	0%

Figure 2: Concept test in calculus lecture and the students' response rates

Figure 2 shows the concept test in definite integral. The accuracy rates (correct answer is number 3) were 57 % and 91 % before and after peer discussion, respectively. It is needed for the students to image the shapes of cosine functions, "2  $\cos x$ " and " $\cos 2 x$ " in answer choices, and to consider the ranges of integration. There is no need to calculate definite integrals, directly.

When the following vectors are not (0,0,0), an appropriate information acquired from

$$\frac{x-1}{2} = \frac{y-2}{2} = \frac{z-3}{3} \text{ is}$$
1.  $(1,2,3) \parallel (2,2,3)$ 
2.  $(x,y,z) \parallel (1,2,3)$ 
3.  $(x,y,z) \parallel (2,2,3)$ 
4.  $(x-1,y-2,z-3) \parallel (1,2,3)$ 

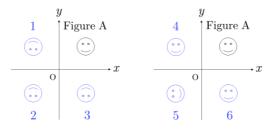
5.  $(x-1,y-2,z-3) \parallel (2,2,3)$ 

Number	Before	After
	discussion	discussion
1	9%	2%
2	26%	15%
3	6%	2%
4	11%	2%
5	49%	<b>79%</b>

Figure 3: Concept test in linear algebra lecture and the students' response rates

Figures 3 and 4 show the examples of concept tests in linear algebra lecture. Figure 3 is used in the concept test to check whether the students deeply understand a definition of an equation of a line or not. Even if the students cannot remember the definition of equation of a line, they can get a correct answer by considering the ratios of the given equations. The accuracy rates (correct answer is number 5) were 49 % and 79 % before and after peer discussion, respectively.

# After flipping a figure A with respect to the line y = -x, the flipped figure is



Number	Before	After
	discussion	discussion
1	4%	0%
2	51%	36%
3	4%	0%
4	2%	2%
5	32%	60%
6	6%	2%

Figure 4: Concept test in linear algebra lecture and the students' response rates

Figure 4 shows a concept test describes flipping figure with respect to the straight line. The accuracy rates (correct answer is number 5) were 32 % and 60 % before and after peer discussion, respectively. It might be difficult for the students to image the movement of the figure with the shape. The rates of the students chose wrong answer (answer choice 2) were 51 % and 36 % before and after peer discussion, respectively. Here, answer choice 2 describes figure's rotation through 180 degrees. In the lecture, we covered the movements of a point, but the movements of a figure with the shape were not covered. In order to get the correct answer, the students need to image the movement of a total face as the eyes move in conjunction with mouse movements. In PI lecture, teacher can give additional explanations to the students by checking their level of understanding.

# **Accuracy Rates Before and After Peer Discussion**

The accuracy rates before and after peer discussion is very useful for teachers not only to check the students' level of understanding but also to analyze the factors in mathematics and physics. Figure 5 shows the examples of the accuracy rates before and after peer discussion in PI lectures in linear algebra I, calculus II, and physics. In fig. 5 circles are drawn around the data of the concept tests in figs. 1-4.

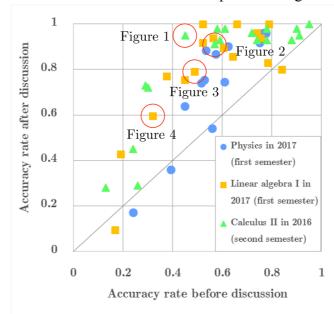


Figure 5: Examples of accuracy rates before and after peer discussion

If the accuracy rate before peer discussion is too low, the students cannot conduct an effective discussion. If the accuracy rate before peer discussion is too high, there is no need to have a discussion. It seems like the students had effective discussions for the concept tests in figs. 1-3. After PI lecture of physics in first semester in the 2017 academic year, the favorable rating for physics of the students increased from 49 % to 69 %, and the rating for mathematics increased from 49 % to 61 %. The unfavorable rating for physics of the students decreased to 12 %, and the rating for mathematics decreased to 8 %. In PI lectures, the students seemed to discuss each other with fun.

## **Conclusion**

We made over one hundred concept tests in mathematics, and delivered PI lectures at the university. We showed the examples of concept tests in mathematics (e.g. calculus and linear algebra) and the students' response rates by clickers in PI lectures. Those rates help teacher to check all the students' level of understanding and to deliver lectures more effectively. The students seemed to have peer discussions with fun in PI lectures. After delivering PI lecture in physics, the favorable ratings for mathematics of the students as well as for physics are increased.

As a future assignment, we will reveal the factors of students' weak and strong points by analyzing the factors for mathematics and physics in fig. 5. Furthermore, we will modify the concept tests and deliver effective PI lectures.

# Acknowledgements

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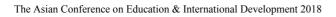
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# A Symbolic Interactionist Study on Blended Learning in Hong Kong

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#### **Abstract**

Information and communication technology, such as computer, has been widely adopted in teaching and learning activities as a way of supplementing with conventional one-way pedagogy. The mixture of lecturing and activities mediated with information and communication technology is usually referred as blended learning. However, there are considerations on rationale behind its adoption in enhancing students' learning desires. Some support using blended learning to meet students' learning needs. On the contrary, under competitive nature of knowledge society, others may cast doubt on its effectiveness when students put emphasis on acquiring qualifications and ignoring essence of education. In a sense, the discussion is about how and why students perceive blended learning in that manner. By understanding how the perception is mediated, educationalists can incorporate the mechanism when designing teaching and learning activities. As symbolic interactionism is one of the theories in understanding how one perceive surroundings, this paper borrows the theory and probes into how university students perceive blended learning and the way in shaping their perceptions. Through semi-structured interview as a case study on undergraduate student in Hong Kong, this paper argues that student may not perceive ICT as a medium to experience learning. Perception towards blended learning can be mediated by the social desirable behaviours among people with whom he is interacting with. This paper calls forth educationists to take students' surrounding social environment into consideration before rationalizing and effectively enhancing an adoption of blended learning.

Keywords: Symbolic interactionism, blended learning, information and communication technology, higher education, Hong Kong.



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### Introduction

Information and communication technology has widely shaped our society in many areas, including education. With an adoption of information and communication technology, blended learning has aroused aimed at enhancing students' learning experiences. Many previous studies link blended learning with students' learning outcome but fail in addressing how students perceive it as pedagogy. Besides, symbolic interactionism is rarely applied on this research area. This case study thus looks into the areas and fill in the gaps. By adopting symbolic interactionism, this paper probes into how university student in Hong Kong perceive blended learning. In the following sections, past literature will be reviewed first. Significance of this case study and methodology will then be explained. Analysis and discussions of this case study will be presented then. Before drawing a conclusion, contribution of this case study will be stated.

## Literature reviews

This session is going to briefly review over previous literature on blended learning and introduce symbolic interactionism.

Blended learning can be defined as "combine face-to-face instruction with computer-mediated instruction" (Graham, 2006, p. 5). Güzer and Caner (2014) provided one of the simple and organized overviews on the flooding literatures of blended learning. There are at least three different phrases of researching blended learning, namely "first attempt", "definition period" and "popularity period" (Güzer & Caner, 2014, pp. 4597-4601).

"First attempt" was roughly around 1999 to 2002. This period marks an emerging of blended learning. According to Güzer and Caner (2014), Cooney et al. (2000) was one of the pioneers in researching BL by looking at the effect of designed activities on children in child care center by mixing two different factors, play and work, together. Their study laid a foundation for thereafter researches on BL (Güzer & Caner, 2014, pp. 4597-4598).

"Definition period" was roughly around 2003 to 2006. A large proportion of studies conducted in this period were on clarification and definition of blended learning. Besides, Garrison and Kanuka (2004) outlined the potency and contribution of blended learning in the spectrum of teaching and learning, especially related to university level (Güzer & Caner, 2014, p. 4598).

"Popularity period" has started roughly since 2007. Researches on blending learning in this period bloomed but mainly focused on two areas, "effectiveness" and "perception" (pp. 4598-4600). About "effectiveness", one of its focus areas is on educational outcomes. For instance, Ginns and Ellis (2007) discovered that, when comparing with traditional face-to-face lecture, blended learning could help to improve educational outcomes among students. Melton et al. (2009) conducted similar study but failed to reach same finding. About "perception", many studies stressed on perceptions on blended learning from the perspectives of teachers and students. For instance, Jarrahi (2010) and Calderon et al. (2012) showed that one of the motivations for teachers to keep adopting blended learning in their teachings is

constructive encouragements and responses from students and institutions. Gerbic (2010) found that students supported blended learning and believed that it helped their studying. Woods et al. (2007) and Dahlstrom and Bichsel (2014) were in line with the argument. Nonetheless, Vaughan and Garrison (2005) indicated that blended learning failed to help students in improving their cognitive performances. Fortune et al. (2006) and Olapiriyakul and Scher (2006) also illustrated that even university students preferred blended learning, their educational outcomes were no different when comparing with those students attending traditional face-to-face lecture. These research findings may cast doubt on whether blended learning can effectively help to instill and promote positive learning attitude and learning to learn environment among students

Students may have formed various views towards blended learning as they have developed different attitudes towards surroundings. Interactionism seems to offer appropriate theoretical approach to this case study as it focuses at micro level of society by looking into how people interact. However, there are more than one theory under interactionism, such as phenomenology and symbolic interactionism. Basically, phenomenology looks into how experience shape one' perception toward his surroundings. Symbolic interactionism focuses on how individual is shaped through interaction with other without concerning the role played by experience. As this case study focuses on how undergraduate perceive blended learning rather than tracing the impacts from their past experiences, symbolic interactionism seems to be more appropriate.

Symbolic interactionism suggests that we assigned meaning to the world with three basic assumptions. First, our response is based on how we assign certain meaning to our surrounding. Second, the assigned meaning can be mediated through our interaction with others. Third, the assigned meaning is tentative and subject to further mediation (Blumer, 1969, p. 2). Meaning is thus socially constructed through the interaction among individuals' symbols.

Symbolic interactionism may question on an effectiveness in adopting blended learning as a mean to enhance students' learning outcome. Students' learning attitudes and learning outcomes can be mediated by how they perceive the blended learning. Since students are at the core of learning, their perceptions on blended learning and the ways of forming the perception deserve further considerations. As students may interact people with different values, such interactions may shape them different views on the purpose of studying and that in return affect the way of formulating their perceptions toward blended learning.

## Significance of this case study

This case study links symbolic interactionism with researches on blended learning at higher education in Hong Kong. Although there were a lot of researches on students' perceptions towards blended learning, most of them focus on either measuring students' taste on blended learning or comparing students' preference between blended learning and traditional lecture (Drysdale et al., 2013, pp. 95-96). Few studies are about how students perceive pedagogy or practice of blended learning itself. Particularly, few attentions have been drawn on appreciating the rationale behind the formulation of the perception among students towards blended learning. Researches

on educational technology in understanding the reason why and the way of how it is adopted in a particular manner are inadequate (Selwyn, 2010, p. 66). Besides, researches on blended learning driven by theory of symbolic interactionism are rare (Graham, 2013, p. 325). To bridge these gaps and contribute a new shore in researching educational technology, this case study tries to unveil the reason and the way of formulation of perception towards blended learning among university students in Hong Kong.

## Methodology

This case study focuses on an elective course supplemented with blended learning offered by one of the universities in Hong Kong. Enrolled students were all non-majored students ranging from year one Higher Diploma to year four undergraduate. Most of them were local Hong Kong students but some come from mainland China or overseas. After lessons, the lecturer uploaded a question to the Blackboard every week and students were required to attempt the question by writing a reflective journal on what they learned from previous lesson and uploaded to the Blackboard in around five days.

One local male undergraduate student signed the consent forms and participate into this case study. To encourage the informant to freely express themselves, the interview was conducted in Cantonese and lasted around one hour.

## **Analyses and discussions**

The followings are analyses of the excerptions from conversations between a researcher (R) and the local student (LS) under perspective of symbolic interactionism. As we will see, interacting people does shape student in assigning meaning on his study which in return affect his formulation of perception towards blended learning.

When asked about assessment, LS proposed a linkage between academic performance with time allocation in courses.

R: You have to read articles before lesson. You need to have discussion in class. You also need to do journal after lesson. What do you think about this arrangement?

LS: If I only take this course in the whole semester, that is ok. That may make me read more. But I, in this semester, I already take less courses in this semester, may be five. But sometimes I take seven courses. Other courses (workloads) can be quite heavy.

LS: But if you engage in the discussion and reading in this manner, you may need to spend seven-hour investment per week. Comparably speaking, you spend less in other courses. Other courses may be your majored subjects, maybe course codes start with three or four. Practically, weighting of GPA (Grade Point Average) for these courses must be heavier.

LS: Time allocation will naturally spend much time on majored subjects.

LS clearly valued majored subjects over non-majored subjects, especially when considering the weighting distribution of GPA. To him, the amount of effort spend in a course seems almost nothing to do with the pedagogy but with its weighting of GPA. In other words, LS concerned about grades.

It appears that earning marks is important to the student. Researcher is interested in finding out the rationale behind it. When asked about the value of marks, LS responded in this way:

R: If your result or GPA is affected, why is that important to you and how it affects you?

LS: I think before talking affecting your GPA, in term of your majored department, you may have interest in this subject before you are admitted to your majored department. You have interest and you want to involve more into it and study it.

LS: (But) you choose this (non-majored) course only because you may have other reasons such as time conflict or need to fulfill certain requirements. Naturally, you will not spend as much time as your majored subjects. Also, if you are talking GPA, thought it does not affect my futures a lot in my subject area, at least GPA comes first when you find a job, internship or placement, especially for your first job, after all.

LS explained why they were so concern about earning marks. As symbolic interactionism suggests, certain pattern of behaviour may be regarded as a path to future success. That pattern of behaviour then becomes kind of social norms and role model to follow. Graduating with a flying result is one of the patterns of social desirable behaviour in our society. Even though there was no much revealing from the interview on who interact with and affect LS, LS is likely to be influenced by the social desirable behaviour. Most likely, part of the influence may come from his parents, teachers and friends. Through interacting with them, it is possible that LS is shaped by the pattern of behaviour and that becomes his model to follow. To him, graduation with undergraduate qualification from university is not good enough. In order to meet with social desirable behaviour and to gain a competitive edge over the other university graduates, graduation with outstanding academic performance is desirable. This is especially important for a fresh graduate like him when looking for his first job. One of the indicators for outstanding academic performance is GPA, especially those of majored subjects. That already explains the reason why he has associated academic performance with time allocation of a course. To the student, the course is his non-majored subject and thus he assigned meaning of "finishing a task" on writing reflective journal so that this non-majored subject will not greatly affect his GPA.

The assigned meaning of "finishing a task" on writing reflective journal is further crystalized when the student described it as homework.

LS: When you write the reflective journal, it just reflects your

viewpoint. I think it is a little bit narrow. Reading can more effectively in enhancing your vision than journal.

LS: I think the activity of reflective journal is meaningless.

LS: It seems that I achieve nothing after completing the reflective journal.

LS: Nothing particular helpful to my learning in this course, if just refer to the reflective journal.

From above, LS seemed offered a negative viewpoint on reflective journal by suggesting that it was meaningless and not helpful to enhance his learning experience.

The afore-analysis outlines that formulation of students' perceptions towards blended learning comply with the social desirable behaviour and form his perceptions towards blended learning after interacting with others.

As discussed, being influenced from interacting with people, student's perception towards blended learning is shaped. This case study discovers that as the student interacted with those who stressed on pattern of social desirable behaviour, he has been shaped, and his perception of blended learning was thus affected. One of the implications from this case study is, we can learn a lesson from symbolic interactionism that if we want to implement something with its intended outcome, we have to consider the interaction among different individuals in the society first.

#### Contribution

This case study contributes to policy makers and educationists.

This case study may disclose negative social influence on students and its future implications to policy makers. Owning to influence of social desirable behaviour after interacting with others, university students will have certain attitudes with blended learning. Such attitudes may increase negative burden, unnecessary stress among students and lead the society towards utilitarianism. To reduce students' stress and shape a brighter society, something must be done on the social influence first. Policy makers may review and implement appropriate educational reforms in primary and secondary school curriculums and overall educational objectives for next generations in Hong Kong to create a favourable environment and instil students with reflexivity on certain social desirable behaviours like qualification, success and life. Besides, for the sake of students' development, policy makers may adjust allocation of resources on blended learning so that educationists can acquire reasonable spaces in achieving educational targets.

As this case study discloses how students perceive blended learning is related to their interaction with others, educationists may make use of the finding and design certain teaching and learning activities within the system to promote positive students' learning experiences and self-developments, say, through peer learnings and competitions. This case study may thus further contribute to educationists by unveiling a possible way of employing symbolic interactionism to motivate students' learning desires in blended or online learning.

#### Conclusion

To sum up, an integration of educational technology and employment of blended learning in teaching and learning activities do not automatically lead to an enhancement of students' learning outcomes. Successful implementation of blended learning depends not only on how it is used but also on how it is perceived. As above illustrated, how students perceive blended learning in return is shaped by social desirable behaviour and their interaction with others. For the sake of successful adoption of blended learning, we have to take students' surrounding cultural and social backgrounds into considerations. As social desirable behaviour can shape one in formulating his perception towards surrounding through interaction, further studies on the ways of how to mediate social desirable behaviour are necessary. Such researches not only can enrich our understanding on social desirable behaviour but also play an important contribution to different fields such as education and policy makers.

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# Implementation of the Mother Tongue-Based Multilingual Education (MTB-MLE) Program: Reactions, Attitudes and Perceptions of Teachers

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#### **Abstract**

In June 2012, the K to 12 Curriculum was implemented in the Philippines. Basic education is now thirteen years instead of the usual ten years. In the K to 12 Curriculum, the elementary grades will focus on the core learning areas namely: languages, mathematics, science and social studies. One of the highlights of the K to 12 Curriculum is the use of the eight major Philippine languages to teach Kindergarten to Grade 3 students. The Department of Education adopted the "Mother Tongue-Based Multilingual Education (MTB-MLE)" after pilot tests showed that students learn better when the language used at home is also used in the classroom. This study aimed to determine the reactions and attitudes of the teachers and the problems they encountered on the implementation of the Multilingual Education and the Teaching of Mother Tongue in the Philippines. The study utilized quantitative and qualitative research methods through document analysis, survey and interview. This paper focused in selected public elementary schools in four municipalities in Northern Isabela in the Cagayan Valley Region namely Cabagan, San Pablo, Santa Maria and Santo Tomas. Survey questionnaire, interview guide and observation checklist were used to document the problems, attitudes and perceptions of K to 3 teachers in the implementation of MTB-MLE for the K to 12 program. Results showed that the reactions, attitudes and perceptions of the teachers on the implementation of the MTB-MLE are generally favorable. However, the teachers encountered problems on availability of instructional materials and facilities.

Keywords: K to 12 Curriculum; Mother Tongue-Based Multilingual Education (MTB-MLE) Program; Reactions, attitudes and perceptions



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#### Introduction

Basic education in the Philippines underwent a radical change in June 2012 when the K to 12 Curriculum was implemented. Basic education is now thirteen years instead of the usual ten years, that is, kindergarten, elementary level which is still six years and high school which is now six years - four years junior high school and two years senior high school, rather than the usual four. This two-year addition in High School is supposed to bring our students at par with global standards and synchronize our educational system to world standards. It will also stream students into the more rational vocational college bound tracks that fill employment demands (Hall, 2012). With the curricular changes for these two additional years, higher educational institutions (HEIs) worry about the impact these changes will have.

In the K to 12 Curriculum, the elementary grades will focus on the core learning areas namely: languages, mathematics, science and social studies. One of the features of the K to 12 Curriculum is the use of the eight major Philippine languages to teach Kindergarten to Grade 3 (K to 3) students. The Department of Education (DepEd) of the Philippines adopted the "Mother Tongue-Based Multilingual Education (MTB-MLE)" program when results of pilot tests showed that students learn better when the language used at home is also used in the classroom. The establishment of Multilingual Education (MLE) support system is necessary to ensure the effectiveness of the use of mother tongue as medium of instruction.

The Mother Tongue Based-Multilingual Education (MTB-MLE) is the government's banner program for education as a salient part of the implementation of the K to 12 Basic Education Program. It was embodied in the Department Order Number 74, series of 2009, an order "Institutionalizing Mother Tongue-Based Multilingual Education (MTB-MLE). Its significance is articulated in Republic Act 10532, otherwise known as the "Enhanced Basic Education Act of 2013."

MTB-MLE is a formal or non-formal medium of communication, in which the learner's mother tongue and additional languages are used in the classroom. The MTB-MLE is a program where the medium of instruction is the mother tongue or the first language (L1) of the learners. In the teaching-learning process, both the teacher and the learners use the mother tongue in explaining the lesson. Other languages are also used during the discussion, provided these languages will help the teacher and the learners understand each other in the discussion

Learners begin their education in the language they understand best, their mother tongue, and develop a strong foundation in this language before other languages. Mother Tongue instruction allows teachers and students to interact naturally and negotiate meanings together, creating participatory learning environments that are conducive to cognitive as well as linguistic development. Children with a solid foundation in their mother tongue develop stronger literacy abilities in the school. Their knowledge and skills will be developed through languages. The implementation of MTB-MLE enables the learners to use different languages for success in school and for lifelong learning.

In rural areas, most of the Filipinos use the native language in their respective localities as their mother tongue. This is especially true before the 20th century.

Later when children go to school, they learn and adopt the Filipino language, the national language of the Philippines, which is very similar to Tagalog. They also learn the English language along with the Filipino language in the school. Learning Filipino and English languages became mandatory because of the bilingual policy. However, in the 20th century many parents trained their children to speak in Tagalog, no longer the native language in their localities because of its advantage in the school. Hence, the mother tongue of many children is not the native language in their localities. Many students find it difficult to relate with their teacher when the local language is used as the mother tongue in the delivery of the lesson.

The Ibanag speaking communities have variety and variation of Ibanag as their language. This is a reality in various places in Region 02 which include some communities in the province of Isabela, although, there are commonalities in the Ibanag language of the different Ibanag speaking communities. In the implementation of K to 12 Basic Education Program, the mother tongue is taught as a subject in the K to 3 levels and is used to emphasize the lessons in Grade 4 to Grade 12. Thus, mother tongue is very significant in the implementation of K to 12 Basic Education Program.

Some of the implications of the K to 12 Program include the following: graduates will be better prepared for higher education; graduates will have a better mastery of basics, and remedial courses will no longer be necessary, graduates of the K to 12 Program will be better prepared for work, thus they can go directly to work. In view of the implementation of the K to 12 Program, a development of a National Qualifications Framework is deemed necessary (Licuanan, 2012).

This study is primarily aimed at determining the perceptions, reactions and attitudes of the teachers on the implementation of the MTB-MLE program. Secondly, this research determined the problems and difficulties encountered by the teachers in the implementation of the MTB-MLE Program in terms of the following: Preparation and delivery of learning tasks, course content, textbooks, school's MTB-MLE facilities, students' mother tongue and school location.

## Methodology

The study utilized quantitative and qualitative research methods through survey and interview. This paper focused in selected elementary schools in four municipalities in Northern Isabela in the Cagayan Valley Region (Region 2) namely: Cabagan, Santa Maria, San Pablo and Santo Tomas. Stratified random sampling of schools was done. The respondents were teachers of the Department of Education teaching in the elementary level. There were 65 respondents from Cabagan, 51 respondents from Santa Maria and 18 respondents from San Pablo and 36 respondents from Santo Tomas, a total of 170 teachers.

In this study, a survey questionnaire was developed where the teacher respondents were asked to respond to statements describing their reactions, attitudes and perceptions, of the teachers on the implementation of the MTB-MLE program and the problems and difficulties encountered by the teachers in the implementation of the MTB-MLE Program in terms of the following: preparation and delivery of learning tasks, course content, textbooks, school's MTB-MLE facilities, students' mother

tongue and school location. An interview guide was also developed to supplement the survey.

## **Results and Discussion**

Teachers under the Department of Education are currently required to implement the MTB-MLB Program. In this study, the teacher respondents were asked to respond to statements describing their perceptions, reactions and attitudes on the implementation of the MTB-MLE program. In addition, the teachers responded to statements describing their problems and difficulties they encountered in the implementation of the MTB-MLE Program in terms of the following: preparation and delivery of learning tasks, course content, textbooks, school's MTB-MLE facilities, students' mother tongue and school location.

The summary of the results is shown in Table 1.

# 1. Teachers Reactions, Attitudes and Perceptions on the Implementation of the MTB-MLE

There were fifteen (15) statements and the respondents indicated their reactions, attitudes and perceptions, using a Rating Scale: 4 for very favorable, 3 for favorable, 2 for unfavorable and 1 for very unfavorable.

Based on the results of the survey, the teacher respondents' feelings, reactions and attitude on the implementation of the MTB-MLE are very favorable in terms of the following statements: the pupils will learn better their lessons; the teachers very much appreciate the effort of school administrators in implementing the program; the vitality of the mother tongue will be preserved; and the teachers would rather recommend pupils to learn their native language before a foreign language.

Table 1. Reactions, Attitudes and Perceptions of Teachers on the Implementation of the Mother Tongue-Based Multilingual Education (MTB-MLE) Program in the Philippines

Areas	Weighted Mean	Description
1. Teachers' Feelings, Reactions and Attitudes on the Implementation of the MTB-MLE	2.88	Favorable
2. Difficulties/Problems Encountered by the Teachers in the Implementation of the MTB-MLE Program		
2.1 On Preparation and Delivery of Learning Tasks	2.50	Moderately Difficult
2.2 On Curriculum Guide	2.39	Moderately Difficult
2.3 School's MTB-MLE facilities		
3.3.1 On MTB-MLE Textbooks and Other Printed Materials	2.65	Moderately Difficult
3.3.2 On Availability of MTB-MLE Facilities	2.78	Moderately Difficult
3.3.3 On Adaptation of Available MTB Facilities	2.57	Moderately Difficult
3.3.4 On School's Location	2.12	Not Difficult

The teachers have favorable feelings, reactions and attitude on the implementation of the MTB-MLE in terms of the following statements: the pupils will be fully prepared for college; the pupils with learning gaps could cope with their lessons even if other languages are used; pupils' poor learning will be corrected; they recommended for the sustainability because it enhances pupils' learning; and they believe that the quality of education for the past years could have not been deteriorated.

On the other hand, the teacher respondents have unfavorable feelings, reactions and attitude on the implementation of the MTB-MLE in terms of the following statements: the pupils are not interested to learn because of too many languages used in teaching; the MTB-MLE is an additional expense to the government; the program is a waste of time; and pupils cannot cope with difficulties in learning even if the lessons were using this program. In other words, the teachers feel that the pupils are still interested to learn the mother tongue even if there are many languages used in teaching such as English, Filipino and/or Tagalog, and Ilocano. Also, the teacher respondents do not agree that the MTB-MLE is an additional expense to the government. The teachers do not think that the program is a waste of time. In addition, the teacher respondents do not agree that pupils cannot cope with difficulties in learning even if the lessons were using this program, meaning, pupils can cope with their difficulties in learning even if the lessons were taught using the mother tongue.

Go (2012) said that the native language or mother tongue is a starting point for beginning reading in the grades while speaking knowledge of English has yet to be acquired by grade school pupils.

In fact, Caguioa (2013) reported that she observed an improved participation among her pupils where they could readily relate the lesson to their own experiences, prior knowledge and other socio-cultural background. Children learned faster and better since they are adept in their mother tongue. The students learned to read faster and fluently because of the songs, poems and rhymes were taught in Ibanag, the mother tongue of most of her pupils. In addition, they were able to think and understand their lessons well and were able to ask questions critically. The children enjoyed playing, singing with indigenous instruments such as coconut shells and improvised tambourines, dancing, dramatizing, writing paragraphs and simple essays. Mother Tongue is very much helpful and effective in the lower grade pupils for instruction.

Based on Table 1, the weighted mean is 2.88 which is described as favorable. This implies that the teacher respondents have a favorable reactions, attitudes and perceptions on the implementation of the Mother Tongue-Based Multilingual Education (MTB-MLE) Program.

The shift to the native language as medium of instruction started with the *Lingua Franca* Education Project through DECS (Department of Education, Culture and Sports now Department of Education) Memo 144, s. 1999. The current Mother Tongue-Based Multilingual Education (MTB-MLE) policy is the continuation of this project. This MTB-MLE approach is based on the premise that to be academically competent, a student must have a strong grasp of his native tongue/first language (L1). This means that education should start from "where the learners are and what they already know" (Nolasco, 2009). Building a strong L1 foundation, the student is then bridged to his/her second language/s (L2) by providing a strong training in his/her L2 listening, speaking, reading, and writing skills.

Lastly, the teacher respondents have very unfavorable feelings, reactions and attitude on the implementation of the MTB-MLE in terms of the statement, "this program might not prosper because the mother-tongue among pupils are different". This result implies that the teachers think that the MTB-MLE program may prosper even if the pupils have different mother tongue.

The culture of students in central areas and in remote barangays are different. It is assumed that the local language spoken by the people is regarded as the mother tongue in a certain municipality or community. However, with the introduction of bilingual policy, many parents trained their children in speaking using English or Filipino language particularly in the central area of a town or barangay (village). The Ibanag speaking communities have variety and variation of Ibanag as their language. Thus, teachers are cautious in the teaching of mother tongue.

# 2. Common Problems and Difficulties Encountered by Teachers in the Implementation of the MTB-MLE Program

# 2.1 On Preparation of Learning Tasks

The teachers had difficulty or encountered serious problems in the following: choosing appropriate activities for motivating the class; availability of resources for pupils' activities; sufficiency of training acquired for the implementation of MTB-

MLE; sufficiency of MTB-MLE materials; coping with the different mother tongue of pupils.

Based on the interview conducted by the authors, there are pupils who are not originally from the town and have different mother tongue. There is a need to guide these pupils and help them adjust to the mother tongue used in the locality.

The teachers had moderate difficulty or moderately encountered serious problems in the following: choosing appropriate teaching strategy; identifying the appropriate language to be used; planning how the learner can cope with the MTB-MLE for those pupils whose mother tongue is not the native language of the locality; adapting the available instructional materials due to the variety (version) of language used which is different from the locality; pupils' engagement in classroom activities due to unfamiliarity of one of the languages used; coping with the different mother tongue of pupils; orientation of the available materials is not patterned from the mother tongue of the locality; due to unfamiliarity of the mother tongue of pupils/locality; fluency/proficiency in the different mother tongue of pupils; and pupils' refusal to learn other languages specially the common mother tongue of the class.

Overall, the teachers have moderate difficulty or encountered moderately serious problems in the preparation and delivery of learning tasks in the implementation of MTB-MLE. The weighted mean is 2.5.

# 2.2 On Curriculum Guide

The teachers had moderate difficulty or moderately encountered serious problem in the following: vagueness of topics and lessons to be covered; achievement of the objectives of the lesson; proper sequence of topics; familiarity of terms used due to variety and variation of language used which is different from one locality to another; coverage of the lesson is too many or congested.

Overall, the teachers had moderate difficulty and/or encountered moderately serious problems in the preparation and delivery of learning tasks in the implementation of MTB-MLE. As seen in Table 1, the weighted mean is 2.39.

## 2.3 School's MTB-MLE Facilities

## 2.3.1 On MTB-MLE Textbooks and Other Printed Materials

The teachers encountered serious problem in attracting pupils' interests due to lack of appeal of textbooks in terms of figures and pictures; attracting pupils' interests due to lack of appeal of textbooks in terms of color; limitation of examples; limitation of questions and exercises making pupils just to understand the lesson rather than to develop the thinking process and reasoning ability of pupils; complicated terms used in writing the book; proper sequencing of the topics

The teachers had moderate difficulty or encountered moderately serious problems in vagueness of instruction; appropriateness to the ability of pupils.

Based on Table 1, the weighted mean is 2.65 which means that the teachers encountered moderate difficulty or moderately serious problems in the MTB-MLE textbooks and other printed materials in teaching.

Based on the interview made by the authors, there is a lack of instructional materials written in the Ibanag language. There are more Ilocano materials, however, most of the students do not speak Ilocano as most of the people in the community speak Ibanag. Ilocano is the language spoken by majority of the people in Isabela, however, in Northern Isabela, Ibanag is widely spoken.

# 2.3 2 On Availability of MTB-MLE Facilities

The teachers encountered serious problem in the availability of mother curriculum guide; audio-visual materials to support the hearing and sighting skills of pupils in mother tongue; modules, manuals and textbooks for further discussion of mother tongue; latest version of Ibanag dictionary; latest version of Ilocano dictionary; latest version of Ibanag Orthography; latest version of Ilocano Orthography; dictionary of mathematical/science/arts & humanities terms and concepts in mother tongue; supplies and materials for reproduction; equipment such as computer, photocopier, printer, and other facilities used for reproduction.

Overall, the teachers encountered serious problems in the availability of MTB-MLE facilities. The weighted mean is 2.78.

# 2.3.3 On Adaptation of Available MTB-MLE Facilities

The teachers encountered difficulty or serious problem in adapting (1) mother tongue curriculum guide because it is not patterned in the mother tongue of the locality; (2) modules, manuals and textbooks because it is not patterned in the mother tongue of the locality; (3) Ibanag dictionary since it is very rare and different from the variety and variation of the Ibanag language in the locality; (4) Ibanag Orthography since it is different from the variety and variation of the Ibanag language in the locality.

The teachers encountered moderate difficulty or moderately serious problem in adapting available MTB-MLE facilities due to varied mother tongue of pupils. Based on the weighted mean of 2.57, the teachers encountered difficulty or serious problems in adapting the available MTB-MLE facilities.

#### 2.3.4 On School's Location

The teachers encountered no difficulty or no serious problem on the following: native language of the locality is dominated by the pupil's mother tongue; some parent's mother tongue is not the native language; too many migrants; some teachers assigned in the locality are not native speakers; unavailability of an expert in the mother tongue to provide further knowledge and information in the locality; promptness to information on MTB-MLE.

The weighted mean is 2.12 which implies that there is no difficulty in terms of the school's location.

The materials used by the teachers to teach and materials that students use to learn are designed to reflect the goals of the curriculum of the Department of Education (DepEd) (Talisayon, et. al, 2000). They also believe that methods that teachers use to teach students and methods that teacher use to train teachers are means of implementing the curriculum. The success of the curriculum depends on the teaching and learning materials and the teaching and training methods. Changes in curriculum do not only focus on content but also on the mode of delivery. Thus, designing, developing and adaptation of appropriate instructional materials needed are important in the implementation of K to 12 Basic Education Program most especially the MTB-MLE program.

#### **Conclusions and Recommendations**

The current K to 12 curriculum implements the MTB-MLE program. One of the key features of the K to 12 Curriculum is the use of Mother Tongue as primary medium of instruction from K to 3. The formation of MLE support system is necessary to make sure the efficiency of the use of mother tongue in teaching K to 3 pupils.

In this study, the teacher respondents generally have favorable feelings, reactions and attitudes on the implementation of the MTB-MLE. The teacher respondents encountered moderate difficulty on preparation of learning tasks, curriculum guide and school's MTB-MLE facilities such as textbooks and other printed materials, availability of MTB-MLE facilities and adaptation of available MTB facilities. However, the teacher respondents did not encounter any difficulty on the schools' location.

The implementation of MTB-MLE in teaching K to 3 pupils helps the teacher in explaining the lessons well. This is also true for the pupils where they can understand and express their thoughts in the language where they are most comfortable with. One of the main concerns of the teacher respondents is the lack of textbooks, curriculum guides and other instructional materials written in Ibanag, the mother tongue of the communities involved in the study.

MTB-MLE is very important in the implementation of K to 12 Basic Education Program. While it is true that the teacher respondents generally have favorable feelings, reactions and attitudes on the implementation of the MTB-MLE, there is a need of more trainings specifically on the preparation of appropriate activities for the pupils.

In addition, more seminars and workshops regarding the implementation of MTB-MLE should be conducted. In-service trainings regarding MTB-MLE be conducted in DepEd Schools in Northern Isabela. Materials written in Ibanag currently available must be revised. The teachers' guide and the learners' material must be written using the mother tongue of the pupils.

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# Development of Mathematical Connection Skills of Grade II Students by Using Problem-based Learning with GeoGebra Program

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#### **Abstract**

The proposes of this study were 1) to develop the students' mathematical connection skills in order to pass the criteria of 50 percent of full score, 2) to study the relationship between the students' learning achievement and mathematical connection skills, and 3) to study the students' satisfaction toward the problem-based learning with GeoGebra program learning activities. The target group was 45 students of grade II student in academic year 2017 from Sarakhampittayakhom School, Muang, Mahasarakham. The research methodology is classroom action research which consists of three cycles. The research instruments were: 1) 12 lesson plans of the problem-based learning with GeoGebra program, 2) the mathematical connection skills test, 3) the learning achievement test, 4) the observation form, 5) the interview form, and 6) the satisfaction toward learning activity test. The data was analyzed by using mean, percentage, standard deviation and Pearson Correlation Coefficient.

The results were as follows

- 1. The students' mathematical connection skills mean scores in the first, the second, and the third cycle were 45.45, 57.47 and 62.76 percent respectively. It obviously be seen that the students' mean score passed the criteria of 50 percent of full score in the second cycle.
- 2. The relationship between students' learning achievement and mathematical connection skills in the first, the second and the third were 0.85, 0.87 and 0.81 respectively. It could be seen that there were highly positive relation in each circle.
- 3. The level of students' satisfaction toward problem-based learning with GeoGebra program learning activities was in high level.

Keywords: Mathematical Connection skills, GeoGebra program, Problem-based Learning, Thailand

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#### Introduction

Mathematics are very important in developing thinking ability, creative thinking and thinking logically. Moreover, mathematics can be integrated with science, technology and another fields (Ministry of Education, 2008, pp. 56.) In Thailand, mathematics consist of 5 skills which are 1) Problem solving skills 2) Reasoning skills 3) Mathematical expression skills 4) Mathematical connection skills and 5) creative thinking skills. Especially mathematical connection skills, it is very essential for students because these skills will make them understand and to be able to combine many mathematical knowledges together in everyday life problems logically (Ministry of Education, 2008, pp. 47). It is according to the concept of program for international assessment (PISA). PISA test is designed to assess the ability to understand the problems, the ability of integrating knowledges to solve problems and finding the solution properly (OEDC, 2017).

In 2015, the average score of PISA test for Thai student was 415 points out of 1,000 points, which was categorized to be under the average group by the score from students around the world at 490 points. It can be seen obviously that Thai students lacked of mathematical abilities when compared to another countries. Therefore, in order to confirm this problem, the researchers assessed the mathematical connection skills for grade II students in Sarakham Pittayakhom school, the number of all students were 45. The score for this test has been set to 5 levels which are very good, good, fair, pass and under criteria level. The results showed that no student in very good and good level but there were 4 students in fair level, 4 students in pass level and 37 students in under criteria level. Therefore the researchers want to find solutions which can improve mathematical skills especially mathematical connection skills of these students.

The researchers have studied many concepts and theories about learning activities that enhance the mathematical connection skills. We found that the way to develop the mathematical skills are 1) Giving students to solve the problems by themselves with a little guide from teacher 2) Using group activity to create interaction, discussion and help each other to solve the problems (IPST., 2003, pp. 172-173). It is according to the problem-based learning activity (PBL), PBL lets student to engage the problems by themselves and interaction among group which can lead to the clearly understanding and be able create several ways to solve the problems (Kammanee, 2016, pp. 137-138). Moreover, learning mathematics is sometime hard to understand because mathematics consist of many abstract knowledges. In order to make mathematics more concrete, we used technologies in modern day like mathematical programs which can be seen widely such as The Geometer's sketchpad program (GSP), MatLab program, Maple program and GeoGebra program. From the programs that mentioned, GeoGebra is the program we were interested because this program is widely used by teacher all over the world and GeoGebra program is also a free program or freeware which means no need to pay money for using it (International GeoGebra Institute, 2017). In GeoGebra program, there are many tools that provide teacher to construct the introduction media very easily for example 3D tools, conic section tools, and calculus tools.

As mentioned before, the researchers want to develop the mathematical connection skills of students in Sarakhampittayakhom School to be in pass level (More than 50

percent of full score) or above by using problem-based learning activity with GeoGebra program.

# **Research Purposes**

- 1. To develop the students' mathematical connection skills in order to pass the criteria of 50 percent of full score.
- 2. To study the relationship between the students' learning achievement and mathematical connection skills.
- 3. To study the students' satisfaction toward the problem-based learning with GeoGebra program learning activities.

# Target group

The target group was 45 students of Grade II student (Room 6) in academic year 2017 from Sarakhampittayakhom School, Muang Mahasarakham, Thailand.

## **Research Instruments**

- 1. 12 lesson plans of the problem-based learning with GeoGebra program.
- 2. The mathematical connection skills test.
- 3. The learning achievement test.
- 4. The observation form.
- 5. The interview form.
- 6. The satisfaction toward learning activity test.

# Methodology

This research is classroom action research, there are 4 steps in each cycle which are 1) Planning, 2) Action, 3) Observation and 4) Reflection. Which was detailed as the following.

# 1. Planning

- 1. Observing students who have problems with mathematical connection skills by using mathematical connection skills test that were adopted from Atchanee Chuchuaisuwan's mathematical connection skills test (2009, pp. 94-112). We only observed in the first cycle, for the next cycle we analyzed results from the reflection step form previous cycle in order to improve the next cycle.
- 2. Constructed the research instruments including 1) 12 lesson plans of the problem-based learning with GeoGebra program, 2) The mathematical connection skills test, 3) The learning achievement test, 4) The observation form, 5) The interview form and 6) The satisfaction toward learning activity test. After finished constructing, all research instrument were examined by experts to ensure the instruments were capable for using with the target group.

#### 2. Action

1. We applied the problem-based learning with GeoGebra program lesson plans to the target group. The lesson was vector in 3 dimensions as showed in table 1.

**Table 1** Problem-based learning with GeoGebra program lesson plans in each cycle.

Cycle	Lesson	Title	Time			
	1	3 Dimensional scene coordinates	1			
	2	Length between two points in 3 dimensional scene	1			
1		coordinates				
1	3	Vector	1			
	4	Adding and subtracting vector  Vector multiplication by scalar				
	5					
	6	Vector in 2 dimensional scene coordinates				
2	7	Vector in 3 dimensional scene coordinates				
2	8	Length of vector in 2 dimensions				
	9	Length of vector in 3 dimensions				
	10	Unit vector in 2 dimensions				
3	11	Unit vector in 3 dimensions				
	12	Directional cosine				
Total			12			

#### 3. Observation

- 1. We used the observation form to observe students during learning activities in each lesson plan.
- 2. We used the interview form to interview students for those who passed the 50 percent criteria and under 50 percent criteria. In order to compare the differences and causes for improving the next cycle.
- 3. We used the mathematical connection skills test and the learning achievement test to assess the mathematical connection skills and find the relationship between mathematical connection skills and learning achievement. After finishing all cycles, we used the satisfaction forward learning activity test to assess the satisfaction of students about problem-based learning with GeoGebra program learning activities.

## 4. Reflection

We analyzed the results from the mathematical connection skills score compared to the 50 percent criteria, the observation form and the interview form. From all results, we improve the learning activity to be effective enough to make the target group pass the criteria. Lastly, after all student passed the criteria, we analyzed the relationship between mathematical connection skills and the learning achievement.

#### Conclusion

The mathematical connection skills score after using problem-based learning with GeoGebra program compared to the criteria was showed in table 2.

**Table 2** The mathematical connection skills score after using problem-based learning with GeoGebra program compared to the criteria.

With GeoGebra program compared to the criteria.  Mathematical connection score						
		atical connection			Crysla 2	
ent	Cycle 1		Cycle 2		Cycle 3	T
Student No.	Percent	Assessment	Percent	Assessment	Percent	Assessment
SZ						
1	40.91	Under	54.55	Pass	63.64	Fair
2	50.00	Pass	63.64	Fair	63.64	Fair
3	45.45	Under	54.55	Pass	54.55	Pass
4	50.00	Pass	63.64	Fair	59.09	Pass
5	45.45	Under	54.55	Pass	59.09	Pass
6	40.91	Under	54.55	Pass	54.55	Pass
7	45.45	Under	63.64	Fair	59.09	Pass
8	54.55	Pass	54.55	Pass	63.64	Fair
9	40.91	Under	54.55	Pass	68.18	Fair
10	40.91	Under	40.91	Under criteria	68.18	Fair
11	40.91	Under	54.55	Pass	63.64	Fair
12	54.55	Pass	63.64	Fair	72.73	Good
13	45.45	Under	40.91	Under criteria	68.18	Fair
14	50.00	Pass	59.09	Pass	59.09	Pass
15	45.45	Under	68.18	Fair	68.18	Fair
16	59.09	Pass	63.64	Fair	54.55	Pass
17	50.00	Pass	68.18	Fair	59.09	Pass
18	40.91	Under	40.91	Under criteria	59.09	Pass
19	36.36	Under	54.55	Pass	63.64	Fair
20	50.00	Pass	63.64	Fair	77.27	Good
21	40.91	Under	63.64	Fair	54.55	Pass
22	40.91	Under	59.09	Pass	63.64	Fair
23	27.27	Under	54.55	Pass	72.73	Good
24	40.91	Under	50.00	Pass	68.18	Fair
25	31.82	Under	45.45	Under criteria	63.64	Fair
26	45.45	Under	45.45	Under criteria	72.73	Good
27	36.36	Under	59.09	Pass	63.64	Fair
28	31.82	Under	63.64	Fair	63.64	Fair
29	40.91	Under	63.64	Fair	54.55	Pass
30	45.45	Under	63.64	Fair	68.18	Fair
31	50.00	Pass	59.09	Pass	54.55	Pass
32	45.45	Under	68.18	Fair	54.55	Pass
33	45.45	Under	63.64	Fair	63.64	Fair
34	54.55	Pass	54.55	Pass	63.64	Fair
35	50.00	Pass	54.55	Pass	59.09	Pass
36	59.09	Pass	68.18	Fair	54.55	Pass
37	68.18	Fair	54.55	Pass	68.18	Fair
$\overline{X}$	45.45	Under	57.47	Pass	62.76	Fair
S.D.	7.98	-	7.64	-	6.06	-

From table 2, the mathematical connection skills score in the first cycle was 45.45 percent when compared to the criteria in was in the under criteria level, the score in the second cycle was 57.49 percent when compared to the criteria it was in the pass level and the score in the third cycle was 62.78 percent when compared to the criteria in was in the fair level. In conclusion, the mathematical connection skills was higher in every cycle after we applied problem-based learning with GeoGebra program lesson plans and all students obtained the pass level in the second cycle but the researchers want to ensure that the learning activities are compatible to escalate mathematical connection skills so we continue applying the third cycle.

The relationship between mathematical connection skills score and the learning achievement score of vector in 3 dimensions learning content was analyzed by using Pearson correlation coefficient. The results were categorized in to cycles as showed in table 3.

**Table 3:** The relationship between mathematical connection skills score after applying problem-based learning lesson plans and the learning achievement score about vector in 3 dimensions.

	Cycle 1		Cycle 2		Cycle 3	
Student No.	Mathematical connection skills percentage	Learning achievement percentage	Mathematical connection skills percentage	Learning achievement percentage	Mathematical connection skills percentage	Learning achievement percentage
1	50.25	52.13	55.82	61.12	65.27	66.17
2	65.43	63.28	63.56	66.67	67.83	73.35
3	56.72	51.26	59.74	63.34	65.87	62.34
<u>4</u> 5	43.26	45.11	51.25	56.89	58.13	63.94
	41.43	47.23	52.00	46.15	57.65	61.45
6	32.76	37.84	45.68	55.35	57.38	60.42
7	45.78	55.32	47.41	50.27	55.43	59.82
8	56.32	51.34	65.13	69.13	68.84	73.25
9	50.00	65.46	56.74	58.44	68.92	73.25
10	43.45	47.65	56.71	61.82	64.18	65.28
11	32.16	40.12	52.13	55.26	65.74	64.13
12	41.28	45.38	56.72	59.95	64.56	67.94
13	48.82	50.67	57.87	60.86	67.58	70.35
14	54.83	56.82	67.88	66.12	70.12	70.72
15	55.34	57.82	65.76	68.23	54.23	57.85
16	56.49	60.49	65.33	68.83	62.34	67.56
17	51.28	53.48	65.33	63.34	65.54	61.12
18	40.32	45.39	58.18	61.12	63.15	67.56
19	37.45	40.94	58.59	61.12	62.83	62.42
20	36.78	41.45	55.61	58.44	58.94	62.42
21	41.93	47.63	56.72	55.35	64.51	67.85
22	52.67	55.39	65.78	68.55	66.72	65.28

23	45.89	47.73	57.89	56.21	65.27	67.94
24	43.37	45.24	58.19	56.89	63.47	64.13
25	29.21	35.65	48.34	55.12	58.75	62.34
26	45.78	59.26	55.76	55.26	61.23	64.13
27	41.12	42.13	58.92	61.12	65.67	67.94
28	45.32	47.68	56.33	59.9	58.82	62.12
29	32.11	40.68	53.12	56.35	56.79	60.72
30	56.73	61.23	67.89	66.84	65.27	64.13
31	43.56	39.45	58.79	61.12	63.46	64.13
32	46.57	47.82	57.28	61.12	62.92	67.94
33	41.19	45.86	56.82	58.44	65.35	66.82
34	42.13	43.32	54.72	56.82	57.30	61.65
35	34.47	37.19	45.67	47.67	58.79	61.65
36	45.89	50.82	56.72	56.35	57.84	60.19
37	52.82	48.16	60.12	63.89	65.43	64.45
$r_{XY}$	0.85	·	0.87	·	0.81	

From table 3 the correlation between mathematical connection skills score after applying problem-based learning lesson plans and the learning achievement score about vector in 3 dimensions in cycle 1, 2 and 3 were 0.85, 0.87 and 0.81 respectively, when compare the Pearson correlation coefficient with the criteria (Bartz, 1999, pp. 184 as cited in Srisa-ard et al, 2012, pp. 92) we found that the correlation was in high level.

The satisfaction toward learning activity of students after we applied the problembased learning with GeoGebra program lesson plans were separated into 3 fields which are

- 1. The nature of work: how satisfaction student have with the learning activities for example the difficulty, contents, challenging and timing.
- 2. Workmate: How satisfaction student have with teamwork for example interacting, cooperation and good relation among group.
- 3. Reward: how satisfaction student have with the returns from the learning activities for example prolong memorizing, deeply understanding and mathematical connection skills.

The results were showed in table 4

**Table 4:** The satisfaction score toward problem-based learning with GeoGebra program learning activity of grade II students.

Item	Question	$\overline{X}$	S.D.	Satisfaction level
Field 1	: The nature of work			
	Student satisfies with the difficulty of the learning activities and it is suitable for student.			High
2*	Student feels that the learning activities are not suitable with the contents.	1.91	0.73	Low

<u> </u>	,		
Student satisfies that the amount of activities are suitable with time.	4.26	0.60	High
4* Student thinks the learning activities are difficult and bored.	1.97	0.74	Low
Student likes the challenging of the learning activities that allow student to learn and solve the problem by yourself.	4.34	0.58	High
Field 1 average	4.18	0.66	High
Field 2: Workmate	•	•	
6 Student likes that the members work together very well.	4.29	0.61	High
Student likes that the members honor each other and listen to other's opinions.	4.26	0.65	High
8* Student dose not satisfy that the members recommend each other to do improper things.	1.37	0.54	Lowest
9 Student likes that all members are friendly.	4.49	0.55	High
10* Student dose like group working.	2.17	0.70	Low
Field 2 average	4.30	0.61	High
Field 3: Reward			
Student satisfies that the learning activities can enhance the abilities to connect the mathematical knowledges together to solve the problems.	4.40	0.60	High
Student likes that the learning activities help student to understand the contents easier.	4.60	0.49	Highest
Student satisfies that the learning activities make student understand the contents deeply and longer.	4.54	0.55	Highest
Student likes that the learning activities can make student constructs the knowledge by yourself.	4.49	0.60	High
Student satisfies with the score that student obtain after the leaning activities have applied.	4.43	0.60	High
Field 1 average	4.49	0.57	High
Overall average	4.32	0.61	High

<sup>\*</sup> Negative question

From table 4 Students satisfaction toward learning activities overall score was 4.32 (S.D. = 0.61) which was in high level, when analyzed in the individual field we found that the satisfaction of students toward reward field had the highest score, average 4.49 (S.D. = 0.57) which was in high level. Next, the satisfaction toward workmate, average 4.30 (S.D. = 0.61) which was in high level and the satisfaction toward the nature of work, average 4.18 (S.D. = 0.66) which was in high level as well.

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# A Survey of Scientific Concepts of Grade 11th Students in Thailand

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#### **Abstract**

The purpose of this study was to survey scientific concepts understanding of grade 11th students. The sample was 116 students of academic year 2017 from school in Thailand selected by purposive sampling. The instrument was conceptual understanding test consisting of 15 questions. Scientific concept understanding are divided in to 5 levels 1) Complete Understanding: CU, 2) Partial Understanding: PU, 3) Partial understanding with Specific alternative conception: PS, 4) Alternative Conception: AC, 5) No Understanding: NU. The results showed that percentage of students considered in CU and PU levels were only 4.36 and 4.20 while percentage of students recognized as PU PS and NU levels were 7.87, 12.47 and 71.10 respectively. The results indicated that most scientific concept understanding of grade 11th students was in a low level.

Keywords: Scientific Concepts Understanding, Survey, Thailand



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#### Introduction

Science is the basis for learning to understand nature and the environment and this will result in the learner being able to link many knowledge into holistic knowledge. It will lead to create things, develop the quality of life, and develop the world sustainability. Science is important for developing countries. Science course is a system of activities which seek to describe, understand, and predict natural phenomena is term of cumulative body of experimentally verifiable laws, principles, and theories (Josef T yap, 1989). The core of science is scientific concept understanding. It is the ability to interpret, translate, explain about a particular topic from the stimulus experience observation or learning. Scientific concept understanding must requires fact and principles and then brought together into a conclusion. Then come to think of it as a conceptual. Physics is quite difficult to make students understand due to the fact that it compose of many abtract idea. Especially, The concept of electricity is abstract and hard to grasp. Electricity is invisible yet omnipresent in our lives. Many models of and analogies for electricity have been used, but none of them fully explains all of its aspects (Frederiksen, White, & Gutwill, 1999; Hart, 2008). Electricity is intangible nature causes many students, even those who have completed a physics course, to have incorrect ideas about it and about the behavior of electrical. If students did not understand basic concepts, it would be difficult for them to understand new physics concepts effectively. Therefore, teachers must know how their students perceive the concepts of electricity prior to designing appropriate learning activities to make the students understand the concepts correctly.

As above, the researcher want to survey the scientific concepts understading of grade 11th students. in Sarakhampittayakhom School, Mahasarakham Province, Thailand. The information will be useful and can be applied in the learning activities for developing students' scientific concepts understading.

# **Research Purpose**

The purpose of this study was to survey about scientific concepts understanding of grade 11th students.

# Sample

The samples was 116 grade 11th students from 3 classrooms which have same levels of the learning achievement of academic year 2017 from Sarakhampittayakhom school in Thailand.

## **Research Instruments**

The instrument in this research was the writing test consisting of 15 questions about electricity. The findings on the scientific concepts understanding were analyzed and categorized using the criteria of Westbrook and Marek (1992), criteria of students' scientific concepts understanding into five levels as follows:

1. Complete Understanding (CU): Responses that include all components of the validated response.

- 2. Partial Understanding (PU): responses that include at least one of the components of validated response, but not all the components.
- 3. Partial understanding with Specific alternative conception (PS): responses that show understanding of the concept, but also make a statement, which demonstrates a misunderstanding.
- 4. Alternative Conception (AC): responses that include illogical or incorrect information.
- 5. No Understanding (NU): responses that repeat the question or contain irrelevant information or an unclear response or leave the response blank.

## **Procedure**

In this research, the data of the scientific concepts understanding of grade 11th students was collected by using the scientific concepts test. The process of collecting data as following:

- 1. The researcher selected the sample from 3 classrooms of grade 11th student in academic year 2017 from Northeast of thailand by using purposive sampling.
- 2. The students were asked to do the test to identify scientific concepts understanding.
- 3. The data were analyzed and categorized using the criteria of Westbrook and Marek (1992).

#### Results

The levels of scientific concepts understanding of 11th grade students in Thailand shown in 5 levels 1) Complete Understanding (CU) was 4.36% 2) Partial Understanding (PU) was 4.20% 3) Partial understanding with Specific alternative conception (PS) was 7.87% 4) Alternative Conception (AC) was 12.47% and 5) No Understanding (NU) was 71.10%. The data were showed in Table 1.

**Table 1**: The levels of students' scientific concepts understanding of electricity

		levels of scientific concepts (number of					
Concept	No.	participants)					
_		CU	PU	PS	AC	NU	
	1	4	5	19	38	50	
Electric current	2	1	8	18	31	58	
	3	0	1	17	14	84	
Ohm's law and resistance	9	3	7	17	25	64	
Electrical resistivity and	7	5	6	11	17	77	
electrical conductivity	8	5	9	10	21	71	
Electromotive force and	4	3	6	11	24	72	
electrical potential	10	1	3	12	6	94	
difference	10						
Electrical energy and	14	5	1	1	10	99	
electric power	14	3	1	1	10	99	
Resistor	11	6	1	0	0	109	
Electric meter	5	0	0	8	14	94	
Electric meter	6	10	5	3	4	94	
Calculate the electrical	15	27	19	4	0	66	
energy of electronics and	12	4	1	0	0	111	
circuits and safe use	13	2	1	6	13	94	
electric	13						
Included		76	73	137	217	1237	
Percentage		4.36%	4.20%	7.87%	12.47%	71.10%	

Note: CU = Complete Understanding, PU = Partial Understanding, PS = Partial Understanding with Specific alternative conception, AC = Alternative Conception and NU = No Understanding. (Westbrook, S.L., & Marek, E.A, 1992)

From the study, it was found that most students did not have scientific concept understanding of electricity especially concepts of resistor in question no.11 and calculate the electrical energy of electronics and circuits and safe use electric in question no.12 which were 109 and 111 students respectively.

### Conclusion and discussion

According to the study, it was found that the answers of students were not correct because a lot of students could not describe the reason of their answer or do the calculations. From student informal interview, we found a lot of students did not understand concepts of electricity because it was difficult to understand and they had to calculate too many equations. Therefore, this might be the reasons why 116 students were classified to No Understanding (NU) and Alternative Conception (AC). These might be because teachers often taught electricity by merely explanation or having some illustrations, and as a result, the teachers could not explain the steps of calculate clearly, and the students hardly imagined and then misunderstood. In the learning process that encourages students to analyze information and to have concrete visualization by themselves, the teacher might use new learning activities or experimental that can help the students apply their experience. According to the constructivist teaching approach, information is constructed socially (Duit, 2002) and

internal motivation gained through group work has an important role in structuring the knowledge (Pintrich, Marx, & Boyle, 1993).

## Recommendation

This research describes about the level of the scientific concepts understanding of only grade 11th students in Sarakhampittayakhom school, Thailand.

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# Internal Audit in the Philippine Provincial Government Office (PGO)

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#### **Abstract**

The study evaluates the internal audit of Provincial Government Office (PGO) in terms of the organizational attributes and functions to identify the demographic profile of respondents, its organizational perspective and the internal audit activities performed by the office. Results show that most of the respondents have taken Accountancy course with professional licensure of Certified Public Accountants with the designation positions as Internal Auditor on a hold over capacity of their permanent plantilla position such as Accountant IV, Management and Audit Analyst and Provincial Government Division Head. On the position level in the organization, majority are internal audit supervisors. On the aspects of organizational perspective, most of the units are created by an Executive Order and established within one to three years or newly created with one to three personnel complement. For the internal audit activities performed by the unit, the highest frequency is "Audit of compliance with regulatory requirements." The significant difference in demographic profile if the respondents are the college course taken which reveals that there are Nursing and Biology graduates were assigned and on organizational perspective, their creation was thru office order with insufficient staff. Thus, the researcher then recommends for the oversight bodies of the PGO to necessitate the institutionalization of the Internal Audit Unit in compliance with existing provisions and for the academic institution to infuse more topics on government accountability and public financial management in the general education system.

Keywords: (Internal Audit, Organizational Perspective, Compliance)



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#### Introduction

Internal audit in the Philippines have been developed throughout the years. The series of laws and executive issuances have been made the internal audit in the government. As early as 1962, the law that creates for internal audit was issued – the Republic Act 3456 or the Internal Auditing Act of 1962. This serves as the general reference, policies and other legal instrumentalities that pertain to government internal audit. The act provided for the creation, organization and operation of internal audit services as an independent staff unit in all departments bureaus, and offices of the national government. Then the broadening of the coverage by amending the RA 3456 to RA 4177 on March 26, 1965 of the internal auditing to include the local government and government owned and controlled corporations.

Several forces in recent times have also led to an intense evolution in internal auditing. These forces include the need for an improved accountability in utilizing public money and the increasing expectations of the public for the most economical, efficient and effective manner of delivering public services. These require government agencies to be transparent, that is to provide the public the adequate information about government and services. There have been established administrative safeguards and system of controls in the government agencies to ensure efficient and effective operations yet there is still the need to evaluate these controls. Conditions may change and new technology emerge thus systems of controls must also constantly updated so as the internal audit process and activities.

Internal auditing is an independent appraisal activity design to add value and improve the effectiveness of risk management, control and governance.(ISPPIA 2013) Government agencies realized the importance of internal auditing and recognized their need for it but others are reluctant in giving full support. This perspective probably stems from lack of understanding of the true nature, objective and function of internal auditing (Dizon, 1990).

At present, internal auditing is not limited to review of accounting and financial activities but an appraisal, verification and analysis of financial, operations and compliance on procedures, regulations, policies and programs, and achievement of performance, targets and contractual obligations.

One of the economic agenda of the current administration highlights the importance of a reliable road network that brings people to work and back to their families affordably and ease. The goal is also to strengthen LGUs as able partners in national development which will be fulfilled not by giving additional funds out of political will or favor but to condition such resources in the implementation of higher governance, standards, improvement of their capacity to generate resources and strengthening of their ability to deliver basic services. (DILG- DBM joint Circular Memorandum no.2017 – 2 dated April 26, 2017)

To improve the competency of the provinces in public financial management which defines—a system of rules, procedures, and practices for government to manage public finances. It encompasses budgeting, accounting, auditing, cash management, management of public debt, revenue generation and public reporting on public sector financial operations.

While Internal Control is the plan of organization and its coordinate methods and measures to safeguard its asset, check the accuracy and reliability of accounting records an encourage adherence to prescribed managerial policies. This essential element of the internal control is control environment. It consists of the organizational structure, as well as the management and personnel set-up of an agency. The creation of an agency is always for a specific purpose and the structure of an agency should be based on its particular mandate, mission and functions. Coordinated Methods and Measures are the control processes that are implemented and which form part of the normal recurring operations of an organization. They comprise the policies, rules and regulations in every agency management system that support and it became integral to the operations. Under the view of the private entity Internal control - as the process designed and effected by those charged with governance, management, and other personnel to provide reasonable assurance about the achievement of the entity's objective. (System and procedures plus human resources working to achieve the common goal)

## **Internal Audit in Provincial Local Governments.**

The Local Government Code of 1991 provides that local accountant shall also perform internal audit services. This is entirely questionable and unacceptable. Thus, the provisions of AO No. 70 and DBM Budget Circular No. 20014-4 mandating LGU's to create a separate IAU equivalent to a department level are both honored and hailed. However, there are sectors whose legal conviction is that the Code should be followed. (Internal Auditing in Philippine Government: Initiatives, Issues and Prospects by Rufo Mendoza, PhD, CPA)

The issue of disparity is not only seen in the international-local dichotomy. This is equally apparent in the practices across and within levels of government. The discrepancy happens not only in organizational structure and staffing but also in the scope and nature of services rendered.

A survey commissioned by The PAGC and conducted by a private auditing firm, SGV & Co. showed that a relatively large number of government agencies do not have IAU's: 44% in NGAs48% in SUCs, 27% in GOCCs 65% in provincial and city government and 100% in municipal government. The survey reflects the apparent lack of compliance to government issuances, it also shows that the government is keeping track of the state progress of IAS in various agencies. The project is expected to result in IAUs established in more agencies and LGUs as well as provide adequate internal control in the government and high standards of IA operations.

This research used descriptive method specifically the survey questionnaire as the main tool in gathering the needed data. The questionnaire was designed to answer the problems raised in this study and focus on gathering the status, problem and prospects of IAU among the PGO in the Philippines. The respondents of this research were the Head of Internal Audit (HoIA) unit or by the representatives of PGO that are present during the Training-Workshop on the Implementation of Internal Audit Unit and Internal Control System for Provincial LGU's.

The following is the profile of the PGO as to place represented:

	No. of Province	No. of Person Represented
Luzon	24	50
Visayas	6	6
Mindanao	8	16
Total	38	72

The PGO represented on the said conference have a total of seventy four ,and the number of provinces are thirty eight which is 46.9 % of the PGO in the Philippines. Interview was also used to gather pertinent data of the research.

Under the CMGP Program on criteria (B) entitled Public Financial Management, Internal Audit Unit must be established and functional in accordance with applicable guidelines issued by DBM and CSC and the projects of the provincial offices are regularly subjected to internal audit process based on the approved Internal Audit Plan. Internal Audit Positions. Legislations and executive issuances on the creation of IA in the government among others are RA No. 3456 issued June 16, 1962 with the general provisions in providing for the creation, organization and operation of internal audit services in all departments, bureaus, and offices of the national government and RA 4177 issued March 26, 1965 amendments to RA 3456 to include Local Government Units and Government Owned and Controlled Corporations, PD 1445 issued June 11, 1978 Government Auditing Code of the Philippines, RA 7160 issued on Oct 10, 1991 Local Government Code of the Philippines, providing for the local accountant to take charge of internal audit services and AO No. 70 Strengthening of the internal control systems of government offices, agencies government owned and control corporations including government financial institutions and local government units (LGUs) in their operations. Internal Audit positions in the PGO with Designations have frequency of 19 with a percentage of 50%, while those with Plantilla positions are 9 PGO with percentage of 23.68%, while other positions are being carried to the office without designations nor plantilla item positions. These series of laws for the creation of IA in the government has not enable various units to establish the IA in their respective offices. The DBM Circular 2004-4 was issued March 22, 2004 the Guidelines on the Organization and staffing of Internal Audit Units (IAUs) with CSC MC No. 12 issued June 22, 2006 provides the qualification standards for internal auditor positions. Despite of these, the IA positions in the Provincial Government have low turnout in the creations of IAUs.

The PGO with Internal Audit Units are performing "Audit of compliance with regulatory requirements" got the highest frequency of 18 and followed by "Evaluating effectiveness of control system" which has a frequency of 17. For the governance reform targets for the PGO in connection with the Internal Audit activities, there must be a Baseline Assessment of Internal Control Systems (BAICS).

Furthermore, on the aspect of the "Service and Role of IA" a study on IA in the public sector conducted by the Institute of Internal Auditors (IIA) Research Foundations, they use the Internal Audit Capability Model Matrix to determine what level is the organization with identified matrix on the capability of internal audit. The matrix for

Services and Role Of IA for level 1 have indicate of an Ad Hoc and unstructured; isolated single audits or reviews of documents and transactions for accuracy and compliance; outputs dependent upon the skills of specific individuals holding the position, no specific professional practices established other thatn those provided by professional associations; funding approved by management\, as needed; absence of infrastructure; auditors; likely part of a larger organizational unit; no established capabilities; therefore no specific key process areas. For Level 2 Compliance auditing and Level 3 Advisory services: Performance/ Value for Money Audit. This study shows sixty two have no response.

As per Administrative Order No. 278, the internal audit activities include ascertaining the reliability and integrity of financial and operational information, ascertaining the extent of compliance and reviewing the system established, ascertaining the extent to which the assets and other resources are accounted for and safeguarded from losses of all kinds among others. With these guidelines the IA have the awareness of their role and responsibilities of IAU in the government.

On the CMGP Program again on the criteria(B) entitled Public Financial Management, Internal Audit Unit must be established and functional in accordance with applicable guidelines issued Furthermore, the recommendations in the Internal Audit Report must be promptly implemented by the Local Chief Executives and the concerned provincial offices.

## **Conclusions**

The Provincial Government Office represented in the study consists of fifty provinces from Luzon, six provinces in Visayas and sixteen provinces in Mindanao with a total of 72 respondents. The current state of Internal Audit Unit in the PGO is characterized by the following: Internal Audit Units consists of the college course taken with Bachelor in Accountancy have a percentage of 37.52 with CPA licensed percentage of 23.6, with designation percentage of 50 as Internal Auditor. The respondents with college course taken of Bachelor of Science in Accountancy have the highest frequency of 27 which is evident that the internal audit in the government is the primary course to consider in the post. The other course taken are part of business courses such as Bachelor of Science in Commerce, Bachelor in Business administration major in Marketing Management and Engineering courses that is necessary for the performance of some IA functions.

**Table 1:** Frequency and Percentage Distribution of Organizational Attributes as to Creation of Internal Audit

Organizational Attributes of		
Internal Audit in PGO	Frequency	Percentage
Created by Executive Order	16	42.10%
Institutionalized	14	36.85%
Without Internal Audit Unit	8	21.05%
	38	100.00%

For the organizational attributes of the Provincial Government Office with Internal Audit Unit / Service that are created by Executive Orders are 16 provinces with small number of personnel under the bracket of 1-3 of employees with 1-3 years established in the province and have several names of office such as Internal Audit Service Division, PGO Internal Audit Section, Provincial Internal Audit Service and Provincial Internal Audit Office. For the position title for IA, most of the positions are by designations specifically on provincial local government units (LGUs) for which the Provincial Accountants are designated as IA and at the same time performing both functions in their operations.

Internal Audit positions in the PGO with Designations have frequency of eleven respondents while those with Plantilla positions are nine provinces while other positions are being carried to the office without designations nor plantilla item positions.

The series of laws and guidelines for the creation of IA in the government has not enable various units in the government to establish the IA in their respective offices. The DBM Circular 2004-4 was issued March 22, 2004 as the guidelines on the organization and staffing of Internal Audit Units (IAUs) with CSC MC No. 12 issued June 22, 2006 provides the qualification standards for internal auditor positions. With these guidelines, the IA positions in the Provincial Government have not yet still institutional in their respective provinces or agencies units thus creations of IAUs needs more compliance. For the total number of employees in provinces with IA most of the personnel complement is 1-3 employees only, for which include the HoIA, Supervisor or staff IA. Provinces with IA have 1 – 3 years established indicating that some are only created for the compliance on the CMGP program for them to qualify in the grant for financial subsidy to provincial LGUs.

**Table 2:** Frequency and Percentage Distribution of IA Positions

PGO with Internal Audit Title		
Positions	Frequency	Percentage
Designations	19	50.00%
With Plantilla Positions	9	23.68%
Others	10	26.32%
Total	38	100.00%

On the "Service and Role of IA" This study shows sixty two have no response which shows that most of the provincial IA are not aware of the structured role and services of internal auditing. They have limited knowledge on the "Services and Role of IA "which resulted to their functions are based on the instructions from the provincial local chief executives. For the activities performed by Internal Audit Units in the PGO most activities are "Audit of compliance with regulatory requirements, evaluating effectiveness of control system, Auditing financial report Investigation of fraud and irregularities, and other duties that are found necessary with conduct of audit. This means the IA activities are isolated single audits or reviews of documents and transactions for accuracy and compliance; outputs dependent upon the skills of specific individuals holding the position, no specific professional practices established other that those provided by professional associations; funding approved by management\, as needed; absence of infrastructure; auditors; likely part of a larger

organizational unit; no established capabilities; therefore no specific key process areas.

 Table 3: Frequency and Percentage Distribution of IA Activities Conducted

Internal Audit Activities Conducted	Frequency
Audit of compliance with regulatory requirements	18
Evaluating effectiveness of control system	17
Auditing financial reports	11
Investigation of fraud and irregularities	8
Others	10

The researcher recommends for the oversight bodies in the creation and establishment of IAUs in the government to necessitate the implementation of the enabling laws in IA by giving allocation of budget by DBM and continue making incentive programs and rewards to its creation and maintenance and functional IAUs.

For the higher educations and academic institutions the researcher suggests for the inclusion of subjects or topics on government accountability and public financial management in the general education system for readiness in working in the government and also to be able practice public accountability.

For the Government Internal Auditors either by designations or permanent plantilla positions to aim and pursue graduate and post graduate studies to enhance their competencies and to make them more qualified in the IA positions. To continue establishing linkages and joining organizations of internal auditors as this will help them in the practice of the IA profession.

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## A Survey of the Mathematics Problem Solving Ability of Grade 10th Students in Thailand

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#### **Abstract**

The purpose of this study was to survey the Mathematics Problem Solving ability of grade 10th students. The participants were 51, grade 10th students at Sarakhampittayakhom school in Mahasarakham province, Thailand, 2nd semester of 2017 that selected by purposive sampling. The instrument was Mathematics Problem Solving ability test that was multiple choice, 30 articles. The data was analyzed by using mean, percentage and standard deviation. It was found that the mean score of Mathematics Problem Solving test was 15.57 of 30. In addition, the percentage of Mathematics Problem Solving score can show qualitative score as follows more than 80 percent is excellent, 60-79 percent is good, 50-59 percent is medium, less than 50 percent is weak. The results show that the number of students who were excellent level were 4, good level were 8, medium level were 17 and weak level were 22.

Keywords: Mathematics Problem Solving Ability



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#### Introduction

Mathematics problems are really difficult. These statements are quite familiarly heard when students are inquired about their homework. They seem to be struggling with their homework especially on mathematics problem-solving. Mathematics problem solving is not a topic but a process underlie the whole mathematics programmes which contextually helped concepts and skills to be learned (Ibrahim 1997). Many mathematics skills were involved in problem-solving. However, large numbers of students have not acquired the basic skills they need in mathematics (Mohd Nizam & Rosaznisham 2004; Berch & Mazzocco 2007).

According to the results of The National Institute of Educational Testing Service (Public Organization) (O-NET) in Thailand indicate the grade 12th Students in Thailand, academic year 2559 had a mean score 24.88 points out of 100 points, which lower than the benchmark of 50 percent. (National Institute for Educational Testing 2017). Problem solving is a core of mathematics because the students have to use thinking skill, principles, rules and formulas in mathematic for solving problems successfully. In addition mathematics problem solving ability is important skill for learning mathematics so teachers should thoroughly teach the process of problems solving skill to students and teacher have to explain each process of problem solving until all students understanding. Although there are some students who can solve the problems by themselves but many students do not know how to start the solving problem, how to solve the problem. As the result shows that some students lack basic knowledge and they do not understand the correct problem solving process. (IPST.209).

Problem-solving is categorized into two aspects; i) how the problems are delivered-linguistic (using words) or non-linguistic (using graphic or problem based); and ii) the illumination of the problem structure – information, objective and action-plan (Zhining et al. 1995). According to Ibrahim (1997), there are two main procedural steps in problem-solving: i) transforming the problem into mathematical sentences; and ii) computation of the operational involved in the mathematical sentences. Difficulties faced among students were more noticeable during the first procedural step in solving problem compared to the other. Polya (1981) problem-solving have 4-hierarchy phase; i) understanding problem; ii) planning; iii) performing the plan; iv) confirmation of the answer. It's obviously show that the process starting from the minute students is faced with the problem until the end when the problem is solved.

As above, the researcher want to survey the mathematics problem solving ability of grade 10th students. in Sarakhampittayakhom School, Mahasarakham Province, Thailand. The information will be useful and can be applied in the learning activities to enhance students' mathematics problem solving ability.

## **Research Purposes**

The purpose of this study was to survey the Mathematics Problem Solving ability of grade 10th students.

## Target group

The target group was 51 students of Grade 10th student (Room 7) in academic year 2017 from Sarakhampittayakhom School, Muang Mahasarakham, Thailand.

## **Research Instruments**

The research instrument of this study was Mathematics Problem Solving ability test that was multiple choice, 30 articles.

## Methodology

In this research, the data of mathematics problem solving ability was collected by using the multiple choice, 30 articles. The process of collecting data as following:

- 1. The researcher selected the sample from 3 classrooms of grade 10th student in academic year 2016 from Northeast of Thailand by using purposive sampling.
- 2. The students were asked to do the test to identify mathematics problem solving ability.
- 3. The data were analyzed and categorized using the criteria of The institute for the Promotion of Teaching Science and Technology (IPST).

### Result

The levels of mathematics problem solving ability of 10th grade students in Thailand shown in 4 levels 1) excellent were 4 2) good were 8 3) medium were 17 and 4) weak were 22. The data were shows in Table 1.

**Table 1:** The levels of mathematics problem solving ability of each students.

No.	Score	Percentage	mathematics p	No.	Score	Percentage	level
110.	Score	Tercentage	icvei	110.	Score	Tercentage	icvei
1	18	60.00	good	27	12	40.00	weak
2	7	23.33	weak	28	16	53.33	medium
3	15	50.00	medium	29	12	40.00	weak
4	17	56.67	medium	30	17	56.67	medium
5	20	66.67	good	31	16	53.33	medium
6	12	20.00	weak	32	21	70.00	good
7	16	53.33	medium	33	11	36.67	weak
8	15	50.00	medium	34	16	53.33	medium
9	14	46.67	weak	35	10	33.33	weak
10	16	53.33	medium	36	19	63.33	weak
11	14	46.67	weak	37	12	40.00	weak
12	15	50.00	medium	38	10	33.33	weak
13	8	26.67	weak	39	24	80.00	excellent
14	23	76.67	good	40	14	46.67	weak
15	17	56.67	medium	41	17	56.67	medium
16	12	40.00	weak	42	8	26.67	weak
17	21	70.00	good	43	11	36.67	weak
18	14	46.67	weak	44	16	53.33	medium
19	16	53.33	medium	45	16	53.33	medium
20	20	66.67	good	46	11	36.67	weak
21	14	46.67	weak	47	17	56.67	medium
22	14	46,67	weak	48	25	83.33	excellent
23	24	80.00	excellent	49	13	43.33	weak
24	13	43.33	weak	50	16	53.33	medium
25	23	76.67	good	51	12	40.00	weak
26	24	80.00	excellent				

The results show that the percentage of mathematics problem solving ability levels of students, excellent level was 7.84%, good level was 15.69%, medium level was 33.33% and weak level was 43.14%. The data were shows in Table 2.

**Table 2:** The number of students and percentage.

Levels	Number of students	Percentage
Excellent (more than 80%)	4	7.84
Good (60-79%)	8	15.69
Medium (50-59%)	17	33.33
Weak (less than 50%)	22	43.14

#### Conclusion and discussion

According to the study, it was found that the answers of students were not correct because they cannot solve the mathematics problems and a lot of student lack of knowledge basic, calculating skill. In addition, the researcher have interviewed the students about how to solve mathematic problems. From student inquiries, we found that many students did not understand questions and they do not know how to begin for solving mathematic problems. Therefore, this might be the reasons why 22 students were classified to weak level. As a result, the teachers should teach the steps of solving problem and explain the process of solving clearly. The teacher might use new learning activities to enhance mathematics problem solving ability of students. This statement was supported by (Bender, 2012). Students who experienced difficulties reading a problem were unable to provide correct answers. In addition, correct of the problem may not be enough for finding the correct answers to a problem, because the mathematical problems involved in the problem must also be understood. There is also a need for students to develop problem solving skill besides understanding the process of the problem solving and the basic knowledge involved in the problem. In addition to the development of problem solving skill, how to apply these strategies to new situations must be understood correctly. Strengthening teacherstudent and student-student relationships is very importance for the understanding of mathematics problems (Mercer & Sams, 2008). Therefore, basic knowledge and the problem solving skills of students should be handled together and instructional activities should focus on the process of mathematics problem solving and another mathematics skills.

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# An Introduction to Intercultural Communication Using Scenes from the Film, Zootopia

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#### **Abstract**

This study reports on the use of the Disney film, Zootopia, as an educational tool in a college-level English course. The Ministry of Education, Culture, Sports, Science and Technology (MEXT) prioritizes the advancement of international education. We argue that, to this end, it is important to develop activities to enhance students' intercultural understanding. Using interesting clips from popular films is an effective way of motivating students and nurturing their understanding. This study aims to enhance participants' intercultural understanding through a practice-based EFL (EFL: English as a Foreign Language) course. To this end, students were divided into pairs and group and were required to discuss and note their ideas on worksheets. The practical EFL course was designed especially for students from Kosen College, Japan. The results of questionnaires administered before and after the classes revealed that the course enabled the students to enhance their intercultural competence. In particular, screening certain scenes from Zootopia enabled the students to enhance their intercultural competence and capacity for intercultural communication. This study can also be used a framework for designing practice-based EFL classes to enhance students' intercultural understanding.

Keywords: communication, EFL, film, intercultural competence, intercultural understanding, material development, stereotype

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#### Introduction

As the number of countries dealing with the phenomenon of immigration has increased recently, the question of multiculturalism has become more salient among the international community. Notably, the United States of America (USA) alone has received approximately 60 million immigrants from all over the world since the midnineteenth century. As a result, it is currently the most multiracial and multicultural state in the world (Nakano, 2010). Immigration does not only engender diversity and multiculturalism; it also complicates intercultural communication, and this sometimes results in communication problems.

Zootopia (2016), a recent Disney film, calls attention to the challenges posed by intercultural communication. Interestingly, the animated film does so by presenting a diverse world populated by various species of anthropomorphic mammals. Unlike previous Disney films, Zootopia focuses on real-life interracial or intercultural problems. In addition, the film is also a significant departure from Disney's preference for formulaic happy-ending stories. For the purpose of this study, we designed an intercultural workshop based on the theoretical work of Kim and Gudykunst (2003). Feedback received from the participants showed that the workshop enabled them to become more aware of the challenges engendered by increased intercultural interaction. The workshop facilitated in-depth discussions in the participants' mother tongues to improve their awareness and understanding of the nuances of intercultural communication

#### Literature Review

Although the Ministry of Education, Technology and Science (hereinafter referred to as MEXT) has prioritized the cultivation of intercultural competence in its drive to develop global human resources, Japanese higher education, however, does not provide many opportunities for students to develop their intercultural competence. Nonetheless, to address the challenges posed by increasing globalization, the ministry aims to develop global human resources with good English proficiency and a sound understanding of the demands and nuances of intercultural communication. To this end, the Japanese government also seeks to enhance intercultural competence at the tertiary levels of Japanese educational settings (Central Council for Education, 1996 and 2010).

Japanese teachers, therefore, focus on facilitating intercultural communication to enhance students' intercultural competence, which is fast becoming a critical skill in the context of global human resources. Aoki's *Intercultural Communication* (2016), one of the most popular books in this field, argues that intercultural understanding is mainly impeded by the wide circulation of one-sided stereotypes, which, the author argues, is mostly politically motivated.

It is especially important to tackle stereotypes to enhance intercultural competence through formal education. Moreover, it is not possible to acquire unbiased perspectives without challenging and eliminating the assumptions we produce naturally and unconsciously in our daily life. Hanamitsu et. al (2013) suggest that stereotype is a form of patterned thinking, which mostly affects people's perceptions of social categories, such as sex, occupation, and race. Human beings also tend to rely

on stereotypes to process information, which in turn has a negative impact on their capacity for intercultural competence.

The DIE theory, developed Gudykunst and Kim (2003), focuses on the cognitive processes involved in social interactions, including the application of stereotypes. In particular, the theory focuses on three cognitive processes people typically employ when they meet strangers: description, interpretation, and evaluation. Description pertains to the ways in which we cognitively register objective details of our meeting. Our interpretations, the theory suggests, are shaped by on our experience and perceptions. Our evaluation of the person and the meeting are based on our points of view, which in turn are shaped by our cultural background. As per Gudykunst and Kim, although we typically go through these process without much cognitive mediation, a person of high intercultural competence, they argue, is capable of controlling not only these processes but also their assumptions or stereotypes. Therefore, one way to enhance students' intercultural competence is by teaching them to control these cognitive processes.

## **Research Questions**

Given the above, this study mainly examines the following two questions:

- Q1) How do films help students to improve their intercultural competence and communication?
- Q2) Can the *DIE Theory* enable students to understand the nuances of intercultural communication?

#### Methods

## Research Site: Kosen college in Japan

Unlike most Japanese universities, Kosen College offers a five-year, practical and professional education program for junior high school graduates. In some cases, the college offers seven-year education programs for students, especially engineers, enrolled in advanced courses. These courses cater especially to students who already the possess the capacity to work in mid-level roles in industrial production sites. In the earlier stages of the regular five-year program, students are offered both general and specialized education, but the focus lies on providing quality general education. In the later stages, however, students are offered more specialized education. Students enrolled in the regular course become members of the Monozukuri Engineering Department and recieve associate degrees, whereas students in the advanced course receive a bachelor's degree in Creative Engineering.

### **Main Educational Goals:**

Both courses focus on developing the following skills: practical skills, basic skills, humanity and social skills, communication skills, and creative skills. By developing students' communication skills, the college aims to produce engineers who can communicate clearly in a globalized world and workspace.

The college mainly prepares students for TOEIC (Test of English as International Communication). However, the college does not offer courses to help students understand the nuances of intercultural communication. Therefore, this study aims to introduce students to the basic principles of intercultural communication, thereby creating awareness about this type of communication.

## **Participant Profile:**

In total, 164 third grade students from Kosen College participated in the study. The participants were divided into 4 groups and were required to enroll in English 3 during the course of this study. The average TOEIC score was approximately 327, which is a typical beginner level EFL score. Although most participants had not traveled abroad, all of them regarded English as an essential language.

Typically, one of us—the researchers—taught the students, whereas the other observed the class. We chose a scene involving Judy and Nick at the US Department of Motor Vehicles (DMV) as the communication setting. In this scene, Judy and Nick find it difficult to obtain information from a clerk at the DMV.

In the film, all clerks at the DMV, a notoriously crowded place, are sloths, a slow-moving arboreal mammal. Judy and Nick find it extremely difficult to communicate with these sloths. This scene was chosen because it involved simple English dialog. In addition, the participants were able to empathize with Judy. Participants found it easier to relate to and understand Judy's body movements, facial expressions, and her tone of speaking.

This study is based on the content analysis method developed by Ishii, S. et al (2013). Content analysis is especially useful in the context of intercultural communication research, and it requires the researcher to register free descriptions in an Excel worksheet. We used this method to identify the keywords students tended to use in each task. According to AXSIS Corporations, a Japanese consulting firm, keywords can be identified using three main steps: extracting, arranging, and identifying. By doing so, researchers can identify frequently used key words or phrases.

## **Results**

Participants were informed beforehand that they would mainly be required to answer subjective questions during the workshop; they were only required to substantiate their answers. Participants were also required to prepare for in-depth discussions.

Participants were required to watch the film the CALL classroom. However, they watched the film on their own PCs. After watching the film, the students were instructed to assess Judy's situation using the DIE theory. They were also required to register comments in a worksheet. Following this, students discussed the scene in pairs and groups. Students then presented their thoughts and ideas using a microphone.

We observed that the students were curious and excited about the workshop. In fact, the workshop was the students' first experience of a practical class about intercultural understanding. Overall, the atmosphere was conducive for learning and the students

were very willing to participate in the proceedings. Students were also required to complete a questionnaire at the end of the workshop.

Through the workshop, students realized that, as future engineers, it was important for them to develop intercultural understanding. They also realized the importance of addressing and overcoming stereotypes.

#### **Discussion**

Students were required to recall the basic points about the *DIE* theory before viewing the clip. We explained the task, including how to fill the worksheet, in Japanese. However, we did not inform the students beforehand that they were only required to focus on Judy's point of view. As a result, some students were confused and found it difficult to complete the task. For instance, some students assumed that they were required to focus on Flash's point of view. We realized that it was very important to provide clear instructions beforehand.

After watching the clip, the students discussed the significance of the scene. The discussion was also intended as an exercise in listening. In addition, the students also engaged in what Yashiro (2016) calls assertive communication. Overall, we encountered no problems during the workshop, and students were more forthcoming than anticipated. Almost all students answered the questionnaire positively. Some of their comments are as follows: "I enjoyed the class and sharing ideas is meaningful." "We should accept the difference in a global society." "In Japan, Flash is a representation for elderly people or people who work very quickly." "From now on, I would like to communicate with people without any discrimination." "I want to take this kind of lessons more in the future."

In addition, one of the comments read, "We should hire people for a suitable job. That is more effective." Through the workshop, the students also learned how to create efficient products. Approximately 67% of the participants answered the free description question.

Future studies should aim to encourage students to think about the stereotypes circulated within Japan society, as well as the common stereotypes about Japanese people.

#### Conclusion

In sum, by screening certain scenes from the film, *Zootopia*, we were able to enhance students' understanding of intercultural communication. In addition, this study can be used a guide for designing introductory lectures and educational programs about intercultural understanding. The short duration of the workshop and the number of the participants limit the generalizability of the findings. We also aim to conduct experimental lessons for other students of the college as well.

## Acknowledgment

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Appendix: Worksheet

**ZOOTOPIA** Handout

Description (状況判断):

Class	No	Name	
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Practice: 映画を観て、次の内容について考えてみよう。

Scene: Meeting Flash (哺乳類自動車局 DMV での場面) 登場人物 Judy ウサギ、Nick キツネ、Flash ナマケモノ

客観的に状況を説明してください。誰がどこで何をしていま	
すか?	
Interpretation (解釈):	
Judyは、この状況から何が分かった?	
<u>sudy 182</u> 207 p(7)(18 5)[-]18 7] 18 5/2 .	
TO 1 (* (FIETHER MIT)	
Evaluation (価値判断):	
・・・・・・・・ 一・・・・・・・・・・・・・・・・・・・・・・・・・・・・	
Judy にとって、解釈した状況は好ましいですか?嫌いで	
すか? その理由は?	
L	
1.ビデオクリップを再度みて、( )に英単語一語を入れな	さい。
Nick: Flash, Flash, Hundred Yard Dash! Buddy, it's nice to see	
Flash: Nice to (1. ) you too.	- <b>y</b>
Nick: Hey, Flash, I'd love you to meet my friend. Ah Dar	ling, I've forgotten your
name.	
Judy: Hmm. Officer Judy Hopps, ZPD. How are you?	
Flash: I am doing just	
Judy: (2. )?	
Flash: as well as I can be	
Flash:- What	
Nick: Hang in there.	
<u>Flash:</u> - (3. ) I do	
Judy: Well, I was hoping you could run a plate	
Flash: - for you	
Judy: - Well, I was hoping you could	
Flash:today?	
Judy: Well, I was hoping you could run a plate f	or us. We are in a
(4. ) big	
(5. ).	
Flash: - Sure (6. ) the plate	
Judy: - 2-9-T	
Flash: - (7. )?	
Judy:- 2-9-T-H-D-0-3.	

Meeting Flash のシーンであなたが考えたこと、学んだことは何ですか。(ir Japanese)
振り返り: 今日の授業を全体的に振り返って、感想、自由意見を書いてください。 (in Japanese)

## The Mother Tongue-Based Multilingual Education (MTB-MLE) Program: Teachers Competencies and Pedagogical Practices in Teaching Mother Tongue

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#### Abstract

The study primarily seeks to assess the background, knowledge, competencies and pedagogical practices of the K to 12 teachers teaching mother tongue and using MTB-MLE as medium of instruction (MIO). Also, it aims to determine effectiveness of the teaching mother tongue/using mother as medium of instruction in the classroom in terms of learning tasks/activities and delivery mode. The quantitative and qualitative research designs through document/trend analysis, survey and interview were utilized. Results show that the teachers are academically qualified and capable of implementing the MTB-MLE. The Department of Basic Education (DepEd) conducted varied and relevant trainings and seminar workshops in different levels for the implementation of the MTB-MLE, however, utmost participation of the direct implementers is not well considered particularly on the aspect of contextualization of teaching-learning process of MTB-MLE and teacher's skills in developing instructional materials. The teachers promote the practice of multilingual approach in teaching. They are satisfactory in their competencies in the teaching of mother tongue/using MTB-MLE as medium of instruction and in applying varied pedagogical practices in teaching mother tongue and using multilingual education as medium of instruction. Teachers' learning tasks/activities of teachers stimulate pupils' interests, develop critical thinking, varied and adequate, source of enjoyment, have clear procedures and instructions, toward real-life situation, bring level of accuracy in skills to pupils and develop opportunity of learners on what they are capable of doing. They provide a learning environment and great opportunities for students to learn effectively their mother tongue as manifested by their use of various instructional methodologies and strategies.

Keywords: MTB-MLE Program; Teachers' Competencies; Pedagogical Practices; and Medium of Instruction



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#### Introduction

In the Philippines, the shift to the native language as medium of instruction started with the Lingua Franca Education Project through DECS Memo 144, s. 1999. The Mother Tongue-Based Multilingual Education (MTB-MLE) policy is the continuation of this project. This MTB-MLE approach is based on the premise that in order to be academically competent, a student must have a strong grasp of his native tongue or first language (L1). This means that instruction should start from where the learners are and what they already know. Building a strong L1 foundation of younger generations will scaffold a solid bridge for them to learn their second language (L2). Consequently, Section 4 of Republic Act 10533, otherwise known as "An Act of enhancing the Philippine Basic Education System by strengthening its curriculum and increasing the number of years for Basic Education, appropriating funds therefore and for other purposes", provides that:

"Basic education shall be delivered in languages understood by the learners as the language plays a strategic role in shaping the formative years of learners." (DepEd Order No. 31 s. 2013)."

The learners gradually learn how to communicate globally through the different stages of becoming multi-lingual. First, the learner acquires his/her mother tongue and this is classified as L1 or first language. Second, the learner adopts his/her national language or second language and this is classified as L2. Third, he/she learns the languages of the other places within his/her country and languages of other countries such as English in order to become globally competitive and this is classified as L3.

Benchmark studies conduct in the international setting show that learners are more likely to achieve better in school when offered opportunities to learn in their mother tongue, particularly in Japan, China, Indonesia, Thailand, etc. Go (2012) believes that the native language is a preliminary medium for beginning reading in the grades while speaking English has yet to be acquired by grade school pupils.

A remarkable level of participation among pupils could be seen in classroom if they could readily relate the lesson to their own experiences, prior knowledge and other socio-cultural background. Children learned faster and better since they are adept in their mother tongue.

Ibanag is one of the native languages used in the northern most part of the Philippines. Caguioa (2013) reported that children in school learned to read quickly and fluently because of the songs, poems and rhymes were taught in Ibanag (mother tongue of most of her pupils). She also said that children enjoyed playing, singing with local instruments like coconut shell and improvised tambourines, dancing, dramatizing, writing paragraphs and simple essays. Thus, children are able to understand the lesson; think well, argue well and ask questions properly and critically.

One of the influences of Americans to Filipinos is the use of English as medium of instruction in the school which have been maintained to the present in the Philippine educational system. Towards this goal, Filipinos were bound to learn English language when the Americans took over the government of the Philippine Republic. The spirit of

using the mother tongue of Filipinos in the classroom became insignificant. To cope with the standard of learning with the use of English as medium of instruction, pupils are trained to speak English in the classroom.

With birth of Bilingual Policy in the country, the spirit of L1 or national language in the classroom was emphasized. Thus, learner adopts his/her national language or second language in classroom.

Majority of Filipinos particularly in the rural areas use the native language in their respective localities as their mother tongue before the 20th century. Later when they go to school, they learn and adopt the national language, the Filipino language. They also learn English language along with Filipino language in the school. Learning Filipino and English languages became mandatory because of the bilingual policy. However, in the 20th century many parents trained their children to speak in Tagalog and some in English no longer the native language in their localities because of its advantage in the school. Hence, the mother tongue of the many children is not the native language in their localities.

With the end goal of making Filipino children lifelong learners, they must be equipped in their L1 (Mother Tongue), L2 (Filipino, the national language) and L3 (English, the global language) so that learning of new concepts is spontaneous until they grew up. These should be taught systematically so that learners will be more prepared to develop their competencies in the different learning areas. The L1 is used to support learning when learners find difficulty in the use of L2 and L3.

In terms of cognitive development, the school activities will engage learners to move well beyond the remembering, understanding, applying, analyzing, evaluating and creating levels to cover the higher order thinking skills in L1 which they can move to other languages effectively.

The adequate and sufficient background of learners in L1, L2, and L3 should be provided to them to become multilingual, multi-literate, and multi-cultural citizens of the country. Teachers have great responsibility in the implementation of MTB-MLE in the classroom as well as the administrators. Thus, the researchers deem necessary to evaluate the initial implementation of MTB-MLE in order to gather feedback for the improvement of this program.

The study primarily seeks to assess the background, knowledge and competencies of the K to 12 teachers in terms of educational qualification, teaching experience, teaching mother tongue or using of MTB-MLE as Medium of Instruction and pedagogical practices in the teaching of MTB-MLE. Also, it aims to determine effectiveness of the teaching mother tongue/using mother as medium of instruction in the classroom terms of learning tasks/activities and delivery mode.

### Methodology

This study utilized a quantitative and qualitative research design through document/trend analysis, survey and interview.

The study focuses in one province in the Cagayan Valley region (R 02) which is Isabela. The northern most part of the Philippines. The subjects of the study consisted of 170 which were taken from the four (4) Ibanag speaking communities in Isabela and broken down as follows: Cabagan–65, Santa Maria-51, San Pablo-18 and Santo Tomas-36. The respondents were pupils, teachers, head teachers and principals.

Survey questionnaire was developed to determine background, knowledge and competencies of K to 13 teachers in terms of educational, teaching experience, teaching mother tongue or using MTB-MLE as Medium of Instruction, pedagogical practices in the teaching of MTB-MLE, also for the effectiveness of learning tasks/activities, delivery mode and assessment procedures. Interview guide was used to validate the data gathered from questionnaire.

The survey questionnaires and interview guides were subjected to content validation and reliability. Document analysis pertaining to profile of teachers was undertaken.

The educational background, teaching experience and trainings and seminar workshops on MTB-MLE attended by teachers and medium instruction were analyzed to determine their competencies and pedagogical practices in the implementation of the K to 12 MTB-MLE Program. Also, the effectiveness of teaching MTB and using MTB as medium of instruction in learning tasks and delivery mode, the instructional methods and strategies used.

Frequency, percentages and arithmetic mean were utilized to analyze the quantitative data. The data generated from document analysis, interview and observation of classes on the capability of teachers teaching mother and using MTB-MLE in teaching in the implementation of K to 12 program were analyzed and categorized to generate interrelated themes/thoughts that emerged from the data.

## **Results and Discussion**

## A. On Teachers' Teaching Competencies in Teaching Mother Tongue/Using MTB-MLE as Medium of Instruction

### **Educational Qualification.**

The K to 3 teachers are mostly BEEd graduates (25 or 38.46%), 8 or 12.31% are BSEd and very few for the following degree courses: BSIEd, BSIEd, BSHT, BSBA and AB. About half (12 or 48%) of them took general education or obtained all content courses/areas instead of an area of specialization. Some also had Filipino (7 or 28%) and English (5 or 20%) as their area of specialization.

About 30% (19) of the K to 3 teachers are master's degree holder with major field of specializations as follows: English, Filipino, mathematics, science, social studies, educational management, administration and supervision.

Some K to 3 teachers earned units (from 12 to 48) in master's degree (22 or 33.85%). Likewise, these teachers majored in of field of specializations which include English, Filipino, mathematics, science, social studies, educational management, administration and supervision and general education.

On overall, most of the teachers who obtained master's degree or with units in master's degree specialized in educational management.

Based on sample surveyed only is a doctorate degree holder.

The aforesaid results imply that elementary teachers are academically qualified not only on the content and teaching rudiments but also toward higher level of skills that is, on leadership and management of the school environment as whole. Seemingly, teachers are expected to cope with the demands of the changes in the educational setting, particularly on curriculum. Thus, teachers are apparently capable of implementing the MTBMLE.

## **Teaching Experience.**

Most of K to 3 teachers had teaching experience within 5 years or less, 6 to 10 and 16 to 20 years while very few are from 20 to 30 and 31 and above.

## Trainings and seminar workshops on MTB-MLE attended by teachers.

The training and seminar workshops attended by K to 3 teachers are presented in Table 1. Based on the sample surveyed data, majority (18) of the K to 3 teachers attended the seminar on K to 12 Mother Tongue-based (MTB). Also, most (14) of the teachers attended the Orientation on the Use of Mother Tongue Ibanag Materials. Very few the following: Division Bench Marking Conference & Enhanced Seminar Workshop, Division Enhancement Training Workshop on MTB-MLE, Regional Workshop on the Development of MTB Teaching Learning Materials for G1, Ibanag MTB-MLE Project Orientation Conference Workshop, Seminar Workshop on K to 12 MTB-MLE, Training Workshop on Contextualized of MTB-MLE, MTB-MLE Regional Training for G3 Teachers, Regional Training on MTB, Joint Cabagan-Santa Maria MTB-MLE Benchmarking Conference & Enhancement workshop, Training of Trainers on Oral Language and MTB-MLE, Harmonizing of Indigenous Peoples Education (IPED) Lessons Emphasis in Ibanag.

The number of hours allotted for the different trainings and seminar workshops range from 8 to 80 hours (1 to 10 days) of which majority was carried on from 8 to 24 hours (1 to 3 days).

It can be inferred from the above finding that the Department of Basic Education (DepEd) conducted varied and relevant trainings and seminar workshops in different levels for the implementation of the MTB-MLE. However, utmost participation of the direct implementers is not well considered particularly on the aspect of contextualization of teaching-learning process of MTB-MLE considering that this is one of the features the K to 12 Basic Education program. Also, on teachers' skills in developing instructional

materials which is one of the essential facets to be contextualized in the teaching-learning process.

Generally, the time allotment for the majority of the trainings and seminar workshops is not adequate and capacitation of skills learning among teachers may be not warranted.

However, based on the interview with k to 3 teachers echoing of trainings and seminar workshops has been conducted with the goal to capacitate them on the necessary knowledge and to effectively implement the MTB-MLE

Seemingly, the goal of DepEd to provide adequate and efficient skills in implementing MTB-MLE as a result of echoing might affect the implementation of this program. In particular, the teachers will be hard up in tailoring their lesson to real-life situation, larger setting or wider sociological text in order to achieve greater understanding among students.

Likewise, teachers will have a dilemma in the development and adaption of instructional materials.

Table 1. Trainings and Seminar Workshops on MTB-MLE Attended by Teachers

Title of Trainings & Seminar	Number of	Number of	Level
Workshops	Teachers	Hours	
1. Orientation on the use of Mother Tongue			
Ibanag Materials	14	24	Regional
2. K to 12 MTB	18	40	Provincial
3. Division Bench Marking Conference on			
MTB-MLE	2	16	Division
4. Division Enhancement Training Worksh			
on MTB-MLE	4	8	-do-
5. Regional Workshop on the Development			
MTB Teaching Learning Materials for C	1	16	Regional
6. Ibanag MTB-MLE Project Orientation			-do-
Conference Workshop	3	16	
7. Seminar Workshop on K to 12 MTB-MI	1		
		40	Division
8. Training Workshop on Contextualization			
MTB-MLE	2	24	Provincial
9. MTB-MLE Regional Training for G3			
Teachers	1	80	Regional
10. Regional Training on MTB	1	36	Regional
11. Joint Cabagan-Santa Maria MTB-MLE			
Benchmarking Conference &	2	16	District
Enhancement workshop			
12. Training of Trainers on Oral Language	1		
and MTB-MLE		24	Division

13. Harmonizing of Indigenous Peoples			
Education (IPED) Lessons Emphasis in	1	24	Division
Ibanag			
14. Contextualized IPED Lesson Exemplar			
	1	24	Division
15. Capability Building on the Dev't of IPI			
Learning materials	1	24	Division

## Medium of instruction used in teaching.

The Ibanag language as the predominant mother tongue of pupils in the locality is commonly (36) used as the medium of instruction in the K to 3 subjects, followed by Filipino (35) and English (32). Only 4 used Filipino.

Most of the teachers (31) use Ibanag from 1 to 5 years while 9 for English, 8 Filipino and they have been using it within 1 to 5 years. Very few use Filipino and English for the varying range of the number of years. There 65 teachers under survey.

The mother tongue of the majority of the pupils in the locality is used as the medium of instruction in the K to 3 program.

Ibanag language is predominantly used as medium of instruction in the K to 3 program in at most five (5) years since the K to 12 was only implemented in 2012 and bilingual policy was still used prior to this date.

The above findings indicate that teachers are practicing multilingual approach in teaching K to 3 subjects. It seems that K to teachers promote one of the features of the K to 12 program.

Table 2 shows that the Ibanag language is mainly used as the medium of instruction in teaching Edukasyong sa Pagkatao (ESP), Mathematics, Araling Panlipunan (AP), MAPEH and Science. Some K to 3 teachers also use Ilocano, Filipino and English as medium of instruction in all subjects.

Table 5. Medium of Instruction Used in Teaching the Different Subjects

	Language			
Subjects	Ibanag	Ilocano	Filipino	English
Edukasyon sa Pagpapakatao				
(ESP)	25	4	4	1
Mathematics	27	1	4	2
Araling Panlipunan (AP)	18	-	2	-
MAPEH	16	-	4	1
Science	8	-	5	2

The above analysis indicates that generally, the K to 3 teachers adhere to the DepEd order No. 31 s. 2012 which states that Mother Tongue is used as a Medium of Instruction (MOI) for Grades 1 and 2 for teaching Mathematics, AralingPanlipunan (AP), Music, Arts,

Physical Education and Health (MAPEH) and EdukasyonsaPagpapakatao (EsP). With this trend of implementation of one of the main features of the K to 12 program, pupils are expected to understand their lessons better.

## **Teacher's Competencies in MTB-MLE.**

The teaching competencies of teachers in teaching mother tongue/using MTB-MLE as medium of instruction is presented in Table 3. The teachers are very satisfactory in using first language (L1) to support pupils learning the language.

Teachers are satisfactory in the following: using L1 as a medium of instruction in the class, engaging pupils in applying mother tongue in group activities, engaging pupils in participating actively in the lesson through motivational words expressed in L1, translating assignments, activities, exercises, songs, poems, etc. that are written in other languages to pupils mother tongue, applying knowledge and skills learned from the seminar-workshop on MTB-MLE, adapting the variety and variation of language in the teaching and learning process, adapting the MTB-MLE materials in teaching despite the variety and variation of the language used and implementing the prescribed curriculum.

Based on overall, the teachers are satisfactory in their competencies in the teaching of mother tongue/using MTB-MLE as medium of instruction.

Apparently, the teachers are generally equipped towards teaching mother tongue and using multilingual as medium of instruction.

### **B.** On Pedagogical Practices

The pedagogical practices of teachers in teaching mother tongue/using MTB-MLE as medium of instruction is presented in Table 3. It shows in the table that teachers are very satisfactory in the following: using common mother of tongue of pupils or the majority language in the class, translating difficult/unfamiliar words in L1 of pupils and encouraging pupils' class participation with the use of their mother tongue.

On the other hand, the teachers are satisfactory in the following: using the different mother tongue of pupils as medium of instruction, discussing with co-teachers how to implement the program, making alternative solutions in explaining the lesson to pupils whose mother tongue is different from the mother tongue of majority, introducing songs written in pupils' mother tongue to arouse their interests in the lesson, introducing poems written in pupils' mother tongue to emphasize the lesson, introducing sayings and quotations written in pupils' mother tongue to emphasize the lesson, introducing games written in pupils' mother tongue to arouse their interests in the lesson, allowing the pupils to do role playing using their mother tongue as medium of communication, introducing prayers written in mother tongue, consulting experts in mother tongue other colleagues in case of vague lessons on MTB-MLE, using mother tongue to emphasize the lesson and involving pupils in group activities using their L1.

Based on overall the teachers are satisfactory in their competencies in pedagogical practices in teaching mother tongue and using multilingual education as medium of instruction.

The aforementioned results imply that seemingly, teachers are set to use varied pedagogical practices in teaching mother tongue and using multilingual education as medium of instruction.

Table 3. Mean Rating and Descriptions of Teaching Competencies and Pedagogical Practices of Teachers in Teaching Mother Tongue/Using MTB-MLE as Medium of Instruction

Aspects	Mean Rating	Description
1. Teaching Competencies	4.34	Satisfactory
2. Pedagogical Practices	4.12	Satisfactory

## C. Effectiveness of Teaching MTB/Using MTB as Medium of Instruction

## On Learning Tasks/Activities.

The K to 3 teachers provide learning tasks in form of the following: group activity, role playing, individual activity, introducing oneself, dialogue, differentiated activities, activity sheet, singing activity, chart, short story, presenting Ibanag poems, introducing Ibanag songs and introducing rhymes songs.

### **Effectiveness of Learning Tasks Used.**

The effectiveness of the learning tasks/activities provided by teachers in teaching mother and using MTB-MLE as medium of instruction based on their perceptions is presented in Table 4. The data on the table shows that teachers' learning tasks/activities are always relevant to the objective of the lesson and appropriate to the ability of the students.

Also, teachers' learning tasks/activities are very effective source of motivation for learning, for enhancement and facilitation of learning, and encouragement of pupil's participation. The teachers are always toward preparing learning tasks/activities which are appropriate application of their lesson.

Table 9. Mean Rating and Description of Effectiveness of Learning Tasks of Teachers in Teaching Mother Tongue/Using MTB-MLE as Medium of Instruction

Teaching Would Tongue, Comg WID WEE as I	Mean	
	Rating	Description
1. Relevance of learning activities/tasks to the objective of the		Very
lesson.	4.7	Effective
2. Appropriateness of activities/tasks to the ability of pupils	4.56	Very
		Effective
3. Learning activities/tasks in stimulating pupils' interests.	4.47	Effective
4. Learning activities/tasks in motivating learning.	4.58	Very
		Effective
5. Learning activities in developing critical thinking.	4.3	Effective
6. Learning activities/tasks in enhancing learning.	4.5	Very
		Effective
7. Learning activities/tasks facilitating learning.	4.61	Very
		Effective
8. Learning activities/tasks as varied and adequacy.	4.44	Effective
9. Learning activities/tasks in encouraging more pupil	4.5	Very
participation.		Effective
10. Learning activities/tasks as appropriate application of the	4.5	Very
lesson.		Effective
11. Learning activities/tasks as source of enjoyment.	4.42	Effective
12. Learning activities/tasks as clear procedures & instructions.	4.45	Effective
13. Learning activities/tasks were towards real-life situation.	4.38	Effective
14. Learning activities/tasks in bringing the learner to a level of	4.35	Effective
accuracy in the skills.		
15. Learning activities/tasks provide the pupils opportunity to	4.45	Effective
develop what they are capable of doing.		
Overall Mean Rating	4.48	Effective

The learning tasks/activities of teachers re effective in stimulating pupils' interests, developing critical thinking, varied and adequate, source of enjoyment, have clear procedures and instructions, toward real-life situation, bring level of accuracy in skills to pupils and develop opportunity of learners on what they are capable of doing.

## D. On Delivery Mode

## **Instructional Methods and Strategies Used.**

The K to 3 teachers commonly employed the following instructional methods and strategies: games, lecture method, differentiated instruction, peer teaching, contextualization, interactive, group discussion, Socratic method, sharing ideas, flashcards, oral recitation and participative learning in teaching mother tongue. Other methods and strategies used were simulation, pair-share, inquiry approach and explicit teaching.

The aforesaid findings indicate that apparently, the K to 3 teachers provide a learning environment and great opportunities for students to learn effectively their mother tongue as manifested by their use of various instructional methodologies and strategies.

## **Effectiveness of Instructional Methods and Strategies Used.**

The effectiveness of teachers' instructional methods and strategies used in teaching mother tongue and using MTB-MLE as medium of instruction based on their perceptions are presented in Table 5. Analysis of the data shows that the instructional methods and strategies used by the teachers are always appropriate to the objective of the lesson, appropriate to the ability of pupils and of source of stimulating pupils' interests and motivating learning.

Also, teachers always use varied and adequate instructional methods and strategies to develop critical thinking, encourage more pupils' participation, and to enhance and facilitate learning. Also, Teachers' instructional methods and strategies always promote outcomes-based learning.

Table 5. Mean Rating and Description of Effectiveness of Teachers' Instructional Methods and Strategies in Teaching Mother Tongue/Using MTB-MLE as Medium of

	Mean	Description
	Rating	
1. Appropriate to the objective of the lesson.	4.65	Effective
2. Appropriate to the ability of pupils.	4.65	Effective
3. Stimulate pupils' interests.	4.55	Effective
4. Motivate learning.	4.7	Effective
5. Develop critical thinking.	4.56	Effective
6. Encourage more pupil participation.	4.67	Effective
7. Enhance learning.	4.7	Effective
8. Facilitate learning.	4.7	Effective
9. Varied and adequate.	4.5	Effective
10. Promote outcomes-based learning.	4.6	Effective
Overall Mean Rating	4.61	Effective

The teachers are likely toward using varied instructional methods and strategies to facilitate effective delivery of instruction in order to achieve the expectations in the classroom based on their perceptions.

## **Summary of Findings**

The K to 3 teachers are mostly BEEd graduates and about half took general education or obtained all content courses/areas instead of an area of specialization. Few had Filipino and English as their area of specialization.

About one third of the K to 3 teachers are master's degree holder and also about one-third earned units in Master's program with major field of specializations as follows: English,

Filipino, mathematics, science, social studies, educational management, administration and supervision and general education. Only one is a doctorate degree holder. Most of the teachers who obtained master degree or with units in master's degree specialized in educational management.

Most of K to 3 teachers had teaching experience within 5 years or less, 6 to 10 and 16 to 20 years while very few are from 20 to 30 and 31 and above.

About one-third of the K to 3 teachers attended the seminar on K to 12 Mother Tongue-based (MTB) and about one-fourth attended the Orientation on the Use of Mother Tongue Ibanag Materials. Very few attended the following: Division Bench Marking Conference & Enhanced Seminar Workshop, Division Enhancement Training Workshop on MTB-MLE, Regional Workshop on the Development of MTB Teaching Learning Materials for G1, Ibanag MTB-MLE Project Orientation Conference Workshop, Seminar Workshop on K to 12 MTB-MLE, Training Workshop on Contextualized of MTB-MLE, MTB-MLE Regional Training for G3 Teachers, Regional Training on MTB, Joint Cabagan-Santa Maria MTB-MLE Benchmarking Conference & Enhancement workshop, Training of Trainers on Oral Language and MTB-MLE, Harmonizing of Indigenous Peoples Education (IPED) Lessons Emphasis in Ibanag.

The number of hours allotted for the different trainings and seminar workshops range from 8 to 80 hours (1 to 10 days) of which majority was carried on from 8 to 24 hours (1 to 3 days).

The Ibanag, Filipino and English languages are predominant used as the medium of instruction in the K to 3 subjects and very few used Ilokano.

Most of the teachers have been using Ibanag for at most 5 years.

The Ibanag language is mainly used as the medium of instruction in teaching Edukasyong sa Pagkatao (ESP), Mathematics, Araling Panlipunan (AP), MAPEH and Science. Some K to 3 teachers also use Ilocano, Filipino and English as medium of instruction in these subjects.

The teachers are very satisfactory in using first language (L1) to support pupils learning the language.

Teachers are satisfactory in following: using L1 as a medium of instruction in the class, engaging pupils in applying mother tongue in group activities, engaging pupils in participating actively in the lesson through motivational words expressed in L1, translating assignments, activities, exercises, songs, poems, etc. that are written in other languages to pupils mother tongue, applying knowledge and skills learned from the seminar-workshop on MTB-MLE, adapting the variety and variation of language in the teaching and learning process, adapting the MTB-MLE materials in teaching despite the variety and variation of the language used and implementing the prescribed curriculum.

Based on overall, the teachers are satisfactory in their competencies in the teaching of mother tongue/using MTB-MLE as medium of instruction.

Teachers are very satisfactory in the following: using common mother of tongue of pupils or the majority language in the class, translating difficult/unfamiliar words in L1 of pupils and encouraging pupils' class participation with the use of their mother tongue.

On the other hand, the teachers are satisfactory in the following: using the different mother tongue of pupils as medium of instruction, discussing with co-teachers how to implement the program, making alternative solutions in explaining the lesson to pupils whose mother tongue is different from the mother tongue of majority, introducing songs written in pupils' mother tongue to arouse their interests in the lesson, introducing poems written in pupils' mother tongue to emphasize the lesson, introducing games written in pupils' mother tongue to emphasize the lesson, allowing the pupils to do role playing using their mother tongue as medium of communication, introducing prayers written in mother tongue, consulting experts in mother tongue other colleagues in case of vague lessons on MTB-MLE, using mother tongue to emphasize the lesson and involving pupils in group activities using their L1.

Based on overall the teachers are satisfactory in their competencies in pedagogical practices in teaching mother tongue and using multilingual education as medium of instruction.

The K to 3 teachers provide varied and adequate learning tasks in form of group activity, role playing, individual activity, introducing oneself, dialogue, differentiated activities, activity sheet, singing activity, chart, short story and presenting ibanag poems, songs and rhymes to contextualize learning in order to create a fruitful and meaningful learning environment among students.

Teachers' learning tasks/activities are always relevant to the object of the lesson and appropriate to the ability of the students.

Also, teachers' learning tasks/activities are very effective source of motivation for learning, for enhancement and facilitation of learning, and encouragement of pupil's participation. The teachers are always toward preparing learning tasks/activities which are appropriate application of their lesson.

The learning tasks/activities of teachers effective in stimulating pupils' interests, developing critical thinking, varied and adequate, source of enjoyment, have clear procedures and instructions, toward real-life situation, bring level of accuracy in skills to pupils and in developing opportunity of learners on what they are capable of doing.

The K to 3 teachers commonly employed the following instructional methods and strategies: games, lecture method, differentiated instruction, peer teaching, Contextualization, Interactive, Group Discussion, Socratic Method, sharing ideas, flashcards, oral recitation and participative learning in teaching mother tongue.

Other methods and strategies used were simulation, pair-share, inquiry approach and explicit teaching.

The instructional methods and strategies used by the teachers are very effective in terms of appropriateness to the objective of the lesson, appropriateness to the ability of pupils and of source of stimulating pupils' interests and motivating learning.

Teachers are effective in using instructional methods and strategies to develop critical thinking, encouraging more pupils' participation, and enhancing and facilitating learning. Likewise, they are effective in using varied and adequate. Teachers' instructional methods and strategies are effective in promoting outcomes-based learning.

## **Conclusions and Implications**

The aforesaid results imply that elementary teachers are academically qualified not only on the content and teaching rudiments but also toward higher level of skills that is, on leadership and management of the school environment as whole. Seemingly, teachers are expected to cope with the demands of the changes in the educational setting, particularly on curriculum. Thus, teachers are apparently capable of implementing the MTBMLE.

The Department of Education (DepEd) conducted varied and relevant trainings and seminar workshops in different levels for the implementation of the MTB-MLE. However, utmost participation of the direct implementers is not well considered particularly on the aspect of contextualization of teaching-learning process of MTB-MLE considering that this is one of the features the K to 12 Basic Education program. Also, on teachers' skills in developing instructional materials which is one of the essential facets to be contextualized in the teaching-learning process.

Generally, the time allotment for the majority of the trainings and seminar workshops is short where capacitation of skills learning among teachers is not warranted.

However, based on the interview with k to 3 teachers echoing of trainings and seminar workshops has been conducted with the goal to capacitate them of the necessary knowledge and to effectively implement the MTB-MLE

Seemingly, the goal of DepEd to provide adequate and efficient skills in implementing MTB-MLE as a result of echoing might affect the implementation of this program. In particular, the teachers will be hard up in tailoring their lesson to real-life situation, larger setting or wider sociological text in order to achieve greater understanding among students. Likewise, teachers will have a dilemma in the development and adaption of instructional materials.

Thus, massive training of teachers on all the necessary skills on MTB-MLE should be programmed prior to the implementation of this program.

The teachers are practicing multilingual approach in teaching K to 3 subjects. It seems that K to 3 teachers promote one of the features of the K to 12 program.

The above analysis indicates that generally, the K to 3 teachers adhere to the DepEd order No. 31 s. 2012 which states that Mother Tongue is used as a Medium of Instruction (MOI) for Grades 1 and 2 for teaching Mathematics, AralingPanlipunan (AP), Music, Arts, Physical Education and Health (MAPEH) and EdukasyonsaPagpapakatao (EsP). With this trend of implementation of one of the main features of the K to 12 program, pupils are expected to understand their lessons better.

Apparently, the teachers are generally equipped towards teaching mother tongue and using multilingual as medium of instruction.

Seemingly, teachers are set to use varied pedagogical practices in teaching mother tongue and using multilingual education as medium of instruction.

The K to 3 teachers provide a learning environment and great opportunities for students to learn effectively their mother tongue as manifested by their use of various instructional methodologies and strategies.

The teachers are likely toward using varied instructional methods and strategies to facilitate effective delivery of instruction in order to achieve the expectations in the classroom based on their perceptions.

#### Recommendations

- 1. Monitoring and evaluation of the MTB-MLE program may be considered not only on conduct of the assessment cognitive achievement of pupils but also other means such as field visitation of stakeholders on classroom environment.
- 2. The Department of Basic Education (DepEd) may allocate adequate funds for the conduct of massive trainings on various skills particularly addressing the features of the K to 12 program to capacitate teachers in the implementation of MTB-MLE.

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# Development of Mathematics Problem Solving Ability by Using the Problem Solving Model of Metacognitive Process of Grade 11th Students

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#### **Abstract**

The proposes of this study were 1) to develop the students' mathematics problem solving ability in order to pass the criteria of 70 percent of full score. The target group was 21 students of grade 11th students in academic year 2017 from Sarakhampittayakhom School, Muang, Mahasarakham. The research methodology is classroom action research which consists of four cycles. The research instruments were: 1) 11 lesson plans of the problem solving model of metacognitive process, 2) Mathematics problem solving ability test, and 3) the interview form. The data was analysed by using mean, percentage, and standard deviation. The results were as follows: The students' mathematics problem solving ability mean scores in the first, the second, the third and the fourth cycle were 55.23, 60.47, 71.76 and 78.89 percent respectively. It obviously be seen that the students' mean score passed the criteria in the third cycle.

Keywords: Mathematics Problem Solving, Metacognitive Process, Thailand



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#### Introduction

Mathematics is a methodical application of matter. It is so said because the subject makes a man methodical or systematic. Mathematics makes our life orderly and prevents chaos. Certain qualities that are nurtured by mathematics are power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills. Although mathematics is an important and essential part of humanity. However, the current state of teaching and learning has not been as successful. Obviously, the results of the Ordinary National Educational Test (ONET) in Mathematics of grade 12th student in 2016. The national average score was 24.88 from 100. It's lower than the benchmark 50 percent (National Institute of Educational Testing Service, 2017). In addition, From Trends in International Mathematics and Science Study 2015 (TIMSS 2015) show that the average score of ability in mathematics of Thai's students was 431, it was 26th of 39 country. It indicated that Thai's student has low level of mathematical ability as compared with international students. This may be due to several reasons. One of the reasons is: Students fail to read and understand problems. Cannot calculate accurately. And students lack understanding, process or solution. Therefore problem solving is the primary purpose of mathematics and problem solving is a process skill that is at the heart of mathematics instruction.

From interviews with students studying mathematics of grade 11th in academic year 2017 from Sarakhampittayakhom School, Thailand. It was found that most students could not solve problems. In addition, the results of the survey were used to measure the ability to solve math problems found that the mean score of Mathematics reasoning ability test was 58.51 percent. The results indicated that the number of students who under criteria score were 21.

The Problem Solving Model of Metacognitive Process developed from from polya's problem solving process. There are 5 step 1) Engagement: Initial confrontation and making sense of the problem. 2) Transformation-Formulation: Transformation of initial engagements to exploratory and formal. 3) Implementation: A monitored acting on plans and explorations. 4) Evaluation: Passing judgments on the appropriateness of plans, actions, and solutions to the problem. 5) Internalization: Reflecting on the degree of intimacy and other qualities of the solution process plans. (Yimer and Ellerton). Each step will focus on Metacognition. Self-control Recognize the process of thinking. This will allow students to develop better mathematics problem solving abilities

As above, the researcher used the problem solving model of metacognitive process in the class of mathematics learning activities develop the students' mathematics problem solving ability in order to pass the criteria of 70 percent of full score.

## **Research Purpose**

The purpose of this study was to develop the students' mathematics problem solving ability in order to pass the criteria of 70 percent of full score.

## Sample

The samples was 21 students of grade 11th students in academic year 2017 from Sarakhampittayakhom School in Thailand.

## **Research Instruments**

The instrument in this research was the 1) 11 lesson plans of the problem solving model of metacognitive process, 2) Mathematics problem solving ability test, and 3) the interview form.

#### **Procedure**

In this research is the Action Research, Researcher have conducted research using the problem solving model of metacognitive process in the lesson plan with learning activities with grade 11th students. To development Mathematics problem solving ability. There are 4 cycle in the research. Each cycle is as follows:

Step 1 Plan: 1) The researcher had studied the level of mathematics problem solving ability of grade 11th students. 2) The researcher created a lesson plan by using the problem solving model of metacognitive process 11 lesson plan and Mathematics problem solving test 4 collection. Step 2 Action: The researcher using lesson plan by using the problem solving model of metacognitive in learning activities. Each cycle consists of different content. Step 3 observe: The researcher collected the data by allowing the students to do a Mathematics problem solving test after completing the learning activities in each cycle and interviewed students with a score lower than 70%. Step 4 Reflect: The Researcher evaluated the test, compared to 70%. Analyst interviews after each cycle, created and improve lesson plans to use in the next cycle.

After that the data were analyzed and conclusion.

#### Results

The results of the analysis of the mathematics problem solving ability of grade 11th students By using the problem solving model of metacognitive in learning activities for development Mathematics problem solving ability in order to pass the criteria of 70 percent of full score. The students' mathematics problem solving ability mean scores in the first, the second, the third and the fourth cycle were 55.23, 60.47, 71.76 and 78.89 percent respectively. The data were shows in Table 1.

Table 1: Average score  $(\bar{x})$ , Standard deviation (S.D.) of total score Mathematics problem solving ability of 21 students from the Mathematics problem solving ability test.

	Total score for Mathematics problem solving.							
	1st cycle		2nd cycle		3rd cycle		4th cycle	
No.	Percentage. (100)	Evaluation.	Percentage. (100)	Evaluation.	Percentage. (100)	Evaluation.	Percentage. (100)	Evaluation.
1	88.89	Passed	88.89	Passed	91.77	Passed	94.44	Passed
2	55.56	Not pass	61.11	Not pass	80.56	Passed	83.33	Passed
3	52.78	Not pass	44.44	Not pass	55.56	Not pass	72.22	Passed
4	63	Not pass	61.11	Not pass	72.22	Passed	83.33	Passed
5	52	Not pass	52.78	Not pass	55.56	Not pass	80.56	Passed
6	33.34	Not pass	55.56	Not pass	61.11	Not pass	75	Passed
7	36.11	Not pass	47.22	Not pass	55.56	Not pass	72.22	Passed
8	52.78	Not pass	52.78	Not pass	58.33	Not pass	75	Passed
9	80.56	Passed	83.33	Passed	88.89	Passed	75	Passed
10	61.11	Not pass	55.56	Not pass	61.11	Not pass	100	Passed
11	61.11	Not pass	61.11	Not pass	69.44	Not pass	88.89	Passed
12	38.89	Not pass	41.66	Not pass	47.22	Not pass	75	Passed
13	30.56	Not pass	58.33	Not pass	91.67	Passed	72.22	Passed
14	38.89	Not pass	47.22	Not pass	58.33	Not pass	58.33	Not pass
15	69.44	Not pass	75	Passed	86.11	Passed	75	Passed
16	55.56	Not pass	72.22	Passed	86.11	Passed	86.11	Passed
17	47.22	Not pass	52.77	Not pass	58.33	Not pass	58.33	Not pass
18	69.44	Not pass	75	Passed	86.11	Passed	91.67	Passed
19	69.44	Not pass	72.22	Passed	88.89	Passed	88.89	Passed
20	58.33	Not pass	61.11	Not pass	83.33	Passed	75	Passed
21	47.22	Not pass	52.78	Not pass	61.11	Not pass	75	Passed
$\bar{x}$	55.23	Not pass	60.47	Not pass	71.76	Passed	78.89	Passed
S.D	15.26	_	12.80	-	14.97	-	10.56	-

The results of the analysis percentage of mean score each step of the mathematics problem solving ability of grade 11th students By Polya's four-step approach (G. Polya, 1957) to problem solving included Understand the Problem, Devise a plan, Carry out the plan and Look Back. The data were shows in Chart 1.

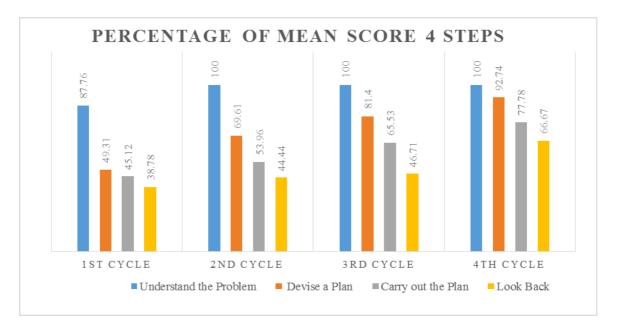


Chart 1: Percentage mean score of total score Mathematics problem solving ability 4 steps of 21 students from the Mathematics problem solving ability test.

#### Conclusion

According to the study of the students' Mathematics problem solving ability, It was found that the table 1 shows that The average student pass score was 70% in the third cycle. Notice that in the third cycle and the fourth cycle shows students have consistently increased Mathematics problem solving scores. In addition, it was found that there are two students who have not passed the Criteria included student No.14 and student No.17. The study found that they could not solve the problem. The process of finding the answer includes the basis for the calculation. This is a weakness so students cannot solve the problem. From chart 1, although the ability of students in each circle. It will increase continuously. However, it is clear that the score at the Look Back step is the lowest in every cycle.

Therefor the Mathematics problem solving must be done step by step when students are unable to complete the first step, so students will not be able to complete the next step. Students cannot find answers or incorrect answers. So student learning by using the Problem Solving Model of Metacognitive Process (Yimmer and Ellerton) can develop the Mathematics problem solving ability of Grade 11th Students.

# Acknowledgements

I would like to thank the Institute for the Promotion of Teaching Science and Technology for providing funding to support this research.

#### Recommendation

This research describes about the level of the scientific concepts understanding of only grade 11th students in Sarakhampittayakhom School, Thailand.

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# The Importance of Student-centered Learning (SCL) in Indonesian Higher Education

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#### **Abstract**

The issue investigated in this paper is about the importance of Student-centered Learning (SCL) in Indonesian higher educations. In some Indonesian universities, the policy to implement SCL has been instructed, but some lecturers seem to teach passively and simply leave the class after finishing their lecture. There are also some arguments from education experts opposing the existence of SCL. Hence, this paper aims to elaborate the benefits of SCL in Indonesian Higher Educations by considering its challenges. As what Angele Attard upholds that Student-centered Learning is generally defined as an approach to concentrate more on students than teachers and to substitute traditional teaching method with active learning, comprehensive self-paced learning activities and/or teamwork development, fundamentally let the students take responsibility for their own learning. The methodology used in this article is the literature review. Selecting a review topic assisted by some kinds of literature from peer-reviewed journal articles through Monash University database, Google Scholar and some websites containing Indonesian higher education data and evidence. As the findings, there are three main benefits of SCL; it provides an opportunity for students to have Independent learning, encourages students to collaboratively work in a group and actively involves them in critical thinking activities. In summary, this paper shows that the implementation of SCL in Indonesian higher education will play important role and help provide opportunities for students to actively study and think out of the box.

Keywords: Student-centered Learning, Higher Education, Teaching Practice, Indonesian Education.

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#### Introduction

The importance of active learning is mainly discussed to promote the activeness of student in learning activities. As part of it, in this essay, I will critically evaluate the importance of Student-centred Learning (SCL) to be implemented in Indonesian higher educations. In particular, this paper will examine how SCL gives more advantages, consider the challenges, and evaluate SCL for students in their learning activity.

Student-centered Learning is generally defined as an approach where all activities are more concentrated on students than teachers. SCL as a wide pedagogical approach that aims to substitute traditional teaching method with active learning, comprehensive self-paced learning activities and/or teamwork development, fundamentally let the students take responsibility for their own learning in education sector (Attard, Di Iorio, Geven, & Santa, 2010). In some universities in developing countries, the lecturers seem to talk a lot without considering the student collaboration (Harsono, 2008; Saragih & Napitupulu, 2015).

As stated in the beginning of this essay, the importance of SCL is the main focus to be discussed. There are three main benefits of SCL found in relation to Indonesia higher education context. SCL provides an opportunity for students to have Independent learning, actively involves students in critical thinking activity, and encourage them to collaboratively work in a group which enhances their teamwork skill.

# I. Higher Education in Indonesia

One-way traffic method occurs within the paradigm of Teacher-centered Learning (TCL). In this paradigm the students tend to be receivers, less instrumental as transformers and / or explorers. In addition, the students get into the situation rote learning, not meaningful learning. Such a situation is reinforced by the conceptual lecture material (Harsono, 2008). Universities in Indonesia considered as the top institutions also face the same problems. The lecturers merely teach their subjects and simply left the class after finishing the lecture. The students only sit along the day and listen to what the lecturers are explaining.

In the context of TCL, the concept of "spoon feeding" for students is no longer appropriate because it makes the learning process slow, and the students do not have the opportunity to choose the appropriate "menu" (Harsono, 2008). The delay in the learning process that occurs in the TCL paradigm will cause learners to always be left behind, unable to immediately adjust to the progress of the times. Hence, to overcome the slowness and backwardness, the learning process needs to be changed, from one-way traffic to two-way traffic and interactive.

To emphasise that SCL should really be implemented, The Law of the Republic of Indonesia number 20 in 2003 on the National Education System also implies the existence of SCL characteristics and "Forecasting of Tri Loka." In Chapter III, Point 4 Paragraph 3 there is provision on the development of education, as follows: "Education is organized as a process of cultivating and analysing the learner that goes on for the rest of the life". Furthermore, in Point 4 paragraph 4 there is a provision as

follows:" Education is conducted by giving exemplary, building willingness, and developing the creativity of learners in the learning process " (Indonesia, 2003).

# **II. Impact Of SCL Implementation**

# A. Independent Learning

Independent learning is the first advantage that the students get through learning by SCL. During the activity, the students will work independently without direct guidance from lecturer to the subject. The lecturer will only facilitate and lead them to primary concentration, which is on the demand of the learners rather than on the information to merely be transmitted (Attard et al., 2010). A lot of students seem to not have a strong willingness to study because they do not feel the freedom of learning. Some top universities in Indonesia, for instance, still involve the lecturers who teach almost all subjects by their own rules and regulations without providing the opportunity for students to do the task with their own way (Harsono, 2008). As the result, the students were reluctant and just do the activities and forget them after the semester is completed. Hence, during the independent learning process, the learners will be encouraged to be more responsible for their own learning and interest, and to educate others.

The idea of giving an opportunity for students to understand how to be in charge for their own learning and let them show their own interests is the main goals of independent learning. Each student will also enhance the capacity to analyze and elaborate their issues which they investigate in order to build strategies for their improvement and know how to solve their problems. If the learners go with their own choices within the lesson given, they will encourage themselves to move and work effectively. In addition, what a facilitator does during the learning activity is to supervise the environment so that each learner can learn their own way and timing (McCabe & O'Connor, 2014). Nowadays, the unrealised mistake is that teachers tend to find themselves helping as soon as the students have a problem. That intemperate assistances make students passive to think for themselves and let them keep relying on someone else. Students who have an active facilitator rather than a passive facilitator will result self-improvement for a great work (Attard et al., 2010). When the lecturers give opportunity for students to work with their own interest, it can also make the students recognize their capability and more realize their own strengths and weaknesses (McCabe & O'Connor, 2014). Hence, by applying independent learning, the students will work more freely and enjoy the learning activity with their own way and interest.

# B. Teamwork

In addition to shaping independent learning, collaborative work among students is also encouraged in SCL. The classroom is set up to let the students work in a group, and activity will involve interaction and sharing among other students to demonstrate effective collaboration in a classroom. Teamwork generally urges learners to have the primary skills related to learning as a collective unit to achieve the goal (a Brush, 1997). It is stated that the learners will have the capability to work together effectively and work in cooperation to enhance their social skills.

As the group work, doing the tasks together is fundamentally necessary. They can all purpose opinion and come up with conclusions together. The students do not only learn by working through the group assignment, but they also learn by giving explanation of their reasoning and thinking processes to other friends in group (a Brush, 1997). Moreover, group work activity also helps encourage group brainstorming, reasoning and problem-solving ability and let the learners understand how to use evaluation skills and critical thinking as a team. A collaborative group work will even distribute the responsibilities, blast through the material and cover more ground than if they do the individual task or homework.

# C. Critical Thinking

Besides collaborative work, Student-centered Learning also gives an opportunity to students to think critically. The facilitator will propose some complex problems to be investigated, and the learners are encouraged to actively participate by questioning, arguing and debating. They will enhance students' knowledge to understand the given subject more deeply. Critical thinking also involves the core of Problem-based Learning (PBL), which is necessary for students to understand how to learn critically and analytically (Hannafin, Hill, & Land, 1997). Hence, there are two main important points that students can get during the learning activity which involves critical thinking.

Firstly, the students learn how to take action in assessing complex issues. They will be urged to improve their own ways to find out solutions to problems that they encounter in a collaborative strategy. Developing precise thinking, deep analysis, and reasoned deliberation is the goal of implementing PBL in Student-centred Learning activity (Attard et al., 2010). Attard thinks that the basis of the capacity for critical assessment and analysis emerges as fundamental for enjoying a good quality of the educational environment (Attard et al., 2010). Therefore, having critical thinking and implementing their study in education contexts, students are able to think broader and deeper, find out solutions of the given problem context, use their reasoning skills to analyse and evaluate the assignment, and have strategic thought and not just take something for granted.

The second point is the student will use a wide variety of resources during assessing the complex issues. Critical thinking encourages learners to evaluate their own habit and thinking and on problems in variety of sectors in order to produce reasonable decisions, counter and take action whether it is individually or collectively (Saragih & Napitupulu, 2015). Besides, Saragih and Napitupulu also uphold that by using varied references the students will be able to enhance their knowledge, so they will find more issues to be investigated and analyzed critically. Hence, learners will be more well informed and figure out the notions that are needed, functional and powerful (Saragih & Napitupulu, 2015).

# III. Challenges of Implementation

Some critiques point drawbacks of SCL. Many students seem to be failed in the class because they keep going on with their own mistakes and have no boundaries to limit their action (Bailey, 2008). Consequently, the students do not acquire any effective lesson from the class. In addition, one of the requirements of independent learning is

the skill to work on their own, with a minimum guide and with confidence. This condition will disadvantage the student with low thinking ability, therefore, they could experience all of the steps psychologists associate with trauma. Moreover, the students with high thinking ability would feel more grief to play a major role when they are instructed to take duty for their own study, especially when they have been studying in a traditional classroom for a long time in their formal education. Hence, there will be inequality during the learning activities.

To challenge those assumptions, SCL does not mean that the tutors do nothing. The teacher obligation is to facilitate the student's goals. They investigate and provide needed resources, create, select, and expand problem contexts, while demonstrating a human resource (Hannafin et al., 1997). SCL is classified by a continuous cooperation teachers and students where all participants are actively get enrolled in discussion in the process of learning. It is also better to include digital resources like computerized databases, data collection and analysis tools, or internet-based resources (UGM, Maret 2007). Resources may also be useful to help the teachers with building a context for the student-centered class activity, or for developing an essential structure or marking rubric for performance assessment on the activity.

Student-centred Learning makes students learn more effectively. Even though this will need more patience and confidence, encouraging the students to concentrate fully on the activity would make them understand the lesson by implementing their own interest but guided by the lecturers. More importantly, the students cannot acquire the independent learning if their teachers still play more major role during the learning activity by including formative feedback that aims to give students a clarity of what they should do to have better improvement (Nanney, 2004). This feedback urges the learners to be more independent since it lets them manage their own learning. To enhance their working activity, one of the ways which are crucial to be included is critical thinking activity which is considered as the second advantage of SCL and will be elaborated on the next point.

On the collaboration point of view, much research focusing on cooperative study group suggests that students cannot be put into a group together without detailed structures in certain place. The structures include positive interdependence, individual accountability, group goals and rewards, and most importantly in the case of Student-centered learning, methods for providing students with opportunities to learn and practice group management and decision-making skills (Schaefer & Zygmont, 2003) (Bailey, 2008). Besides, the students who have high order thinking ability will play more major role in group and show their individualism. With collaborative work in group, some learners will respond inappropriately, reject the improvement and the individual responsibility involved, keep complaining the other without considering their mistakes and wasting time explaining to the slower learners in the group (Schaefer & Zygmont, 2003). The students with passive thinking will not get a chance to participate, and they will not get significant improvement in the learning activity.

On the other side, providing proper training for students will be much helpful to result in effective cooperation and experience in cooperative and collaborative skills which are needed to enhance the teamwork skill. The role of the instructor in SCL is to facilitates every single student or in a cooperative team by providing problem-based context, controlling the time limits, demonstrate various amounts of guidance, asking

leading inquiries, selecting response of students, or giving positive feedbacks (UI, January 2016). The teacher also determines when the focus of discussion changed or the discussion ended. Cooperative groups totally explore open-ended problems needing critical and often creative thinking, and teamwork activity also gives the chance for group work and social interaction. Directed circumstances concentrate on the fundamental aspect as analyzed by the instructor and which are explained externally through practice and explicit teaching activities. In workplace, it is also required to have teamwork skill in order to make the work effectively with other people, have string leadership, and know when should be a follower.

From those explanations, it can be stated that teamwork is a great change and gets the students out of their seats. The assignment is more rewarding and enjoyable when the students are incorporated in teamwork exercises. Just to ensure that teachers define some teamwork limitations before starting the group work. The students should understand what they need to achieve, knowing when they should finish their task and how much time they need for doing the task (Harsono, 2008). The teamwork introduces varied skills that will be useful for students later in the workplace, such as communication, collective effort, and negotiation.

On the lecturer side, in critical thinking activity, it is more challenging for the lecturer to manage the class because the learners are really diverse in their skills, weaknesses, and learning styles, but lecturers are just as diverse in their abilities and areas of expertise (Bailey, 2008). The teachers are occasionally confused because they do not really know how to handle the varied skills of students. As a result, they would not enjoy their teaching activity since they have complex materials to provide to students. There would also be an imbalance among the students in the class since the students' abilities are different to each other, so only the smartest one who will more participate in the learning activity.

What is important in SCL is that the role of lecturers is not only to tell them but also guide them to understand the lesson. The instructor who teach patiently and confidently will gain the rewards such as having students who study harder and have better manners towards their lessons, friends and themselves. In addition, providing SCL training will help the teachers to understand the concept and to have better preparation before getting involved in SCL class. In Indonesian University, for instance, the lecturers of chemical engineering faculty in 2008 conducted the seminar of SCL for lecturers because the academic staffs of the university were aware of students need of active learning (UI, January 2016). The seminar also encouraged the lecturers to be more active in teaching by providing problem-based context. In addition to assumption rebuttals, Saragih and Napitupulu in their investigation depict that improving the critical thinking analysis especially in finding mathematical problem solving, mathematical communication and mathematical concept will bring positive improvement of students' thinking ability (Saragih & Napitupulu, 2015). By critical analysis, the student will acquire more ways to develop their ability of high order thinking by not just work individually but also work collaboratively with their friends in group.

#### IV. Conclusion

In summary, Student-centered Learning truly plays important role in education especially at higher education level in the Indonesian context. Having investigated this issue, this essay shows that the implementation of SCL will help provide an opportunity for students to have Independent learning, boost them to actively engage in critical thinking activity and encourage them to collaboratively work in group which enhances their teamwork skill. Further, Student-centered Learning implementation also leads to some suggestions and recommendations for the student learning improvement. More concern for the supplementary assistances needed by instructors as they demonstrate more efforts to apply these kinds of activities in their own teaching method. Moreover, the most considerable aspect is that helping the students to activate their intellectual development by engaging them in each activity to work and enjoy their learning process. Therefore, as Kincheloe said, in the future, the teachers will not always be considered as the experts who have all of the answers and the students will not be the empty vessel who only passively absorb information and experiences given by the teachers (Kincheloe, 2008).

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Official Conference Proceedings

# Assessment Practices and Students' Approaches to Learning: A Systematic Review

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#### **Abstract**

Student Approaches to Learning (SAL) differentiates between student learning objectives/behaviours that are focused on the memorization of course content (surface approach) or the construction of meaning and comprehension (deep approach). For nearly five decades, researchers have explored Student Approaches to Learning (SAL) as an important framework for understanding, evaluating and guiding learning and instruction. An evidently robust and generally relevant construct, SAL has spawned numerous instruments to capture its Deep and Surface approaches, most notably the Study Process Questionnaire (SPQ) and its successor the Revised Two-Factor SPQ (R-SPQ-2F). Despite its history, there are few comprehensive reviews of its utility. Here we present the results of a systematic review of the literature describing how deep and surface approaches to learning are associated with different assessment practices. This paper uses vote counting to investigate the relationship between assessment practices and students' approaches to learning. After a systematic search of the literature over 1,482 abstracts were reviewed, from which 21 articles were selected and 53 voting scores were extracted. Several assessment types were grouped and analyzed to help explain the voting results. Pedagogical implications and suggestions for further research are discussed.



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Student approaches to learning (SAL) is one of the most enduring and robust constructs of the education research literature. Its surface and deep approaches differentiate between learning objectives and behaviors that focus on the memorization of course content or the construction of meaning and comprehension, respectively. Assessment practices, a powerful component of course design, influence learning expectations and the approaches students adopt in a course. Summative assessments are typically high stakes; post hoc assessments of learning, and formative assessments offer scope for feedback and learning within the course. Both types of assessments could nudge students towards deep or surface approaches, based on their design. A systematic review of four decades (1976 – 2017) of research literature on SAL was performed, and the peer-reviewed articles that examined the association between assessment practices and student approaches were compiled and examined carefully for design quality and results. We present the results of this review describing how different student approaches to learning are associated with different assessment practices. The role of assessment in setting expectations for learning will be discussed.

#### **Objectives or purposes**

The systematic review is an exploratory study that aims at answering the following research questions:

RQ1: What is the relationship between Deep Approach to Learning (as measured by the SPQ or revised version of the SPQ) and assessment practices?

RQ2: What is the relationship between Surface Approach to Learning (as measured by the SPQ or revised version of the SPQ) and assessment practices?

#### Perspective(s) or theoretical Framework

Anchoring the systematic review in students' approaches to learning (SAL) as measured by Biggs' Study Process Questionnaire (SPQ) and/or subsequent versions of it.

## Data Sources, Evidence, Objects, or Materials

When we started exploring the relationship of SAL as measured by SPQ or subsequent versions of it, we wanted our data sources to be comprehensive. In light of that, we explored various peer-reviewed databases. These included ERIC database, Canadian Business & Current Affairs, Academic Search Complete, PsycINFO, Proquest Dissertation, EdITLib, Communication & Mass Media Complete, and Medline. Our search strategies also included unpublished materials such as theses and research reports to avoid publication bias. We conducted web searches using several search engines such as Google and Bing to complement the data search process utilizing branching techniques to find as many articles as possible. All searches included combination of SPQ key terms that varied according to database or source researched. These included the following terms "two-factor study process questionnaire", "two factor study process questionnaire", "SPQ, RSPQ, R-SPQ, "R SPQ", R-SPQ-2F. The search was aimed at the abstract field of each database. Different databases

required search key terms or search locations to be changed slightly to fit the appropriate Boolean search. Adaptations were made to the above keywords as needed.

Overall, 1,482 abstracts were reviewed. This initial number went down to 259 by the end of the first filtering phase<sup>1</sup>. The count went down further to 228 after removing duplicates and applying the following inclusion-exclusion criteria:

- The population being tested had to be university learners.
- Adoption of the SPQ or any subsequent version of it as a measure of student approach to learning.
- English version of the tool
- English as language of publication of article

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Next, we categorized the 228 articles according to Biggs' three-P model: articles that related Students' Approaches to Learning (SAL) to Presage, Process or Product of learning. We then decided to narrow in on studies that involved Presage characteristics. Presage was chosen specifically since it has repercussions on Product and Process of learning and can typically be manipulated to possibly improve the quality of teaching-learning.

This finally left us with 166 articles. The Presage category itself allows for more granular categorization. While clearly each of the presage components affects the other, we considered it prudent to categorize our articles in the hope of a more nuanced understanding. For example, while course design and assessment are more a continuum, we chose to analyze them separately, starting first with assessment practices. In the end, we had 21 studies in the assessment category hence 21 studies were included in this systematic review, and our research question were: What is the relationship between Deep Approach to Learning (as measured by the SPQ or revised version of the SPQ) and assessment practices? What is the relationship between Surface Approach to Learning (as measured by the SPQ or revised version of the SPQ) and assessment practices?

# Methods, Techniques, or Modes of Inquiry

Like with any systematic review, we followed a predefined sequence of steps in order to ensure transparency and replicability, following Cooper's (2016) approaches to systematic review reporting. The steps consist of the following:

- 1. Determine and develop the terms of reference of the research question.
- 2. Establish criteria for inclusion and exclusion of studies.
- 3. Develop a search strategy for identification of relevant studies.
- 4. Select studies based on abstract review.
- 5. Select studies based on full-text review.
- 6. Code study features and moderator variables
- 7. Conduct analysis and interpretation

<sup>&</sup>lt;sup>1</sup> This sharp drop can be explained by the fact that SPQ is used as an acronym for a couple of other instruments in business, psychology, and psychiatry fields.

Inter-rater reliability was established to assure the validity of the extracted information: two coders worked independently and rated 10% of each article batches at each point-screening- eligibility- inclusion and coding for study features. At all times percent agreement was 88% or higher. When disagreements between coders occurred, mismatches in rating were discussed and a final agreement reached, to tighten procedures of acceptance and rejections. Each study was combed for instances of associations between the variables identified in the two research questions. Individual voting results and relationships between variables of interest were recorded onto Excel spreadsheets.

# **Vote Counting Procedures**

Our data set included 21 studies dated between 1976 and 2016. Research countries included Australia, Greece, Netherlands, Belgium, and Canada. Research methodologies varied and incorporated highly statistical studies as well as descriptive and mixed methods studies. For a comprehensive observation of relations between assessment practices and learning approaches, qualitative as well as quantitative results were extracted from the different studies. To maximize the includes of the qualitative as well as quantitative studies, we had to be agile in choosing our methodology and hence votecounting methodology was used. A voting mechanism for each type of finding was charted. Instead of effect sizes, a categorization system was created to code the strength of each association. For coding purposes, these associations were categorized according to data type. Labelled A to F, they included the following: test of difference, correlation, regression, proportion of sample, point on a Likert scale, and/or qualitative statement of the relationship. As an example, consider a study exploring the research question: what is the relationship between the form of assessment and learning approaches? If the reported r value was significantly positive, it received a score of +2. If it was positive but not significant, it got a score of +1. 0 was marked for no relationship, -1 for a negative but not significant relation, and -2 for significant negative relationship.

#### Results

For this analysis, and after we proceeded to answer the aforementioned research questions, findings were as follows:

RQ1: Relationship between Assessment practices and DA. Our data set gave 26 votes counted, indicating an overall average vote of +0.58

RQ2: Relationship between Assessment practices and SA. The data set gave 27 votes counted, indicating an overall average vote of -0.19

#### Weighing Voting Results by Quality and Sample Size

We noticed that the quality of studies varied, and because it is recommended in systematic reviews to appraise the quality of studies (Huff, 2009; Petticrew & Roberts, 2006; Ramey & Rao, 2011), we coded for the quality of studies. Studies were coded for 'low' quality, 'medium' quality, and/or 'high' quality.

However, we realized that our studies varied substantially by sample size as well since we included qualitative as well as quantitative results. In light of that we recalculated weighted voting for quality and for sample size so that we get a more gauging figure of the voting results the qualitative and quantitative differences.

With regards to quality, the highest quality was coded 0.8. The latter was considered 1 and all the other quality values were divided by it to make sure they were related to 'the highest scoring quality value'.

With regards to weighted sample size, 2 calculations are proposed:

We considered the median of the sample size and worked with the assumption that the median sample size is a full score and anything above the media is also is a full score.

For studies with sample sizes smaller than the median (N=107), we used two methods to calculate the impact of the sample size on the vote size:

First is linear – we simply divided the smaller sample size by the median sample size. The second is logarithmic, taking into effect the decreasing effect of the increase in sample size from 0 to the median value, which is 107.

The resultant weighted voting for quality and sample size was calculated by multiplying the raw voting score by the resultant quality factor and the resultant sample factor. The final results were as follows:

RQ1: Relationship between Assessment practices and DA. Our data set gave 26 votes counted, indicating an overall average vote of +0.44

RQ2: Relationship between Assessment practices and SA. The data set gave 27 votes counted, indicating an overall average vote of -0.28

# Theme-based Analyses by Assessment Types

To add detail and access additional insights to the results of the vote counting, we took a qualitative approach to analyzing the themes. For a thematic analysis, we first clustered the articles based on the type of assessment involved in the study. The purpose was to see patterns in reported discussions if any, between SAL and specific assessment types. The 21 studies in our pool clustered as follows: Multiple Choice: 6, Portfolio: 4, Essay (Long form writing): 2

All the others studied individual approaches that did not cluster into any themes or groups (For example: there were single studies dealing with Multimedia assessments, Progress Testing, Viva, Case Study and so on).

In this process, we first listed all the key claims and observations made by the authors in the results, discussion and conclusion sections of the papers. The authors were seeking to explain better, add nuance, or justify their findings. Having listed these author observations, we then extracted themes from them. Some of the recurring themes are reported below, organized by assessment type.

Multiple Choice Questions (MCQs) as assessment. It appears that students are flexible in the learning approaches they employ to succeed in MCQs. In some cases, students

moved from a surface approach at one point to a deep approach at a later point, as in the case of Dickie's (1994) freshman physics students. In Leung's et al. (2008) study, however, students began with a deep approach, and later moved to a surface approach. From student interviews, Leung et al. (2008) conclude this shift happens on account of a big workload - or more accurately, because the students perceive their workload to be big. But in spite of this shift to surface approach, these students still did better than those who started out and stayed with surface approaches.

Yonker's (2011) study of psychology students found that students' surface approach harms their MCQ performance more than deep approach helps them. This is contrary to common practitioner belief that MCQs encourage and reward a surface approach. The impact of student perception played a role again, in this case: when students perceived MCQs as something that tested lower cognitive ability, they tended to take a surface approach, which in turn lead them to a poorer performance on the MCQs.

Rajaratnam et al (2013) find that students with deep approach did very well on an MCQ Exam, in the physiology context of their study. The authors also use the findings to justify the use of didactic teacher-driven instructional methods, since the students were exposed to such a method before they attempted the MCQ exam.

To summarize the three themes in the MCQ studies: Relying purely on surface approach does not help students perform well on MCQ exams. Taking a deep approach might help, or not, but is less likely to harm performance. Workload is seen a factor driving students to surface approaches.

**Portfolio assignments as assessments**. Studies that investigated learning approaches with Portfolio as an assessment type, found that students' deep approach increases with higher order thinking tasks, and surface approach reduces. Gijbels et al. (2006) found that students with higher deep approach prefer portfolio assessments especially if they allowed the students to demonstrate their more complex learning. However, after exposure to several portfolio formative assessments, students tended to prefer the portfolio lesser. The authors speculate that the workload may have been a factor leading to this shift from deep to surface approach.

Segers et al. (2008) and Fong and Wai (2012) also find that portfolio increases the deep approach and decreases surface approach. Segers et al. (2008) add that however, approach to learning also relates to the students perceptions of the portfolio task. The quality of feedback was seen as an important aspect in stimulating learning. Segers et al (2008) identify several characteristics of feedback, which they believe is more amenable to nurturing deep approaches.

Baeten et al. (2008) found that even though students seemed to prefer deep approach when it came to portfolio tasks, it did not predict better performance. In his study, students shifted to surface approach on portfolio tasks, but that did not improve performance either. This author too speculates that the reasons for the shift are workload, and the students not being adequately motivated. He also emphasizes that students strategically shift between approaches based on their context. In summary, these studies

seem to suggest that Portfolio assessments are quite likely to trigger deep approaches, but the deep approach in itself does not seem to be a predictor of success on portfolio tasks.

**Essay /Long form writing.** In the case of essay type answers too, perception seems to matter. Gerzina at al (2003) found that students who perceived the essay answers as not being representative of the course content adopted a surface approach. If they did perceive the essays to be representative of the course, they adopted a deep approach.

As with MCQ, in the essay assessments, students seemed to use the two approaches strategically. Verkade and Lim (2016) found that the writing assessments did not require "deep writing" – a form of writing comparable to "deep reading". Even though students in his study took a deep approach to reading, they did not mimic the style of their reading in their writing. Verkade and Lim (2016) conclude that perhaps the test in question had an issue – it assumed that a deep approach for reading would translate into a deep approach for writing, though he does not get into too much detail about what "deep writing may specifically engender. In his study, the majority of the subject did not leverage comprehensiveness of reading, even though students were required to undertake comprehensive "deep" reading. Students in that study preferred a deep approach but were willing to apply a surface approach strategically.

From among MCQ, Portfolio and Essay assignments, if we were to further distill themes, it would be as follows: Strategic use of SAL, Student perception of assessment tasks affecting performance, the design of assessments affecting SAL and performance, and student workload (or perception of workload), and the role of feedback.

# Scientific or Scholarly Significance of the Study or Work

While we recognize that this is a relatively exploratory systematic review, it does provide evidence that assessments do have a relation to students' approaches to learning. In conjunction with a review of studies involving course design and SAL, it might be possible to arrive at a deeper understanding of the relationships between Presage components and students' approaches to learning.

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Studies included in the systematic review are marked by an asterisk.

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# A Basic Study on the Conformity of Japanese University Students in Language Communication Activities

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#### **Abstract**

As a basic study of the communication activities with the system we have been developing, we investigated the affective factors related to student conformity by conducting a questionnaire with 81 Japanese university students in two classes. The results showed that: (1) there was no significant relationship between student conformity with another's opinion and nervousness during English communication in either of two classes, while there was a weak relationship between student conformity and negative attitudes toward listening/speaking in English only in the Business Administration class; (2) in both classes, there was a moderate relationship between student conformity and indirect ways of self-expression, as well as feelings of apprehension regarding the possible rejection of their opinions. These results suggest that there exists no significant relationship between student conformity and nervousness during English communication. However, from the detailed analyses, it is assumed that some factors exist between them. Further investigation is required by targeting more students. The results and analyses also suggest that indirect ways of self-expression may be one of the factors which slightly influences student conformity. Meanwhile, student conformity is related to feelings of apprehension regarding the possible rejection of their opinions. However, it is not clear which is the main factor of this relationship. Therefore, these results and discussion indicate that we should focus on reducing students' feelings of apprehension regarding the possible rejection of their opinions and on familiarizing them with expressing their true intentions, when we design and implement communication activities.

Keywords: communication activities, nervousness, conformity, affective factors

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#### Introduction

According to the general policies of the Ministry of Education, Culture, Sports, Science and Technology-Japan (MEXT) (2014a, 2014b), it is important to establish an educational environment that corresponds to globalization and to foster younger generations with wide global perspectives and strong communication skills. However, many students feel inhibited or nervous during face-to-face communication in foreign languages (Horwitz, 1995; Suleimenova, 2013). Some of them may feel a similar way even when speaking Japanese.

We have been developing a prototype system for communication activities using CG characters in order to help reduce student nervousness and shyness while facilitating their familiarity with real conversation (Kashiwagi et al., 2016; Shibuya et al., 2016). As a basic study for supporting and encouraging students in their communication activities through the above system, we investigated potential affective factors related to student nervousness in language communication activities by conducting a correlational study. The results of our prior study (Kashiwagi et al., 2017) showed weak positive relationships between the item "I tend to conform with another's opinion" and student nervousness during face-to-face English communication, as well as negative attitudes toward reading/writing in English. The item of student conformity with another's opinion belongs to a different category than other items in this study, such as taciturnity and shyness.

The term conformity is often used to indicate an agreement made in order to "fit in" or "go along" with surrounding people. Depending on the situation, conformity can have positive or negative effects. When it works positively, communication runs smoothly and constructively. It may help people feel that they are accepted and encourage them to develop harmonious relationships.

However, some studies have claimed that there are negative aspects of conformity. Igarashi et al. (2014) pointed out that recent Japanese university students tend to conform with the opinions of others and refrain from stating their own opinions in order to maintain social relationships. Sakamoto (1999) reported that conformity can produce conflicts between an individual's opinion and those of others, which may cause emotional stress. Tajima et al. (2014) examined the interpersonal motivations and conforming behaviors of Japanese university students. Their study found that overtly conforming with the opinions of others has resulted in difficulties with and the dilution of reliable relationships. If conformity works negatively, a lack of diversity will result. The person engaging in conformity may be scared of rejection, and may become reluctant to express his/her own opinion. In some cases, conforming with the opinions of others can cause individuals to agree with other members of their groups publicly while inwardly dissenting.

Therefore, understanding the importance of behavior leading to conformity may help Japanese students to develop healthier communication habits and good interpersonal relationships. To focus on student conformity in this study, we conducted a correlational study based on the results of a questionnaire administered to Japanese university students in two classes (i.e., 40 in Engineering class and 41 in Business Administration class).

In the following chapter, we describe our prior study. Then we provide the methods of the present study, the results, and discussion. Finally, we present our conclusions and recommendations for further study.

# **A Prior Study**

In our prior study (Kashiwagi et al., 2017), we investigated the affective factors related to student nervousness during language communication activities by conducting a questionnaire. The questionnaire was administered to 84 Japanese university students in two classes to gather responses regarding nervousness during face-to-face Japanese and English communication, taciturnity and shyness, negative attitudes toward English, and conformity with another's opinion.

The results provided significant evidence that: (1) student nervousness during face-to-face Japanese communication is to some extent influenced by their taciturnity and shyness; (2) student nervousness during face-to-face Japanese communication, their taciturnity and shyness, and negative attitudes toward English influence their nervousness during face-to-face English communication. The affective factors related to student nervousness during face-to-face English communication differ according to the classroom settings.

The results also showed weak positive relationships between student conformity with another's opinion and nervousness during English communication, as well as negative attitudes toward reading/writing in English.

To investigate further in this study, we added question items to our original questionnaire (Kashiwagi et al., 2017) focusing on student conformity. We conducted a correlational study using the revised questionnaire, which is discussed in the following chapter.

#### **Research Questions and Methodology**

#### **Research Questions**

This study's intent was to address the following research questions:

- (1) Is student conformity with another's opinion related to either nervousness during English communication or negative attitudes toward English?
- (2) Is student conformity with another's opinion related to indirect ways of self-expression or feelings of apprehension regarding the possible rejection of their opinions?

# **Participants**

This study's participants consisted of 81 first-year students in two English language classes at a university in Japan (i.e., 40 in Engineering class and 41 in Business Administration class). The number of students and their respective majors are shown in Table 1. These students completed a questionnaire, the questions of which being displayed in Table 2.

Table 1: Number and Major Field of Participants

Class	Grade	Major Field	Number of Students		
A	1 <sup>st</sup> year	Engineering	40		
В	1 <sup>st</sup> year	<b>Business Administration</b>	41		

# **Data Collection and Analysis**

A questionnaire was administered to gather responses from students about their nervousness during face-to-face communication in both Japanese and English, conformity with another's opinion, negative attitudes toward English, and taciturnity and shyness. The questionnaire items are shown in Table 2. Responses were scored on a five-point Likert Scale (i.e., 1 point for Strongly Agree, 2 points for Agree, 3 points for Neutral, 4 points for Disagree, and 5 points for Strongly Disagree). As the statements were posited in negative terms in this questionnaire, we scored 1 point for Strongly Agree and 5 points for Strongly Disagree. Through a correlational analysis, we attempted to investigate how the variables were related to one another.

Table 2: Questionnaire Items

# Regarding Face-to-face Communication in Japanese and Student Conformity

- Q1. I feel nervous when I use Japanese during face-to-face communication.
- Q2. Usually I don't say a lot in Japanese.
- Q3. I feel shy when I'm communicating in Japanese and have to look the other person in the eye.
- Q4. I tend to conform with another's opinion.
- Q5. I express myself in an indirect way.
- Q6. I'm afraid that my opinion might be rejected.

# Regarding Face-to-face Communication in English and Negative Attitudes Toward English

- Q7. I feel nervous when I use English during face-to-face communication.
- Q8. I'm not good at reading/writing in English.
- Q9. I'm not good at listening/speaking in English.

#### **Results and Discussion**

We investigated research questions related to student conformity. The results of the questionnaire responses are listed in Table 3. To analyze the relationships between the variables, we calculated Spearman's rank-order correlation coefficients on the data from the questionnaire, as shown in Table 4. \*Correlation represents statistical significance at the 0.05 level.

# Relationships Between Student Conformity and Nervousness During English Communication, and Negative Attitudes Toward English

We investigated how student conformity with the opinions of others was related to nervousness during English communication and negative attitudes toward English. Q4 in Table 3 and Table 4 concerns student conformity, Q7 concerns nervousness during

face-to-face English communication, and Q8 and Q9 concern negative attitudes toward English.

The results of the correlation coefficients between Q4 and Q7 in the two classes indicated in Table 4 (class A:  $r_{Q4Q7}$ =0.31, class B:  $r_{Q4Q7}$ =0.18) show that no significant relationship exists between student conformity and nervousness during face-to-face English communication. The results of the correlation coefficients between Q4 and Q8 in the two classes (class A:  $r_{Q4Q8}$ =0.26, class B:  $r_{Q4Q8}$ =0.22) also show no significant relationship between student conformity and negative attitudes toward reading/writing in English.

Meanwhile, the results of the correlation coefficient between Q4 and Q9 in class B in Table 4 ( $r_{Q4Q9}$ =0.33) show that a significantly weak positive relationship exists between student conformity and negative attitudes toward listening/speaking in English. However, the correlation coefficient between Q4 and Q9 in class A is not statistically significant.

These results suggest that student conformity with the opinions of others is not related to nervousness during English communication, nor is it related to negative attitudes toward reading/writing in English in either of two classes. Conformity with another's opinion is slightly related to negative attitudes toward listening/speaking in English only in the Business Administration class.

Table 3: Questionnaire Results

Items	Class	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Q1	A	5 (12.5%)	9 (22.5%)	6 (15%)	14 (35%)	6 (15%)
	В	6 (14.6%)	9 (22%)	5 (12.2%)	11(26.8%)	10(24.4%)
Q2	Α	1 (2.5%)	11(27.5%)	14 (35%)	9 (22.5%)	5 (12.5%)
	В	7 (17.1%)	7 (17.1%)	8 (19.5%)	15(36.6%)	4 (9.7%)
Q3	Α	2 (5%)	12 (30%)	10 (25%)	9 (22.5%)	7 (17.5%)
	В	4 (9.8%)	9 (22%)	4 (9.8%)	14 (34%)	10(24.4%)
Q4	Α	5 (12.5%)	14 (35%)	14 (35%)	5 (12.5%)	2 (5%)
	В	5 (12.2%)	12(29.3%)	14(34.1%)	8 (19.5%)	2 (4.9%)
Q5	Α	3 (7.5%)	10 (25%)	12 (30%)	13(32.5%)	2 (5%)
	В	2 (4.9%)	9 (22%)	12(29.3%)	17(41.4%)	1 (2.4%)
Q6	Α	1 (2.5%)	15(37.5%)	14 (35%)	7 (17.5%)	3 (7.5%)
	В	3 (7.3%)	16 (39%)	12(29.3%)	6 (14.6%)	4 (9.8%)
Q7	Α	12 (30%)	18 (45%)	6 (15%)	3 (7.5%)	1 (2.5%)
	В	16 (39%)	19(46.3%)	4 (9.8%)	2 (4.9%)	0 (0%)
Q8	Α	6 (15%)	15(37.5%)	11(27.5%)	7 (17.5%)	1 (2.5%)
	В	7 (17%)	13 (32%)	10 (24%)	11 (27%)	0 (0%)
Q9	Α	18 (45%)	14 (35%)	7 (17.5%)	0 (0%)	1 (2.5%)
	В	22 (54%)	10 (24%)	3 (7%)	6 (15%)	0 (0%)

Class Q1 Q2 Q3 **Q4** Q5 Q6 **Q**7 **Q8** Q9 Q1 A B  $\mathbf{Q2}$ A 0.35\* B 0.53\* 0.42\* Q3 A 0.26 0.53\* B 0.68\* Q4 A 0.14 0.12 0.38\*B 0.30 0.34\* 0.23 0.24 0.59\* A 0.38\* 0.26 Q5 B 0.36\* 0.50\*0.49\* 0.53\***Q6** A 0.21 0.11 0.13 0.55\*0.48\*B 0.32\* 0.34\* 0.27 0.53\* 0.49\* $\mathbf{Q7}$ A 0.29 0.14 0.26 0.31 0.23 0.20 В 0.46\* 0.28 0.40\* 0.18 0.47\*0.27 **Q8** 0.08 -0.04 0.13 0.26 0.05 0.08 A 0.02 B 0.10 0.20 0.22 0.05 0.41\* 0.37\* 0.26 Q9 0.26 0.13 -0.030.17 -0.030.32\*0.25 A 0.10B 0.20 0.13 0.02 0.33\* 0.33\* 0.35\*0.43\* 0.30

Table 4: Correlations Among Questionnaire Items

To deepen our analysis, we will further analyze the following results: (1) the relationship between student conformity with another's opinion (Q4) and nervousness during face-to-face English communication (Q7); (2) the relationships between student conformity with another's opinion (Q4) and negative attitudes toward English (Q8 & Q9).

First, we will look at how the participants who showed agreement with Q4 responded to Q7. Meanwhile, we will look at how the participants who showed agreement with Q7 responded to Q4. According to the results of Q4 in Table 3, a total of 19 participants in class A (47.5%) showed agreement with Q4 (i.e., "I tend to conform with another's opinion"). In class B, a total of 17 participants (41.5%) agreed with Q4. In both classes, a little more than 40% showed agreement with Q4. Regarding Q7, among 19 participants who agreed with Q4 in class A, 16 (84.2%) showed agreement with Q7 (i.e., "I feel nervous when I use English during face-to-face communication"). In class B, among 17 participants who agreed with Q4, 13 participants (68.4%) showed agreement with Q7. Approximately 70 to 80% of the respective participants who tended to conform with the opinions of others felt nervous when they used English during face-to-face communication.

Conversely, the results of Q7 in Table 3 showed that a total of 30 participants in class A (75%) showed agreement with Q7. In class B, a total of 35 participants (85.3%) agreed with Q7. In both classes, more than 75% felt nervous when they used English

<sup>\*</sup> p<.05

during face-to-face communication. Regarding Q4, among the participants who agreed with Q7, 16 (53.3%) in class A and 13 (37.1%) in class B showed agreement with Q4. Approximately 40 to 50% of the respective participants who felt nervous during face-to-face English communication tended to conform with the opinions of others.

The results of the correlation coefficients in this study showed no significant relationship between student conformity with another's opinion (Q4) and nervousness during face-to-face English communication (Q7). However, from the above detailed analyses, it is assumed that some factors exist between them. We need to investigate further by targeting more students.

Next, we will look at how participants who showed agreement with Q4 responded to Q8 or Q9. Meanwhile, we will look at how participants who showed agreement with Q8 or Q9 responded to Q4.

Regarding Q4 and Q8, among 19 participants who agreed with Q4 in class A, 12 (63.2%) showed agreement with Q8. In class B, among 17 participants who agreed with Q4, 8 (42.1%) showed agreement with Q8. A total of 63.2% (class A) and 42.1% (class B) of the respective participants who tended to conform with the opinions of others felt that they were not good at reading/writing in English.

Conversely, from the results of Q8 in Table 3, a total of 21 participants in class A (52.5%) showed agreement with Q8. In class B, a total of 20 participants (49%) agreed with Q8. In both classes, approximately 50% of the participants felt that they were not good at reading/writing in English. Regarding Q4, among the participants who agreed with Q8, 12 in class A and 8 in class B showed agreement with Q4. A total of 57.1% (class A) and 40% (class B) of participants who were not good at reading/writing in English tended to conform with the opinions of others.

These analyses support the above suggestion that student conformity with another's opinion is not related to negative attitudes toward reading/writing in English.

Meanwhile, regarding Q4 and Q9, among 19 participants who agreed with Q4 in class A, 16 (84.2%) showed agreement with Q9. In class B, among 17 participants who agreed with Q4, 14 (73.7%) showed agreement with Q9. More than 70 to 80% of the respective participants who tended to conform with the opinions of others felt that they were not good at listening/speaking in English.

Conversely, from the results of Q9 in Table 3, a total of 32 participants in both classes (class A: 80%, class B: 78%) showed agreement with Q9. Approximately 80% of the participants in both classes felt that they were not good at listening/speaking in English. Regarding Q4, among the participants who agreed with Q9, 16 (50%) in class A and 14 (43.8%) in class B showed agreement with Q4. In both classes, approximately 40 to 50% of the participants who were not good at listening/speaking in English tended to conform with the opinions of others.

The results of the correlation coefficients in this study showed a weak positive relationship between student conformity and negative attitudes toward listening/speaking in English only in the Business Administration class. However,

from the above detailed analyses, it is also assumed that some factors exist between them. We need to investigate further regarding this relationship.

# Relationships Between Student Conformity and Indirect Ways of Self-Expression, as well as Feelings of Apprehension Regarding the Possible Rejection of Their Opinions

We investigated how student conformity with another's opinion was related to indirect ways of self-expression, as well as feelings of apprehension regarding the possible rejection of their opinions. Q5 in Table 3 and Table 4 concerns students' indirect ways of self-expression, and Q6 concerns feelings of apprehension regarding the possible rejection of their opinions.

From the results of the correlation coefficients between Q4 and Q5 in the two classes in Table 4 (class A:  $r_{Q4Q5}$ =0.59, class B:  $r_{Q4Q5}$ =0.53), a moderate positive relationship exists between student conformity with another's opinion and indirect ways of self-expression. The results of the correlation coefficients between Q4 and Q6 in the two classes (class A:  $r_{Q4Q6}$ =0.55, class B:  $r_{Q4Q6}$ =0.53) also show a moderate positive relationship between student conformity with another's opinion and feelings of apprehension regarding the possible rejection of their opinions.

These results suggest that student conformity with another's opinion is related to indirect ways of self-expression, and feelings of apprehension regarding the possible rejection of their opinions.

To deepen our analysis, we will look at the following relationships further: (1) the relationship between student conformity with another's opinion (Q4) and indirect ways of self-expression (Q5); (2) the relationship between student conformity with another's opinion (Q4) and feelings of apprehension regarding the possible rejection of their opinions (Q6).

First, we will look at how the participants who showed agreement with Q5 responded to Q4. Meanwhile, we will look at how the participants who showed agreement with Q4 responded to Q5. According to the results of Q5 in Table 3, a total of 13 participants (32.5%) in class A showed agreement with Q5. In class B, a total of 11 participants (26.9%) agreed with Q5. In both classes, approximately 30% showed agreement with Q5. Regarding Q4, among 13 participants who agreed with Q5 in class A, 11 (84.6%) showed agreement with Q4. In class B, among 11 participants who agreed with Q5, 8 (72.7%) showed agreement with Q4. In both classes, more than 70 to 80% of the participants who expressed themselves in indirect ways tended to conform with the opinions of others.

Conversely, among 19 participants who agreed with Q4 in class A, 11 (57.9%) showed agreement with Q5. In class B, among 17 participants who agreed with Q4, 8 (47.1%) showed agreement with Q5. Approximately 50% of the respective participants who tended to conform with the opinions of others expressed themselves in indirect ways.

From the above detailed analyses, it is implicated that indirect ways of self-expression may be one of the factors which slightly influences conformity with another's opinion.

Next, we will look at how the participants who showed agreement with Q6 responded to Q4. Meanwhile, we will look at how the participants who showed agreement with Q4 responded to Q6. From the results of Q6 in Table 3, a total of 16 participants (40%) in class A showed agreement with Q6. In class B, a total of 19 participants (46.3%) agreed with Q6. In both classes, approximately 40% showed agreement with Q6. Regarding Q4, among 16 participants who agreed with Q6 in class A, 11 (68.8%) showed agreement with Q4. In class B, among 19 participants who agreed with Q6, 12 (63.2%) showed agreement with Q4. In both classes, approximately 65% of the participants who were afraid that their opinions would be rejected tended to conform with the opinions of others.

Conversely, among 19 participants who agreed with Q4 in class A, 11 (57.9%) showed agreement with Q6. In class B, among 17 participants who agreed with Q4, 12 (70.6%) showed agreement with Q6. Approximately 60 to 70% of the respective participants who tended to conform with the opinions of others were afraid that their opinions would be rejected.

These analyses support the above suggestion that student conformity with another's opinion is related to feelings of apprehension regarding the possible rejection of their opinions. However, it is not clear which is the main factor of this relationship.

Therefore, the above results and discussion indicate that we should focus on reducing students' feelings of apprehension regarding the possible rejection of their opinions and on familiarizing them with expressing their true intentions, when we design and implement communication activities.

However, a limitation of the current study should be mentioned. This study was conducted among only two classes, resulting in a small group of students. As a continuous study, we need to target more students with the same major and investigate further.

#### Conclusion

As a basic study of the communication activities with the system we have been developing, we investigated the affective factors related to student conformity by conducting a questionnaire with 81 Japanese university students in two classes (i.e., 40 in Engineering class and 41 in Business Administration class).

The results showed that: (1) there was no significant relationship between student conformity with another's opinion and nervousness during face-to-face English communication in either of two classes, while there was a weak relationship between student conformity and negative attitudes toward listening/speaking in English only in the Business Administration class; (2) in both classes, moderate relationships existed between student conformity and indirect ways of self-expression, as well as feelings of apprehension regarding the possible rejection of their opinions.

These results suggest that there exists no significant relationship between student conformity with another's opinion and nervousness during face-to-face English communication. However, from the detailed analyses, it is assumed that some factors

exist between them. We need to investigate further by targeting more students. The results and analyses also suggest that indirect ways of self-expression may be one of the factors which slightly influences student conformity with the opinions of others. Meanwhile, student conformity with another's opinion is related to feelings of apprehension regarding the possible rejection of their opinions. However, it is not clear which is the main factor of this relationship.

Therefore, the above results and discussion indicate that we should consider the way of reducing students' feelings of apprehension regarding the possible rejection of their opinions and of familiarizing them with expressing their true intentions, when we design and implement communication activities.

Given the limitations of the data, we will continue to investigate further.

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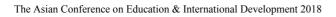
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# "Tell Us Your Story": Documenting the Nalik Culture Through an Educational Project in Papua New Guinea

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#### **Abstract**

Papua New Guinea has more languages than any other country, about 840 accounting for 12% of all languages spoken in the world. This work aimed to record and document the lifestyle, stories and folk tales about birds present in the cultural imagination of one of the numerous Papua New Guinean ethnic groups, the Nalik people. This research was conducted at Madina and Luaupul villages in New Ireland Province during the months between September to November 2016. Among the intended objectives were enhancing an awareness of cultural biodiversity and contributing to the empowerment of the community through renewed interest in its cultural heritage. The participants were six and seventh grade students and members of the local community. Research was conducted through three steps: (1) recordings of oral narratives in the community, and subsequent interpretation of their symbols in the local context; (2) exploration of these recordings through interdisciplinary activities with the students and developing the transposition of oral narratives into drawings and written forms; (3) validation and correction of the students' text by the community. The material resulting from this process was subsequently edited and the final output was the short jointly authored book, A Maani: Birds and Nalik Culture, created through the eyes and experiences of the participants of the project.

Keywords: action research, traditional knowledge, indigenous community, educational project, Papua New Guinea, Nalik



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#### Introduction

Papua New Guinea has more languages than any other country, about 840 (Simons & Fenning, 2017), accounting for 12% of all languages spoken in the world (Volker, 2014). It also has 5% of all biodiversity in the world (WWF, 2017). These data suggest a great biocultural diversity and a subsequent wealth of traditional knowledge of numerous ethnic groups. Much of this is related to plants and animals and is knowledge that has evolved over generations in a long process of human interaction and relationship with nature (Maffi, 2007).

Through a participatory and interdisciplinary approach, this research aims to record and document the lifestyle, stories and folk tales about birds present in the cultural imagination of one of the numerous Papua New Guinean ethnic groups, the Nalik people. This research was conducted through an education project lasting over eight weeks in 2016 with Grade 6 and Grade 7 students at Madina Primary School (MPS) and members of the Nalik community in New Ireland Province (NIP), Papua New Guinea (PNG).

This research also represents the conclusion of another project that began in 2010 when I was living in Japan and working as a teacher at an international school for Brazilian immigrants there. At that time, my first contact with MPS was at a distance as part of a Pen Pal Project (da Silva, 2013) between students there and students at my school in Japan, the Escola Brasileira Professor Kawase - Hiro Gakuen. I began this project so that my students would have an opportunity to practise and improve their English writing as well as to learn a little about another culture and country. As the letters went back and forth, the students on both sides shared information about their daily lives, and learned a lot about each other's environment and way of life. My students' curiosity was infectious so that just like them, their other teachers and I were eager to receive the next package with letters from MPS with stories and explanations about life in PNG.

This is the magic of educational projects. We might begin by planning the steps and goals of the project, but it ends up taking on a life of its own, taking us on physical and mental journeys that we had never thought of.

In my case I had an opportunity to visit PNG in 2014, when I went to NIP and spent a month in Madina Village. During this time, I had the pleasure of meeting and getting to know some of the students whose letters we had been reading in Japan over four years. I also experienced the warm hospitality and rich culture of the Nalik people. While I was in Madina, I began to think of a new educational project that could give students at MPS the possibility to document for themselves some of their people's oral literature and folklore about animals in New Ireland. They could do this so much better than an outsider because they could describe their own experiences, speak from their own perspectives, and explore the ideas that would matter to them.

It took some time before I could begin to turn these thoughts into reality. But in 2016 I was able to return to Madina Village to put this project into practice as part of my masters' studies in social education at the University of Coimbra in Portugal (da Silva, 2017a). The final product of this process was the construction of collective

book entitled *A Maani: Birds and Nalik Culture* (da Silva & Volker, 2018), created through the eyes and experiences of the participants of the project.

# Research territory and the participants

NIP is formed by a group of islands, located in the northeast region of PNG. The main island, New Ireland (NI), has about 194,000 inhabitants and two districts: Kavieng, the administrative headquarters, located in the north of NI and Namatanai, located 260km to the south (Australian Doctors International, n.d.).

According to the Ethnologue (2016), NIP has 22 ethnic groups. The practices described in this work were developed in the domain region of the Nalik group, which is distributed in 15 villages in NI. The census conducted in 2000 listed 4000 people as belonging to this group, where the largest village is Madina, with about 600 inhabitants (Volker, 2014).

The participants involved in the pedagogical practices were 57 students, 23 of the grade six and 34 of the grade seven of the MPS, located in the village of Madina. These students live in Madina and in another village, about 2km away, called Luaupul.

The ethnic groups of NIP have a close interaction with animals, where they are represented in ceremonies, religious gatherings and social structuring. They also have very similar cultures sharing, for example, matrilineal societies that contrast directly with most other PNG indigenous groups that are patrilineal. The indigenous communities of the north of NIP, which includes the Nalik group, are organised into a clan system (Were, 2003), which are an important social feature, as they define family arrangements (kinship and descent), influencing marriages, land ownership, social positions, and the construction of personal identity. The clans are managed and led by maimais<sup>1</sup>.

The Nalik group has eight clans, represented by wild animals from the NI region, seven species of birds and one snake (Table 1). The animals have great importance in traditional ceremonies representing clans, among which the most important are malagan (or malanggan), which feature sculptures carved of wood in honour of their ancestors (Volker, 1993, p.111). They are also protagonists in several stories, where they represent a complex relation with the ancestors.

<sup>&</sup>lt;sup>1</sup> The title maimai means "leader of a clan", having permission to administer it and speak in public meetings, according to the traditional laws of its groups (C. A. Volker, personal communication, June 23, 2016).

**Table 1:** Nalik clans' name and their totemic animals.

clan names	symbolic animal	animals' English names	animals' scientific names
Moxomaaraba	a regaaum	Eastern osprey	Pandion cristatus
Moxokala	a rok	Red-bellied pitta	Pitta erythrogaster
Moxomaaf	a mangaaf	Coconut lorikeet	Trichoglossus haematodus
Moxokaamade	a babanga	Blyth's hornbill	Aceros plicatus
Moxotirin	a dau	Great frigate bird	Fregata ariel
Moxonuaas	a baalus	Red-knobbed imperia	<sup>al</sup> Ducula rubricera
Moxomunaa	a manungulaai	White-bellied sea eagle	Haliaeetus leucogaster
Saramangges	a xalawizi	Sea krait*	Laticauda sp.

All the animals are birds, excepted the sea krait that is a snake (da Silva, 2017b)

#### Working with educational projects

Working with educational projects can bring much satisfaction both to the teachers who are involved and to their students. It brings a dynamism into the classroom, as it gives the participants the opportunity to construct knowledge from their own experiences. In order to allow the students to have positive educational outcomes from this educational project, all the activities were planned carefully following the following steps:

- The project does not work if the teachers use an authoritarian teaching style. It needs to be part of a democratic process that lets the students participate with their own ideas and suggestions, which can often take the project in a different direction from what the teachers had originally planned (Abrantes, 1995).
- The activities in the project need to give space for the students to learn by doing. They should be engaged in dialogues, debates, and discussions at all stages of the project. This gives a dynamic tension to the work and makes the activities more interesting to all the participants at the same time that it uses the students' own curiosity to push them towards wanting to learn more (Prado, 2003).
- Projects tend to work best when discussions are closely related to the social and cultural reality of the students so that they are encouraged to propose interventions. This makes activities practical and functional, not just theoretical (Abrantes, 1995).
- It is especially important for the project to produce a final product, something concrete. This needs to be something that the students themselves have produced and that recognises their authorship (Valente, 1999).
- The whole school community should be involved, parents as well as other members of the community so that the experience of learning goes beyond the school. This will help to validate the students' learning, to encourage others to learn, and to make the project more interesting for the students.

- It is important to remember that in an educational project, teachers are not just givers of information to the students. In this kind of learning, teachers need to be people who guide the students through different learning experiences and who participate in both the planning and the execution of the project along with the students. Even more important, they need to be aware that they, too, will be learning many things during the project (Moura & Barbosa, 2006).

These steps were some of the elements that shaped the design of this research, conducted by action research as a working methodology. In action-research the researcher does not act isolated from the participants, but together, submitting the results emerged during the practices to the whole group, providing a dynamic learning process (Graciani, 2014). It also emphasises aspects of horizontal methodologies, aiming to make possible the construction of knowledge through the intersection of knowledge and a more open dialogue with the participants (Daniel, 2012).

# A step-by-step description of how the project was conducted

The central theme of this project was the birds of NIP. This topic was the focus of several practical workshops that used different techniques to explore stories, drawing and painting techniques, scientific reading, and English writing. Discussions looked at the diversity of birdlife in New Ireland and its importance to and influence on Nalik culture. Because the school is in a Nalik area that is organised into clans usually represented by birds, there are many traditional stories about these animals. These form an important part of the cultural heritage of this ethnic group and are valuable both to the students and the other members of the community.

In order to construct knowledge based on the students' own experiences, the activities in this educational project were planned in such a way as to arouse their curiosity and encourage questions that could be answered through the activities that they carried out. To do this, I had to plan activities that made use of the students' creativity and that were not necessarily the same as the way they were normally taught in class.

In this way, the students were free to suggest and create their own materials (texts and drawings) that were reactions to discussions that arose during the workshops. This process involved hands-on activities that went beyond just participating in group discussions, leading to better interaction and cooperation during group work. This contributed to the social and intellectual development of the students.

The main purpose of this project was to document the legends and myths Nalik people have about birds and to present these in a Nalik cultural context. This meant that I first had to collect these narratives. To do this I decided to ask the people who would know these best: members of the Nalik community itself, in order words, local residents and their leaders. For three weeks I interviewed ten people from the community, including teachers, maimais (clan chiefs), and elders, and met with larger groups of people at weekly village meetings in Madina and Luaupul. I asked them to explain certain aspects of the local culture, to share traditional local narratives related to the history of the region, and to identify birds that symbolise clans in the community. They were told that this information would be shared with children at their local primary school.

This first step was essential in developing the workshops and running activities. It gave me as an outsider some knowledge of the local culture and helped me to interact with the theme in an appropriate way. At the same time the community could become acquainted with the project that was going to take place with students at their school. I was rewarded with strong backing for the project by many leaders in the community.

The investigative process considered, in its various stages, a circular system where information about Nalik culture emerged from participatory and reflexive dialogue with village community leaders during interviews conducted between September 12 and October 8, 2016, and was used in interdisciplinary educational practices at the MPS school, throughout a workshop, *Storytelling - Our Book Project*, developed between October 5 and November 22, 2016. Through the workshop, narratives were built that documented information about the local culture. Then, between November 20 and 24, 2016, the narratives produced by the students were analysed by members of the community to validate these records. The diagram represented by Figure 1 shows in schematic form the main steps developed in this investigation.

During the phases developed in this research, the action research methodology, applied in the whole process, was understood to be both critical and transformative, enabling the establishment of a dialogue between participants and researcher within a system that allowed the exchange of knowledge, the intersection of knowledge, as well as intervention in and reflection on the proposed practices and actions developed. Thus, during the research, I considered some assumptions that would guarantee the collaboration of the participants so that they could make decisions, as well as interventions in the research process itself, and participate actively in the elaboration of instruments in the intervention actions and / or suggest modifications and evaluate the adequacy of previously planned activities.

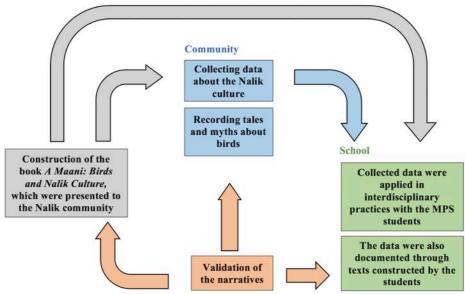


Figure 1: Diagram of the steps applied during this research (da Silva, 2017a)

As this research involves the documentation of cultural aspects of a particular indigenous group, I considered that the methodology proposed should enable documentation based on the voices of the participants, as well as prioritising the

subjects which they considered most important within their culture. Invisible groups, such as traditional and indigenous communities have knowledge that is not valued, and are excluded from the knowledge historically accumulated by mainstream society, so that there is a need to build knowledge belonging to the people with the people that allows for a more critical understanding that goes beyond the boundaries of letters and is constituted in social and historical relationships (Maciel, 2011, 328). In this sense, the investigative process was represented by an open and flexible plan where, during the progression of its stages, the hypotheses, problems and theories could be constantly reconstructed and complemented with the participants.

# The Process of Interdisciplinarity

When we think of an educational project, it is important to think about the kind of activities that can access content knowledge in an interdisciplinary way. By this we mean content from different subjects that can touch on and explore different aspects of one theme. During the project that led to the production of *A Maani: Birds and Nalik Culture*, the theme involved more than just writing and producing texts in English. Students worked with a number of different subjects, including:

- Geography: important aspects of the local geography and of New Ireland as a whole, including its natural features and ethnic groups,
- Science: problems in the local natural environment, animals and plants found in the area, and the international scientific way of identifying and naming the birds representing Nalik clans,
- History: actions in the past that have influenced the present-day make-up of the Nalik community and how it is organised today, and
- Expressive Arts: drawing techniques that enable students to represent animals more vividly and naturally.

Besides these school subjects, the students also investigated various aspects of Nalik culture, collecting traditional oral stories, describing cultural events and symbols, and learning how to put these into a narrative. A suggestion by students as they consulted on how to present their texts was to use the correct Nalik terms for the names of animals and concepts from Nalik culture, followed by a translation and/or explanation in English, a technique that can be seen in the pages of the book. This helped students to become more familiar with classical Nalik terms that were unfamiliar to some of them who had a weak grasp of their ancestral language.

# The workshop Storytelling - Our Book Project

The various exercises carried out over the course of this project were organised into four practical activities incorporated in a workshop called *Storytelling - Our Book Project*. In the classroom, I was able to count on the help of a linguist, Dr Craig Alan Volker<sup>2</sup>, and a Maimai of the Moxokala Clan, Neil Gaalis, as facilitators during my

<sup>&</sup>lt;sup>2</sup> Adjunct Professor of the Cairns Institute, James Cook University in Australia; He was responsible for the, documentation and elaboration of a writing system for the Nalik language (Volker, 1998).

communication with the students, assisting with the elucidation of issues referring to Nalik terminology, Nalik culture, as well as the orientation and organisation of the groups during the several practices. During conversations with students, doubts often arose about the meaning and the etymology of some Nalik terms, or even the grammatically correct form of several words. One example was the form of Nalik writing of clan names. Students from the Luaupul Village wrote differently from those living at Madina, which was subsequently elucidated as being a problem related to the dialects used in these two regions. Thus, both forms were correct and were later included in the final production of the book.

The presence of both facilitators was also important during the correction of the texts produced by the students, making it possible to optimise the time spent in the classroom and the dynamics in the construction of the narratives, in which it was essential to attend to the students' questions, allowing special treatment for those with some difficulties with writing (Figure 2).



Figure 2: Composition of photos showing students receiving orientations during the correction of their texts. (all photos: da Silva, 2016 - except the image to the left, at the bottom, captured by Volker, 2016).

The following is a brief description of each of the activities and how they were developed.

# 1. Storytelling

In this activity students could learn about the different styles of narratives used in legends and fairy tales, which were read to the students in English, accompanied with colourful figures illustrating the different parts of these stories. After first listening to the stories and then reading them in groups, students talked about their social importance as well as the messages and symbols in these narratives. After this, students drew pictures to illustrate a Nalik legend about the origin of their clans, which was included in the final book.

# 2. Technical aspects of books

In this stage, many books representing different literary genres were brought into the classroom. Students were asked to identify the different parts of the books and to comment on their similarities and differences.

The main elements that make up a book, such as the cover, authors' names, and technical requirements were also presented to the students. It was important for them to understand that there are rules governing the preparation and inclusion of these elements in a final publication. I also observed that the construction of the group book would be guided by these rules. Thus, the students were directed to think not only of the texts they would write, but also how to create all the elements necessary to make up a book.

#### 3. Hand-made books

In this stage students had an opportunity to put into practice all the concepts and information they had been learning about.

Working in groups of no more than four people, the students were asked to write a simple story describing an event, telling a personal story, or re-telling a local legend. The topic was up to the group, but it had to deal in one way or another with "birds".

As they wrote, the students were helped to correct their English style and grammar, and relevant rules about English usage were explained. After the texts were produced, the students were shown how to put these stories into small individual books, with covers, title pages, introductory material, and illustrations. After the individual pages were finished, they were stapled together and bound with colourful tape (Figure 3). Some of the stories and illustrations from these individual books can be found in the final book



Figure 3: Some of the handmade books developed by the students during the workshop (photo: da Silva, 2016).

# 4 Working with texts and illustrations

As explained earlier, material such as narratives and traditional information had been collected earlier from members of the Nalik community. Working with this material, students discussed what they did and did not know about clans in general and their own clans in particular, as well as about the birds that represent them. They also identified these birds scientifically and learned about how the birds live, both from books and from what their elders told them.

After exploring the information that had been collected, we worked with students to decide which other texts should be written for the collective book. After much discussion, the group decided they needed texts describing the important characteristics of the Nalik people, the villages where the students live, their habits and customs. Then they described the Nalik clans and the birds that represent them. The students again worked in groups. Each group had responsibility for producing one group text for the collective book. These texts were improved and re-written many times. The three teachers were available to make suggestions about English usage and the content of the texts. The texts were re-read many times until everyone was satisfied with the final results. The groups also produced drawings of the clan birds that illustrate this book (Figure 4). After they were finished, the texts were joined together and edited. The final text was shown to students for their approval and for any final corrections or additions.



Figure 4: Some of the pictures drew by the students during the workshop (photo: da Silva, 2016).

# The book A Maani: Birds and Nalik Culture

During the first two weeks of the workshop, at MPS, I proposed to the students to contribute themes that could be used in the development of texts to compose the collective book (see Table 2). This resulted in a first compilation of possible chapters and topics that, through the reflections that emerged during the practices developed in the classroom, would end up undergoing several modifications, until the final production.

In the final book, the topics chosen by the students were organised in sequential chapters in order to increase their coherence and structure, a strategy that allowed the expansion of the range of information about socio-cultural, historical and environmental aspects used in describing the Nalik group.

**Table 2:** Chapters and themes suggested by the students for the collective book (da Silva, 2017a)

Chapters chosen by the Main theme to be explored in each chapter students						
	Location in Papua New Guinea					
New Ireland	Beauty: the forest and the sea					
	<ul> <li>How many tok ples (local languages)</li> </ul>					
	<ul><li>Who are the Nalik people?</li></ul>					
Nalik people	<ul> <li>Main villages</li> </ul>					
	<ul> <li>How do Nalik people live?</li> </ul>					
	<ul><li>How many Nalik clans are there?</li></ul>					
Nalik Clans	<ul> <li>The name of clans' animals in tok ples</li> </ul>					
	<ul> <li>One of them isn't a bird but a snake</li> </ul>					
	<ul> <li>Description of the name of the animals in a Western</li> </ul>					
	way					
	<ul> <li>Their colour, size, feeding habits and where they live.</li> </ul>					
	<ul> <li>Stories about birds</li> </ul>					
Birds	<ul> <li>New Ireland birds</li> </ul>					

Next, I will present each chapter of the final book as it was organised after reviewing the suggestions provided by the students.

#### **New Ireland Province**

This chapter describes NIP, its location, wealth, and natural beauty. Here also the students highlight the cultural richness of this region represented by its 23 native languages, the Nalik language being one of them.

# The Nalik area and our villages

The Madina and Luaupul villages are presented in this chapter through their biodiversity and places considered important by students. The animals, cited in English, also had their names translated into the Nalik language, a decision made by the students themselves and adopted for all the natural and socio-cultural elements present in this work. Here, too, some historical aspects, are inserted to describe the German colonial period between 1884 and 1914 and the Japanese invasion and occupation during World War II.

# Nalik society and Nalik culture

Here the students specifically address the matrilineal social organisation of the Nalik group, their leaders and clans, and describe cultural elements present in the traditional memorial ceremonies known as malagan.

# The Origin of the Clans

This chapter contains a traditional Nalik tale that explains the origin of the clans. The narrative was structured and complemented with seven illustrations made by the students;

# Birds of New Ireland - Their importance for the environment and Nalik culture

The ornithological diversity of the NIP is addressed in this chapter, as well as its importance for the local environment and culture.

# Description of the birds that represent the Nalik clans

Here each of the seven species of birds used as totem of the Nalik clans is depicted. Each animal is presented by its name in the Nalik language, accompanied by the vernacular name in English, and its scientific classification. In the description, information was searched in *Birds of New Guinea* (Pratt & Beehler, 2014), *Birds of Melanesia: the Bismarcks, Solomons, Vanuatu and New Caledonia* (Dutson, 2011) and *Indo-Pacific Coral Reef Field Guide* (Allen & Steene, 1998). During the workshop, this information would be complemented with traditional knowledge shared by community members and illustrations drawn by the students;

# Other important birds in Nalik culture

In this chapter, five narratives are compiled that were shared during the *Tell Us Your Story* activity in the *Hand-made Books* workshop. These were selected by the students from among the various productions developed. Also included are four traditional songs, recorded during an interview with community members, with their respective translations and / or information on the subject addressed. All this material deals with themes related to several species of birds that live in the NIP region, showing the importance of these animals to the local culture.

# **About this book**

This chapter describes the whole process involved in conducting the *Workshop: Our Book Project*. It also contains some guidelines for teachers and community members who wish to develop similar educational projects in their schools that consider the local reality, conducted in an interdisciplinary way and with community involvement.

# Showing the project to the community and asking for validation

During the activities, the students and I made a timeline of the steps we were developing. At the end of every meeting with them, the students were asked to discuss and write together some paragraphs about the activities they had taken part in, what they had learnt that day, and what topics or questions they found especially interesting. This timeline was made with colourful paper and acted as a visual guide of the project, documenting and illustrating everything we had been doing. At the end of the workshop I brought the individual books the students had made together with the timeline and showed them to the weekly Monday community meetings in Madina and Luaupul villages (Figure 5). Parents and other community members showed great

interest in what the students had been doing and could see how the stories and information they had shared earlier contributed to the project.



Figure 5: Community members at Luaupul Village observing the material developed by the students during the workshop (photo: da Silva, 2016).

Because the topic of this book and of this project contained elements referring to the culture of an entire ethnic group, we thought it was also important to give the final text to several members of the community so that they could validate the vocabulary and content. Eight members of the Nalik community, including maimais and teachers, were asked to read and correct the texts. Based on their recommendations, some Nalik words were changed and some additional explanations were included.

#### **Conclusions**

The process depicted in this paper is the result of a dynamic collaboration between young students, community leaders, and a researcher from outside the community. It is an example of how educational projects can enrich students' learning and be a way for small communities to produce literature to share their culture and local knowledge.

The use of action research, which enables several moments of dialogue and collaboration with the community, was fundamental in establishing a climate of trust and interest on the part of the members of the Nalik group. Among other potentialities mentioned by the participants, it prevented the production of decontextualised descriptions about local culture, a criticism mentioned by many community members in relation to anthropological research developed in the region that, according to them, end up portraying their customs and way of life in a superficial and misguided way.

The book A Maani: Birds and Nalik Culture (Figure 6), built through experiences and voices of these participants, compiles various aspects of Nalik culture as well as traditional songs and narratives, documented and described through the eyes of the

community. It also represents a set of information about this ethnic group, documented for the first time using their own oral narratives.

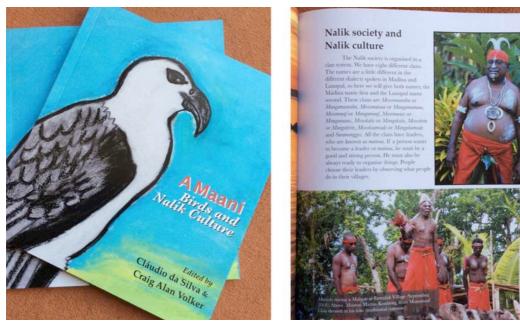


Figure 6: Cover of the book A Maani: Birds and Nalik Culture and an example of one its pages (photos: da Silva, 2018)

It exemplifies a practical-constructive model, for education contextualised within aspects of the local culture in the search for a possible dialogue that leads to the revaluation and acknowledgement of traditional knowledge and practices that are part of the identity of its members.

This research identifies a methodological process that could be replicated in other cultural contexts, such as with other groups in northern NIP with which the Nalik group has similarities in relation to social organisation in clans and the observance of malagan ceremonies. It would also be interesting to conduct a similar contextualised investigation in other indigenous and / or traditional communities. The reflexive and participatory process developed throughout this research can contribute to the empowerment of the community in the maintenance of its cultural identity, since it provides a space for a deep discussion of these elements, by the community itself.

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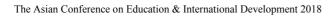
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Official Conference Proceedings

# Explicit and Implicit Grammar Instruction in English Writing

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#### **Abstract**

The present study aims to explore the experimental assessment of different instructional approaches (i.e. explicit and implicit grammar instruction) in English writing. Specifically, it seeks to investigate whether grammar should be taught explicitly or implicitly in English composition classes in Taiwan, and which option can help students enhance their grammatical accuracy more effectively after a period of teaching. A quasi-experimental research design was carried out in comparing two treatment groups who were 7th graders in two English classes in a junior high school. Results showed that students in the explicit teaching group improved more and received higher scores in a posttest and delayed posttest, as they made fewer grammatical errors in comparison with the group in which grammar was implicitly taught. Metalinguistic awareness tended to play an important role in grammar learning. In addition, there was a discrepancy between students' and teacher's perceptions of explicit and implicit grammar instruction. Implications for writing pedagogy and awareness-raising are discussed.

Keywords: explicit grammar instruction; implicit grammar instruction; English writing; quasi-experimental research; awareness-raising



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#### Introduction

Over the past few decades, there have been several arguments about the different possible approaches to teaching grammar in EFL contexts. Grammar instruction is a controversial issue among teachers, curriculum designers, and language practitioners. Some teach grammar explicitly; others teach it implicitly; and still others probably do not want to teach or talk about it in class at all. Until now, English teachers still face the issue of deciding the best approach to improve their students' grammatical accuracy. If grammar has been viewed as a taboo by some people, it has also been appreciated and supported by some others. Insights into the issues of how best to teach grammar in second language (L2) writing classrooms or, indeed, whether to teach grammar at all in composition classes, continue to be of great interest and concern to teachers and researchers alike.

There has been a continuing argument in the current curricula regarding how to meet schools' language requirements (Chang, 2011). In Taiwan, it is generally assumed that with years of learning English language in classrooms, students should have some basic knowledge of grammar. However, it is evident that many students still struggle with their grammar and are weak in using it accurately, especially in their writing compositions. In view of the problem in learning grammar mentioned above, therefore it is important to explore how to best teach students to use grammar accurately.

This paper attempted to contribute to the body of research, with the aims of exploring which one (explicit or implicit grammar instruction) is better to help students learn to use grammar accurately for academic purposes, and discovering the effect of two instructional treatments in the school context. As grammar is an area that affects all writing teachers and their students, it is important that the literature should be augmented by research studies conducted in different parts of the world. In the past, the large majority of published grammar research has been conducted in L1 and ESL college contexts, and in English-dominant countries, particularly the US and UK. Empirical research carried out in other contexts, especially under-represented contexts such as elementary level and EFL contexts, will be a welcome addition to the field. In other words, research that explores explicit and implicit grammar instruction in writing in different contexts and ages is very much needed in order to add new knowledge to the current research base on the effectiveness of grammar teaching and learning.

#### Literature Review

#### **Explicit grammar instruction**

The debate between the effectiveness of implicit and explicit grammar instruction persists in the past literature. In particular, whether grammar should be taught explicitly or implicitly is still controversial (Ellis, 2008, 2012, 2015).

Referring to *Implicit and Explicit Knowledge in Second Language Learning, Testing and Teaching*, Nazari (2013) pointed out that explicit grammar instruction "involves teaching a certain rule during the learning process and encouraging the learners to develop metalinguistic awareness of that rule" (p. 157). Explicit grammar instruction

comprises drawing student attention to a particular learning objective in a highly structured situation without referring to context. More specifically, grammar is taught in a logical order guided by the teacher through demonstration, explanation and practice. Grammar rules are presented before any examples are given. The aim of explicit instruction is to introduce a new grammatical concept, offer guidance for understanding rules, and provide students with specific instruction through modeling, which gives them opportunities to develop an understanding through practice (Ellis, 2008). Ellis (2008) stated that explicit instruction is conscious, declarative and only accessible through controlled processing in planned language use. Grammar is potentially learnable at any age and consequently, and language rules could be performed automatically if the sequences are sufficiently practiced. Explicit instruction makes students recognize ungrammaticality, since it not only activates their prior knowledge of the target structures, but also raises their awareness of the target grammar form (e.g., Ellis, 2012, 2015; Larsen-Freeman, 2003).

Major affordances and constraints of explicit grammar instruction are summarized in Table 1 (Ellis, 2008, 2012, 2015).

**Table 1:** Affordances and constraints of explicit grammar instruction

Affordances of explicit grammar	Constraints of explicit grammar		
instruction	instruction		
	<ul> <li>non-communicative learning</li> </ul>		
<ul> <li>conscious learning</li> </ul>	<ul> <li>rule memorization</li> </ul>		
<ul> <li>in a more structured way</li> </ul>	<ul> <li>generally without enabling</li> </ul>		
<ul> <li>straightforward rules</li> </ul>	individualized understanding		
<ul> <li>practice through grammar drills</li> </ul>	<ul> <li>generally without providing</li> </ul>		
and exercises	authentic, contextualized		
	learning		

# **Implicit grammar instruction**

As opposed to explicit instruction that involves teaching grammar rules during the learning process and facilitating students to develop metalinguistic awareness of the rules, implicit instruction aims to give students opportunities to infer the rules without being consciously aware of them and most importantly, internalize the rules naturally without having attention focused on them (Ellis, 2009). The idea that grammar can be learnt implicitly comes from Krashen (1985, 2013). He rebutted any statements that attempt to advocate the effectiveness of explicit grammar instruction. As suggested by Krashen, explicit grammar instruction as contributing to SLA is controversial. Spontaneous use of grammar rules is the outcome of a series of an independent process of acquisition, which occurs subconsciously through exposure to input.

An important issue of explicit grammar instruction is whether it results in successful internalization in learning grammar rules. Krashen's input hypothesis (1985) maintained that students learn a language by understanding messages, not through understanding form, and that comprehensible input plays a crucial role for language acquisition. Specifically, he argued that given comprehensive input and wide-ranging opportunities for meaningful communication in class, grammar could be learnt naturally and automatically through different exposure. The aim of implicit grammar instruction is to introduce grammar in a student-centered manner, to give students

instruction with various examples and exposure without teaching students grammar rules, and to let students build their own schemas for understanding and applying rules by themselves.

Major affordances and constraints of implicit grammar instruction are summarized in Table 2 (Ellis, 2008, 2012, 2015).

**Table 2:** Affordances and constraints of implicit grammar instruction

Affordances of implicit grammar instruction	Constraints of implicit grammar instruction
<ul> <li>subconscious learning</li> <li>more contextualized and authentic</li> <li>more communicative</li> <li>in a more natural situation</li> </ul>	<ul> <li>difficult for some students to deduce rules</li> <li>problems of misinterpreting rules</li> <li>tending to be unstructured</li> </ul>

It should be recapped here that there are distinctions between explicit and implicit grammar instruction. The focus of explicit grammar instruction is on the forms, rather than on the meaning. On the other hand, implicit grammar instruction gives no attention to the forms and explanation of grammatical rules, and the primary concern of teaching activity is on communication of meaning.

To conclude, so far, in the practice of English language teaching, teachers still face the issue of how to best improve their students' grammatical competence. Nonetheless, as people from different contexts may have a different learning preference, it is therefore necessary for teachers to vary their method to optimally teach students. For instance, in Mainland China and Taiwan, although there is an increasing trend toward implicit grammar instruction such as designing more communication-oriented teaching activities, its effect, especially on grammar learning, is still uncertain concerning whether it is effective in developing learner's grammatical accuracy. Thus, teachers may need to consider reverting to explicit grammar instruction. Therefore, in light of different approaches to teaching grammar (explicit and implicit grammar instruction), it would be useful to examine the effect of these approaches on students' performance in writing narrative compositions. It would also be interesting to explore which approach would lead to better improvement of students' grammatical accuracy.

#### Research Method

#### Research aims and questions

The present study aims to explore approaches to teaching grammar so as to find ways to improve students' grammatical accuracy, which is generally tested in school and internationally-recognized standardized exams, such as the TOEFL, IELTS and SAT. In this study, the simple past tense and the past continuous tense in the student textbook were selected as target grammar rules because the students had to learn these in junior high school, as stipulated by the Taiwan Ministry of Education. They play an important role in narrative writing, especially in describing past events. The research questions in the present study are as follows.

- 1. Do explicit grammar instruction and implicit grammar instruction have different effects on students' performance in grammatical accuracy in narrative writing?
- 2. If there is an effect, which teaching approach can lead to better improvement on students' performance in grammatical accuracy in writing?
- 3. Does the improvement sustain over a period of time?
- 4. What are grammatical errors that students make in narrative writing?
- 5. What are students' and teacher's perceptions of explicit grammar instruction and implicit grammar instruction?

# Research design

The design of the study was a quasi-experiment (i.e. treatment group 1 and treatment group 2). Data were collected in 2016 from students' pretest, posttest and delayed posttest scores, and also from follow-up semi-structured interviews with students and teacher. The study was conducted over a 4-month period (from pretest to posttest: 3 months; from posttest to delayed posttest: 1 month). Since it was conducted in a junior high school setting, students were already grouped into different classrooms. It was at this stage that students were required to learn past tense in the curriculum guidelines set by the Taiwan Ministry of Education (Taiwan Ministry of Education, 2005). All of the research subjects were 7th graders between 12 and 13 years old (Mean: 12.4 years; SD: 0.8 year). Before entering junior high school, they had studied English as a compulsory subject in elementary school for 4 years. They had started to learn English in third grade in elementary school (Taiwan Ministry of Education, 2005). Their previous study in elementary school mainly focused on learning basic vocabulary, rather than sentences.

As this study was quasi-experimental in nature, the researcher formed the classroom groups to be studied, treatment group 1 (explicit grammar instruction) and treatment group 2 (implicit grammar instruction). Two classes were selected at random by a draw to be assigned to use one of these two approaches to teaching grammar. The number of students in each class was between 40 and 42 and their English language proficiency varied. It is noted that for the purpose of this study, only 35 students were selected from each class. In order to avoid any bias in the study, for each class, the researcher chose the students from the class register list after excluding those who did not meet the requirements of the study as follows. First, students from English-speaking countries or who had studied there over six months or a semester were excluded from the study. They were also identified through interviews about the language(s) used at home and at school. Second, the students who were absent during pretest, posttest and delayed posttest were also excluded from the study. In other words, the students who did not participate in pretest, posttest and delayed posttest were eliminated from this study. The final number of students was 70 (explicit grammar instruction group: 35; implicit grammar instruction group: 35).

# **Instructional activities**

For a full understanding of the theoretical framework for the treatments (explicit and implicit grammar instruction) adopted in this study, a comprehensive review of Ellis' studies (2008, 2012) is essential. In brief, for explicit grammar instruction, learning the form is the major concern, and the instructional focus is on the grammatical structure. Selected forms are taught by the presentation and direct explanation of

grammar rules, followed by the giving of examples. Students usually practice the form in output tasks. Thus, in the present study, regarding the teaching of grammar, in treatment group 1, the students were directly explained the use of rules of the simple past tense and the past continuous, and learned how grammar rules worked, with some reference to linguistic terminology. They were also provided with examples of the rules in a linguistic and functional manner (Ellis, 2012) so as to be able to confirm their conclusions when they had questions about whether or not their answers were correct. In addition, the students were provided with direct feedback. In other words, the teacher underlined errors and made corrections, referring to the rules.

With regard to implicit grammar instruction, according to Ellis (2008, 2012), the major focus is on understanding the meaning of the text, rather than the rules. A lot of practical usage examples from authentic materials in real life situations containing the grammatical structure are given as input. The meaning of the text is the major concern. Students may deduce rules by themselves from the examples. Grammar discovery is part of the task-based activity and no grammatical rule is discussed. Thus, in the treatment group 2, the students learned through less conscious or subconscious processes (Celce-Murcia, 2002; Krashen, 1985, 2013). The activities of teaching grammar were communicative and meaning-focused in order to let the students produce the target grammar and get feedback on the productions, but the feedback was given indirectly. The teacher wrote the number of errors that the students had made using the target grammatical structure, but did not provide corrections, thereby leaving it up to the students to find and fix them on their own.

The students were taught according to the guidelines (Housen & Pierrard, 2006) in Table 3 and lesson plans in Table 4. Having done related activities in either explicit or implicit grammar instruction, the students needed to write on a narrative topic requiring them to use the target grammatical structure (i.e. past tense forms) and to make an individual decision on the tense feature in each sentence. It should be noted that to avoid the possibility of teacher effects on the results, the same regular teacher taught these two groups.

**Table 3:** Grammar instruction guidelines: treatment group 1 (explicit) and treatment group 2 (implicit)

Explicit grammar instruction	Implicit grammar instruction			
directs attention to target forms and	attracts attention to target forms and			
caters to intentional learning of the	caters to the incidental acquisition of the			
forms, as students are mainly focused on	forms, as students are mainly focused on			
forms	meaning			
is predetermined and planned (e.g., as	is delivered spontaneously (e.g., in a			
the main focus and goal of a teaching	communication-oriented activity)			
activity)				
is obtrusive (interruption of	is unobtrusive (minimal interruption of			
communication of meaning)	communication of meaning)			
presents target forms in isolation	presents target forms in context			
uses metalinguistic terminology (e.g.,	makes no use of metalanguage			
rule explanation)				
involves controlled practice of target	encourages free use of target forms			
forms (only focusing on teaching and				
eliciting production of target forms)				
gives explicit feedback	gives implicit feedback (e.g., "Please try			
	again.")			

**Table 4:** Grammar instruction lesson plans: treatment group 1 (explicit) and treatment group 2 (implicit)

Pretest (20 mins)					
Explicit grammar instruction	Implicit grammar instruction				
(3 months; 12 sessions)	(3 months; 12 sessions)				
(Meeting for this experiment once a	(Meeting for this experiment once a				
week, lasting 45 mins)	week, lasting 45 mins)				
I. Introduction and sentences illustrating	I. Introduction and sentences without				
the rules and patterns (form-focused) (15	illustrating the rules and patterns				
mins)	(meaning-focused) (15 mins)				
II. Practice session:	II. Practice session:				
Pair work: explicit feedback given (e.g.,	Pair work: implicit feedback given (e.g.,				
grammar errors corrected directly and	grammar embedded in the feedback				
immediately) (20 mins)	naturally and frequently) (20 mins)				
III. More drills:	III. More exposure:				
Rules and patterns repetition (10 mins)	Communication-oriented activities (10				
	mins)				
Posttest (20 mins)					
1 month					
<b>Delayed Posttest</b> (20 mins)					

# Data sources and data analysis

The narrative compositions written by the students in pretest, posttest and delayed posttest were major data sources. In order to avoid repletion effect, the students were assigned to write narrative compositions to describe what had just happened yesterday in these three tests.

The writing prompt was: Please describe what happened to you yesterday. You have 20 minutes to write. The rationale for selecting the prompt for this grammatical focus was that on the one hand, learning how to write well about something happening in the past is important. On the other hand, the prompt asked them to write something familiar to them, so that high engagement could be expected. The simple past tense and the past continuous tense in students' compositions were analyzed by gauging their grammatical accuracy. Specifically, the improvement in performance on the writing was evaluated based on verb form (including spelling) accuracy. Grammatical accuracy was chosen for measure of writing effectiveness as it is commonly tested by English or high school entrance exams in Taiwan.

To measure the students' performance, an obligatory count procedure was adopted to analyze the data. The method used for the obligatory count procedure was that the number of correct use of the simple past tense and the past continuous tense was divided by the number of obligatory occurrence (when the students referred to the past event). In other words, the number of correct use from each test for each student in each treatment group was calculated respectively from the three tests. The data were documented on spreadsheets according to explicit and implicit instruction treatment groups. The scores were calculated and tabulated as follows.

(Number of correct use/Number of obligatory occurrence) x100%= Score (%)

As for Target-Like-Use (TLU) analysis, inter-rater agreement between the researcher and the research assistant in pretest, posttest, delayed posttest, improvement between pretest and posttest, and improvement between pretest and delayed posttest was 100%. The measure of intra-rater reliability was reached as the researcher coded the same data subset in pretest, posttest, delayed posttest, improvement between pretest and posttest, and improvement between pretest and delayed posttest again about four weeks after each inter-rater reliability measure was reached. Intra-rater agreement was all 100%. These results show that inter-rater agreement and intra-rater agreement were high.

Raw scores were submitted to independent samples t-test to explore if there were any differences between the two groups in pretest, posttest, and delayed posttest. The results of treatment group 1 (explicit grammar instruction) were then compared with those of treatment group 2 (implicit grammar instruction).

After the end of the last teaching session (the 12th session), follow-up semi-structured interviews with students and teacher were conducted in their first language (Mandarin Chinese) in order to obtain more specific information about what they perceive regarding explicit and implicit grammar instruction. Each interview (focus group student interview and individual teacher interview) lasted about 30 minutes. As for the analysis of interview data, attention was particularly paid to the question how they could be systematically analyzed. For instance, student responses were rendered in a more objective fashion rather than that of impressionistic. It was ensured that students' responses were analyzed unselectively instead of picking out some salient examples.

# **Findings**

To answer the first research question, based on the findings of the students' written data, both teaching approaches showed positive effects, with different degrees of improvement. There was a reduction in the students' written production errors. However, compared with the implicit teaching group, the explicit teaching group showed a greater reduction in their written production errors. For each group, grammar mean scores are presented in Figure 1.

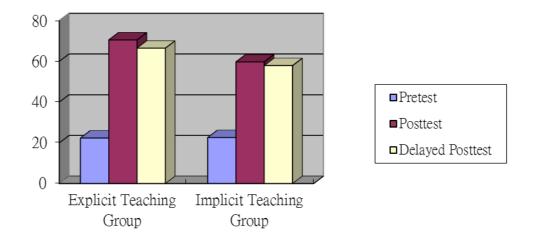


Figure 1: Grammar mean scores for the three tests in each group

The second and third research questions can be answered from the improvement in each group. Analysis of the improvement for each group is shown in Tables 6, 7 and 8 as follows

**Table 6:** Pretest, posttest, and delayed posttest (independent samples t-test)

Group	N	Mean	SD	t	DF	p	
Pretest							
Explicit teaching group	35	22.34	2.35	-0.43	68	0.67	
Implicit teaching group	35	22.57	2.06				
Posttest							
Explicit teaching group	35	70.46	2.38	19.07	68	0.00*	
Implicit teaching group	35	59.71	2.33				
Delayed posttest							
Explicit teaching group	35	66.43	2.57	14.52	68	0.00*	
Implicit teaching group	35	57.86	2.37				

Note: \*An alpha level of .05 was chosen as the significance level.

In order to test homogeneity of the two groups, as Table 6 shows, in the independent samples t-test, there were no significant differences in the pretest between explicit and implicit teaching groups at the very beginning of the study (p=0.67). Nevertheless, after different forms of grammar instruction, the two teaching groups differed

significantly in the posttest (p<.05) and delayed posttest (p<.05). Compared with the students in the implicit teaching group, the students in the explicit teaching group received higher scores not only in the posttest, but also in the delayed posttest.

In addition, based on the findings in posttest and delayed posttest, the students' improvement sustained over a period of time. The explicit teaching group outperformed the implicit teaching group in both immediate and delayed posttests. In comparison with the group that grammar was implicitly taught, the students in the explicit teaching group tended to be more aware of the importance of correct grammar usage during writing.

Finally, both explicit and implicit teaching groups showed a moderate decrease in their delayed posttest, a month after the treatment. It is noted that the explicit teaching group showed a higher percentage of decrease, 4.03%, while the implicit teaching group showed a lower percentage of decrease in performance that is only 1.85%. Nonetheless, the grammar mean score in the explicit teaching group (66.43%) was still higher than that in the implicit teaching group (57.86%).

**Table 7:** Improvement between pretest and posttest (independent samples t-test)

Group	N	Mean	SD	t	DF	p
Explicit teaching group	35	48.12	3.58	-13.97	68	0.00**
Implicit teaching group	35	37.14	2.96			

Note: \*\*An alpha level of .05 was chosen as the significance level.

**Table 8:** Improvement between pretest and delayed posttest (independent samples t-test)

Group	N	Mean	SD	t	DF	p
Explicit teaching group	35	44.09	3.89	10.40	60	0.00**
Implicit teaching group	35	35.29	3.15	10.40	68	0.00**

Note: \*\*An alpha level of .05 was chosen as the significance level.

As shown in Tables 7 and 8, the two teaching groups differed significantly in improvement between pretest and posttest (p<.05) and improvement between pretest and delayed posttest (p<.05). In other words, when compared with the implicit teaching group, the explicit teaching group showed the most improved performance in grammatical accuracy in narrative writing. In addition, the students in the explicit teaching group also improved more in both posttest and delayed posttest.

# Students' perceptions of grammar instruction

Since the debate of explicit-implicit grammar instruction is an important one in SLA, students' perceptions of this issue can provide a good indication of their orientation. As shown in student interviews, no matter whether students were in the implicit or explicit grammar instruction group, they tended to expect the teacher to present grammar points explicitly. One representative example is given as follows:

I would like to learn grammar from one-sentence examples. Learning grammar from authentic texts without explicit grammar instruction is difficult for me as

there are a variety of grammars appearing in texts that I did not encounter before. A lack of explicit grammar instruction makes me feel insecure. Also, I find the explanation of specific grammar rules useful. I think that the major grammar instruction in Taiwan, in case of English grammar in particular, is explicit. My expectation is that the teacher could provide direct explanation of rules. (Student 5)

The finding revealed that explicit grammar instruction is favored by students due to their feelings of security. They saw the explanation of grammar rules as useful. It might also be linked to students' prior language learning experience in Taiwan and they were accustomed to it. If grammar was taught implicitly, students might not feel at home, particularly without giving the explanation and having practice of grammar rules.

# Teacher's perceptions of grammar instruction

In addition to student interviews, the teacher was asked to comment on the role of grammar instruction and the kind of instruction which might be more beneficial for students. As pointed out by the teacher, students could learn grammar more effectively in implicit grammar instruction, which is to some extent different from students' perceptions. She understood the value of learning language as real communication and tended to support this approach for pedagogical reasons of her own. For instance, the following comment from the teacher indicates her favor for an implicit approach to grammar teaching:

I think that students can increase their communication competence at the university. Their grammar can improve when they have had implicit grammar instruction and their sub-consciousness is awakened. In other words, I think when compared with explicit grammar instruction, in implicit grammar instruction students can pick up grammar and learn grammar more extensively from meaningful exposure to the language.

Based on the interview data, it may be reasonable to conclude that the teacher feels that implicit grammar instruction may increase communication competence and is favored by her. However, it should be noted that as shown previously in student interview data, there are some concern for students about lack of enough explanation of rules for the development of grammar, something which could be linked to communicative tasks.

## **Discussion and Conclusion**

#### **Explicit versus implicit grammar instruction**

The study demonstrates the existing controversy among researchers about the roles of explicit and implicit grammar instruction in helping students to overcome grammatical errors. The finding indicated that when compared with the implicit teaching group, the explicit teaching group showed the most improved performance in narrative writing. This parallels Spada and Tomita's (2010) findings, revealing that explicit instruction positively contributes to students' grammar knowledge. Although in the present study, implicit grammar instruction did have a positive effect on

enhancing students' grammar accuracy in writing, students in the explicit teaching group tended to learn rules of the simple past tense and past continuous tense more firmly and did better in posttest and delayed posttest, as it is important to have grammatical knowledge in order to express one's intended meaning precisely in writing.

Despite the fact that in this study modest progress was made by the implicit teaching group, implicit grammar instruction still has its place. However, it may be regarded as an alternative method in Taiwan. For Chinese learners, one possible reason is because students may not be able to translate effectively without explicit detailed and systematic grammatical knowledge. If students know why and how rules work, they may avoid the violation of incorrect grammar rules.

### Students' and teacher's perceptions of grammar instruction

Interestingly, the study shows that there is a disparity between students' and teacher's perceptions of explicit and implicit grammar instruction. Such a mismatch is that students are more in favor of systematic, explicit grammar instruction, while the teacher prefers communicative activities. This incongruence between students' and teacher's perceptions suggests that when teachers make decisions in grammar instruction, they may need to take students' needs and concerns about lack of explicit grammar learning into consideration. Students' preference for grammar instruction may not accord with implicit instruction, but teachers may be able to utilize students' perceptions to make adjustments in their courses and to be open in talking to students about their teaching activities.

Based on the interview data, it is also possible to make some claims concerning students' and teacher's beliefs about grammar teaching and learning. The teacher tended to have positive comments on the explicit grammar instruction. This result is contrary to Nan's (2015) study. Being a spokesman for grammar teaching instructors, Nan argued the positive aspect of explicit grammar instruction which "will empower the English learners with the potential and enthusiasm for inquiry learning and active learning" (p. 82). Nonetheless, in the present study, the teacher's preference for implicit grammar instruction may indicate that she is inclined to use authentic texts and real-life tasks for practice within communicative or skills-based work to facilitate students' learning (Başöz, 2014; Yoo, 2016).

However, comments from students suggest that the authentic materials were difficult for them to learn. The level of the readings could have made it harder for them to learn language forms implicitly because of the content's difficulty. In addition, although students seem to favor more explicit grammar instruction, there does not appear to be a bias against decontextualized presentations of grammar. On the student side, they tend to perceive that it is relatively easy for them to learn if grammar is taught explicitly. They indicated that their grammar errors need to be explicitly pointed out and corrected; or they cannot 'learn' from their errors. This might be due to their need and expectation of detailed explanations of specific grammar rules and sense of feeling security (Weger, 2013). The result is to some extent in line with Nazari (2013) study, stating that generally speaking, learners who "are informed of the grammatical rules...feel more comfortable, self-confident and motivated in the classroom" (p. 161).

# Implications of the study

There are several areas in grammar instruction that can be considered for future research. First, further studies can be conducted to explore which specific grammatical features benefit more through explicit grammar instruction than others do, so as to get to know which aspects to focus on. In other words, in writing pedagogy, it could be helpful for teachers to be aware of which aspects of explicit grammar instruction are more successful and less successful. Most importantly, they also need to consider what explicit grammar instruction is relevant to the target text and context of communication. For example, in terms of teaching simple past tense and past continuous tense, as there is no tense system in Mandarin Chinese, it may not be easy to teach simple past tense and past continuous tense implicitly since there is no counterpart of the tense present in students' native language.

In addition, as different students may have different ways to learn grammatical rules, it is important to ensure that teaching activities are appropriate, so that students' awareness can be raised. Students' needs for grammar learning may not coincide with the methods employed in implicit grammar instruction, but teachers may include more integrated, skills-based grammar activities in their courses to make learning more meaningful. Nevertheless, it is noted that teachers may also need to be explicit in informing students the grammar-orientation of these activities in order that they are appreciated as fulfilling students' wishes.

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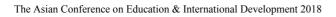
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Official Conference Proceedings

# Team Based Learning of the Mercato Project to Nurture Criticism, Creativity and Problem Solving during Orientation Camp of ESC-KMUTT

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#### **Abstract**

Team-based learning (TBL) is a learning practice supporting small group for powerful instructional effect. There are four essential elements of TBL including groups, accountability, feedback and assignment design. The objectives of this study were to use team based learning for instructing "The Mercato Project" and nurture soft skills such as criticism, creativity and problem solving to freshman students during orientation camp. The project was organized to nurture 70 new students of Engineering Science Classroom, King Mongkut's University of Technology Thonburi (ESC-KMUTT). They were divided into 2 rooms of different feedback teacher's team receiving the same team assignment. Data were collected form 34 questionnaires, 6 open-ended questions and model evaluation. The result showed the most of students agreed that Mercato activity made them learning substantially (4.41±0.58), working as a part of Mercato team to be a valuable experience (4.41±0.69) and working in team helped to learn better than working alone (4.41±0.81). Quantitative analyses confirmed that although the construction of Mercato model was built differently, there was no significantly difference of overall student TBL self-evaluation by using independent sample t-test (p<0.05). In addition, we also found that they used criticism, creativity and problem solving much more during working in Mercato team. In conclusion, the Mercato project was accomplished using TBL to expose students and help them improve their soft skills for applying course content during orientation camp.

Keywords: Creativity, Criticism, Problem solving, Team based learning (TBL)



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#### Introduction

ESC-KMUTT's students batch number 10 were recruited to attend an orientation camp before enrolled the academic year of 2017. Many soft skills were nurtured to our students during the camp including critical thinking, creative thinking, visual thinking, problem solving and teamwork skill. The main hands-on project during this camp was called "The Mercato" which aim to create a model of innovative market center. The last 3 days of orientation camp, students need to apply their contents and soft skills to construct the mercato model. Therefore, the objectives of this study were to use team based learning for instructing "The Mercato Project" and nurture soft skills such as criticism, creativity and problem solving to freshman students during orientation camp.

Team-based learning (TBL) is a learning practice supporting small group (5-7 members) for powerful instructional effect. There are four essential elements of TBL including groups, accountability, feedback and assignment design. Group require time to cultivate into high-performance team because enough time helps developing cohesive to grow into self-managed and actually effective learning teams (Michaelsen & Sweet, 2008). The task of members to teams is essential for this use of TBL. Students' capability in some characteristics should be spread throughout the small groups. The instructor should plan the composition of the teams with this in mind instead of letting students to basically self-assign themselves to groups (McMahon, 2010). The constructing of good problems is one of the keys to achieve in team-based learning. Problem solving skills were developed by increasing difficulty into problems or inputting serial problems which could not solve individually. TBL makes chances to develop these skills supported by the frequent feedback from their coworkers and the teacher (Sibley & Parmelee, 2007). A first time of TBL was implemented to medical education since late 1990s (McMahon, 2010). Later on, TBL was applied in many fields. For Science, TBL with challenging projects enhanced the undergraduate students' comprehension and long term retention, critical thinking, creativity and attitudes about the Microbial Physiology course and concentrated student-instructor collaborations on learning rather than grades (McInerney & Fink, 2003). For Engineering, First-Year Engineering Projects (FYEP) course at the University of Colorado at Boulder was introduced to freshman which is the design/build hands-on process in a team-based setting, supported by experimental testing. It was indicated that the engineering students were significantly more likely to be retained at the third, fifth, and seventh semesters than their peers who did not join the FYEP (Knight, Carlson, & Sullivan, 2003, 2007).

# Methods

#### 1. Participants

The project was organized to nurture 70 new students of Engineering Science Classroom, King Mongkut's University of Technology Thonburi (ESC-KMUTT). The students were divided into 2 rooms which the activities were run parallel by different feedback teacher's teams.

# 2. Learning process

Each room had 2 groups of students received different assignments, A and B. One group composed of 3 small teams containing 5-6 members. Team coding used "1A1, 1A2, 1A3" that 1A1 stands for room1, assignment A and team 1. The main assignments were given to group 1A, 1B and 2A, 2B and assignments were defined to the concept of "The Mercato". During the orientation camp, there were also another activities including "Ask is Free", "Teamwork Concept Learning" and "Da'Vinci Bridge" provided with knowledge of critical thinking, teamwork skill and creative thinking. Then, field trip activity was designed to let them exploring the real market atmosphere at Amphawa floating market, seeing the architecture of Buddhist temple at Wat Bang Kung, in Samut Songkhram province, Thailand. After came back from the field trip, the students in each group had to the design and sketching under their main assignments. When the sketching was done, the students had to present it to the teacher team. Until the draft was approved by the teacher, then the model could be made. At this step, 3 small teams working separately to build the city in their parts. Finally, 3 parts of the model were assembled and the prototype was completed.

# Assignment A:

One day morning, a small boat arrived at the port of the city of world trade center, Mercato, the city where various cultures have met. A young artist sailed along all the night because he wish to see how beautiful Mercato is. In Mercato, there is a famous fountain where is the meeting point of the teenager from everywhere. There is sacred place nearby where many people come to worship and pray. Although time has passed, Mercato has changed little at a time, this sacred place is still the same. After the young artist go ashore from his boat, he walked around, bought some local sweet, found a small lovely bouquet used as a brooch and pined on the shirt, and wrote the poetry in his mind. Among the crowd, he met his friend who was a merchant coming from the northern city. He friend was unloading the precious cargo of which came from the deep sea and the North Pole, including the fresh food which was due to the modern train, which allowed for a shorter transportation time, as if the northern city was close to this market. The village in the northern city was composed of the Mediterranean architecture and design, while the cathedral's castles were built in Ottoman style. It was such a cold and colorful territory. While he was talking to the merchant, he saw a beautiful young woman walking in a beautiful cotton dress. She would have come from a famous and largest cotton-cloth production village where was surrounded by cotton plantations and wheat fields. In the center of northern territorial, there was an ancient 800-year-old castle, the current owner of this castle descended directly to the Lord who was famous in the battle with the giant dragon in the Middle Ages. People were still using the carriage for most of their transportation. even if there were cars. On a journey by carriage from the village to Mercato had to enter the tunnels of several high mountain. There were many famous waterfalls where the young artist used to paint the landscape but he had never been visited to the village of Spinning. Just like he had never seen this beautiful girl before. It attracted him to want to go there once. He imagined that if he had known and intimately acquainted with this beautiful girl. He wanted to take her by cruise to a nearby city of Mercato in the eastern. The eastern city was surrounded by the sea but there was a large road connecting Mercato to this city. This city was amazing because many canals were cut through. It seemed to be complicated but it was well organized. The

bridge across of each canal had a legendary love inscribed. If he go cruising and singing to her, it would be great. The city landmark was a very steep tower. If you went up that tower in the evening, you would see the sun shining through Mercato on the horizon. The hot color of water surface in the canal gave the canal network a more beautiful appearance. There were many wealthy men in this city so the city was filled with luxurious mansions and modern architects. We could say that Mercato was flourishing by the purchasing power of people in this eastern city. Before that beautiful woman would walk away, the young artist thought that he should follow her and introduce himself to her.

### Assignment B:

In the early Sunday morning, "May" a little girl who travelled from the far away city ride on the overnight train to the port city named Mercato. Along the way going to this city, May could see the scenery through the train's window such as the fisherman on the boat seeking for fish, squid, and shrimp. Then she saw the mountain and the green forest, the field covered with the yellow of the ear of paddy, many villages located along the railway. Finally, she had arrived at the terminal station which was the center of this city's transportation. After May got off from the train with many travelers, she saw many merchants selling various foods and goods at the platform. Then she walked around and found the local market aside the old railway which was built across the main river. On the other bank of the river, there was a large temple where the large status of Buddha located. The Buddha status was created in the Sukhothai period and the pose is the attitude of persuading the relatives not to quarrel. We could see this Buddha status from everywhere in Mercato. May was fascinated with this city because the market was opened since 5 am till midnight and had various goods came from far and wide for supplying of million residents of this city. In addition, the market also sold the local products for the travelers. While May was shopping at the market, a group of travelers had approached to her asking the way to the palace, museum, temple and ancient remains. So May suggested them buying oneday trip package for travelling around the city guide by the local people and going by boat and tricycle. After that, May planned to visit her relatives by getting on a ferry boat to a large-sized village located along the river. This main river was the heart of Mercato. The agriculture was the way of life of citizen in Mercato, we could found the cultivated areas wherever, including low land, highland, and on the mountain. May walked through the folk arts and crafts center, met the villager were making the handicraft from local materials. May felt curious about what was the product that they were making, so she asked the villager. The villager smiled happily and answered her "It was the unique good which you could only buy here, in Mercato".

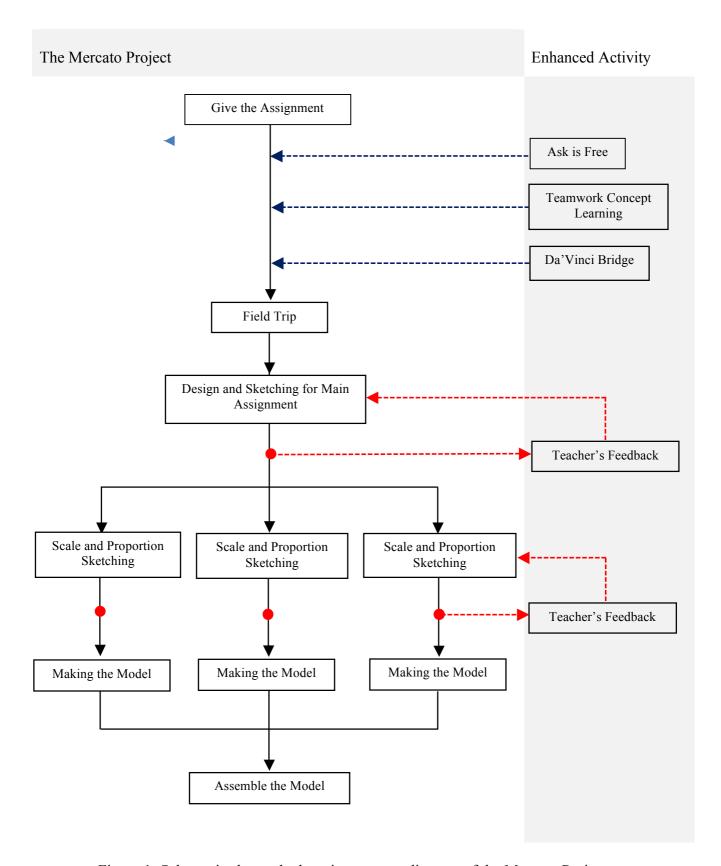


Figure 1: Schematic shows the learning process diagram of the Mercato Project.

## 3. Data collection procedures

Data were collected form 34 questionnaires using 5 point Likert scale of TBL self-evaluation (Gibbs, 1994; Griffith University, 2011; Gallegos & Peeters, 2011), 6 open-ended questions (Gibbs, 1994; Griffith University, 2011) and model evaluation.

## 4. Data analysis

Data from the students were collected from the 70 ESC students in Mercato activity. The study want to compare mean between two groups of 34 items. The statistical analysis using by independent sample t-test (p<0.05).

#### Results and discussion

#### 1. Model evaluation

The models of group 1A, 1B, 2A and 2B were created in three-day duration but we found that the models of the students in room1 were changed a lot when compared to the first-day design. The students in room 1 faced the problems about changing their idea at the last minute during the second day while the students in room 2 followed their initiate idea. Therefore, room 2 models were complete and more details than room1. Model 2B was the most beautiful and high creativity.

#### Room 1



Assignment A

Assignment B

## Room 2





Assignment A

Assignment B

Figure 2: Mercato Models from the two assignments.

#### 2. TBL self-evaluation questionnaire

The result showed the most of students agreed that Mercato activity made them learning substantially  $(4.41\pm0.58)$ , working as a part of Mercato team to be a valuable experience  $(4.41\pm0.69)$  and working in team helped to learn better than working alone  $(4.41\pm0.81)$ . In addition, we also found that they used criticism, creativity and problem solving much more during working in Mercato team. The mean score of group A and group B students' TBL self-evaluation were compared using independent sample t-test. Data was shown in table 2.

**Table 2:** The results of TBL self-evaluation in term of total mean score, standard deviation and p-value of independent sample t-test between group A and group B.

Items	T-test p-value	Group A mean±SD	Group B mean±SD
1. After finished with the Mercato workpiece, I have found that I have learnt more about how to plan many tasks well.	0.088	4.26±0.61	3.97±0.76
2. I have found that this activity made me learning substantially.	0.457	4.46±0.51	4.35±0.65
3. I have found that the activity did not too difficult to manage but I have learnt a lot from itself.	0.659	4.03±0.86	3.94±0.78
4. I have realized the links in all of the Mercato's activities which have run from the assignment, the field observing, the 3 people group's task, the 6 people group's task, the 18 people group's task, the drawing and the modeling.	0.868	3.80±0.96	3.76±0.78
5. I have found that being part of a team improves my problem solving skill.	0.665	4.26±0.89	4.18±0.63
6. Being part of a team discussion has improved my ability to think through a problem.	0.9	4.23±0.77	4.21±0.73
7. In most of the teams I have been on, the team has made good decisions and worked well together.	0.973	4.23±0.84	4.24±0.82

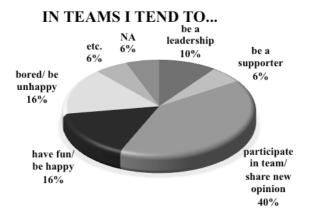
8. The team experiments with different ways of doing things and is creative in its approach.	0.87	4.18±0.58	4.15±0.67
9. I feel that team-based learning has improved my critical thinking skill.	0.127	4.37±0.65	4.09±0.87
10. I have found that working as teams always make good decisions.	0.529	3.86±0.77	3.74±0.83
11. I have found that teacher's comments was valuable for every step of working process.	0.153	4.17±1.01	4.47±0.66
10. I think the duration for doing Mercato was suitable.	0.684	3.20±1.13	3.09±1.14
12. I have found that I loved working with a team.	0.783	3.97±0.98	3.91±0.79
13. I have found that I had a foundness for Mercato	0.783	3.94±1.06	3.94±0.81
workpiece.  14. have found that working with a team has helped me develop leadership skills.	0.076	3.43±0.74	3.09±0.83
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Items	T-test		Group B
	p-value	Mean	Mean
15. The leadership roles were shared by all of the team members.	0.384	2.91±0.92	3.12±1.01
16. If there is an activity that working in a team like this, I will be happy to participate in.	0.365	3.94±0.87	3.76±0.74
17. I felt very impressive in the team members.	0.424	3.89±0.99	4.06±0.78
18. I have found that I have a high degree of trust in the team members.	0.63	3.94±0.68	4.03±0.80
19. The controversy has happened in my team.	0.848	3.49±1.01	3.53±0.86
20. Disagreements did not arouse defensive reactions such as projection, repression and rationalization.	0.595	3.43±1.46	3.62±1.48
21. Member resources are fully recognised and utilised	0.58	3.74±0.95	3.62±0.92
22. Communications between members were opened and the team members participated in team.	0.673	3.66±0.97	3.56±0.96
23. The team members have actively listened to the other's opinions.	0.491	3.60±1.01	3.44±0.89
24. The team has well-established and agreed on approaches to problem solving and decision making	0.264	3.57±0.78	3.32±1.04
25. I have found working as part of a team in my classes to be a valuable experience.	0.269	4.31±0.68	4.50±0.71
26. I have found that the other team members respected me.	0.212	3.86±0.81	3.59±0.96
27. I could show my ability in a team to achieve the success.	0.387	3.86±0.81	3.68±0.91
28. I have found that the team has worked well together.	0.074	4.06±0.64	3.76±0.70
29. I have found that team-based learning has more efficience than learning alone.	0.517	4.34±0.84	4.47±0.79
30. I have found that the team members could motivate me to work harder.	0.319	4.09±0.92	4.29±0.80
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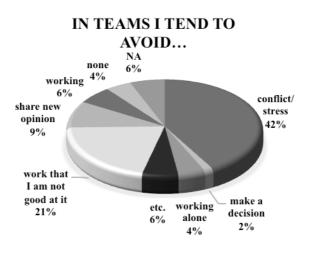
31. I feel that the task's distribution in a team has been fair.	0.602	3.62±0.99	3.74±0.86
32. I have found that working with a team helps me develop skills in working with others.	0.848	4.38±0.60	4.41±0.66
33. I have found that working with a team has helped me develop more respect for the opinion of others.	0.591	4.26±0.74	4.35±0.73

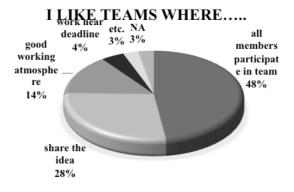
Quantitative analyses confirmed that although the construction of Mercato models between 2 groups were built differently, there was no significantly difference of overall student TBL self-evaluation by using independent sample t-test (p<0.05). Statistical analysis indicated that we could control the standard of learning process and feedback process between 2 rooms which did not make the students feel different significantly.

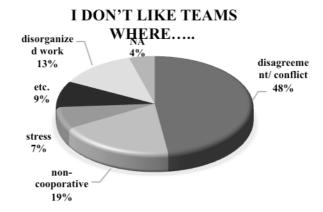
#### 3. Open-ended questions

From 6 open-ended questions, the results showed that in teams they tended to participate in team and shared new opinion (40%) but they tended to avoid conflict and stress (41%). They liked teams where all members participated in team (48%) but they didn't like teams where had the disagreement and conflict (48%). They would like to be in the united team (36%) and funny or happy team (29%). They would like their team to be a perfect team (43%) and good friend (25%). Finally, 67% of our students thought that they could be a good leader or supporter in their team while 30% of them thought that they could not be a good leader and supporter (N/A 3%).









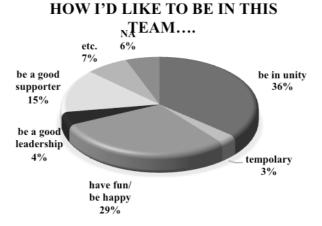




Figure 3: Percentage of the answers from 6 open-ended questions.

#### **Conclusions**

The Mercato project was accomplished using TBL to expose students and help them improve their soft skills such as criticism, creativity and problem solving for applying course content during the orientation camp. Most of the students had the good attitudes toward the Mercato project which will help us easily to encourage more TBL projects with them during the 3 years long in our school. In contrast, some students still had poor attitudes toward team project such as felt boring and unhappy that we need to improve more instruction techniques to develop their attitudes. Further study need to follow up and measure TBL performance of the 10th batch of ESC-KMUTT students.

## Acknowledgements

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# The Multidisciplinary Project to Promote Story-Based Learning and Soft Skills: Integrating Biology, Technology, Engineering and Mathematics study

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#### **Abstract**

Story-based learning is the Engineering Science Classroom of King Mongkut's University of Technology Thonburi (ESC-KMUTT) curriculum promoting high school students to learn through "stories" by which all learning topics are interwoven and integrated. For applying knowledge, the multidisciplinary project called "Ecobox" was created by integrating ecosystem, computer programming, engineering drawing and mathematical modeling topics. Our previous research indicated that this project could enhance the student's soft skills. Therefore, the aim of this study is to find out how and why ecobox project could promote students' soft skills such as teamwork skills, problem solving skills, criticism and creativity. Data were collected form 45 questionnaires, 12 open-ended questions and model evaluation. The participants were 10th grade students form 3 classrooms (n=70). The result found that 12 groups of student in 3 classrooms accomplished to create ecobox models during one month. In term of teamwork skills, the most of students had found that working in ecobox team made them more respect and listen to friend's opinion (4.43±0.65) while mean value of team conflict was low (2.70±1.14). For problem solving, work as part of a team helped students to solve problem better (4.25±0.77). For criticism, working in team could increase the use of critical thinking (4.29±0.84). For creativity, ecobox project helped students to know how to use creativity when constructed ecobox model and increase the creative problem solving (4.06±0.80). The finding of this study could bring more understanding on nurturing students' soft skills using multidisciplinary project.

Keywords: multidisciplinary, story-based Learning, soft skills, ecobox



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#### Introduction

Ecobox project was created using concept of Project-based learning (PBL). PBL is a student-driven, teacher-facilitated approach to learning which students motivate their learning through inquiry. In addition, they learn through collaboration to research and create projects and employ 21st Century skills as they participate in projects (Bell, 2010). The 21st Century skills included creativity/innovation, critical thinking, problem solving, communication, and collaboration, etc. (Finegold & Notabartolo, 2010). The Ministry of Higher Education, Malaysia recently announced that the 7 soft skills are to be introduced to undergraduates of Institutes of Higher Learning in Malaysia. Those soft skills are communication skills, critical thinking and problem solving skills, team work, lifelong learning and information management skills, entrepreneurship skills, ethics, and professional moral and leadership skills (Shakir, 2009). For making more complex project, a multidisciplinary concept was also applied to ecobox. Many research found that a multidisciplinary project could enhance students' understanding and soft competencies. A multidisciplinary project called "Computer Integrated Manufacturing" was given to a required course in Mechanical Engineering at Temple University. The project integrated the design of electrical and mechanical component. The results indicated that 83% of the students discovered the project being a good implement to learn the knowledge and 96% of the students had the satisfaction of gaining hands-on experience when they was doing activities on the project (Jahanian & Matthews, 1999).

Story-based learning is the Engineering Science Classroom of King Mongkut's University of Technology Thonburi (ESC-KMUTT) curriculum promoting high school students to learn through "stories" by which all learning topics are interwoven and integrated. In the first semester, ESC-KMUTT students need to apply their knowledge to create the multidisciplinary project called "Ecobox" in subject ESC 415 The Relation. This project was designed by integrating ecosystem, computer programming, engineering drawing and mathematical modeling topics. Our previous research indicated that ecobox project could enhance the student's soft skills (Wongta et. al, 2015; Chomngam, et. al, 2017). Therefore, the aim of this study is to find out how and why ecobox project could promote students' soft skills such as teamwork skills, problem solving skills, criticism and creativity.

#### Methods

## 1. Participants

The participants were 10th grade students form 3 classrooms (n=70) of ESC-KMUTT. Each classroom consisted of 4 groups (5-6 students) therefore there were 12 groups in total. They were our new coming students who enrolled during 2017 academic year. The sample consisted of 38 male and 32 female students, at the age between 14-16 years old.

## 2. Multidisciplinary study

## 2.1 Ecosystem contents (Biology)

## 1) Lecture about ecosystem

A lecture about ecosystem's concept, structure and function was taught to our students for 3 hours. Topics are, for example, ecosystem definition, ecosystem types, food chain, food web, pyramid of energy and 10% laws which are basic knowledges for math modelling.

## 2) Laboratory of Mangrove forest

According to the Mangrove forest surrounded KMUTT Bangkhuntien campus, laboratory activity was design to promote the understanding of plant anatomy, animal and water inside Mangrove forest ecosystem for 3 hours.

## 3) Mangrove forest field trip

One day trip at Klongpittayalongkorn school was planned in order to introduce Mangrove forest ecosystem where students could learn through real experience.

## 2.2 Basic engineering drawing and design (Engineering)

Students learned how to use basic tools for engineering drawing, front-view, sideview, top-view, 3D isometric and oblique, and perspective drawing from subject called "ESC 417 Fundamentals of Engineering I". Many drafts were sent to teacher until the final draft of ecobox drawing was proved by teacher. Then, basic knowledge about drawing was applied to design terrarium inside 12×18×12 inches aquarium tank under different ecology conditions. Each group was randomly assigned for creating ecobox of an ecology type. There were 4 groups of land ecosystem, water and land ecosystem, water ecosystem and desert ecosystem.



Fig: 1 The example of Food web and drawing of Lower Falls in Yellow Stone National Park USA.

## 2.3 Mathematical models of population dynamics (Mathematics)

For this part of activities, we would like the students to learn the predictability of science in study about population dynamics. The students were experienced about how ecologists use mathematics, modeling, and computer simulations in their research works for investigating the relation between species in the ecosystem. The class for learning population dynamics was given in two hours. The first hour of instruction focuses on the definition of population growth and various parameters such as birth rate, death rate and others through the ecosystem models of exponential growth and logistic growth. The second hour was designed to practice students in simulating the model through the Excel program. For some students, this is a good time to start working on it seriously because they had not used it so much in the past. Hopefully, the skill of using Excel in data analysis and data visualization would be helpful for them in their future workings in school life. The activity in the class will be elaborated in the following.

Firstly, the students were persuaded to discuss what the population and population growth are. Then, we discussed about the parameters in the model of exponential growth through story telling approach. It is the story of Fibonacci's rabbit puzzle. This states that starting with the birth of one pair of rabbits in the first month and growing of that pair in the second month. Then this pair grows enough to give birth of another pair in the third month. The new pair needs to grow for one month and then

give birth of another pair of rabbits, while the old pair do not need another month at all to give birth. So, the ecosystem has one pair of rabbits in the first and second months, then two pairs in the third month, and so on. With the given conditions of the puzzle, the instructor asked the students to think or calculate to find out how many rabbits exist in the ecosystem when the time passes for twelve months. Let students work on it for ten minutes. Then, the solution of the puzzle was shown with the discussion. In this step, many students could recognize the pattern of the Fibonacci sequence and its relation to the golden ratio. For students, it is the good moment to appreciate the magic of mathematics.

This set of number from the Fibonacci sequence was plotted in a graph on the blackboard. Students were made to realize the J-shape of the plot. After that, we related this with the growing of money savings due to the interest rate, which is analogous to the growth rate in the population. It was defined as the difference between the birth rate and death rate. It was time to introduce the model of exponential growth (J-shape) and logistic growth (S-shape). Next, let the students practice simulating these models using Euler methods and Excel. For example, the equation of the exponential growth could be written in the form

$$N(t + \Delta t) = N(t) + rN(t)\Delta t,$$

where N(t) was the size of population at time t, r the growth rate, and  $\Delta t$  the size of time step. According to Euler method, this could be iterated to simulate for next step of time. This could be done by dragging down a line of the typed formula in table of the Excel program, and then the data was plotted to express the characteristics of the growth.

Similarly, students were taught in the second hour to learn how the model could represent the predator-prey relation between species. By designing the lessons, this model was used to link with what students had learned before about the pyramid of energy, food chain, and different kinds of the relations in ecosystem, etc. This should be one of reasons that the subject name of these activity is "The Relation." One of the best governing equation of the predator-prey relation could be the Lotka-Voltera equation. The set of equations describing population dynamics of two species, with X(t) and Y(t) are the sizes of population of species X and Y respectively, in the form of discrete mapping as

$$X(t + \Delta t) = X(t) + r_X X(t) \Delta t - h_{XY} X(t) Y(t) \Delta t,$$
  
$$Y(t + \Delta t) = Y(t) + e \left( h_{XY} X(t) Y(t) \Delta t \right) - d_Y Y(t) \Delta t,$$

where  $r_X$  is the growth rate of the species X,  $h_{XY}$  the death rate of X per each predator of species Y, e the efficiency of producing Y from turning each unit of species X killed from hunting, and  $d_Y$  the death rate of Y in the condition of nohunting from other species. After learning this model and discussing each parameter, students practiced again to simulate the model using the Excel program and visualize the data. It took time for some students to practice this model in class. To ensure that all students able to simulate it, it was repeated in the task of simulating population dynamics of three species with this model. This was given as a homework. Apart from simulation, students had to give rational explanation of choosing the valid value of each parameters. With difficulties, some students had to be coached in using the

program and adopting the concept of modeling. Interestingly, students could enjoy working on it when they could change the parameters and then the plotted graphs changed. In some ways, it looked like the animations.

As mentioned above, this activity would link to the main task of designing their own ecosystem. Therefore, students needed to choose the valid parameters for their designed Ecobox. It was the intersection between being an artist and a science researcher. The graphs were plotted using Excel to express the prediction of population growth of each species in time. Furthermore, integrating this with coding skills learned in another subject, the Python codes were launched to students. In our opinion, this exposition of using programming to data visualization was significant for them to realize about how to adapt many learned skills in their research works. However, what students needed to do was not to write the codes from nothing, but they just had to write the flow chart expressing their understandings of logical sequence of the codes. Furthermore, students used them with chosen values of parameters to data visualization. Finally, the plotted graphs were shown in the presentation and the discussions about the difference between using Excel and Python was given in the wrap-up by instructors.

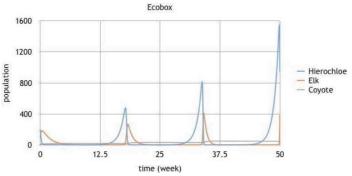


Fig: 2 The mathematical modelling of Lower Falls in Yellow Stone National Park USA showed the relationship between X= Hierochloe, Y= Elk, and Z= Coyote using excel program.

## 2.4 The implementation of read sensor value in Arduino (Technology)

This technology part was developed to create sensor for ecobox and apply the knowledge of basic programming. The user communicated with the PC and Arduino Board. Python programs were developed to create Lotka-Volterra equation for creating predator-prey graph.

## A. Monitoring sensor reading

Sensor reading from Arduino: Arduino enables users to monitor various kinds of sensors such as thermometers, humidity, moisture, light and LCD display. The analog and digital pins on the Arduino board can all serve as general purpose input and output pins (GPIO). The ATmega328microcontroller embedded on the Arduino board contains the analog-to-digital converter (ADC), analog input signal to a number between 0 and 1023. The integer number is proportional to the amount of the voltage being applied to the analog input. Any sensor operating on 5 volts can be directly connected to the Arduino board. As a prototype for monitoring sensor readings with

Arduino, we had implemented a simple setup to connect the analog sensor to the Arduino board, and received the sensor readings from the PC.



Fig: 3 Monitoring sensor reading of Lower Falls in Yellow Stone National Park USA.

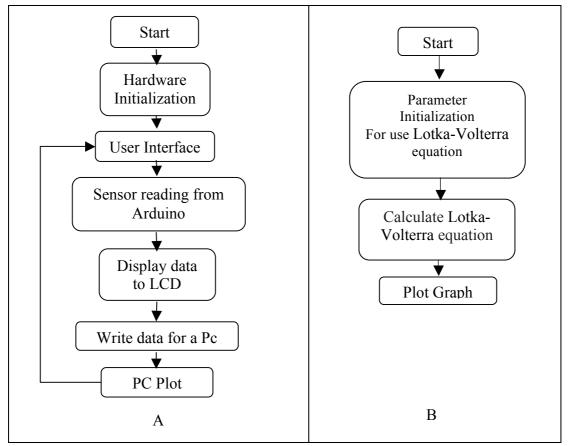


Fig: 4 The flow chart of read sensor value on the Arduino (A) and the flow chart of Lotka-Volterra equation on the Python programs (B).

## B. The calculation of Lotka-Volterra equation using Python programs

Mathematical model in Microsoft Excel faced the problem when we used the plenty of time or compare many value of the step size for simulating the relationship between predator and prey. For over the limitation of excel program, Python programs were developed to create Lotka-Volterra equation to create predator-prey graph.

## PLOT IN PYTHON

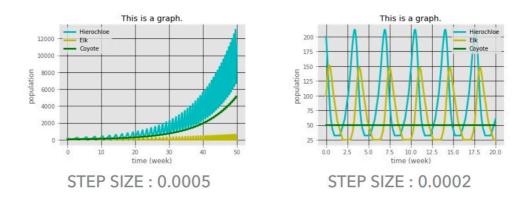


Fig: 5 The mathematical modelling of Lower Falls in Yellow Stone National Park USA showed the relationship between X= Hierochloe, Y= Elk, and Z= Coyote using Python programs with different step size.

The flow charts of sensor reading from Arduino and the calculation of Lotka-Volterra equation were shown in Fig.1A and 1B, respectively.

### 3. Learning process

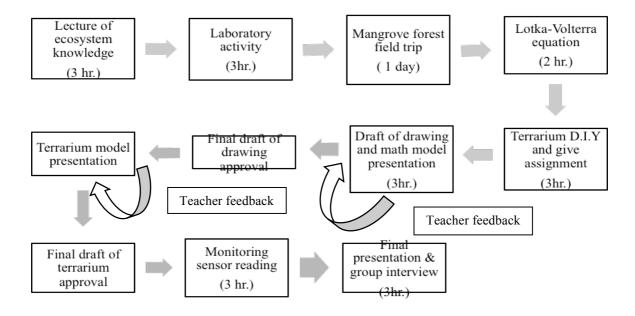


Fig: 6 Schematic diagram showing learning process of the Ecobox project.

## 4. Data collection and analysis

Data were collected form 45 questionnaires (Gibbs, 1994; Griffith University, 2011; Gallegos & Peeters, 2011), 12 open-ended questions (Gibbs, 1994; Griffith University, 2011; Gallegos & Peeters, 2011) and model evaluation.

#### Results and discussion

Model evaluations were divided into 2 parts. First, the teacher evaluation showed that Yellowstone National Park, Red sea and Fly geyser at Black Rock Desert had got 28, 27 and 24.5 point, respectively (Table: 1). Second, peer assessment form their friend showed that Yellowstone National Park, Red sea and Huai Kha Khaeng had got 34%, 16% and 10%, respectively (Table: 2). It seems like teacher and students evaluation quite agreed with each other.

Table: 1 Ecosystem location and teacher evaluation.

Group	Ecosystem type	Location	Ecosystem name	Teacher evaluation (Total 30)
1E	Land	15° 19' 59.988" N 98° 55' 0.012" E	Huai Kha Khaeng	22
2E	Water	7° 45' -8° 15' N 98° 15' - 98° 40' E	Andaman Phuket	21
3E	Land and water	44° 43' 05''N 110° 29' 46''W	Lower Falls in Yellow Stone National Park USA	24
4E	Desert	32° 39' 55.404" N 113° 6' 31.7736" E	Sonoran desert	20.5
Group	Ecosystem type	Location	Ecosystem name	Teacher evaluation (Total 30)
1S	Land	16° 52' 12" N 101° 47' 60" E	Phu Kradueng National Park	20
2S	Water	27°44'06.55" N 33°59'10.17" E	Red sea	27
3S	Land and water	16°11′59″N 99°12′07″E	Klong Lan National Park	24
4S	Desert	35°03'13.57"N 115°22'35.56"W	Mojave desert	22.5
1C	Land	44° 25' 25.2876" N 110° 35' 18.6576" W	Yellowstone National Park	28
2C	Water	35°16'14.0"N 120°53'52.5"W	Kelp Forest at Bluff Trail	21
3C	Land and water	14°22′55″N 101°25′54″E	Heo Prathun Waterfall at Khao Yai	23
4C	Desert	40° 51′34″N 119° 19′55″W	Fly geyser at Black Rock Desert	24.5

Table: 2 Peer assessment by voting from their friends.

**Rock Desert** 

119° 19′55″W

Ranking	Room	Group	Percent of vote (%)	Room
1	C	Yellow stone National Park	34	C
2	S	Red sea	16	S

3	E	Huai Kha Khaeng	10	E

The results of self-evaluation questionnaire that related to students' soft skills showed the interesting information (Table 3). In term of teamwork skills, the most of students had found that working in ecobox team made them more respect and listen to friend's opinion  $(4.43\pm0.65)$  while mean value of team conflict was low  $(2.70\pm1.14)$ . For problem solving, work as part of a team helped students to solve problem better  $(4.25\pm0.77)$ . For criticism, working in team could increase the use of critical thinking  $(4.29\pm0.84)$ . For creativity, ecobox project helped students to know how to use creativity when constructed ecobox model and increase the creative problem solving  $(4.06\pm0.80)$ .

Table: 3 The results of self-evaluation questionnaire that related to students' soft

Soft skills	Mean	SD	Item
Soft skins	value	SD	item
Teamwork	4.43	0.65	I had found that working in ecobox team made them more respect and listen to friend's opinion.
	2.70	1.14	There was team conflict.
Problem solving	4.25	0.77	Work as part of a team helped students to solve problem better.
Critical thinking	4.29	0.84	Working in team could increase the use of critical thinking.
Creative thinking	4.06	0.80	Ecobox project helped students to know how to use creativity when constructed ecobox model and increase the creative problem solving.

#### Conclusion

All ecobox teams could complete their work on time and some model showed high creativity and innovative such as Yellow Stone National Park which had lighting for expressing the volcano. The implementation of this project evaluated that ecobox learning process could help promote students to apply soft skills and knowledge for creating completely model. However, teacher feedback was a very important catalyst to encourage students' using their capabilities. The finding of this study could bring more understanding on nurturing students' soft skills using multidisciplinary project called "Ecobox".

#### Acknowledgement

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## Appendix

Grou p	Ecosyste m type	Ecosystem name	Photo
1E	Land	Huai Kha Khaeng	
2E	Water	Andaman Phuket	
3E	Land and water	Lower Falls in Yellow Stone National Park USA	
4E	Desert	Sonoran desert	

Grou p	Ecosyste m type	<b>Ecosystem</b> name	Photo
1S	Land	Phu Kradueng National Park	
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3S	Land and water	Klong Lan National Park	
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4C	Desert	Fly geyser at Black Rock Desert	

## Fostering "Glocal" Awareness Through a Short-Term Study-Abroad Program on Poverty and Sustainable Societies in the Philippines

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#### **Abstract**

Study abroad programs have become increasingly popular in Japanese tertiary education in response to the nationwide campaigns and movements for fostering "global human resources" (Yonezawa 2014). In the current discourse of development of human resources with a global perspective, students' acquirement of global awareness and intercultural skills is often emphasized. Given that Japan's regional communities are in an urgent need of revitalization, considering various local issues such as declining birth rate, depopulation, and declining provincial industries, we advocate a new perspective about study abroad programs that cultivate understanding and awareness of both global and local issues ("glocal") as well as their interconnectedness. This paper aims (1) to foster glocal awareness among students through short-term, content-based study abroad programs related to poverty and sustainable society issues in the Philippines and (2) to examine whether participants acquire glocal awareness and a sense of ownership by thinking through both global and local issues. Glocal awareness is examined under the following three categories; (a) awareness of the interconnectedness of global and local issues, (b) personal growth and development, and (c) motivation to take an action to positively influence global and local issues. Such programs are found to have a significant self-perceived impact on participants' glocal awareness with respect to poverty and becoming motivated to take actions on global, local, and personal levels.

Key word: short-term study abroad program, Philippines, poverty, glocal



The International Academic Forum www.iafor.org

#### Introduction

#### 1. Global human resources

Nurturing global human resources has recently become a prioritized agenda in tertiary education in Japan. The Global Human Resource Development Committee of the Industry-Academia Partnership for Human Resource Development (2010) reported that Japan's economic stagnation for more than two decades has had grave consequences for the competitiveness of the Japanese economy and society in the international market. Japan is facing challenge from the rapidly aging society. According to a national survey conducted by the Ministry of International Affairs and Communication, 25.2% of the total population was 65 years or older in 2013; furthermore, the youth and working age population is decreasing continuously, mainly because of the low birth rate. The Japanese enterprises are of the opinion that to revitalize the Japanese economy, it is necessary to employ foreign labor and expand their businesses in the global market. Because of these circumstances, the industry had expressed a demand for new university graduates, ready to conduct business in the international environment. However, the committee (2010) pointed out that the number of Japanese students going abroad to study has been decreasing since 2004. Furthermore, students increasingly appear to have inwardly looking attitudes, preferring to stay in Japan. A discussion to globalize universities in Japan and foster globally competitive human resources through the universities has started to result in changes. In addition, financial support has been provided to enable programs to promote international education. In response to the nationwide campaigns and movements to foster global human resources, a study-abroad program has become extremely popular in tertiary education in Japan (Yonezawa, 2014). In the current discourse of the development of human resources with a global perspective, emphasis is often placed on the participants' acquisition of global awareness and intercultural skills.

#### 2. Glocal leaders

Glocal is a coined word; it was created from two words, namely, "global" and "local." Iwate Prefecture faces various local problems such as a declining birth rate, depopulation, out-migration of youth to urban cities, and declining industries and social infrastructure. Consequently, Iwate University has advocated a new way of viewing a study-abroad program that will foster glocal leaders by cultivating an understanding of both global and local issues; in other words, glocal awareness and its interconnectedness. The Short-term Content-based International Program (SCIP) was created to foster glocal leaders.

#### **Short-term Content-based International Program (SCIP)**

## 1. Concept of SCIP

SCIP started as a pilot program in 2010 with a focus on sustainable energy. In 2012, SCIP Sustainable Energy was launched; it had 12 students who were divided into two teams: the Iceland team and the Sweden team. Subsequently, new programs with different topics have been developed. As shown in Figure 1, there are five topics with their relevant destinations. Each topic was selected because of its importance in the

local society, especially in relation to the glocal perspective and the availability of a knowledgeable faculty. The duration of study-abroad program is up to two weeks. To maximize their study-abroad experiences, the programs are carefully planned so that the students are able to not only understand commonality but also develop a sense of ownership of the issues discussed.

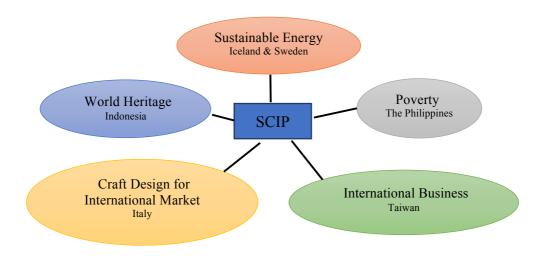


Figure 1: Program Map of SCIP

## 2. Structure of a program and function of each component in the program

The program consists of three parts: a pre-departure session, study-abroad, and a session after the students have returned home. Before the students go abroad, they read reference books in Japanese and English to deepen their understanding of the issue and learn equivalent technical terms in English. In addition, they attend lectures on campus and visit relevant facilities that will enlighten them about the topic such as energy power plants, NPOs, and local government offices. These learning opportunities are expected to bridge the gap between theory and reality. There are also several sessions devoted to discussions. Based on information that they collect during the pre-departure sessions, they compile a list of questions and issues for the study-abroad period.

Once they visit the particular country, they go on field visits to relevant sites and meet people through whom they are able to develop an in-depth understanding of the issues. The visits and interactions are carefully programmed so that the students meet the relevant stakeholders; these include service providers, beneficiaries, government officers, policy makers, and local residents. Students are continually asked relevant provocative questions so as to ensure that they pay attention and further deepen their understanding of the themes.

Once they have returned home, they collate the information that they collected, conduct further discussions on the topic, write a report, and deliver oral presentations about their learning through the SCIP.

## **SCIP Philippines**

In this study, the SCIP conducted in the Philippines is examined. The theme thereof was poverty and sustainable society. Accordingly, the aim of the study is, first, to foster glocal awareness among students through short-term, content-based study-abroad programs that are related to poverty and sustainable society issues in the Philippines and, second, to examine whether participants acquired glocal awareness and a sense of ownership by examining both global and local issues. While poverty was measured using the absolute poverty index in the Philippines and the relative poverty index in Japan, it is a pressing issue that is similar in both countries. The Housing and Urban Development Coordinating Council (HUDCC) of the Philippines defines slums as buildings or areas that have deteriorated, and are hazardous and unsanitary or lack standard conveniences. Slums have also been defined as the squalid, crowded, or unsanitary conditions under which people live, irrespective of the physical state of the building or area (UN-Habitat, 2003). According to these definitions, slum dwellers are identified as the urban poor: individuals or families residing in urban areas whose income or combined household income is below the poverty threshold. In 2009, approximately 1.4 million children in the Philippines were living in such informal settlements (Reyes, Tabuga, Asis, & Mondez, 2014).

On the contrary, it is often believed that Japan, as a developed country, does not have to deal with issues related to poverty. However, the relative poverty rate, which is the percentage of people of all generations who live in households with an income below 50% of the national median level, is 15.6%. Furthermore, 13.9% of children under 18 live in households that exist on less than the relative poverty rate (Health, Labor and Welfare Ministry, 2017).

The aim of SCIP Philippines, which was developed on an understanding that poverty is a common issue in the Philippines and Japan, was to raise students' awareness of the structural commonalities and differences and to further engender a sense of ownership of the issue at a global and local level by means of both a theoretical approach and an interaction between the stakeholders of the two countries.

## The pre-departure session

The pre-departure session was conducted by employing an active learning style that involved discussions after lectures, students' presentations, role-play games, photo language sessions, and visits to local stakeholders that assist marginalized families. The topics included theories of development, poverty and social exclusion, international aid and assistance, poverty in Japan and the Philippines, field work, and interviewing methodology. The students were required to read related literature to improve their basic knowledge and listening and comprehension English skills through the ICT platform so as to become familiar with English terminology that they would encounter during the fieldwork in the Philippines. The students also practiced their presentations on poverty in Japan, which were subsequently delivered before local university students and urban poor children in the Philippines. During the pre-departure training, a visit to local government and non-governmental organizations that assist marginalized families and children in Iwate Prefecture was organized. Accordingly, the students learned that poverty is also a problem in the community and consequently, developed a sense of ownership toward the issue.

## Program in Cebu province, the Philippines

The program in the Philippines consisted of two parts. During the first week, the students attended English language classes at the language academy of the University of San Carlos, Cebu City. The purpose of the English language course was to enhance their oral communication skills by conducting interviews with local students and residents, attending classes facilitated by language instructors, and interacting with local student partners. The purpose was to integrate communication skills with fieldwork during the following week. This is illustrated in Figure 2.

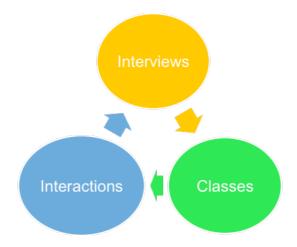


Figure 2: Cycle of English language program

During the second week, a series of fieldwork was conducted in urban informal settlements or slums in Cebu City and Mandaue City through partnership with local NGOs. Bidlisiw Foundation and JPIC have a history of assisting marginalized urban poor children and families. The visits and interactions conducted with children and families in need of special protection during the fieldwork involved the following.

- Visit slums/informal settlements in Cebu City and Mandaue City including a community on a dump site and a relocation project facilitated by JPIC.
- Interact with and interview children that are involved in prostitution, and children in conflict with the law as well as their families who have been assisted by the Bidlisiw Foundation.
- Participate in a feeding program at Balay Salamaritano, which is a day care center for street children and elderly people.
- Participate in programs on health and nutrition, education, vocational training, and livelihood that are conducted by Bidlisiw Foundation under "Child and family: healing, recovery, and re-integration framework."
- Presentation before the children of the students' own lives including their daily lives, dreams, families, and financial struggles.

#### Post-arrival reinforcement

During the post study-abroad reinforcement, the students reflected on what they had learned in the field and provided analytical feedback through active learning sessions. They analyzed the interconnectedness, structural commonalities, and possible actions to be taken so as to improve the conditions related to the poverty of the two countries.

A pre-departure and a post-arrival questionnaire were administered to examine the impact of the program on their glocal awareness.

## Method to evaluate students' learning

From 2015 until 2017, three programs were conducted. In total, 13 students from all the faculties participated; namely, the Faculty of Education, Faculty of Humanities and Social Science, Faculty of Engineering, and Faculty of Agriculture. Furthermore, the students received four credits. This is presented in Table 1.

Number of programs conducted	Academic year	Number of students participated	Female: Male	Faculties	Credits given
3	2015 2016 2017	13	10:3	Engineering Humanities and Social Science Education Agriculture	4

Table 1: Profile of the participating students

The students' learning outcomes on glocal awareness and sense of commitment and understanding of the commonality of the issue were evaluated through discussions and observations, reports written by the students, and a pre-departure and post-arrival questionnaire. The pre-departure and post-arrival questionnaires employed a 5-point Likert scale to assess the degree to which the respondents agreed or disagreed with each statement in the questionnaires.

#### Results

## 1. Understanding structural commonalities

The structural commonalities of poverty between the Philippines and Japan that were discussed are thus explained. First, a cycle of poverty exists wherein poor families become trapped in poverty for generations as a result of limited or no access to critical resources such as education and financial services. Second, the poor tend to be excluded from the mainstream society; furthermore, it is not easy to extricate a community from the trap of poverty. However, government support is insufficient and families have a tendency of relying on social welfare in both counties. Third, under these circumstances, NGOs play an important role in uplifting the well-being of the poor. Finally, the students also play a part in providing opportunities to urban poor children to have a new perspective by interacting with them.

## 2. Results of questionnaires

The pre-departure and post-arrival questionnaires revealed that the students raised their awareness on the commonality of the issues between the Philippines and Japan through the study-abroad program. In the question that assessed the extent to which the respondents agreed with the statement: "I feel that poverty is an immediate

= 5)

problem for myself and my own community," three of five students rated it higher in the post-arrival questionnaires in comparison to their rate in their pre-departure questionnaire and all rated it either "I agree." or "I strongly agree." during the post-arrival period. Similarly, with respect to the statement, "I feel that developing countries including the Philippines are close/related to me.", 8 of the 9 students rated it as higher in the post-arrival questionnaire and five rated it as the highest "I strongly agree", after they had returned from Cebu. The responses to these particular questions are presented in Figures 3 and 4.

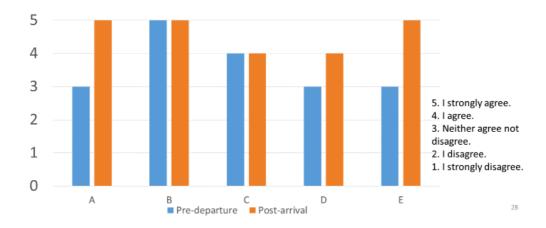


Figure 3. From questionnaire 1 "I feel that poverty is an immediate problem for myself and my own community." (n

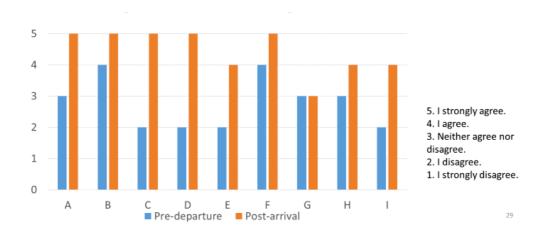


Figure 4. From questionnaire 2

"I feel that developing countries including the Philippines are close/related to me." (n = 9)

All the students responded in affirmative to the following statements: "Do you want to be engaged in activities to improve situations of the poor in Japan?" and "Do you want to be engaged in activities to improve situations of the poor in developing countries including the Philippines?"

## 3. Actions taken by students

After spending two weeks in the Philippines, immersed in intensive interaction with stakeholders and critical global issues, the students wanted to remain involved in social change when they returned home. The actions taken by the students after the program are as follows. In protecting the privacy, their names have been modified.

## Social actions on campus

Haru, a second-year Education major student, and Sei, a second year Humanities and Social Science major student, organized a photo language session with other students so as to share their experiences in the Philippines with other students on campus in 2017. Similarly, Sao, a second year Humanities and Social Sciences major student, organized a workshop to ask for donations to assist poor urban children in Cebu in 2017. Furthermore, Kaz, a third year Humanities and Social Sciences major student, presented at a global symposium on student loans and financial struggles of current Japanese university students. While he was preparing his presentation, he realized that the issue of the student loan was not merely a personal issue that he was facing, but rather a current social issue faced by thousands of Japanese youth. The participants' actions were based on feeling empowered and knowledgeable because of the study program; they felt a sense of obligation to become involved. Consequently, they became a solution-based gathering that brought together a diverse audience in order to bring about positive changes in their communities.

## Return to the country

To explore possibilities for further involvement to make a difference, Haru returned to Cebu in the spring holiday and became engaged in volunteer work recommended by a local student of the University of San Carlos with whom she had connected during the study program.

#### Connecting study-abroad and career development

The program impacted the students' academic motivation and career choices. Masa, an Engineering student studying for a master's degree explored new career options in the education sector after he had arrived home; he had come to the realization that education plays a vital role in alleviating poverty. Sei was motivated to study and decided to enroll for an advanced degree in Psychology.

## Integrate study abroad experience into daily lives

It has been observed that the students used the study-abroad experiences in a variety of ways in their daily lives. Shin, a third year Agriculture major student, participated in an international joint class conducted in English because he wanted to be challenged to use English. Several students noted that they tried to communicate with their families and talk about themselves more after they had been inspired by the children and families that they met in the Philippines.

## Positive feedbacks from stakeholders in the Philippines

In addition to the students' learning outcomes, positive feedback was given by the stakeholders in the Philippines. JT, a 15-year-old boy who joined the students in an interactive session, stated that it was a great opportunity to learn about the Japanese culture. The staff of Bidlisiw Foundation noted that they were not aware of the financial struggles that Japanese students experienced as well as the fact that they worked in order to study at the university; the staff believed that this would inspire and encourage the children. Furthermore, a discussion has started between concerned faculty member of University of San Carlos and Iwate University to have a joint session where Japanese student would present their experience and observation about poverty both in Japan and Cebu before the Filipino students for mutual understanding and discussion. It is notable that the interaction of the university students may create opportunities to broaden views and perspectives not only of Japanese students but also of Filipino students; for instance, the Filipino students were surprised when they learned that Japanese students often had to undertake part-time jobs to pay for their tuition fees and participate in university activities.

## **Conclusion**

The purpose of this study was to foster glocal awareness among students through SCIP Philippines with a focus on poverty and sustainable society. Whether the participating students developed a sense of ownership toward global and local issues or glocal awareness was examined. Positive impacts of their understanding of the commonality of the issue, sense of connection/commitment to the issue, the people and the country, and becoming motivated to take tangible actions on global, local, and personal levels were observed.

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# From Information to Empowerment Tertiary Students' Experiences with the Use of Social Media in Learning

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#### **Abstract**

The aim of this paper is to examine tertiary students' learning outcomes, experiences and perceptions of using social media; YouTube to enable a collaborative and participatory learning process. From a survey of literature on tertiary students' use of social media for experiential and participatory learning, there seems to be very little evidence of detailed examination to gather students' perceptions and experiences and to determine learning outcomes. Thus, this present study of participatory and collaborative learning supported by scaffolding provides an attractive glimpse of the use of social media, such as YouTube videos created by groups of tertiary students in class. Two groups of tertiary students, adult learners from the University of Social Sciences in Singapore, were the participants as case study of this study. This paper, with a discussion of social-constructivist learning theory, is to determine if the leveraging of social media is able to provide adult learners with a tool to implement a collaborative and participatory process in which students move from being informed to an active learner and self-directed learner of their own, hence an empowerment of learning from information.

Keywords: Social Media Technologies, YouTube, Digital Technology and Communications, Tertiary Students' Learning Experiences



#### Introduction

In this present study of participatory and collaborative learning supported by scaffolding provides an attractive glimpse of social constructivist learning theory with the use of social media, such as YouTube videos created by groups of two groups of tertiary students, adult learners from the University of Social Sciences in Singapore who were the participants as case study of this study. Students were provided online learning lessons and materials for a Communication module via Canvas learning management system and they were tasked to leverage on YouTube video for a class presentation for teaching and learning. After which, a survey and interview were conducted for data gathering after all the groups have participated in their learning process. Qualitative text analysis of the interview script analysis clarified the different merits of leveraging of social media as experienced and perceived by students from the group activity and the presentation. The leveraging of social media, YouTube video as a learning tool for collaborative and participatory learning served well in meeting challenges set in the learning outcomes and from the survey and interviews conducted, students found this way of learning to be both enjoyable and useful and benefitted them both in empowerment in learning and in learning collaboratively.

## Methodology

This study is based on a qualitative research method based on grounded theory that uses a systematic set of procedure to develop an inductively grounded theory (Strauss & Corbin, 1998) to better understand students' learning and students' perceptions of using social media for learning. The study uses a data collection approach that is by conducting an email-based questionnaire survey targeted at SUSS undergraduate adult students. The questionnaire primarily serves as a purpose to retrieve data regarding three aspects. The first aspect will be to identify what students' needs are in seeking learning information from social media which consist of students' reasons for learning in which learning could be either formal or casual, the information sources used and information type or category. The second aspect will be to understand how students explore learning resources. The third aspect will be to analyse students' perceptions in using social media for learning which consist of usability issues and problems encountered.

The questionnaire will consist of two sections. In the first section, the focus will be on identification of students' needs in social media learning and understanding behaviour of students' who use social media learning based on students' responses. The second section focus will be identification of usability issues and problems encountered by students when they use social media as a tool for learning. Analysis of data was carried out manually using grounded theory of open coding, constant comparison, memos, axial coding and then theory generation.

## **Theoretical Discussion**

This paper is written to provide an in-depth understanding of students' learning experiences and perceptions of using social media for learning via the social constructivist learning theory. Social constructivist learning theory is derived from Vygotsky's social constructivism theory in 1978 that students' learning is of a collaborative nature. Learning collaboratively and from one another is more effective

in learning than independent learning that contributes to achievement oriented and creating collaborative beneficial outcomes. In this current digital mediated age that is inundated with every day use of social media, learning is no longer an individual activity but an information creation and sharing society where learners learn through multiple resources via the social media platform (Chen & Bryan, 2012).

#### What is Social Media?

Social media refers to a broad range of applications that enables users to create, share, comment, and discuss a multitude of digital content(s). It is regarded as 'dynamic', 'interactive', 'democratic', 'people centric', 'volatile', 'social', and 'adaptive' (Manca & Ranieri, 2016b). Another aspect of social media that is often overlooked is its ability to transform teaching/learning into a more social, open, and collaboration-oriented endeavour and the use of social media and its potential as a learning tool (Osgerby & Rush, 2015) are indeed worth researching in the 21<sup>st</sup> century of social mediated society. Blogs, Wikis, YouTube, Facebook, and Twitter are some of the more common forms of social media (Gao, Luo, & Zhang, 2012). YouTube grants the students satisfaction due to the use of videos in a traditional classroom setting (Torres-Ramírez García-Domingo, Aguilera, & Casa, 2014).

YouTube is an example of social media that allows for the formation of social relationships that revolves around uploaded videos. YouTube is the third most visited website in the world, behind Google and Facebook (Alexa, 2015). Videos pertaining to education, entertainment, marketing, and science are constantly being uploaded to YouTube since 2005. It was confirmed that many students used YouTube to learn and seek information, however, studies show that the use of YouTube for academic learning and its effectiveness as a teaching tool lag far behind other social media, such as Facebook. Its usage in a higher education classroom setting is fast becoming a niche endeavour(Torres-Ramírez et al., 2014). It is reported that the use of YouTube to teach nursing procedures improved the students' attention and retention, due to the fact that it is much easier to remember visual cues than auditory ones (Johnson & Mayer, 2009). Students reported higher satisfaction and increased retention when social media is integrated into their courses (Alon & Herath, 2014).

#### What is Blended Learning?

Driscoll (2002) defines blended learning as mixing of any instructional forms to achieve an educational goal, while Garrison and Kanuka (2004) note that to blend simply means integrating classroom teaching with online experiences. Singh (2003) explains blended learning as combining different delivery media to promote meaningful and motivating learning. Live chats, self-paced learning, instant messaging, social networking, blog and forums, applications, and webinars are examples of tools that educators are able to incorporate online opportunities into their lessons.

As with all pedagogies for learning, there are positive aspects and the challenges and in terms of the feasibility and applicability of implementing hybrid learning in higher education context, a body of research supports the idea of combining face-to-face instruction with an online delivery mode. Such a combination provides better learning outcomes (Garrison & Kanuka, 2004). The trend of merging asynchronous Internet

technology with face-to-face interaction is associated with improved pedagogy and easier access to information (Bonk & Graham, 2004). Similarly, Garrison and Kanuka (2004) suggest that blended teaching can facilitate independent and collaborative learning experiences.

Blended learning, according to Fleck, Beckman, Sterns, & Hussey (2014), was used to examine the usage of YouTube in a classroom setting. He noted that students are receptive towards using familiar online learning tools, which ultimately enhance their learning experience. Blended learning also allows the students to be flexible and to freely provide feedbacks vis-à-vis the course (Alebaikan & Troudi, 2010).

In fact, millennials in Singapore spend almost 3.4 hours a day on their mobile phones and thus there is a huge amount of time that young adults are immersed in some form of information seeking(New Straits Times, 2015). Furthermore, with about 67% of the population being Internet users, of which more than 50% are users of social media (Statista, 2016), Social media-linked technologies are expected to play a pivotal role in realising learning in the case of higher education. Universities in Singapore, like SUSS implements blended learning, while instructors are utilising YouTube and Facebook to complement their traditional teaching approaches. Students responded to this shift by also increasing the use of YouTube to learn, however, there is little in way of formal research elucidating the effectiveness of YouTube for learning/teaching purposes.

#### Results

The data was transcribed manually and analyzed thematically, guided by keywords used in the grounded theory approach. New codes were formed based on the analysis. After the initial coding, the transcripts, thematically-coded remarks, and results were reviewed by a fellow colleague who is also teaching the same module at the University. The main themes were the advantages of blended learning, purpose of social media use, and its positive and negative effects on academic performance, the effectiveness and the problems of using YouTube for learning.

The students identified that with blended learning, there is flexibility of being able to complete assignments at any place/ any time, convenience of not having to come to campus as often, and the benefits of the online component. There is learning at one's own pace and the study units online allow for theoretical understanding when job responsibilities and other commitments make it difficult to attend all the face-to-face in-classes except when possible. The problems and issues with blended learning is that learning makes lectures redundant as all information is online, there is less interactive/lack of direct communications with lecturers online; time lapse in communication. There is also the lack of in-depth knowledge, only superficial learning just from the study online materials and they lacking the "human' element and relation to real life scenarios unlike some situated examples shared by lecturer in class. Finally, the technical issues of technical glitches and that of connectivity problem.

The data also revealed that all the students use YouTube for entertainment and relaxation. At least ten of them pointed out that they use YouTube to relieve stress. One of them said that "It is ...for me to relieve stress after studying", while another indicated "It helps me a lot in my studies...". They regarded YouTube as an

entertainment tool: "It releases tension and help me pass time" "When I have free time, I tend to visit YouTube".

Almost all of the respondents watched the videos for information and educational purposes and for social purposes of keeping with trends, knowing what is around the world and be updated with latest development and technology. Interestingly, they would use social media, such as YouTube every day.

Students are not just using YouTube for learning, but to solve non-academic problems such as "I use YouTube for tutorials with step-by-step instructions to perform certain tasks and how to troubleshoot problems". And to "...learn cooking from YouTube too". Many of them mentioned that YouTube helps them solve academic problems and increase their knowledge "I watch many academic-oriented videos on YouTube. It helps me learn and understand and inspire me to come up with creative and useful ideas". "I use YouTube for a lot of work-related problems, as it provides tutorials with step-by-step instructions on how to perform certain tasks and how to troubleshoot problems". "I learn tutorials on management and communication modules" and "I watched a video on YouTube to understand accountancy topics that I could not understand from the textbook and lecture notes. These videos helped me learn effectively, and I am now more knowledgeable than my classmates".

They are convinced that learning from YouTube is easier and fun, and its heavily visual content makes it easier to understand the message(s) it is trying to convey, "YouTube is attractive to me because videos are more interesting than words".

One of them pointed out that "It is beneficial to understand a theory that can be explained by a video; it has a positive effect on learning because the course requires more in-depth explanation". They believed that using video help them understand difficult topics, "I use YouTube to help me with my studies, and before every exam, I use YouTube for revision because I do not understand some of my instructors in class".

The last theme is that of the difficulties and issues such as fake or false information and news online, distractions with games and other social events and postings and that of superficial social learning only with the use of YouTube. However, they emphasized that social media, particularly YouTube can complement and supplement formal learning provided the teachers and lecturers were to incorporate it during lesson time.

#### Discussion

These results confirm that using videos to teach have a prolific positive effect on students' learning for higher education students that YouTube grants the students satisfaction due to the use of videos in a traditional classroom setting (Torres-Ramírez et al., 2014). Students reported higher satisfaction and increased retention when social media is integrated into their courses (Alon & Herath, 2014).

According to Clifton and Mann (2011), the use of YouTube videos almost guarantees increased student engagement, critical consciousness, and accelerated in-depth learning. These findings are consistent with those reported that YouTube videos will

simplify the understanding of a topic to improve the students' attention and retention due to the fact that it is much easier to remember visual cues than auditory ones (Johnson & Mayer, 2009). Alon and Herath (2014) reported similar findings and argued that students believe that they learn more and are more satisfied with a course integrated with social media. The results of this study are beneficial for academia and academic institutions, since it creates knowledge pertaining to students' usage of YouTube for learning and students' perception towards the effectiveness of video for learning purposes. The results highlighted the importance of blended learning and using complementary tools to improve traditional learning approaches. Many universities are invested in traditional methods of teaching using books and lecture notes. Increasing the use of social media amongst students and facilities that these technologies provide for learning creates the opportunity for educators and universities to redesign the teaching method and facilitate the usage of these technologies for teaching and learning within a blended learning context.

From the results, hence, there is need to design participatory & collaborative activities with the school curriculum and to engage students with creating and participating in activities using YouTube videos for learning and assessments. YouTube Resources for both teaching and learning and to promote active learners with educator's interactions and feedback too.

The results also confirmed the effectiveness of YouTube video on students' learning and highlighted the fact that traditional teaching methods need to be improved. Thus, there can be good incorporation of social media, YouTube as tools of learning within a blended learning context. The following diagram explains the details between Face to Face interactions with educators/tutors in class followed by online spaces with the use of social media, such as YouTube.

	Tutor	Student	Resources	Feedback
F2F	Lecture on product design.	Take notes	Greirson (2003)	
Work- space	Make sure students can access workspace	Access task and resources  Assign roles to team members	Series of online articles and simulations	From tutor and other students
F2F	Task students: upload the resources sourced  Information literacy workshop	Learn information literacy skills		From tutor, peers and librarian
Work- space	Monitor student progress	Upload resources View resources uploaded by others	Uploaded resources shared across groups	Feedback from tutor, peers
F2F	Students present final concept	Group presentation		Peers and tutor

Figure 1: Strategies for Blended Learning with Social Media Conclusion

This study elucidated that the uses of social media, like YouTube is well liked, effectively used for collaborative learning amongst university students and their perception on its effectiveness for teaching and learning. The results confirmed that many students rely on YouTube to solve academic problems and answer any questions that are beyond the boundaries of the textbook book and formal learning in class. Almost all of the students use YouTube to seek information and learn. The extensive use of social amongst students, their familiarity with it, and the effectiveness of videos for learning makes it necessary that suitable technologies be adopted for teaching and educational methods be redesigned and also within a blended learning context. Thus, there can be better leveraging of these tools for learning. New technologies/channel can be used as a complementary tool for the education system, which will eliminate the weaknesses of traditional pedagogies and enhance teaching and learning. Using visual objects, especially YouTube videos to explain something will make it easier for students to visualize and understand the topic much better and in- depth learning. Thus, with the use of social media, like YouTube as a tool, students move from being informed to an active learner and selfdirected learner of their own, hence an empowerment of learning from information.

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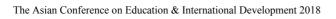
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# Factors Influencing Teens to be Involved in Social Problems in a Protection Center, Selangor

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#### Abstract

This study was conducted to identify factors that influence behavioral depravities among teens. Respondents in this study consist of trainees aged 13 to 19 years old and above. The methodology of this study is a survey using questionnaires as instrument. Respondents were selected using a purposive sampling technique involving 70 teenage girls in a state protection center of Selangor. The findings of the pilot study on 30 teenage girls involved with social problems at the protection centre in Selangor showed that items had high reliability with alpha cronbach values above 0.8. The data analysis of this study uses SPSS (Statistical Package for the Social Sciences) version 23.0 to analyze descriptive statistical data, mean and standard deviation. The results showed that the influence of self factor, parent factor, mass media factor and peer factor was moderate. Hence, this study can be used as a guide to finding solutions for relevant authorities by taking into account the factors that influence teen involvement in social issues. In conclusion, all parties should work hand in hand to address this increasingly worrisome social problem.

Keywords: Factors, behavourial depravities, moral problems, teens, protection centre



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#### 1.0 Introduction

The need for noble moral development at this moment is increasingly pressing upon the social problems that arises in line with the economic development and the rapid development of the world. In this case, the issue of producing cildrens with the noble and good religious values is also increasingly difficult. A study on 200 students to identify the level of religious knowledge among them found that the level of majority of the students was moderate (Nurzatil Ismah et al 2015). The findings of this study illustrate that the higher the religious knowledge, the lower the tendency of the student to engage in immoral activities (Fauziah et al al 2012). However, in reality today shows the task of applying the moral education to students as the goals set by the government are very challenging (Mohd Musnizam et al 2012). This is based on news and reports reported in the printed and electronic media on these issues is increasingly worrying.

According to Shuhada Mansor's (2015) report, the statistics of the number of criminal cases recorded by the Royal Malaysian Police (PDRM) recorded a big rise in moral crisis among students. The rise is staggering in numbers and is looked upon as very serious and worrisome. The Ministry of Education Malaysia (MOE) recorded 13, 359 primary and secondary students across Malaysia engaged in serious disciplinary misconduct (Utusan Malaysia 2016). As a response, The Ministry of Education Malaysia has listed 402 school hotspots associated with disciplinary cases as well as drugs throughout the country as a guideline and one of the early prevention measures since the Student Discipline System (SSDM) of MOE had recorded the incidence of misconduct and student discipline problems is on the high side (Berita Harian 2017). The reported statistics illustrate a major challenge in terms of student morality (Noornajihan et al al 2012).

These issues of moral depravities should have relation with influences such as self-factor, family, peers, western influences, surrounding communities, mass media, etc. (Nor 2009; Fauziah et al 2011; Zainudin & Norazmah 2011; Wan 2013). The problem is also the impact of the modernization and cultural shock that hit children of this age which not only affects individuals, but also involve family, community and national institutions (Zainudin & Norazmah 2011; Tengku Elmi Azlina et al 2015). The issue of student's moral failure is a major threat to achieving country development. Noornajihan and Ab. Halim Tamuri (2013) emphasizes that the failure of an institution, organization, race, nation or civilization is due to the inherent moral character of the individual. This is also acknowledged and proven through the theory of birth and fall of civilization posed by Ibn Khaldun (1993).

This situation shows that the rate of teen involvement in social issues is increasingly serious. However, teens are the natural assets of the nation and will play a very big and important role in shaping the political, economic and social future in Malaysia. Hence, recognizing the importance of the weight of responsibility to shape today's generation of student's ethics, there is a need for researchers to examine the factors that influence teens involved in social problems. Recent studies have found that studies on the factors of teen involvement in social problems are still underperformed, especially studies involving teen girls (Nurul Husna et al., 2017). Although there are studies that look into influencing factors (Zainudin & Norazmah 2011; Husin 2011; Noradilah 2014), but there are still a small number of studies

focusing on these four factors alone, namely self-factor, parents, peers and media mass. However, in the context of the study, there is still a lack of research on factors affecting teens involved in social problems being carried out at the protection center (Azlina 2012) and focusing on the age group of teen girls aged 13, 13 to 15, 16 to 18 years old and 19 years old. Hence, this quantitative study is aimed at exploring the influence of self-factor, parent, mass media and peer to social problems of teens.

#### 2.0 Literature Review

Teenage years are full of various problems and conflicts that arise because of several factors. Azlina (2013) explains that these factors are said to not onlydisturbing the mind, emotion, and body but also shake the faith of these teen until they finally get caught up with social problems. Hence, the term of these factors is generally defined as the element that contributes to a particular or more specific result of the cause which causes the occurrence of such social problems (Hashim et al al., Husin 2011). In this case, the findings of previous studies find that self-factor, parents, mass media and peers are the four most dominant factors that motivate teenagers to engage in social problems (Badlihisham et al., Zainudin & Norazmah, 2011; Wan Norina et al 2013).

Self factor is one of the factors that encourage teenagers to do something negative or positive. Hence, to understand the problems arising from the teenagers themselves, the definitions of the term 'teenage' should be understood first. Teenage are a period of transition, stage of development from childhood to adulthood, in terms of physiology, emotion and social (Badlihisham et al., 2000; Azizah 2013; Sahlawati et al 2015), where their age is in 10 to 20 years old and have reached puberty (Fariza 2005; Badlihisham et al 2000; Rogers 1962 in Zainudin & Norazmah, 2011). At this stage of their life, they have high curiosity. So every thing that happens in this teenager environment will invite the curiosity that ultimately encourages them to try to do it according to their own needs without regard to the pros and cons of the matter (Muhammed Sharif & Suria 2012).

The act of making observations that later transform to curiosity to do something is to in line with behavioral theory. This theory emphasizes behavioral learning based on observations from surroundings (Mok Soon Sang 2010; Novi Irwan 2016). Mok Soon Sang (2010) further explains that the attempt to do something is a trial and error process, which is coherent as it happens to teenagers who constantly observe and try to do things until eventually they can be involved in social problems. In addition to curiosity, the desire to express dissatisfaction, wanting to take revenge, self-factor that lacks behavioral appreciation are among the factors that come from the teenagers themselves that encourage them to be involved in social problems (Zainudin & Norazmah 2011).

Apart from self-factor, there is a parental influence that also contributes to social problems. If the education given by the parents is lacking, then the teenager has the potential to fall into social problems (Zakaria et al 2012). This is evidenced by previous studies showing that the cause of social problems among teens is due to the lack of religious education adopted by parents to children (Sabitha 1995; Sharifah et al al., 2010; Fauziah et al. 2012). Not only in terms of educating and exemplary behavior, the issue of unrest and the collapse of households between the parents can

also ultimately affects teens (Nik Haslinda 2007; Tam Chai 2009; Yusuf & Najihudin, t.th). The results of Fauziah et al. al (2012) found that parent's fights are one of the factors that contribute to social problems among teenagers in the protection centre.

Peers also have a strong influence on the formation of teenage behavior and morals. Peers are the ones that gives a different environment, where the familiarity is beyond the family environment and can be a place of letting out all unspoken problems and act as a substitute for parents (Azizi Yahaya t.th; Zakaria et al 2012). This intimate relationship can be a good thing and but can also can happen the other way around. This is because good friends can guide you to goodness, but if you mistakenly choose a friend, then your teen will get stuck with bad things. This was agreed upon by Husin Junoh (2011) who found that peers were the dominant influence on issues of moral formation. This is because of the teenager's willingness to do something bad because of wanting to get approval by their friend (Dian & Faradilla 2000).

The results of the study by Azlina (t.th), Azizi Yahaya et. al (t.th), Zainudin and Norazmah (2011) as well as Azizah (2013) found that peer's influence affects social problems among teens. This is because in the current age of teens they are more likely to imitate the behavior shown by peers (Maizatul Akmam 2007) as described in the theory of social learning introduced by Albert Bandura (1977), where learning takes place through observation of people's behavior in the surroundings. The observational learning that is also named as this modeling is a result when teens observe their significant peer's behavior. Peer-to-peer monitoring is an impersonation process that will shape a person's deviant behavior (Azizi Yahaya & Mohd Sofie, t.th; Qumruin Nurul Laila 2015) which ultimately causes teenagers to fall into social problems.

The mass media factor also contributes to social problems among teens. Although the mass media serves a variety of information and information, at the same time, the mass media have a negative influence especially on teens as well as affecting their morals such as free association, dressing that does not cover aurat, western lifestyle and so forth (Mohd Dahlan & Ida Shafinaz , t.th; Syed Muhammad & Mohd Lufti 2009; Tengku Elmi Azlina et al 2015). This proves that mass media is a medium of behavioral impersonation for teens who ultimately plunge them into social problems. The situation is coherent as it is said in the theory of social learning, where teens are learning by imitating what is in their environment and environment including exposure through mass media (Ab. Halim & Zarin t.th; Nailul Falah 2004; Qumruin Nurul Laila 2015) .

Teenage behaviors that are heavily influenced by the four factors mentioned here show the ever growing of social problems today. This problem not only affects young men, but also social issues involving teenage girls are increasingly being talked about. This situation illustrates that teenage girls are now more aggressive, courageous and wild. The existence of protection center devoted to teenage girls also proves that these groups are increasingly in need of assistance to be rehabilitated (Azlina t.th; Zanariah et al al 2016). The protection center involved in this study is devoted to teenage girls who are involved with social issues alone. In this study, the respondent's background also involves social problems, namely violence, sexual misconduct and drug abuse.

# 3.0 Methodology

The methodology of this study is a survey. Population in this study is the number of teens in a state protection center of Selangor, a total of 100 people. While the total sample used in this study is 70 respondents. This study used the selection method sample to select the appropriate sample in this study. This survey study uses descriptive method through the use of 5 Likert scale questionnaires as a research instrument. The questionnaire consisted of 32 items which involved four main constructs, namely 7 items for demography, self-factor (6 items), parent factor (7 items), mass media factor (6 items) and peer factor (6 items). This questionnaire was adapted from some previous studies. The findings of the pilot study on 30 teenage girls showed that items had high reliability with a score above 0.8. Data analysis in this study uses the SPSS (Statistical Package for the Social Sciences) version 23.0 which refers to descriptive analysis, mean and standard deviation.

For the purposes of descriptive data analysis, the mean score interpretation used in this study is referring to the following table:

**Table 1 Mean Score Interpretation** 

Range Scale	Mean Score Interpretation
1.00 - 2.00	Low
2.01 - 3.00	Moderately Low
3.01 - 4.00	Moderately High
4.01 - 5.00	High

Source: Nunally (1978); Norasmah (2002); Norasmah & Sabariah (2005)

# 4.0 Results

This study involve respondents among teen girls who is involved in social problems in a protection center, Selangor. In detail, the respondents' demographic profile is shown in the following table.

**Table 2 Respondents Demography Profile** 

Respondents		Total	Percentage
Age	13-15 Years Old	9	12.9
_	16-18 Years Old	22	31.4
	19 Years Old &	39	55.7
	Above		
Type of offence	Violence	19	27.1
	Sexual Misconduct	34	48.6
	Drug Abuse	5	7.1
	Others	12	17.1
Parents Occupation	Government	30	42.9
-	Private	20	28.6
	Self-own	16	22.9
	Others	4	5.7
Parents Earnings	RM 100-500	5	7.1
_	RM 501-1000	20	28.6
	RM 1001-2000	17	24.3

RM 2001 above	28	40.0	

Based on table 2 above, respondent profile analysis showed that the whole sample was 70 people. Of these, 9 were 13-15, 22 were 16-18 and 39 were over 19 years old. When viewed from the type of offense, 27.1% are involved with violence, 48.6% are engaged in sexual misconduct, 7.1% are involved with drug abuse and 17.1% are involved with other social problems. Next to the demographic status of parents there are 52 people who have married parents, 11 people who have divorced parents and 7 people have no parents.

In addition, the demographic of this study was also seen in terms of parents' education and found that 22.9% had PMR graduates, 54.3% had SPM parents, 8.6% had STPM parents, 1.4% had PHD parents and 12.9% have parents of other approvals. Of these, there are 30 people with parents working in the government sector, 20 have parents working in the private sector and 16 have self-employed parents and 4 have parents working in other sectors. In terms of income, 7.1% have parents who earn RM100-500, 28.6% have parents earning RM501-1000 and 24.3% have parents earning RM1001-2000 and 40.0% have parents earning more than RM 2001.

Next, table 3 below shows the overall score table of factors affecting teens involved in social problems.

**Table 3 Mean Score Factors Affecting Teens Involved In Social Problems** 

Factors	Mean	Level
Self	3.63	Moderately High
Peer	3.12	Moderately High
Mass Media	2.97	Moderately Low
Parents	2.43	Moderately Low

Based on the table above, the results showed that the mean score of all factors affecting teens involved in social problems, ie self (min = 3.63) and peers (min = 3.12) were at moderately high level. Meanwhile, mass media factor (min = 2.97) and parents (min = 2.43) are at moderately low level

Table 4 below shows the overall data analysis of items for self-factor in detail.

**Table 4 Self-Factor** 

Questionnaire	Mean	Std Deviation	Interpretation
I often deny parent's instructions and family members	3.48	1.53	Moderately High
I do not practice religious teachings like prayers	3.77	1.39	Moderately High
I like to mingle with a group that practices an unhealthy lifestyle	3.47	1.46	Moderately High
I always want freedom in life	3.88	1.44	Moderately High
I have no goal of life	2.87	1.50	Moderately Low
I always like to try something new	4.31	0.87	High
Overal mean	3.63	1.03	Moderately High

Table 4 above shows that the overall self-factor factor is at moderate high (mean = 3.63 and standard deviation = 1.03). Items with the highest mean are "I always like to try something new" (mean = 4.31 and standard deviation = 0.87) and are at high level. Whereas the item with the lowest mean is "I do not have the goal of life" (mean = 2.87 and standard deviation = 1.50) and is at moderately low level.

Table 5 below shows the overall data analysis of items for peer factors in detail.

**Table 5 Peer Factor** 

Questionnaire	Mean	Std Deviation	Interpretation
I was easily influenced by my friend's insistence	3.24	1.31	Moderately High
I did wrong because of my friend's insistence	2.84	1.15	Moderately Low
I would rather express my problems to friends than my family	3.67	1.41	Moderately High
I would rather spend time with my friends	3.62	1.43	Moderately High
I'm easy to accept if I'm skipping with my friends	2.42	1.43	Moderately Low
I can easily accept a friend if I follow the latest fashion	2.91	1.54	Moderately Low
Overall mean	3.12	1.06	Moderately High

Based on the above table shows that overall peer factors are at moderately high (mean = 3.12 and standard deviation = 1.06). Items with the highest mean are "I would rather express my problem to my friend than my family" (mean = 3.67 and standard deviation = 1.41) and are at moderate high. Whereas the item with the lowest mean is "I'm easy to accept if I'm skipping with my partner" (mean = 2.42 and standard deviation = 1.43) and are at moderately low level.

Subsequently, table 6 below shows the overall data analysis of items for mass media factors in detail.

Table 6 Mass Media Factor

Tuble o Muss Media I actor				
Questionnaire	Mean	Std Deviation	Interpretation	
I prefer to watch sex TV shows	1.91	1.13	Low	
I prefer to surf the web with sex contents	2.00	1.32	Low	
Sex scenes between men and women should be blocked in this age	4.10	1.39	High	
TVs broadcast a lot of negative things	3.41	1.61	Moderately High	
The web site (internet) broadcasts a lot of negative things	3.41	1.61	Moderately High	
I like to watch the plan of violence	3.00	1.55	Moderately Low	
Overall mean	2.97	0.90	Moderately Low	

Based on the table above shows that the mass media factor is at moderately low level (mean = 2.97 and standard deviation = 0.90). Items with the highest mean were "sex scenes between men and women should be blocked in this age" (mean = 4.10 and standard deviation = 1.39) and at high levels. While items with the lowest mean are "I

prefer to watch sex TV shows" (mean = 1.91 and standard deviation = 1.13) at low level.

Table 7 below shows the overall data analysis of items for parent factors in detail.

**Table 7 Parents Factor** 

Questionnaire	Mean	Std Deviation	Interpretation
My parents have a bad habit of home	1.74	1.28	Low
My parents are less concerned about my lessons	2.25	1.34	Moderately Low
My parents rarely stay home because of their busy work	2.61	1.52	Moderately Low
My parents are less communicating with me about the needs and problems I'm facing	2.82	1.53	Moderately Low
My parents rarely motivated me	2.65	1.35	Moderately Low
My parents rarely support me	2.40	1.33	Moderately Low
My parents rarely praise me	2.55	1.48	Moderately Low
Min Keseluruhan	2.43	0.98	Moderately Low

Based on the above table shows the overall factor of the parent is at moderately low level (mean = 2.43 and standard deviation = 0.98). Items with the highest mean are "My parents are less communicating with me about the needs and problems I'm facing" (mean = 2.82 and standard deviation = 1.53) and are at moderately low level. Whereas the item with the lowest mean is "My parents have a bad habit of home" (mean = 1.74 and standard deviation = 1.28) is at low level.

## 5.0 Discussion

Overall, the results of this study show that self-factor and peer factors are at moderately high level. Meanwhile, mass media and parent factors are at moderately low level. This finding shows that two more dominant factors affecting teens to engage in social problems stems from self and peers. It can be concluded that there are two main aspects, namely internal factors that emanate from themselves as well as external factors that come from peers who play a major role in influencing teens to do social problems. This finding is in line with the study conducted by Tengku Elmi Azlina (2015) which found that the involvement of teens in various social phenomena is due to the personal factors of the teen themselves covering aspects of personality development which will lead to tension and emotional stress in teens if they are not getting full guidance in facing the challenge of youth. This causes teenagers to be inclined towards moral collapse and do things that they should not do and are unlawful.

The results of this study also coincide with the study of Zainudin and Norazmah (2011) who also find that self-factor is the the dominant factor that influences teenagers to be involved in social problems at Tunas Bakti School, Lereh River, Melaka compared to peer influence and school environment problems. Fauziah et. al (2012) states that teenage morals can be formed through themselves, namely from the perspective of education and the appreciation religion from inner-self. If their identity is intact, then they will be motivated to do positive things. On the other hand, if their

personality traits are poor, then moral deprivation and negative actions that violate norms in society include social problems (Azlina 2013; Zanariah et al 2016).

Furthermore, the results of this study also show that many teenagers always love to try something new and this item is at the highest level. This is in line with the study conducted by Zainudin and Norazmah (2011), Azlina (2012) and Zanariah et al. al (2016) which finds that students who are involved with social problems are students who have a high desire to try something new that they never did. A study conducted by Azizi et. al (2010) also shows that student attitude towards the aggressive behavior that causes discipline among students is the desire to try something new. In general, this is one of the dominant attitudes that occur naturally in teens, the internal instincts of themselves internally who always want to try something new to find fun that ultimately encourages them to deliberately do it.

However, this study also found that overall teenagers do have a living goal. The findings are in line with the study of Zainudin and Norazmah (2011) who also find that students involved with social problems have a living purpose. It also shows that they are also concerned about the future. However, their goals of life are easily observed and concentrations are focused only on individuals rather than the general population as teens are more self-centered and the concept of human rights has not been fully mastered (Anuar 2001). This is an internal element that stands out in a teenager and the maturity level of their thinking will grow as the age rises, and then goes to the adulthood.

In addition to self-factor, this study also found that peer factors were the second highest factor with moderately high level affecting teens to engage in social problems. This is in line with the findings of the study of Azizi Yahaya and Muhamad Friday (t.th), Maizatul (2007) and Zainudin and Norazmah (2011) who found that peers were external factors influencing the formation of teenage morals. The results of this study found that peers were the main choice of teenagers as a place to express problems over their own families. This finding is consistent with Tengku Elmi Azlina et al. al (2015) which states that teens love to find peers as a place to express their concerns and attention. However, this study also found that teens did not regard the act of truancy with their peers as an act to be accepted by their friends. This finding is contrary to the study conducted by Norhasilah et. al (2012), where peer influencing factors are at a high level in influencing students to perform truancy.

In addition, this study also found that overall social problems from mass media factors were at moderately low levels. This is in line with Abdullah and Mawaddah (t.th) study findings, Ab. Halim and Zarin (t.th), Badlihisham (2005), Nurul Huda (2011), Zaharah (2013) which found that the mass media factor influenced the formation of teenage morals today. The results of this study found that the mass media featured many social scenes between men and women. Scenes that do not preserve the boundary of aurat between this type of sex contribute to the problem of free association, free sex, out-of-marriage pregnancies and the like. In this regard, the researcher is of the opinion that teenager's parents should be more attentive and care about each of the programs that their children watch to fit their age and not damage their morals. However, this study also found that teenagers do not like watching TV shows. This is contrary to the study conducted by Ab. Halim Tamuri and Zarin (2009)

who find that teens prefer to watch TV shows and VCDs with sexual contents, where these symptoms lead moral depravities among teens.

Finally, the finding of this study also found that overall social problems from parent factors were at the lowest mean position and were at moderately low level. This is in line with the findings of Anuar (2001), Maizatul (2007), Azlina (2011) and Nurzatil et. al (2015) which states that parents also influence in the formation of teenage morals. The results of this study found that most parents lacked communication with their children about the needs and problems they faced. This is in line with the findings of Tengku Elmi Azlina et. al (2015) which proves that the lack of communication between parents and children causes teenagers to be trapped by social problems. Researchers are of the view that bilateral communication is an important part of the eradication of teen misconduct. However, the findings of this study are contrary to the study of Zainudin and Norazmah (2011) that students disagree that the aspect of a parent's lack of communication with students about the needs and problems faced by their children leads them to social problems

#### 6.0 Conclusion

Teenage social problems are an issue that is often discussed today. The impetus of the social environment creates and affects the behavior of teens. Among the factors identified in this study were self-factor, parents, mass media and peers. The study found that these factors were one of the causes of social problems among teens. This study is important to find solutions that are really effective in combating teen involvement in social issues. Hence, the implication of this study is that relevant authorities can know and take into account the factors that influence the involvement of teens in social issues to be guided in preserving the national heirs from being trapped in social problems that threaten the well-being of the nation. Among the proposed research proposals that can be done with the social problems of the teen is by involving more respondents and using theories related to teen environment. This is because teenagers at this age are more easily affected by their social environment.

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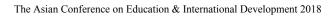
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Official Conference Proceedings

# Care as a Key Contributor to Student Learning and Teacher Effectiveness

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#### **Abstract**

This study examines how *care* is a pivotal factor in contributing to student learning as well as teacher effectiveness. In this context, care can be defined as actions that encourage students to learn and succeed. The act of caring requires both teachers and students to interact. This relationship acts as foundation that holds both parties together, producing meaningful pedagogical experience. However, care does not stand alone. It is supported by presence and emotions that prompts the caring act. Presence is an influential feature in caring as it maintains the intensity of the relationship. Emotions is important to control how the caring act will be executed. These aspects, care, emotions, and presence are interrelated, moreover, vital for the existence of the relationship. There are several constructive outcomes of caring on teachers and students. The act of caring allows teachers to be supportive and aware of their pupils as an individual and a learner. Therefore, teachers can create and offer authentic pedagogical approaches to meet and increase students' learning needs. In relation to that, care increases teacher efficacy. As teachers know and understand their pupils more closely, they have more confidence in constructing relevant instructional plans to implement for the students' learning development. Moreover, it will improve teachers to enhance their teaching skills. Thus, teacher effectiveness as well as classroom management is achievable. Developing a teaching relationship through care will impact pupils as individuals, bringing valuable connections into their lives.

Keywords: care, student learning, teacher effectiveness, teacher efficacy, classroom management



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#### Introduction

According to Osterman (2000), the relationship that students have with teachers is one of the fundamental predictors in student learning (as cited in Stipek, 2006). Learning is a process that requires effort, engagement, and motivation so students can achieve high levels of achievement. In order for them from reach this goal they also need a support system from their teachers, which is crucial to this progress. Based on Noddings (1992), academic goals cannot be met unless teachers provide students with a caring and supportive classroom environment (Noblit, 1993, as cited in Wentzel, 1997). In relation to that, a research study conducted by Woolfolk-Hoy and Weinstein (2006) revealed that students perceive that class interaction and cooperation is shaped by their relationship between their teachers and how supportive and caring they are (as cited in Wolff, Bogert, Jarodzka, & Boshuizen, 2015). Loughran (2010) also suggested that teaching is not only an act of delivering knowledge to students in classrooms but is also a process of building a relationship between teachers and students; students and students; theory and practice; and students and content to create a meaningful pedagogical experience. Thus, this requires both teachers and students' involvement to make a difference in the students' learning experience and achieve a successful pedagogical practice.

Reflecting on these theories, it is clear that teacher's care play a significant role in students' learning outcome. Through care, students know they are respected, valued, and acknowledged as individual learners. Demonstrating care in such a way places them in the center of the learning process, and thus indicates that teachers believe in the student's abilities (Lumpkin, 2007). Thus, teachers would engage students in the learning process as well as encourage them to achieve higher goals. Furthermore, teacher will also be determined to develop teaching approaches that are appropriate so that it will meet with the students' learning needs. As teachers reflect on their instructional methods, they improve their teaching capacity. Understanding what teaching strategies are suitable for students can increase teacher efficacy (Collier, 2005). Collier (2005) also explains that enhancing teacher efficacy can have extensive impact in teacher effectiveness. By improving teacher efficacy, teachers are more familiar with what type of pedagogical approach is best used for what type of student. This results in effective teaching.

As stated previously, student learning is highly determined by the relationship they have with their teachers. John Macmurray (1964) stated that 'teaching is one of the foremost of personal relations' (p. 17, as cited in Noddings, 2012). To build relation with others one of the foundations of building a relationship is through care (Noddings, 2012). This paper will explore care in the education context. Firstly, the definition of care will be explained. Secondly, other aspects that support the act of caring will be elaborated. Thirdly, this paper will investigate the role of care in student learning and teacher effectiveness.

### **Definition of care**

As a human being we are able to care, have an emotion or feeling for one another. Caring is defined as a value on how a person think they should view and relate to others (Noblit, Rogers, & McCadden, 1995, as cited in Collier, 2005). When a person asks their friends or family how they are doing or when a teacher comforts a student

with a problem, these illustrate the act of caring. It applies to all relationships, whether it is between parent and child, teacher and pupil, or coach and player. The subjects in the relationships consist of *carer* and *cared-for*. Based on combination of Tronto (2010) and Noddings (2012) work, there are four stages of care which include; (1) attentiveness, where the *carer* becomes attentive to the *cared-for*'s situation and recognizes the need for care, (2) responsibility, in which the *carer* attends to the *cared-for* and determines how the *carer* will respond, and (3) competence, the carer fulfills the need, and (4) responsiveness, the phase where the *carer* actively responds to the *cared-for*'s needs. Every phase it crucial to maintain because it will affect the caring act.

In this process of caring relation, listening and trust plays an important role. Noddings has extensively written on care and how care is successfully executed. She describes a *carer* as one that is attentive, watches, and listens (2012). Micheal Fielding and Peter Moss believe that listening is the heart of teaching (Noddings, 2012). Through listening we are able to understand one's situation or concern in which allows a relationship to develop. As the relationship grows, trust is built between one another which is central to connected teaching (Belenky et al, 1986, as cited in Rodgers & Raider-Roth, 2006). Caring is deeply rooted in forming a relationship which would also apply in a relationship between teachers and students. Noddings also noted that care encourages competence because when we care about someone or something we try to give them the best (1995). Thus, having or developing care is essential because it can influence the teaching and learning practice.

# Importance of presence in care

In the process of caring, there are also other features that contribute to determine how successful the act will be executed. Noddings (2003) suggested that presence plays crucial role in care (as cited in Rodgers & Raider-Roth, 2006). When a teacher cares about their pupils, they will try to present themselves wholly by being alert and ready to respond. Presence is defined as an act of being mindfulness, awareness and investment in the present moment (Tremmel, 1993), wide-awakeness (Grene, 1973), and openness for compassionate interaction (Waks, 1995, as cited in Rodgers & Raider-Roth, 2006). Presence is not a qualification that teachers are trained to master and it is also not a factor that educators consider when recruited as a teacher (Garrison & Rud; Liston, 1995, as cited in Rodgers & Raider-Roth, 2006). Yet, it is a feature that is significant to care which also applies in teaching. Having presence allows teachers to be connected with their student, being attentive and listening intently. By doing so, students will feel that extra attention given to them which can make a difference in how students view the lesson and learning process. For example, during a group work, a student is suddenly praised for sharing their opinion, in that instance, it can change the way the pupil engages in the classroom. Giving positive feedback will justify their belonging and acceptance as students and individuals. This is congruent with Waks's theory of presence as openness by accepting others through close interaction (as cited in Rodgers & Raider-Roth, 2006).

As teachers present themselves with their whole-hearted intention to understand the pupils' concern or situation it shows an emotional feeling of being seen. This refers to what Janet Surrey describes as empathy or mutual empathy (1991, as cited in Rodgers & Raider-Roth, 2006). Mutual empathy refers to the connection with one another and

to recognize and understand them through vision, as being seen (as cited in Rodgers & Raider-Roth, 2006). As simple an act as making eye contact can indicate that the other person sees them and is aware of their presence. Morse (1992) suggests that there are four components of empathy: emotive, moral, cognitive, and behavioral (as cited in Mercer & Reynolds, 2002). The capacity of identifying, understanding, and responding to what other people are genuinely feeling can produce a strong connection with each other. For example, when a student struggles with writing their essay and a teacher meets him, takes the time to be there, and assures him that the teacher is there to help, this is a huge sense of relief for the student. For teachers to place themselves in the students' position or their perspectives enables them to connect with their students and have a meaningful relationship.

## Importance of emotion in care

According to Palmer (1997), emotions are one of the determining factors of good teaching. It influences the way teachers teach and pupils learn. Emotions are also a significant part of care. Without emotion, care cannot be generated. Emotions have the power to control our actions although we are not aware of this. They are present in all activities in our daily lives including teaching and learning. Emotions are strongly linked to affecting the relationship between teachers and students (Nias, 1989, as cited in Oplatka, 2011). In such state, emotion can change what relationship the teacher and student has based on the emotion they convey, it will either bring them closer together or create distance between them. For example, if a teacher cares about their pupils but the pupil shows disrespect, this can trigger the teacher to lose control of their emotion and display an act of frustration. This type of stance can significantly impact the relationship of teacher and student. Furthermore, emotion management becomes part of the teacher's teaching practice because it is used a natural aspect of teaching and learning (Zembylas, 2005, as cited in Oplatka, 2009). Although this might be the case, it is not compulsory for teachers to display emotions as part of their task in teaching, thus, if they fail to show emotions they will not receive any sanctions (Oplatka, 1997a, as cited in Oplatka, 2007). Emotion and caring are two intertwined features that impacts teaching practice. It is important to note that care becomes central in emotional labor (Oplatka, 2009). Oplatka's extensive work on emotion suggested that care can also be regulated and managed similar to emotions in classroom context (2009). Therefore, care can be adjusted through emotion management in shaping how we want to express care.

When developing a curriculum, or recruiting applicants for a teaching position, administrators, educational policy makers, and educators do not take emotions into consideration (Hargreaves, 2000). Based on relevant studies on emotion in the education context, it was found that teachers' emotion was linked to a number of aspects such as teacher and student relations, teaching quality, emotion management, identity, and teacher and student attitude (Day & Lee, 2011; Meyer, 2009, as cited in Oplatka, 2011). When teachers express a certain type of emotion, pupils can sense what the teacher is feeling. For instance, when a teacher takes a deep sigh while explaining a lesson or their voice tone is flat or they start raising their voice when a student is having trouble, it demonstrates that the teacher is apathetic, tired, or angry. These emotions are clearly felt by pupils and this can impact their learning environment. One finding from Sutton's (2002) study revealed that avoiding negative emotions such as frustration can result in effective classroom (as cited in Oplatka,

2009). This is due to the effort of not distracting students' learning and not causing a potentially toxic learning atmosphere. Classroom environment can be determined by the teachers' emotions, whether it be a dull, innovative, or interactive classroom.

#### Care in the education context

Nowadays, teachers are expected to fulfill the teaching and learning goals based on some standardized curriculum. This causes teachers to focus their teaching on the subject material to achieve high scores rather than to shape caring and competent individuals (Noddings, 1995). The implications of this has affected teachers to neglect factors that contribute to good teaching. It is believed that a good teacher is one who has a clear purpose, able to manage their class wisely, and encourage good behavior (Economist, 2016). Typically, pupils are not approached through meaningful teaching styles. This negatively impacts their learning as well as self-development. Thus, it should be acknowledged that one of the effective ways of developing expertise in teaching is through care. It is through care that a relationship will be built that will enhance pedagogical development.

Care enhances student learning and teacher effectiveness through teacher efficacy

As stated previously, teacher effectiveness can be achieved through enhancing teacher efficacy. To successfully reach this goal, care plays an essential role. The act of caring of teachers is key in developing relationship with between student and teacher. When teachers demonstrate care towards students it will generate a sense of presence, value, and respect to the students. Lumpkin (2007) suggested that a student feels cared-for when a teacher acknowledges and respects their individual abilities and interests. Moreover, according to Berliner in his concept of nature of expertise in teaching, he one of the factors that distinct experts to novices is that expert teachers have self-efficacy and positive expectation on their students. (Berliner, 1992)

Teacher efficacy is the ability to make an impact in student learning, including the unmotivated students (Berman, McLaughlin, Bass, Pauly, & Zellman, 1977; Guskey & Passaro, 1994, as cited in Tschannen-Moran, A. Hoy, & W. Hoy, 1998). Being a teacher that is committed in influencing student learning has a greater chance of creating an effective classroom because teachers are familiar of what strategies are best applicable for their students. According to a number of education experts, it is found that when teacher efficacy is highly exhibited they perform more effectively in classrooms (Ashton and Webb, 1986; Sparks, 1988; Fritz, Miller-Heyl, and MacPhee, 1995, as cited in Collier, 2005). In relation to this, care contributes in influencing the teachers' behavior of efficacy because it generates a sense of lovingness, compassion, and motivation towards students. Motivated teachers will encourage students to motivate themselves because of the relationship they share with their teachers. As a result, when students feel they have support from teacher and they are valued they become more active in class prompting their learning aptitude in a positive way (Wentzel, 1997).

There are several assumptions that is drawn from what caring teachers can influence, particularly on student learning (Noblit et al., 1995, as cited in Collier, 2005). First, when teachers care about their students they tend to have a stronger commitment and responsibility for their learning performance. They want to be able to provide the

necessary support for students to help them in their learning. For example, if a student is having difficulties with their task, a committed teacher would offer her or his help in assisting the student outside of school period. This also illustrates how teachers feel responsible for their students' learning progress. Expert teachers compared to novice teachers take responsibility of their students' success or failure in student learning (Ashton, 1984; Berliner, 1992). Second, being a caring teacher motivates them to give the best for their students including improving their teaching skills so that they will be able to effectively fulfill the students' learning needs. This notion is aligned with Noddings's (1995) idea on how caring can boost competence, that is to give the best towards something we care about. An example of this situation is when a teacher continues to create innovative ideas that are suitable for certain activities so that it will be easier and become meaningful for students to understand. Thus, teachers' support through motivation will not only improve teaching skills but also increase student achievement. Studies have revealed that teachers' support have positive impact on students' engagement as well as their academic performance (Klem & Connell, 2004). As discussed earlier, the relationship between teachers and students is crucial. Caring teachers are able to share their emotions and thoughts in order to connect with the student and to understand them. This type of act can be demonstrated in cases where a teacher consoles a student having difficulties with a subject. The teachers' attention will be felt by the student and a sense of comfort will develop. Through that, trust will also grow. By building this connection, it will stimulate respect, trust, and motivation that influences the students' engagement in classroom tasks (Collier, 2005).

Caring brings the teaching and learning to a deeper level. As teachers increase their years of teaching they gain familiarity with the instructional strategies, how to manage a classroom, and deal with students with different needs. To successfully meet these aspects of care is the heart that guides teachers to these aspects of expertise in teaching, in which some educators or teachers ignore or are not aware of. The link between care and relationship is intertwined. Based on a study conducted by Mary Poplin and Joseph Weeres (1993) in California schools, the most prevailing and important issues in schools is the human relations, including teacher and student relationship and moral values such as respect, care, and understanding (as cited in Coleman, 1993). This illustrates what parents, staff, and students evaluate and expect from schools. They do not prioritize the school rank in the region or the percentage of graduates who enroll in top schools or universities. Rather, it is the human connection that is the foundation. Thus, caring teachers do not merely affect the student learning but also the students as a whole.

As teachers know better of their students' potential and progress in learning they are able to conduct lessons according to their capacities. Knowing what is best for them can become a routine. This is one approach that can put caring into practice. According to Berliner (1992), expert teachers were able to achieve this through automaticity or routinization. Automaticity and routinization demonstrates the capability of teachers' efficacy because teachers know what and how things should be done in classrooms, able to manage and implement consistent instructional plans, and how to efficiently complete tasks. For example, when caring teachers know what instructional approach best supports their students' learning needs the students will feel more comfortable and create less stress and concerns about the lesson. Thus, this will be easier for students to follow and be more active in class (Wentzel, 1997).

Berliner also noted that students' involvement in learning can increase students' curiosity and learning performance (1992). Furthermore, understanding what instructional methods works best can also improve classroom management. Emmer and Stough (2001) suggested that based on research studies effective classroom management is reflected through the time they have invested in, as well as care in initiating and teaching classroom routines to students. Thus, showing care in teaching can lead to teacher efficacy, which in turn increases teachers' effectiveness as well as improved classroom management. These outcomes are considered factors that contribute to expertise in teaching (Berliner, 1992; Emmer & Stough, 2001; Wolff et al., 2015).

#### Conclusion

The act of care in teaching plays an influential role in education. The relationship between teachers and students acts as foundation that holds both ends to produce a meaningful pedagogical experience. Here, care plays a central aspect of relationship. Care is supported by presence and emotions that prompts the act of caring. These aspects are interrelated and vital for the existence of the relationship. Care facilitates student learning through teachers understanding their students' learning need by developing and enhancing teaching skills. It is important that teachers are authentic in this state so that they are able to build strong learning connections with students. Thus, student learning is achievable. Implementing an appropriate instructional approach will also enhance teacher effectiveness. Developing a teaching a relationship through care will not only touch the surface of learning but more importantly impacts the pupils as an individual, bringing valuable interpersonal connections in to their lives.

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# Child Sexual Abuse Prevention Program: A Response to Emergency of Pedophiles for Preschool In Indonesia

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#### **Abstract**

Child sexual abuse is a worldwide global issue which currently is threatening Indonesian children. The massive number of Child sexual abuse and the various models of the cases such as intra-familial sexual abuse, child prostitution, online sexual exploitation of children, and much more put Indonesia in the emergency of Child sexual abuse condition. In this essay, I will propose child sexual abuse prevention in Preschool as a viable solution to address Child sexual abuse in Indonesia and suggest the strategies of implementation which might suit in Indonesia context. This investigation is conducted by reviewing a range of literature which mainly discusses three core concepts; (1) The need for Child sexual abuse prevention in Indonesian preschool, (2) The implementation of Child sexual assault prevention in a global context, (3) The strategies to implement child sexual abuse prevention which might suit in Indonesia. The key finding of my investigation indicates that the taboo perception and lack of sexual education exposure share an essential premise that there is a reciprocal relationship between them. Furthermore, it also suggested from evaluated studies that Child sexual abuse prevention Intervention program effective to enhance self-protection of young children. Two elements should be considered to implement Child sexual abuse prevention intervention program in Indonesia are the prevention program should be in multi-systemic intervention focused, and the sexual education content should be culturally/religiously relevant.

Keywords: Child sexual abuse, Prevention, Intervention program

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# **Background**

The number of violence cases against children in Indonesia had increased significantly. UNICEF estimated that 30% of sex workers in Indonesia was under the age of 18, with some as young as ten years old. It was also expected that there were 40,000 to 70,000 children who were victims of sexual exploitation. Furthermore, about 100,000 children are trafficked for sexual purposes every year. According to data from the Indonesian Child Protection Commission (KPAI) from 2011 to 2014; they found 932 cases of cybercrime and pornography, 197 cases of child trafficking, 2,882 cases of child sexual abuse, 193 commercial sexual exploitation of children and 186 cases of child prostitution online. (ECPAT, 2016).

Child sexual abuse is a worldwide global issue which currently is threatening Indonesian children. The massive number of Child sexual abuse and the various models of the cases such as intra-familial sexual abuse, child prostitution, online sexual exploitation of children, and much more put Indonesia in the emergency of Child sexual abuse condition. In this essay, I will propose child sexual abuse prevention in Preschool as a viable solution to address Child sexual abuse in Indonesia and suggest the strategies of implementation which might suit in Indonesia context. First, I will investigate why Child sexual abuse prevention for preschool is needed in Indonesia. Second, I will discuss the implementation of Child sexual assault prevention in global context. Lastly, I will examine the strategies to implement child sexual abuse prevention which might suit in Indonesia context.

# The need for Child sexual abuse prevention in Indonesian preschool

Why should a child sexual abuse prevention intervention program be implemented in early years? The increasing number of sexual abuse which occurs in young children reported from several cases in Indonesia. The case of sodomizing which happened in Jakarta International school, the rape by the preschool principal in Sleman, and the case of Official candy's group, an online sexual exploitation case with thousand young child victims estimated, are several cases in Indonesia which involving young children (BBC Indonesia, 2014; Wisnuwardani, 2016; Nailufar 2017). The study draws on research conducted by Finkelhor &Baron (1986) also suggested that sexual assault often begins during the preschool years. Despite the enormous number of child sexual abuse, most young children have a little knowledge about self-protection of their body, lack of awareness about the possibilities of the close relative's offenders and rarely encouraged that they don't have to keep secrecy promise made by an adult (Koblinsky & Behana, 1984). Further, with the vast development of technology children often seek the answer from the internet which has various contents, includes the inappropriate information. The child sexual abuse prevention program will reduce the likelihood of children getting inappropriate information.

Finkelhor (1984) argues that one precondition must be met for sexual abuse to occur is child must be unable to resist abuser's action. It means that the prevention program should be conducted to enhance the children's ability to protect themselves from abuser. Child sexual abuse prevention program believes as one of the viable solutions which can address the increasing number of young child sexual abuse. The purpose of the Child sexual abuse prevention program mostly includes these three elements: (1) children have an information about body ownership and self-protection, such as good

touch and bad touch, also encourage them to share frightening secret to people that they've believed most; (2) children develop their intuition to prevent sexual abuse such as saying no, run and scream if there is someone doing unwanted touching to them (3) Children gain a knowledge about support systems, if they experience actual or potential abuse (MacIntyre & Carr, 2000). The aim of Child sexual abuse prevention program seems to accomplish the need of Indonesian young children for the appropriate of sexual education, however, how it relates to the taboos perception between parents?

Talking about sexuality has never been easy in Indonesia culture. Earlier in this year, Indonesian parents had ordered to withdraw sexual education book for children named "I Dare to Sleep Alone, and I Learn to Control Myself" from the bookstore for being too vulgar (Suroyo Gayatri & Cindy Silviana, 2017). Even though the aim of this book is to educate the parents about sexual education, many communities assume that the content of the book is too vulgar, and does not suit in Indonesian culture and religious beliefs. Some people also argued that the society is not ready yet for sexual education exposure. As the result, the data gathered by Lentera sintas Indonesia through online polled indicates that more than 90% rape cases in Indonesia go unreported. Majority people (around 63%) said that they felt guilty and embarrassed if their family and community know they were sexually abused (Yi, 2016). Since talking about sexuality still is seen as a sin, child sexual abuse remains as a hidden crime among community. The taboo perception of sexuality likely contributed to the lack of sexual education exposure for young children in Indonesia. Even though many countries had conducted school-based sex education, Indonesian government seems reluctant to allow sexual education to become a part of the school curriculum (Schonhard, 2013). Instead of conducting sexual education, government legalised chemical castration as a punishment for child sexual abusers. This policy has been widely debated because it deals between human rights and child protection (Fransiska Asmin & Nugroho Adipradana, 2016). Correspondingly from the lack of sexual education exposure, several people from online polled conducted by Lentera Sintas Indonesia claimed that they did not know they were sexually abused at that time. The taboo perception and lack of sexual education exposure in Indonesia share an essential premise that there is a reciprocal relationship between them. To conquer the complex situations, Indonesia needs not only law enforcement for precipitator but also an intervention program which provides appropriate information of sex education to give young children protection of sexual offenders as well as deliver a better understanding of sexual education for the parents.

The avoidance to talk about sex education between parent and child might happen due to several reasons including the uneasiness to speak sex-related topic, the lack of adequate knowledge about sexuality and the misleading interpretation of children's sexual behaviour from adult's viewpoint (Lu, 1994). In addition, the religion and cultural beliefs also contributed on parent's perspectives and attitudes toward sexuality (Landeryou, 1994). The majority of Indonesian people which is Muslim believe that premarital relationship ("zina") is sinful. However, there seems to be a misconception that speaking about sexuality will lead children to do zina since sexuality often related to pornography. Implementing child sexual abuse prevention in preschool providing the opportunities of sexual education exposure to parents since teacher will socialize the core elements of sexual education and report the development of their children during the class to parents. To promote an efficient

sexual education, both educators and parents should be cooperative in preparations. (Alexandros, 1998). Further, he argued that early childhood sex education should be supported by all who provide education during preschool years, includes educators, parents, and relatives. Along the similar lines MacIntyre & Carr (2000) argued that in multisystem of child sexual abuse prevention program which focus are on children, parents and teacher shows that parents gain the significant knowledge of child protection issues from intervention training. To conduct school-based sexual education programs, the first steps that should be done is preparing the home environment. School should ensure that parents are also comfortable and familiar with the core contents of sexual education as well as delivery approaches and support system (Wurtele, 2009). The involvement of parents during sexual education in preschool will shaped their perspectives of sexuality and the need of child sexual abuse prevention for young children.

The hesitation to implement child sexual abuse prevention has been discussed by several researchers (Alan et al., 1994). Preschool aged children usually have difficulty to addressing the abstract concept such as sexual assault prevention; moreover, they have a less verbal skill, lack of attention and awareness also less developed on planning settings compared to older children. Several studies evaluated primary prevention curricula for preschool showed that preschool only gained a small knowledge from the prevention program. For these reasons, Alan et Al. (1994) argued that the prevention program between pre-school and primary school should not be the same and there must be appropriate material instructions for Preschool aged children. They then conducted a study to investigate the effectiveness of Children' primary training program using story books as the media deliver. The result showed that Preschool aged children gain benefits from the intervention program. The scripted book claimed as one of the useful resources that contributed to the success story of Child sexual abuse prevention for preschool. Moreover, several studies analyzed by Barron & Topping (2008) indicates the effectiveness of Child sexual abuse prevention in preschool to improve child's awareness and their self-protection skills. Corespondingly, MacIntyre & Carr (2000) which also investigated several programs of child sexual abuse prevention claimed that the intervention can increase children's knowledge of safety-related concepts and enrich teachers and parents information about child protection procedures. The foregoing discussion implies that the abstract concept of sexual abuse prevention can be learned by preschool through appropriate approach which suit to their development stage.

## The implementation of Child sexual assault prevention in a global context

The child-focused prevention has been implemented in many countries and integrated in school-based sexual education curricula. The majority of child-focused prevention delivered based on social learning principles through instruction, modeling, rehearsal, and feedback, also behavioral skills training model (Zeuthen & Hagelskjær, 2013). Several programs provided by each country such as the Canadian Red Cross Violence, the American Child Assault Prevention Program which also adapted by Netherland, One in Five Campaign of European and the globally used Good Touch Bad Touch continuum share the same purpose of addressing Child sexual abuse. The core elements of school-based sexual education include body ownership, bad touch good touch, saying no, escaping, sharing secrecy, building intuition, providing the support system, reducing self-blame and bullying (MacIntyre & Carr, 2000). In the

Asian context, several countries also adapted the school-based sexual education curricula as their mandatory subject, such as Taiwan, Vietnam and Thailand. Studies conducted in China examined the implementation of child sexual abuse prevention program designed for Western children to Chinese pre-schoolers (Zhang et.al, 2013). The kindergarten conducts The Body Safe Training program which delivered use behavioral skills training model. The cores elements of The Body Safe Training program included the following main points: (1) The body ownership (2) introducing the reproductive organs (3) Recognizing several models of sexual abuse. (4) Addressing self-blame among pre-schoolers. The study suggests that Chinese preschool-aged children gain benefits from Body Safe Training program regarding the knowledge of child sexual abuse and protection skill comparing with the control group.

In Middle East context such as Turkey, the study claimed that there is not the structured system of child sexual abuse prevention programs in school settings (Cecen-Erogul & Hasirci, 2013). The pilot study conducted to prevent child sexual abuse in the school context in Turkey showed that child sexual prevention program was effective in the primary stage. Despite the result of the program, the study also indicates that there was a rising enthusiasm to expand and implement school-based Child Sexual Abuse Prevention as well as to train educators to deliver the comprehensive curriculum of prevention sexual assault in Turkey. While in Iran, which is a country with 97% Muslims population still struggling on implementing school-based sexual education prevention as it seems contradictory from Islamic law (Alireza, 2015). Along with Turkey, the majority of school in Iran schools do not yet have a well-developed educational strategy to address sexual issues. revolutionary, Iran government enforced the communities to preserve their modesty through wearing a veil for women and conducting sex segregation as well as maintains the control of sexually explicit media content to reduce the risks of sexual abuse and premarital sexual activities. The young Iranians will receive sexual education, once they reach puberty about the signs of puberty and the Islamic rituals they should pay attention. However, the study indicated that it is not impossible to conduct school-based sexual education and there may be ways to develop and implement school-based sex education while taking religion and sociocultural sensitivities into consideration.

The parents-focused prevention believed as another way to prevent child sexual abuse from home. In addition, there is overwhelming evidence for the notion that parent's involvement plays a prominent role in conducting Child sexual abuse prevention education (Finkelhor & Dziuba-Leatherman, 1995). Several studies evaluated by Hunt & Walsh (2011) to examine the parent's view about Child sexual abuse prevention education program and the effectiveness of the program. The result from the evaluated studies reported that research with parents of preschool or primary schoolaged children had been implemented in United States, Canada, Australia, China, and Hongkong. The result suggested that even though majority parents from several countries evaluated agreed that child sexual abuse prevention is essential for their young children, very few parents had participated in child sexual assault prevention program; a mere 6.8 percent of 447 parents in China reported experienced Child sexual abuse prevention program in school (Chen and Chen's, 2005, cited in Hunt & Walsh, 2011). The data appears to suggest that 25–79 per cent of parents discussed child sexual abuse prevention with their children. In the countries that had been

conducted child sexual abuse prevention longitudinally, such as the United States and Canada showed greater detail and prevalence of discussions between parent-child. Majority parents in the United States and Canada also agreed their children participate in School-based child sexual education even before the program began. In the Australian context, the study suggested that only 25 percent of Australian parents had ever discussed Child sexual prevention with their children; less than 1 percent had talked about unwanted touch and the need to report abuse action to adult (Briggs, 1988 cited in Hunt & Walsh, 2011). While in two Chinese studies, the data indicated that 50 percent of approximately 1000 sample of parents in these studies had discussed unwanted touch and telling secrecy to the trusted adult (Chen & Chen, 2005; Chen et al., 2007). In addition, the result also suggested that parent's attitude about Child sexual abuse prevention affects their practices towards their children regarding delivering sexual education context. In terms of the effectiveness of intervention program, the evaluated studies from the United States and Canada presented the data that parents who participated in child sexual abuse prevention program increased their willingness to speak about sexual education and selfprotection. The parent's attitude which did not provide sexual education before also changed after the intervention. As expected children also gain benefits from the parents focused prevention, studies from Hébert, Lavoie, Piché & Poitras (2001) reported that children showing greater self-confidence, better at conveying likes and dislikes, better on addressing conflict and showing fewer negative impact after conducting the sexual education conversation. (Hunt & Walsh, 2011).

The professional-focused prevention is targeting the intervention to teachers, trainers, day care providers and all of the institution's element which works with young children. This program is essential to implement, in terms of complementing teacher's knowledge with sexual education before delivering it to young children or parent, especially in Indonesia. The data generated by General of Early Childhood Education of Indonesia, Non-Formal Education and Informal indicated that approximately 80 percent of kindergarten teachers (TK) have not qualified in bachelor yet (Zubaidah, 2014). Further, Maureen's (2004) conducted an investigation in United States concerning teacher's knowledge of child sexual abuse symptoms as well as procedures for reporting child abuse; the result indicated the lack of teacher's awareness in this issues. Recent research conducted in Denmark support the view that many teachers claimed that they do not have enough knowledge to teach sexual education and how to avoid being abused (Helweg-Larsen, Andersen, & Plauborg, 2010 cited from Zeuthen & Hagelskjær, 2013 ). However, Earlier evaluated studies suggested that professional-focused prevention is useful to increase teachers' knowledge of child protection issues and procedural skills (Hazzard, 1984; McGrath et al., 1987; Allsopp and Prosen, 1988; Kleemeier et al., 1988; cited from MacIntyre & Carr, 2000). Clearly, the intervention for professional is essential to make preventive programs successful.

The effects of child sexual abuse prevention intervention are often discussed by the researchers. Several meta-analyses conducted to investigate the possible negative effect on young children after the intervention. The researchers raise the questions whether child sexual abuse prevention program actually can reduce the number of child sexual abuse cases due to the difficulty of measurement. The growing knowledge of self-protection doesn't merely decrease the occurrence of Child sexual abuse. The general evaluation which used to measure children's knowledge of self-

protection is only the questionnaire, such as Personal Safety Survey. The simulation conducted to evaluate children's ability is reliable and more authentic, but it might cause enormous consequences and doesn't fit with ethical research. However, despite the evidentiary chaos, the child sexual abuse cases in the United States had declined significantly since the early 1990s (Finkelhor, 2009). Even though the decrease doesn't instantly indicate the contribution of child sexual abuse prevention program, but Finkelhor (2009) suggested that something is helping. The broader scope of evaluation research is needed to address this complex issue. On the other hand, several evaluated meta-analyses also reported that Child Sexual Abuse Prevention Program caused minimal anxiety issue (Zeuthen & Hagelskjær, 2013). The author indicated that it might happen because theoretical frameworks concerning the child (cognitive development, emotional development, rational and the inclusion of learning theories) are not articulated properly. Theoretical coherent model when conducting the child sexual abuse prevention intervention program is needed to addressing this issue. Further, MacIntyre & Carr (2000) claimed that the anxiety caused a good self-protective skill for majority children. Also, they suggested that the minimum anxiety was not adequately serious to prevent parents and teachers from conducting prevention training.

# The Possible Strategies to Implement Child Sexual Abuse Prevention In Indonesia

There are a plenty strategies to implement sexual education prevention for young children in Pre-School. However, the approach of implementing programs that are culturally appropriate should be considered. Two elements should be reckoned to conduct Child sexual abuse prevention intervention program in Indonesia. Firstly, the prevention program should be in multi-systemic intervention model. Multi-systemic intervention is prevention programs that targeted children and either parents or teachers or both (MacIntyre & Carr, 2000). Based on the background, Indonesia has three issues that should be addressed: (1) The taboo perceptions among parents, (2) Preschool teacher apparent lack of competence, (3) Children less of sexual education exposure. Multi-systemic is very likely the most effective programs which involve all the elements. Along similar lines, Jordan (1993) also suggested to conduct a comprehensive program which involving parent and community to gain parental support and to success the intervention programs.

Secondly, it's important to keep the sexual education content culturally/religiously relevant. Indonesia is a country with a majority Muslim population. It becomes one of the reasons why the influence of Islam is very strong in Indonesian culture. The evidence supporting the idea of considering socio-culture and religion before conducting child sexual prevention program may lie in the findings of Bennet (2007) who investigated the notion of "zina" related to sex education implementation for Indonesian Muslim youth. She argued that the mutual understanding about sexual education goals and Islamic approach should be accomplished in terms of decision-making. The sexual education purposes along lines with Islamic regulations which assist young Muslims to obey Islam rule of avoiding premarital activities, rather than encouraging them to have premarital sex should be understood. Along the similar lines, the purpose of conducting child sexual abuse prevention in Preschool is to protect the young child from sexual assault and not to promote sexuality to young children nor to encourage young children to do something that is forbidden by

religion or cultural belief. The study conducted by Zahrulianingdyah (2015) which use "Damarwulan" Film as a media to educate young children about reproductive health education succeed to enhance children's knowledge as well as gain parental support. The intervention not only culturally relevant but also overwhelmingly accepted by parents as the parents understand the importance of reproductive health education. The result from Focus Group Discussion also suggested that the cooperation between parents and teacher is beneficial as they can discuss the content of reproductive health education. Parents claimed that they hardly discuss reproductive health education with young children because they couldn't choose what content is acceptable to children and convey the information scientifically.

#### Conclusion

The background of the sexual education presence and child sexual abuse cases in Indonesia shows that the taboo perception and lack of sexual education exposure share an essential premise that there is a reciprocal relationship between them. To address the increasing number of child sexual abuse in Indonesia, I argued the need for intervention program which provides appropriate information of sex education to give young children protection of sexual offenders as well as deliver a better understanding of sexual education for the parents. Child sexual abuse is a global issue which occurs in worldwide. Several countries had been conducted a prevention intervention program which targeting children, parents, professional or multisystematic to address this issue. There is a rapidly growing literature on the effectiveness of prevention program also meta-analysis which indicates the challenges on the implementation effect. However, many research has provided ample support for the assertion the prevention program succeed to enhance self-protection for young children. Two elements should be considered to implement Child sexual abuse prevention intervention program in Indonesia are the prevention program should be in multi-systemic intervention model and keep the sexual education content culturally/religiously relevant.

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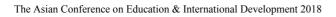
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Official Conference Proceedings

# A Descriptive Analysis on Mathematics Learning Environment and Metacognitive Awareness Among Secondary School

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#### **Abstract**

Students spend a lot of time interacting between friends and teachers in the classroom environment of learning. The learning environment is an essential element in shaping a conducive learning environment and promoting creative and critical thinking. A conducive learning environment can also help to create the comfort of teaching and learning while maintaining the focus and interest of students in mathematics. The classroom environment and psychosocial interactions of students can bring about changes towards achieving teaching and problem solving goals. The aim of this study is to identify the level of learning environment and metacognitive awareness among secondary school. A total of 420 form four students in Masjid Tanah Melaka were randomly selected as respondents for the study. This study is a survey study using instruments consisting of two parts. Part A is a student demographic, part B is a questionnaire related to the learning environment (WIHIC) and metacognitive awareness. The data were analyzed descriptively using frequency, percentage and min. The findings showed that mathematical learning environment and metacognitive awareness were at moderate level. This study provides an important indicator as it demonstrates that the importance of the learning environment is noted by the teacher as it is capable of raising metacognitive awareness and improving students' mathematical problem solving skills.

Keywords: Learning Environment, Metacognitive Awareness, Problem Solving Skills

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#### 1.0 Introduction

Mathematics is an important subject in schools all over the world. Mathematics can produce competent people with knowledge in their everyday life and enhancing their problem solving skill and critical thinking. Metacognitive is a process in which an individual thinks about his / her own thinking during cognitive activity. It is a high-level thinking that involves the process of managing and controlling his own mind (Flavell, 1979). The learning environment has a very strong relationship in building critical thinking as compared to the skills (Cheng & Wan, 2017) and supports student creativity as well as enhance the student metacognitive level (Liu et al, 2012). The study by Mazlini et al (2014) also shows the relationship between learning environment and achievement as well as learning environments with metacognitive awareness (Nurulhuda 2016). Effective learning can be achieved with metacognitive skills, while metacognitive awareness is needed to develop metacognitive skills. With metacognitive awareness students can build a more in-depth understanding of concepts (Nik Nur Fadillah, 2012).

## 2.0 Problem Statement

The comparison of Malaysia's position in the PISA test compared to other countries places Malaysia in the third group below among 74 countries. Nearly 60% of 15-year-olds participating in the PISA 2009 failed to achieve a minimum level of math skills (Ministry of Education, 2015). Issues of TIMMS and PISA put Malaysia among medium achievers. This decision also illustrates that students in Malaysia cannot perform well in terms of cognitive skills, apply knowledge in problem solving and ability to solve problems. Less attention to the needs of pupils mastering various cognitive skills such as problem solving, reasoning and creative thinking and innovative causes students to be less incapable of applying knowledge and thinking creatively beyond the academic context. Conventional teaching methods such as "chalk and talk" alone are also less relevant to current developments. Additionally, teachers emphasize the practice of drilling and formulas without understanding the concepts (Abdul Razak Idris & Noor Asmah Saleh, 2010; Kheong 2011).

Marzita et al (2014) conducted a study on the climate learning environment in schools. This study finds that thermal comforts are important as the basis for improving the quality of education and the effectiveness of classroom teaching and learning. Mazlini et al (2014) found that student achievement was influenced by the learning environment. This is supported by the findings of Ernest et al (2013) whose interesting learning environment can be the key to success of students. The study by (Cheng & Wan, 2017) found that the learning environment had a very strong relationship with students' curricular thinking. High metacognitive awareness factors are influenced by the level of intelligence in which gifted students have a higher level of metacognitive awareness than non-gifted students (Sarıcam & Ogurlu, 2015)The study conducted by Idris et al. (2015) to identify the relationship between metacognition awareness and concept understanding in solving problems. The findings showed that students 'metacognition awareness was moderate and students' understanding of the concept was low. While Suzana (2015) study found that the metacognitive behavior exhibited by excellent, moderate and weak students varies.

# 3.0 Research design

The objectives of this research were to examine the level of mathematics classroom environments and metacognitive awareness among secondary schools students.

# 3.1 Population and sampling method

This study involved a total of 420 form four students in Masjid Tanah Melaka area. The student's are from eight secondary schools of 420 respondents. This study involved 155 male students and 264 female students. This study was quantitative using survey method by using questionnaire. Rivera and Ganaden (2001) stated that there are advantages to conducting research through questionnaire as the learning environment information is based on the vast experience of the students as long as they attend school while the findings from observations are for a certain period of time

## 3.2 Reasearch Instrument

According to Cresswell (2008), some alternatives need to be considered taking into account existing instruments that can be used to measure the study variables or make judgments to modify existing ones. In this study, instruments are drawn from existing sources of learning environment and metacognitive awareness.

A mathematics classroom environment questionnaire was constructed based on existing instruments *What is Happening in This Classroom* (WIHIC) (Chionh & Fraser, 1998; Fraser et al., 1996). There are 39 items for the components of the learning environment. The metacognitive awareness questionnaire was adapted from Affandi (2003) modified from the *State Metacognitive Inventory* (Oniel & Abedi, 1996) and the Trait Thinking Questionnaire (O'Neil & Schacter, 1997) metacognitive component. Distribution of items to measure 3 aspects of metacognitive awareness with 24 items.

The Cronbach Alpha reliability index for the three instruments is between 0.70-0.96. According to Mohd Majid (2005) and Hair et al (2010), the value of Cronbach Alpha is good and acceptable. This study involves descriptive statistics. Descriptive analysis uses mean, percentage, and standard deviation. The level of mean score shown in the table 1.

Table 1: Mean score

Mean score	Level of students perception
1.0 - 2.33	Low
2.34 - 3.66	Moderate
3.67 - 5.00	High

# 4.0 Finding

# 4.1 Learning environment levels for student cohesiveness, teacher support, involvement, cooperation and equity

Table 2 shows the level of learning environment for student cohesiveness, teacher support, involvement, cooperation and equity.

Table 2: Level of learning environment for student cohesiveness, teacher support, involvement and cooperation and equity

support, involvement and cooperation and equity				
Subscales	Mean	Standard	Level	
		<b>Deviation</b>		
Students Cohesiveness	3.95	0.62	High	
Teacher support	3.56	0.79	Moderate	
Involvement	3.18	0.61	Moderate	
Cooperation	3.54	0.74	Moderate	
Equity	3.50	0.68	Moderate	
Overall	3.55	0.69	Moderate	

Descriptive analysis in table 2 shows that the learning environment for student cohesiveness is at a high level with mean score of 3.95 and sd = 0.62. Teacher support aspect was moderate with mean = 3.56 and sd = 0.79. For the aspect of student cohesivenss was at a moderate level of mean 3.18 and sd = 0.61. Cooperation are also in moderation with mean = 3.54 and sd = 0.74. Next to the equity aspect, the mean is at a moderate level of min = 3.50 and sd = 0.68

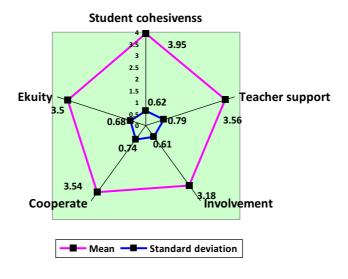


Figure 1: Mean and standard deviation of learning environment

# 4.2 Metacognitive awareness level for planning, self checking and cognitive strategies

Descriptive analysis involving mean and standard deviation is carried out to determine the level of student metacognitive awareness. The results of the descriptive analysis are as follows.

Table 8: Metacognitive Awareness Level

		5	
Scale	Mean	Standard deviation	Level
Planning	3.81	0.74	High
Self checking	3.65	0.63	Medium
Cognitive strategies	3.77	0.69	High
Total Mean	3.81	0.74	High

Descriptive analysis of metacognitive awareness on planning, self-assessment and cognitive strategies as a whole showed mean = 3.81 and sd = 0.74. The scale of the highest mean is planning with mean = 3.81 and sd= 0.74 and the lowest mean = 3.65 and sd= 0.63 is self checking. Cognitive strategies also shows high level with mean= 3.77 and sd= 0.69

Planning
3.85
3.81
3.75
3.65

Cognititive strategies

Self checking

Figure 2: Analysis of Metacognitive Awareness

#### 5.0 Discussion

## 5.1 Learning Environment Level

The matehematics learning environment of the secondary school in this study is at a moderate level. The findings of this study show that the learning environment for student cohesiveness is at high level. This finding is consistent with the study of Mazlini et al (2014) and Brok et al (2008). However, this finding is contrary to Murugan's (2013) findings where the level of student integrity is moderate. This finding also shows students feel their classroom atmosphere has a conducive environment and allows them to be close friends and work together.

While the student environment for teacher support, student involvement, cooperation and equity is only at moderate level. This is in line with the study of Arba'at Hassan, Sabri Ahmad, Bacho Abdul Karim and Jumat Sulaiman (1997) which found that 58.77% of the students sample considered mathematical teaching and learning was boring and 51.97% of students thought the physical environment of the school was less encouraging their mathematical learning. Generally, students can learn better when their classroom environment provides satisfying, challenging, positive interaction with other students and teachers as well as given the opportunity to make a

decision, as well as provided with clear borders and organizations (Walberg & Greenberg, 1997).

This means that there are ongoing efforts to improve the aspects studied such as teacher support, student engagement, collaboration and equity to provide a good learning environment and to enable students to learn better. In general, many studies have found that higher learning outcomes if a classroom is considered by students with a sense of belonging, satisfaction and direction and disagreement and conflict (Fraser, 1991).

## **5.2 Metacognitive Awareness Level**

Descriptive analysis of metacognitive awareness on the aspects of planning and cognitive strategies are at high levels. The findings of this study are contrary to the findings of the previous study which indicate that students with the knowledge needed to solve problems but fail to apply them correctly because they fail to implement metacognitive processes or lack of metacognitive skills (Idris et al., 2015). However, this finding is consistent with the findings of the study by Effandi, Zainah and Sabri (2009); Hafizah (2012) found that the level of metacognitive awareness of students was high. Some important aspects such as planning and strategy have been applied to students in mathematical learning. This shows that metacognitive awareness has attracted attention amongst students and is important in improving students' skills and performance in problem solving (Desoete, 2003).

While metacognitive awareness for self-help aspects is only at moderate level. According to Noor Erma and Leong Kwan Eu (2014), one of the factors of decline in mathematical examination results is from the student's own attitude. There are many students who do not really answer questions and are too confident with their answers until they do not check the answers back. This is because many students who consider this assessment are not important. Students are also aware of the steps taken but are weak in re-evaluating the work. It will cause repeated errors to affect their metacognitive awareness.

Learning environment is an essential element in shaping a conducive learning environment and promoting creative and critical thinking. As the study shows that students' perception of the learning environment is moderate, further studies have to be carried out to determine the causes of this phenomenon. Teachers play an important role in contributing to a conducive learning environment and contributing to excellence.

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# Role of Teachers in Teaching Piano for Children

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#### **Abstract**

The research is a qualitative research. The objective of this research was to study piano teaching skill for children. The research tool was an in-depth interview. The samples used in this research was 17 piano teachers. The main issue in the interview emphasize about the skill and knowledge for piano teacher. The results of the study found that the skill which necessary for piano teacher must to have and must to understand can summarize in 4 skills consists of 1. Piano skill: piano teacher must to pass the piano examination from Trinity or ABRSM at least Grade 6. 2. Knowing about the music theory: such as Music Notation, Scale and interval etc. 3. Understanding about teaching technique and pedagogy, for example: understand how to use instructional media or understand how to explain the knowledge for piano student etc. 4. Understanding about psychology of learning in each age and music learning behaviors in each age for maximum benefit that happen for the piano student.

Key words: Roles of teachers, Teaching piano, Piano skill



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#### Introduction

Current study of music Very popular. Parents will send their children to learn music as more knowledge. In addition to education in the school system. It can be noted that there are institutions of music education. Or private music schools have opened a lot of teaching and the most popular instrument is a piano.

Children can benefit greatly from taking piano lessons. This is especially true as young children are developing their senses and piano playing can help to improve hand and eye coordination, focus and concentration. Piano lessons for children can create a sense of accomplishment, as they learn and gain more skill the will feel that they are able to be successful if they put in the effort.

Beginning music lessons can start at a young age. It may be said that the child in 3 years old to start learning the instrument. Because the body begins to have a stronger muscle. But the teaching is focused on the nature of the call. And dance to the beat.

The aim to teaching music for children is focus on teaching the learner and musical skill. In addition, student will gain knowledge of the theory of music and the general knowledge. To experience the music the music whether it is singing or playing the instrument it will also give student aesthetics in music as well. This is helping to calm the mind of the student and help the development more better.

The art of piano pedagogy is ultimately about working our way out of a job then there are surely many ways to go about this, and much that needs to be done before a student reaches the level of maturity.

From the importance of piano lessons as mentioned above. Preparing to be a teacher for the piano. Need to have knowledge ability in many aspects to be ready to transfer knowledge to learners effectively.

In addition to the knowledge of music. The piano instructor needs to have a good understanding of the students as well. Both physically and behavioral Because of the music. Both skills need to be taught. If the instructor does not really understand the student, then teaching will not be fully effective.

The importance of music education. And the importance of the piano teacher as mentioned above. This research was conducted as a guideline for preparing to be a piano teacher who an effective.

## Methodology

The research is a qualitative research. The objective of this research was to study piano teaching skill for children. The research tool was an in-depth interview. The samples used in this research was 17 piano teachers. The main issue in the interview emphasize about the skill and knowledge for piano teacher.

#### Conclusion

The results of the study found that the skill which necessary for piano teacher must to have and must to understand can summarize in 4 skills

## 1. Piano skill

Piano teacher must to pass the piano examination from Trinity or ABRSM at least Grade 6

2. Knowing about the music theory

Piano Teacher must to understand about the music theory include

- 1. Notation
- 2. Tempo
- 3. Scale
- 4. Interval
- 5 Chord
- 3. Understanding about teaching technique and pedagogy

Piano teacher must to understand about the technique for teaching include

- 1. Use the music instructional media
- 2. Use of word that appropriate with the age of the children.
- 3. Know the way to explain about the skill for the children.
- 4. Psychology in each age and Music learning behaviors in each age
  - 1. 0-2 years old

In this period, intellectual development is based on sensorimotor stage. Experience or learning happens as a child uses his or her own senses as a medium then learning is limited. Initially, the behavior is reversed. Later, children began to have more control over their senses.

2 years old, the child has improved awareness. The perception in this age is. Children will be interested in things in the foreground only. If it disappears, then there is no interest in it.

The musical development of children at this age is in the free movement of the body. Like singing but it is not very melodious. The children in this age began to understand melody and rhythm. In the part of music skill, Children in this age like to listen to music than playing music. And like singing by imitation music.

# 2. 2-7 years old

Children in this age begin to learn about the symbolic system in their minds. To use instead or experience. Children in this age have the idea that they have experience, but it cannot be realized that other people are experiencing not the same as themselves. Children in this age have more language ability. Can remember things when using media as a medium. However, it is difficult to understand the difficult concept. So complex solutions are no longer available. Children in this age do not like inaction. Will reduce the time. The relationship between the hands and eyes has not yet developed. This kid likes to dream. And girls will develop faster than boys.

The musical development of children at this age is like the past. But can do better. But not always and cannot respond to do the musical development of children at this age is like the past. But can do better. But not always and cannot respond to complex rhythm. The children can sing better but sing not true sound because the idea about the pitch isn't fully development and the limited range. Children of this age begin to understand the subject of speed and the lightness of the sound.

## 3. 7-12 years

Children in this age can understand things in a rational way. I cannot understand abstraction very much. Children of this age understand the quantity and the capacity can hold the items. Children have more concentration. Can adapt to friends at school. Like rewarding when doing something.

The musical development of children in this age is progressing. Can respond to more complex rhythms. And there is a constant rhythm. Begin to understand the sound. And concentrate on listening more. Understand more about volume. And sing more directly.

# 4. 12-15 years

The development of the child's mind at this age has been developed to the point of completion. Children in this age can think hypothetically. Because there is more about things more abstract. The basic idea of this child is to take the child to adulthood. The children in this age can think about the results that will happen.

The musical development of children in this age began to deepen the idea. And musical skills Can express the feeling of the song more.

## Conclusion

The results of the study found that the skill which necessary for piano teacher must to have and must to understand can summarize in 4 skills consists of 1. Piano skill: piano teacher must to pass the piano examination from Trinity or ABRSM at least Grade 6 2. Knowing about the music theory: such as Music Notation, Scale and interval etc. 3. Understanding about teaching technique and pedagogy, for example: understand how to use instructional media or understand how to explain the knowledge for piano student etc. 4. Understanding about psychology of learning in each age and music learning behaviors in each age for maximum benefit that happen for the piano student.

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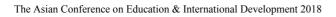
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Official Conference Proceedings

# How to Play Drum Set for Teacher in Private Schools

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The Asian Conference on Education and International Development 2018 Official Conference Proceedings

#### **Abstract**

The objective of this research is to study the how to play drum set for teacher in private Schools. According to the result, this is a quality research that collects data and informative in-depth interview with private music school teachers (3 years experiences) in Bangkok. The study concluded the purpose of this research project. The necessary skills in teaching drum sets in private music schools are that teachers must have teaching techniques, motivation, and basic musical skills. Reading the basic drum kit as to advance the levels such as wood catching techniques, snarling technique. The technique for pedaling, beating the drum set style. The student must have a good drum technique. They must have good knowledge of teaching techniques as well as motivation to teach. These are the guiding principles for students in higher education. This is to prepare for further education after graduation, as well as to be a guideline for teaching in the future.

Keywords: How to play drum set, Teacher, Private schools.



The International Academic Forum www.iafor.org

#### Introduction

Education is important for human developments to survive happily in the society. The education system must be developed to be the lifetime education. There are data and standard improvements of various knowledge data including modern knowledge framework development in every fields of studies corresponding to the present progress. The Thailand National Education Act 1999 and its Amendment (2nd copy) affected educational reforms in every levels, focused on curriculum improvements and adjusted teaching methods to develop students to be able to think, solve problems and appreciate to Thai culture together with provision of more freedom to private higher educational institutes. These changes cause more varieties of the higher education institutes together with the following problem of how to make the society trust to the degrees granted to those graduates of all institutes as equally both in quality and standard.

At present, in Thailand, music is one of many fields that is provided in all educational levels. Music is accepted as both of Science and Art. Veha Lataiwitthaya (online, 2011) stated that the music was both of Science and Art, it was Science since it could be proved and it was a fact.

The Suan Sunandha Rajaphat University has admitted the students majoring in Music since 1980, starting from students for teacher vocation, higher certificate of education and two years continuous studies in 1986, then the 4 years courses majoring in Music at 1987, which was later adjusted to be Liberal Arts, program of Music in 2003 and then Fine Arts majoring in Music at 2006. At present the program of Music has been adjusted its course according to the standard of the Higher Education Institutes which was improved in 2011. The study on program of Music, apart from theoretical studies, it also provides study on musical skills, one of those is western musical skills on a drum kit. To success in study on program of Music, it strongly requires knowledge and sound understanding on playing skills of musical instruments and musical theories which can create musical works or pass on music correctly and initiate standard skills. This research focused on guidelines of good behavior during study at higher education for preparing to be the professional after graduation due to, at present, music study at higher education levels is very popular with high number of admitting interests for further studies, then the students should know the way to prepare themselves after graduation and use it as their careers.

The researcher made up a research work in guidelines on skills development of learning and teaching a drum kit in private musical schools, in order to standardize the operation of music program of Suan Sunandha Rajaphat University according to the standard criteria of the Higher Education and corresponding to the University's goals.

## **Objectives**

To develop the process of learning and teaching on music study for the students to use it as their careers after graduation.

## The Research Scope

This research studied on three private musical schools in Bangkok and three drum kit teachers who have teaching experience not lesser than 3 years.

# **Basic Agreements**

This research project, the guidelines on skills development in learning and teaching a drum kit for being to be a drum kit teacher in private musical schools, collected research data during approximate years 2017-2018.

# The Expected benefits of the research

- 1. The research readers should know guidelines of development and skills on teaching and practice about necessary knowledge elements.
- 2. To be used as knowledge elements for further researches.

#### The related literatures and researches

This research, the study of the guidelines on skills development in learning and teaching a drum kit for being to be a drum kit teacher in private musical schools, the researcher studied the related documents and researches which would be presented respectively as follows:

- 1. Ideas about learning and teaching
- 2.Basic knowledge of a drum kit
- 3. Teaching method of musical practice of a drum kit
- 4. The related researches

# **Summary, Discussions and Suggestions**

The research, the guidelines on skills development in learning and teaching a drum kit for being to be a drum kit teacher in private musical schools, has studied according to the research objective which aimed to develop music learning and teaching processes for the students to be used as their careers after graduation.

This research studied on three private musical schools in Bangkok and three drum kit teachers who have teaching experience not lesser than 3 years. The research project, of the guidelines on skills development in learning and teaching a drum kit for being to be a drum kit teacher in private musical schools, collected research data during approximate years 2017-2018.

The researcher had collected various data which could be summarized according to the research objectives as follows: ......

#### Conclusion

The research could be concluded according to its main issues as follows:

#### 1. How to teach technics and motivation

The drum kit teaching method of the teachers could be concluded as teaching one student by one teacher and the schools gave free opportunity to the teachers to teach with their own styles. This teaching form could be adjudged or improved according to each students' skills, needs and conditions. However the objectives and details of the teaching topics must be in the same direction which composed of 2 main issues, these could be summed up as follows:

- 1. Basic note theories of drum kit, the teachers would describe the subject matters along the assigned topics and let the students to remember the main issues.
- 2. The learning issues on drum kit in practice composed of many levels depended on students e.g. drumsticks grabbing technics, snaring technics, drum pedal stepping technics and drum kit drumming styles.

For various songs playing styles, high level of Latin songs playing, playing song technic in jazz style and song performing, the teachers would describe the subject matters according to the assigned topics and let the students to remember the main issues, then they demonstrated to the students as an example in several formats according to the assignments. Mostly the issues could be added to each student that depending on the students' abilities and goals, as a main point.



Fig. 1 Note exercise used in learning and teaching



Fig. 2 Note exercise used in learning and teaching

# **Technic and Teaching Motivation**

Technic and Teaching Motivation could be concluded as follows:

Discussion aspect, technic and motivation: from interviews, at the beginning of the class, most teachers stated about an important of learning each other between student and teacher, an importance and necessary of theory learning and practice, what the students could get from the learning. These all were important to the students' interests and then they might give more precedence to the music. Another motivation, which the teachers used in learning and teaching, were encouragement and praising the students who well performed the teacher's assignments.

Practice teaching aspect, technic and motivation: most teachers demonstrated practice to the students as an example in such topics and then played songs or videos related to those learning topics. The songs used for learning and teaching were well-known to the students or their favorites. In a part of video, this focused on showing drumming of the drummer in that song. This type of media was an important part for building motivation in learning and encouraged the students to play more attention to the lesson and then practice more.

In each lesson period, all teachers had planned teaching week by week and took note of teaching to keep up with the development and problems of each student and then were used for teaching improvement to fit for the students and more effective learning and teaching achievement.

# 2. Media and teaching instruments which were mostly available for learning and teaching.

From the study, media and teaching instruments could be categorized into 2 main parts as follows:

- 2.1. Media and teaching instruments which were provided by schools such as:
- Drum kits
- Amplifiers
- VCD players
- Rhythm controllers (Metronome)
- Broads
- Textbooks

All of media and instruments above were very important, any should not be absent. However some media and instruments were not available for all classrooms which must be taken to schools by the teachers, themselves, to correct these problems.

2.2. Mostly personal media and teaching instruments which were taken to the schools by the teachers themselves such as:

# 2.2.1. Examples of song notes



Fig. 3 Example of song note used for learning and teaching

- 2.2.2. Main textbooks were Alfred's Drum set Beginning, Intermediate and Mastering etc.
- 2.2.3. Complement textbooks were Yamaha Book 1 and 2, Rhythm Section Drumming, Drum Note magazines etc.





Fig.4 Examples of Drum kit used for learning and teaching

# 2.2.4. Metronome Amplifiers

Teaching media and instruments of each teacher might be similar which depended on the appropriate lessons.

# 3. Evaluation and Appraisal

From interviews with the drum kit teachers in this research of the guidelines on skills development in learning and teaching a drum kit for being to be a drum kit teacher in private musical schools, the evaluation and appraisal could be summarized according to the following topics:

# 3.1. The evaluation and appraisal by the teachers

The evaluation and appraisal should be made before and after learning, from the first time of learning and testing by performing during the class as the teacher's assignments, then noticed the student's performance and recorded the student's development, fault and suggestion in every class of study. For the suggestion; exercises or songs should be assigned as the student's homework. Sometimes videos should be recorded during learning and teaching for the students to observe their developments and problems clearly.

# 3.2. The evaluation and appraisal by knowledge examinations.

The students were sent to do an examination. In the schools, examinations were arranged 2 times per year with several regulations. At a beginning level of drum kit learning, an examination was arranged within the school which was evaluated and appraised by other teachers. The student must pass the school's criteria which could reflect the student's own faults. This evaluation and appraisal was a standard method.

## 3.3. The evaluation and appraisal by concert performing.

The evaluation and appraisal by concert performing was arranged by school yearly. Each concert performing, there would be other teachers staying for suggestions which could add more beneficial knowledge and varieties to the students from these teachers' opinions. This also promoted the student to show bravely.

However, the above evaluations and appraisals should be beneficial or not, depended on many factors such as:

- 3.3.1. The completeness of learning instruments, both at home and school, for the student could practice regularly.
- 3.3.2. Attention of the student's parent and teachers on the student's learning.

# 4. Problematic Situations of Learning and Teaching

Problematic situations of learning and teaching, from this study and interviews with the teachers, the found problems and obstacles could be summarized as follows:

- 4.1. The learning and teaching problems caused from students e.g.
- 1.1. Absence from a class of students
- 1.2. Students arrived to schools late or not on time.
- 1.3. Students did not pay attention to the lessons and did not practice the teacher's assignments.
- 1.4. Students were forced to study by their parent.
- 1.5. Students did not concentrated on the lesson.
- 4.2. The learning and teaching problems caused by media and teaching instruments.
- 4.2.1. Incomplete numbers of complementary learning and teaching instruments or these were lacked as the teacher or student need e.g. pairs of drum pedals, stereo, amplifier, computer, glass etc.
- 4.2.2. A classroom was not completely soundproofed that created noise.
- 4.2.3. No cabinet for keeping documents in a classroom, then learning and teaching documents were easily to loss.
- 4.2.4. No suitable rhythm controller (Metronome) and some models were not appropriate for complementary learning and teaching a drum kit.
- 4.2.5. Incomplete numbers of textbooks and song notes as need.

## Discussion of the research's results

The study of the research about the guidelines on skills development in learning and teaching a drum kit for being to be a drum kit teacher in private musical schools would be discussed in the following aspects:

How to teach technic and motivation, media and teaching instruments, evaluation and appraisal.

#### 1. How to teach technic and motivation

How to teach technic and motivation were regarded as importance in learning and teaching process in classroom activities for effectiveness of learning and understanding according to the teacher's objectives.

Discussion about the main issues could be summarized as follows and conformed to various theories as follows:

- 1. Teaching method by demonstrations and then let the students practice by imitating the teachers. This method conformed to Sugree Charoensuk (2014: 59) who stated that learning by imitating the teachers was the instinct method which was natural and the most primitive, also conformed to Thisana Khammani (2011: 330) who explained the meaning of teaching by demonstrating that was the process which the teacher used to assist the leaner to learn according to the specified objectives by showing or making thing needed to be learned to the learner.
- 2. How to teach technic and motivation by teaching practice together with theory learning at every time of learning and teaching conformed to Naruth Suthajitt (2002: 8) who stated that the music matter composed of two main components i.e. music matter and music skills. For learning basic music theories, all teachers would give more precedence to this concept. All students must be able to read musical notes

which conformed to Naruth Suthajitt (1988: 12) who stated that reading skill of musical symbols was regarded as one important basic skill in music studying.

- 3. In each teaching, the teacher had planned to teach every time, mostly had planned within a short period- week by week, sometimes the plan might be longer depending on each student as precedence. In the first teaching period, most teachers gave this period as the most precedence to understand each other by asking for a student's private data such as age, school and interviewed with the students for their aims of studying a drum kit, why they liked a drum kit, their favorite music styles, whose were their favorite drummers. These all things were regarded as teaching technic and motivation to make familiar between teachers and students for more effectiveness of learning and teaching which conformed to Thisana Khammani (2011: 415) who stated that teaching technic was a tactic to complete any process, step or manner with more quality and effectiveness. Teaching technic was necessary to complete more effective teaching.
- 4. In each learning and teaching, most teachers assigned exercises for students to practice which conformed to Boonchom Srisa-ard and Nipa Sripairoj (1988: p.20) who stated that exercising was an activity to assist the learners to reconsider their knowledge and understanding, then they could practice to use knowledge in any situation, together with increasing their experiences with deeper and more skills. Exercising might be assigned in the class after the learners understood what they learned or after school as a homework or both. In addition, teachers should suggest students to practice when it was possible since music was skillful and needed practice for being professional which conformed to Sugree Charoensuk (2011: p.116) who stated that music was a skill matter relating to practice.
- 5. At the beginning of each class, the teacher would motivate a class study by using psychology and described how that subject matter was important?, and why it would affect to the students?, or motivated that class by playing songs, teaching by using music notes those were familiar to the students, playing video concerts and performances of the popular artists who were satisfied by the students which would create interesting learning and teaching that conformed to Thisana Khammani (2011: 474) who stated that knowledge and an ability to apply several knowledge such as psychology, methods and technics in each teaching situation would create interesting, enjoyable and jolly teaching, then encouraged the students easily, comfortably, rapidly and happily to learn together. This motivation conformed to Daldy Max F (1993: pp.60-63) who concluded that interests caused motive for selecting suitable, favorable and imaginable songs and favorite musicians which was regarded as a good method to create motivation. Another motivation that the teachers used in learning and teaching was encouraging and praising the students who well performed the teachers' assignments which conformed to Walberg (1984: p22) who stated that reinforcement was very important for learning. Walberg had collected the researches from 1970 to 1983, approximately 3,000 items, he found that reinforcement was the most effective factor for learning. There were 2 types of reinforcements i.e. positive and negative ones. Positive reinforcement focused on making the leaners to know that their performances were accepted and praised e.g. verbal praising (good, well, great etc.)

# 2. Media and Learning Instruments

Media and complementary instruments for learning and teaching could divided into 2 main components:

- 1. Media and teaching instruments which were provided by schools such as drum kits, stereos, musical notes tripods and some textbooks. Mostly the students should buy their own textbooks.
- 2. Personal media and teaching instruments which were taken to the schools by the teachers themselves, when they were not available at schools but needed to be added for more understanding to the lessons which conformed to Srimongkol Thep-re-noo (2002: p0192) who stated that learning and teaching media meant the media that using in learning and teaching process for effective mutual understanding for passing knowledge between teachers and students, together with goal achievement of learning and teaching.

# 3. Evaluation and Appraisal

From the study of the researches on evaluations and appraisals by the teachers, there were three main parts should be discussed i.e. evaluation and appraisal by the teacher, evaluation and appraisal by examination and evaluation and appraisal by concert performing these conformed to Orrawan Bunjongsilpa (khanthasiri) (n.d.) who stated that evaluation on the children's progression should be done both in their imagination and skills, being continuously to know their achievements step by step which could help plan for the next lessons.

# **Suggestions**

- 1. Give a chance to teaching staffs or teachers for consulting with parent about the subject matters often to know the students' progressions and emerging problems.
- 2. Let teaching staffs to communicate with parent to know the problems when students were often absent from a class or going to school late.
- 3. Schools should improve instruments with modern items regularly, such as all classrooms should have computers etc.
- 4. Add teaching media especially textbooks, VCDs, videos and other instruments to all classrooms completely.

# **Other Suggestions**

- 1. School should provide training on teaching technics for continual developments of teachers.
- 2. School should award to good performing teachers annually for willingness and motivations of all teachers.
- 3. School should annually evaluate teaching achievements of teachers to create enthusiasm for the works.
- 4. School should add a subject on band organizing for increasing skills to students.

# **Suggestions for Further Research**

The researcher suggested further studies on the following topics:

- 1. Study on guidelines in teaching a drum kit of teachers in Thailand higher educational institutes.
- 2. Study on guidelines in teaching a drum kit of teachers in Thailand international schools.

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# Musicianship for Professional Trombonist in Symphony Orchestra

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#### Abstract

The purpose of the study "Musicianship for Professional Trombonist in Symphony Orchestra" is to study skills and techniques of musicianship for Trombonist in Symphony Orchestra. This research is a qualitative research by collecting data through interviews from the musicians in Symphony Orchestra and music teachers in universities, totally 17 persons and is analyzed by content analysis. The research result shows that 1) skills for a trombone musician are to play the songs from trombone method books from basic to advanced stages and to read notes from new song sheets accurately and quickly. The special techniques of a trombonist are slur and glissando with a trombone manner. The Trombone musicians must be responsible for both practicing and time-managing. These are very important for a professional trombonist.

Keyword: Trombone, Professional Musician, Symphony Orchestra

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#### Introduction

At present music study in universities in Thailand is widely available for those who would like to study music comprehensively and who would like to enter the music profession and further their careers. According to music study in undergraduate degree, there are two types of study programs: Western Music and Thai Music. Most of the universities provide these two programs equivalently. However, each of the program can be sub-categorized based on learning activities and course management; for example, Western Music course can be sub-programmed as Music Performance, Music Composers, Popular Music and Jazz etc.

The universities whose music study is available are 1) National Universities 2) Autonomous Universities 3) Private Universities which are universities, Rajabhat universities, institutes, and colleges under the Higher Education Commission.

To have the same directions and practices, Thai Qualifications Framework for Higher Education; TQF: HEd is established so that National Education Act concerning education standards can be concretely practiced by focusing on Learning Outcome Management for graduates in each expected qualification through specifying directions to control and develop the standards of education as well as for evaluation standards of the 6 areas of music study which are Virtue and Ethics, Knowledge, Cognitive Skills, Interpersonal Skills and Responsibility, Numerical Analysis, Communication, and Information Technology Skills, Psychomotor Domain.

After conducting the research, most of the music study programs focus on the importance of graduates to possess international music abilities, to value music creation, and to realize aesthetics, morality, and ethics in the profession. However, some of the programs are consistently-designed so as for graduates to live their lives in the society. Moreover, with the international cooperation, some of the programs are competitively-designed towards globalization, advanced science and technology, and unlimitedly wireless communication system. Based on these changes, music harmoniously plays an important role in the society although types of music has been varied greatly; furthermore, music can be found in organizations, both government and private, or in businesses such as advertisement, public relation, soundtrack, sales promotion, etc. This is why most musicians prefer to apply music to fit activities in their professions.

Professions in music are more diverse according to changes in the digital age. One of the music professions that many music performers think it is well-established are a musician in the orchestra which is gained more attention from musicians in Thailand; nevertheless, being a musician in the orchestra is not that easy because the audition is very competitive: to compete with both Thai and foreign music performers, and musical talents and the performance techniques need demonstrating vividly. Another reason why the audition is so difficult is that the vacancy (for trumpeter, trombonist, and violinist, etc.) is limited. Why so many musicians go for the orchestra audition is that the remuneration is somewhat high and experiences they shall get from local and international performances are priceless. Not only a talent does play an important role

for being a musician but morality and ethics are also necessary for being in the music industry.

In this study, the researcher is interested in the importance of teaching activities for music study in higher education in Thailand towards standardization, improvement, constructionism, and theoretical and practical music abilities under the supervision of Thai Qualifications Framework for Higher Education; TQF: HEd via bringing National Education Act concerning education standards into concrete use by focusing on Learning Outcome Management for graduates in each expected qualification through specifying directions to control and develop the standards of education.

# **Objective**

This research is to study skills and techniques for musicianship for professional trombonist in Symphony Orchestra

# Research Methodology

The universities providing 79 music study courses from 49 universities in Thailand are as follows

# University

1	Chulalongkorn University	9	Burapha University
2	Mahidol University	10	Thaksin University
3	Silpakorn University	11	University of Phayao
4	Kasetsart University	12	Ramkhamhaeng University
5	Khon Kaen University	13	Payap University
6	Naresuan University	14	Rattana Bundit University
7	Mahasarakham University	15	Siam University
8	Rungsit University	16	Assumption University

# Rajabhat University

1	Suan Sunandha Rajabhat University	16	Roi Et Rajabhat University
2	Bansomdejchaopraya Rajabhat University	17	Rajabhat Rajanagarindra University
3	Chandrakasem Rajabhat University	18	Rambhai Barni Rajabhat University
4	Phranakhon Rajabhat University	19	Lampang Rajabhat University
5	Kampaeng Phet Rajabhat University	20	Loei Rajabhat University

6	Chiang Rai Rajabhat University	21	Valaya Alongkorn Rajabhat University under the Royal Patronage
7	Chiang Mai Rajabhat University	22	Sisaket Rajabhat University
8	Chiang Mai Rajabhat University	23	Sakon Nakhon Rajabhat University
9	Nakhonratchasima Rajabhat University	24	Songkhla Rajabhat University
10	Nakhon Si Thammarat Rajabhat University	25	Suratthani Rajabhat University
11	Nakhon Sawan Rajabhat University	26	Surindra Rajabhat University
12	Buriram Rajabhat University	27	Muban Chombueng Rajabhat University
13	Pibulsongkram Rajabhat University	28	Muban Chombueng Rajabhat University
14	Phetchaburi Rajabhat University		
15	Phuket Rajabhat University		
16	Roi Et Rajabhat University		
17	Rajabhat Rajanagarindra University		

# **Institute of Technology and University of Technology**

# 1 Rajamangala University of Technology Thanyaburi

# 2 King Mongkut's Institute of Technology

According to the objective above, the research is a qualitative research and is conducted by

1. The researcher has chosen to research music study courses from 5 out of 49 famous universities in Thailand are as follow:

1.1 Chulalongkorn University
1.2 Mahidol University
1.3 Silpakorn University
1.4 Kasetsart University

1.5 Rangsit University

# 2. Selecting a topic and an objective

Because the researcher teach music in higher education whose subject relates to trombone practice, the interest in studying techniques and methods for teaching trombone shall be developed so as to find out international standards for the guidelines and the practices of trombone practice with the reference to Thai Qualifications Framework for Higher Education; TQF:Hed by focusing on Learning

Outcome Management towards the specified goals to be developed for improving desired effective teaching in accordance with international standards and to assure education quality to graduates to further their careers consistently with the supervision of Office of the Higher Education Commission.

# 3. Sampling

The target samples and the population of the research are the specialists in teaching and practicing trombone, trombone instructors, and trombonists in orchestras in the country.

# 4. Collecting data

- 1. Data is collected from in-depth interviews with target samples and the population which are the experts in trombone, trombone instructors, and trombonists in orchestra totally 17 persons.
- 2. Questionnaires are filled by trombone instructors.
- 3. Music study programs in higher education in Thailand are researched.
- 4. Results of higher education in accordance with Thai Qualifications Framework for Higher Education; TQF:Hed are studied.

## 5. Analyzing Data

According to the analysis,

- 1. The data from the in-depth interviews are analyzed and synthesized the results of higher education in accordance with Thai Qualifications Framework for Higher Education; TQF:Hed that have impacts on the course of music study for universities whose Thai music study courses are available so as to find out how to practice trombone properly with quality and efficiency according to international standards as well as exercises for trombone practice.
- 2. Questionnaires which are filled by trombone instructors are analyzed to find the results of higher education in accordance with Thai Qualifications Framework for Higher Education; TQF:Hed that have impacts on the course of music study for universities in Thailand.
- 3. The data from the observations and the note-taking are summarized for the results of higher education in accordance with Thai Qualifications Framework for Higher Education; TQF:Hed that have impacts on the course of music study for universities in Thailand.

#### Result

The results of the study skills and techniques of musicianship for Trombonist in Symphony Orchestra are as follows:

From trombone teaching's point of view, learners shall have knowledge of western music, together with the practice of trombone:

- Rudiments and Specify Staff, Major-Minor and other Scales, Note Values, Time Signature, Interval, and Articulations and Accidental Note and relating drills.
- Trombonists shall have a clear understanding of musical structures or compositions in order to properly interpret and get the mood of the songs.
- Trombonists need to know and understand their roles in the performance and be responsible for their duties by rehearsing or reviewing a song thoroughly.
- Trombonists shall have knowledge and understanding of related Western Music histories as well as famous composers in each era in order for trombonists to understand more a song.
- Trombonists shall have the knowledge and understanding of different forms.

The exercises for trombone practice used to enhance skills and prepare trombonists for orchestras are slightly different according to the interviews of trombone instructors and trombone experts. Practically speaking, basic and advanced techniques are available in exercises which can be brought into practice. Importantly, regular practice is advised for a good musician because practice with different forms of music can help understand quickly. Moreover, the more the rehearsal is done, the more techniques, tones, mood, etc. can be easily conceptualized. The mostly-used song for practice is Trombone Orchestra Excerpt.

In addition to specific practice, trombonists or musicians shall have morality and ethics in the music profession so that working or living, responsibility for themselves and others, discipline, punctuality and generosity can be made.

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#### **Samples of Trombone Exercises**









#### Conclusion

How to be a professional musician is when practice is done correctly, systematically, and ethically as usual.

According to the analysis of teaching activities to be trombonists in orchestra of universities in Thailand whose music study courses are available, they are consistent with Thai Qualifications Framework for Higher Education; TQF:HEd by focusing on Learning Outcome in order to assure students of quality. The directions for control and development to standardize the learning evaluation of desired characteristics are Virtue and Ethics, Knowledge, Cognitive Skills, Interpersonal Skills and Responsibility, Numerical Analysis, Communication, and Information Technology Skills, Psychomotor Domain.

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# Teaching Empathy Through Self-experience and Diary Reflections

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#### **Abstract**

To prevent any repeated human wrongdoings such as war, in the future, many people say that humans need to learn from their own past mistakes. However, classroombased education about history of wars may not be adequate in order to create sense of empathy among students toward others. Empathy is important not only in the field of psychology, but also peacebuilding process; yet it is challenging for teachers of how to effectively encourage empathy within students. This study aims to explore if students can develop empathy from participating in an extracurricular project and whether students' self-experience or classroom-lecture styles of learning could better encourage empathy among students toward war trauma and war victims. The author created a three-day academic field trip to the WWII historical sites and Sangkhla Buri District Office at Kanchanaburi, Thailand, which there were eighteen students in psychology major who volunteered to participate in this project. All of the students were assigned to take parts in self-experience and class-lecture styles of learning, and that dairy writing as a tool for self-reflection was required at the end of each day. Using discourse analysis methodology, the results suggested that 94% (n = 18) of the students could develop empathy toward war trauma and war victims. Moreover, the results implied that self-experience style of learning was more efficient in teaching empathy when compared to classroom-lecture learning style.

Keywords: Empathy, Empathic learning, Self-experience, Self-reflections



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#### Introduction

Empathy is an emotional phenomenon when you imagine putting yourself into other people's shoes. This allows you to understand others' emotion and feeling as if you were experiencing the situation by yourself. When empathy occurs, it results to emotional connection between two, or more, parties. People start to think and concern about, not only for themselves but, others' wellbeing (Hoffman, 2000). With empathy, positive and genuine relationship can be promoted (McAllister & Irvine, 2002), and that moral development can stem from (Joliffe & Farrington, 2006).

Smith (2006) suggested that the concept of empathy can be divided into two broad categories, which are emotional empathy and cognitive empathy or mental perspective taking. While emotional empathy discusses about compassionate feeling between two or more parties that could possibly lead toward helping behavior, cognitive empathy focuses on the accurate perception and understanding of emotion between each other (Hodgers & Myers, 2007). In 2014, Decety and Cowell expanded the idea of empathy as the notion that involves three separated processes: emotional sharing, emotional concern, and perspective-taking, where emotional sharing has similar connotation with emotional contagion, the automatic emotion that happens when you learn about others' experience; emotional concern is associated with care; and lastly, perspective-taking is another term for cognitive emotion. Despite different attempts to clarify empathy, the idea gathers around two dissimilar but closely related acts, concern and positive intention to help others.

Today, empathy is a key term that is popularly mentioned in many fields of knowledge. According to the field of psychology, empathy is a useful technique that helps therapists understand what clients emotionally carry with them, which could lead to positive therapeutic outcome (Lambert & Bergin, 1994). In the same direction with psychology, empathy is addressed as an important skill that enables social workers to perform more productively with their client works (Gerdes & Segal, 2011). Additionally, empathy also plays a crucial role in the field of politics and peacebuilding due to its characteristic of being a powerful soft skill for problem solving (Pedwell, 2012), and a chief supporter for social contact (Gerdes, Segal, Jackson, & Mullins, 2011). Empathy is not only benefit professional works in any particular fields, because of its ability to strengthen human relationship; it can also benefit mankind as a whole. Like Gerdes et al. (2011) once mentioned that, "Lack of empathy underlies the worst things human beings can do to one another; high empathy underlies the best." (p. 109).

Although empathy seems to be crucially important, there is still misperception about it. People usually think of empathy as an innate capacity or a personality trait; however, this is not true. In fact, empathy is a skill that can be trained and promoted (Everhart et al., 2016). Notwithstanding the fact that empathy is teachable, the challenges facing today are how to instruct and assess whether the lesson is learned (Blasco & Moreto, 2012). Several scholars suggest that empathy can be delivered inside classroom (Aronson, 2002; Everhart et al., 2016; Gerdes et al., 2011; Salmon, 2003). Nevertheless, with the nature of empathy that deals with self-experience, Pepler, a psychologist and professor from York University, argued that classroom lecture is inadequate for teaching this topic (as cite in Hammer, 2017). Lastly, people seem to be aware of empathic teaching only when the conflict has already occurred,

which is not appropriate. Empathy needs to be encouraged in everyone as potential ways for nourishment of human relationship and prevention toward any social harms in the future.

# **Purpose and Methodology of the Study**

This study aims to study if students can develop empathy from participating in the academic field trip and explore whether students' self-experience or classroom-lecture styles of learning could better encourage empathy toward war trauma and war victims among students. The author conducted a three-day academic field trip for senior year undergraduate students in psychology major at Thammasat University, Thailand. Using the WWII historical sites and Sangkhla Buri District Office at Kanchanaburi, the author planned the program of the trip so that every student had opportunities to self-educate through self-experience about the WWII events that happened in Kanchanaburi, and listen to the lectures provided by a descendant of a wartime hero, Khun Boonpong Sirivejaphan; and the Deputy District Chief of Sangkhla Buri District office who provides assistance for Karen refugees at Ban Ton Yang refugee camp.

Students were given information of this project prior to the field trip. They were required to participate in every activity of the trip and reflected their thoughts, emotions and feelings in their own diaries at the end of each day. After the trip was completed, students were asked to hand in their diaries, which the author employed discourse analysis as a methodology to analyze the extent of empathy that projected through vocabularies used in students' diaries.

#### Conclusion

There were eighteen students (n = 18), between the ages of 20 - 23, voluntary participated in this academic field trip, which comprised of sixteen females and two males. Among this number, there was only one student who originally came from Kanchanaburi, another one student was from the Southern part of Thailand; and other sixteen students were from the Central region of Thailand. Eight students out of the total eighteen reported having visit Kanchanaburi before, and three students out of the total number of participants addressed having no historical knowledge about WWII at Kanchanaburi at all.

Diary was analyzed as a written discourse type, which the author viewed diary as a tool for communication that students narrated their emotional reactions toward the trip to the author. Using Kanchanaburi where is home to many WWII historical sites as a location for this project, students reflected themselves by connecting the past with their present emotional states.

One diary was excluded from the analysis due to the lack of content. Student decided to draw pictures instead of writing, therefore it could not be examined by discourse analysis. This resulted to the total number of seventeen, out of eighteen, diaries left for analysis. All of the vocabularies reflected in students' diaries can be categorized into two groups, intellectual and emotional contents. According to the purpose of this study, the emotional content is the type of content that the author focused upon. After translating the Thai words into English, it was found that words closely related to the

concept of empathy that students often echoed in their diaries are sympathetic, compassion, deeply moved/reflected, depress and downcast, respectively.

**Table 1:** Activities of the Academic Field Trip Separated by Days and Percentage of Students Reported Empathy

Day	Activities	Percentage of Students Expressing Empathy
1	River Kwai Bridge WWII Museum Boon Pong's Residence Khao Pun Cave	47.06
2	Hellfire Pass Memorial Museum and Walking Trail	82.35
3	Sangkhla Buri District Office	5.88

After the completion of the trip, sixteen out of seventeen students (94%) expressed vocabularies that reflected empathy towards war trauma and war victims. Examination of empathy that occurred each day (Table 1) showed that the visit to Hellfire Pass Memorial Museum and Walk Trial encouraged the highest percentage of empathy (82.35%), and that visiting Sangkhla Buri District Office yielded the least empathy (5.88%) when compared to other activities.

**Table 2:** Students' Diary Reflections Reported by Each Type of Activities

	Self-experience (Observation)	Lecture (Historical Event)	Self-experience (Experiencing)	Lecture (Professional Work)
Activities	River Kwai Bridge WWII Museum Boon Pong's Residence Khao Pun Cave	Boon Pong's Residence	Hellfire Pass Memorial Museum and Walking Trail	Sangkhla Buri District Office
Students' Reflections	<ul><li>Emotional vocabularies</li><li>Empathy</li></ul>	<ul><li>Emotional vocabularies</li><li>Empathy</li><li>Intellectual vocabularies</li></ul>	<ul><li>Emotional vocabularies</li><li>Empathy</li><li>Intellectual vocabularies</li></ul>	<ul><li>Emotional vocabularies</li><li>Empathy</li><li>Intellectual vocabularies</li></ul>

In addition, the author studied students' diary reflections followed by each type of learning activities (Table 2). The results revealed that self-experience in the form of observation could activate emotional reactions and empathy within students toward war trauma and war victims. Nevertheless, it was less effective when compared to the self-experience style of learning that allowed student to physically participate in the activity. Interestingly, although classroom-lecture style of learning may develop less empathy when compared to self-experience learning type, it could promote

intellectually concerns among students toward war victims and well-being of Karen refugees that currently lived in Ban Ton Yang refugee camp.

This study contained several limitations. Short timeframe due to limited funding and small number of participants were among them. Plus, the results from this study was concluded with no follow up plan; therefore, it cannot be determined at this point whether empathy that emerged from this project could last long. Future studies should focus on these limitations.

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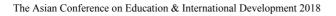
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# Stabilizing Mechanisms in Formula-based Funding of Universities: The Case of Poland

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#### **Abstract**

The research is inspired by the decades-long debate on the effectiveness of education and steering of educational systems in Europe and in particular - in Poland. Government funding serves to stabilize the functioning of public universities and to influence them to get compatibility with the educational *raison d'etat*. In the paper an attempt to measure the effect that government funding has on the educational system and public universities is presented. The focus is set on stabilizing mechanism introduced in formula-based funding, especially the case of Poland. The data from Ministry of Science and Higher Education in Poland are used to perform simulations which aim at evaluation of influence on stability and universities motivation to move towards strategic goals set by the government.

Keywords: higher education, formula-based, stabilizing mechanism, influence



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#### Introduction

There is a visible trend of shifting from centralized to decentralized systems also in higher education, where universities get more financial autonomy (Jongbloed, B., 2010; Estermann, 2008, 2012, 2017). E.g. in Poland, in a simplified way, it can be stated that funds reach public universities in two streams - the first is financing research, education and the processes that support them. They create together an annual budget. Decisions on its spending are made by the university authorities in accordance with the regulations that are formula-based. The second stream reaches the universities in the form of grants, which ensure financing of research projects selected through a competition. The latter stream is managed by the collegiate body equivalent to the national council for research in other countries. As a result of the transformation of the 90s, the body previously subordinate to the executive authority was depoliticized and replaced by two agencies independent of the government - the National Science Center (agency for basic science) and the National Center for Research and Development to finance research.

According to data from Central Statistical Office in Poland (GUS, 2017), higher education institutions had an income from research activities of 2 794.603 million PLN in year 2016 (out of which 1 076.651mln PLN was from the budget of two agencies mentioned above).

Educational expenditures were growing during last years in all OECD countries (OECD, 2017). The split between spending on core educational services and R&D activities differs significantly among OECD countries. It ranges from Switzerland where 20% more money is spend on R&D than core educational services to Chile where R&D expenditures comprise only 5.2% of tertiary educational spending.

There is a tendency to change the method of funding allocation to formula-based budget allocation that is becoming to be the most popular mechanism. ("...Countries are increasingly reliant on using formula funding to determine overall institutional levels of block grants..." – de Boer et al., 2010). "Education systems simultaneously pursue many (often conflicting) goals, with the many system actors continually interacting in complex ways" (World Bank, 2018). The aim of the formula is to combine those goals in set of the rules that will shape how resources will be allocated to universities. Researchers mention few advantages of formula-based allocation that make it more widely used (McKeown-Moak, M. P., 1999): "reduced political competition and lobbying by the institutions, simple and understandable basis for measuring expenditures and revenue needs of campuses and determining the adequacy of support, provide a reasonable compromise between public accountability and institutional autonomy, easy comparisons between institutions, promotion of efficiency in institutional operation". These circumstances in fact enable implementation of effective educational policy.

Changes in financing are implemented through a change of the algorithm of funding allocation to universities. It is assumed that economically rational agents (universities) will take actions which outcomes will be rewarded with higher payoffs defined by the algorithm. If the algorithm is constructed in accordance with educational policy this leads to achievement of this policy goals.

Changes of algorithm may also lead to unexpected results. The most obvious reasons for that are uncertainty in environment and delayed appearance of effects of the policy, but also lack of stability of the system. In Poland, government has a stabilizing mechanism called "transmitted factor" that makes the previous year subsidy influence the level of this year's subsidy<sup>1</sup>.

Let us focus on the stability perspective now.

Governance is a "processes aimed at coordination, stability and structure in a world of actors of different sizes, power and resources." (Strehl et al., 2007). It has a broader meaning than allocating funds. In the environment that is changing rapidly, stability becomes more important for governments to provide.

Countries are using different mechanisms to achieve stability in the funding level. In Ireland it is provided by limiting the changes in core grant to plus or minus 2% of average sectoral change in any one year (Higher Education Authority, 2016). England has a similar system for teaching mainstream grant, but the range is plus or minus 5%. Czech Republic introduced a stabilizing mechanism only for the time of shifts in the calculation of budget allocations. The changes were limited to 10% compared to budgets from previous year (Koucký, J., 2013). In Denmark there is a fixed amount per university which is representing 25% of the total teaching budget (Maassen, P., 2000).

The aim of this paper is to define stability mechanisms in such system and investigate conditions influencing this stability. More precisely the objective of the study is to examine the principles of how the stabilizing mechanism in Poland works and assess its influence on stability and universities motivation to move towards strategic goals set by the government.

#### **Research Methodology**

Parts of equations in formula-based budget allocation that aim to decrease changes in funding level from year to year are considered to be stabilizing mechanisms. To examine the principles of stabilizing mechanism in Poland – transmitted factor – we analyzed the funding formula in detail.

It is assumed that educational system is stable when its' agents are financially stable. Universities stability is considered in terms of allocated resources from one year to the next one. The less volatile are the funding levels of universities the more stable the system is. The influence of transmitted factor on stability was assessed through simulations based on data from Polish Ministry of Science and Higher Education. Data included information on funding levels of all public universities covered by the formula-based allocation from three consecutive years (2015, 2016 and 2017). We calculated changes of funding levels and checked the 5. and 10. percentiles. The change in the funding level of university that had the 5. percentile result was

<sup>&</sup>lt;sup>1</sup> Transmitted factor in Poland is equal to 0.5. This means that each year half of previous year's subsidy is guaranteed and decision made by university have half of the influence power they would have had if there was no transmitted factor.

considered to be 5% Value at Risk<sup>2</sup> for the certain year (10. percentile as 10% VaR). To further explore financial stability, we checked how many universities will fall out of boundaries set by governments in Ireland or England depending on different transmitted factor value.

Simulation based on a probable change in one of the universities dimension (number of students and the pay-off related to that change) was used to measure the influence of transmitted factor on motivation. The pay-off was calculated in the first 3 years and following years pay-offs were discounted with 5% rate.

#### **Case of Poland 2015-2017**

In Poland universities are rewarded for students taught  $(S_i)$ , professors and academic

staff hired  $(P_i)$ , research that is conducted  $(R_i)$  and internationalization  $(U_i)$ . The level of funding is determined by a certain part of previous years funding (transmitted

factor - T) and the remaining part is influence by the dimensions of universities that were mentioned (equation 1). Each of the dimensions has a different weight that reflects the emphasis that government is putting on a certain task.

$$F_{i} = F_{i,t-1} * T + (1 - T) \times (W_{S} \times S_{i} + W_{P} \times P_{i} + W_{U} \times U_{i} + W_{R} \times R_{i})$$
(1)

If we assume that the weights near the dimensions (components) are constant we can rewrite the equation that I presented as:

$$F_i = \sum_{k=1}^n (W_k \times C_{kt}^*)$$
(2)

where  $C_{kt}^*$  is the k-th component with distributed lag in time t given by the formula:

$$C_{kt}^* = [T^t \times F_{i0} + (1 - T) \times \sum_{j=1}^t (T^{t-j} \times C_{kj})]$$
(3)

When the equation (1) is re-written in the form of equation (2) and (3) it becomes apparent that the funding calculated for a certain year takes into account all the decisions affecting components that were made by the university authorities when the algorithm was in place. Apart from the decisions made by the university starting level

of funding  $(F_{i0})$  and the transmitted factor (T) impact the value of components and thus the level of funding.

<sup>&</sup>lt;sup>2</sup> Value at Risk is interpreted as a maximum possible loss with certain probability in a given time.

Due to transmitted factor in the formula, each universities decision, good or bad, affects the level of funding not only in the year it was made. Depending on the value of transmitted factor the effect can be seen in shorter time (for smaller transmitted factors) and in a longer one (for bigger transmitted factors). To illustrate that (see Figure 1) we performed a simulation where the components' values dropped by 30% in one year. University had seen the negative influence and came back to the previous state of components' values. It is visible that eventually the level of funding drifts to what would be the status quo if no changes were made. The lower the transmitted factor is the deeper is the downturn, because this year's decisions has a bigger impact on the funding level. To make up for the losses there has to be a positive influence to net out the negative one.

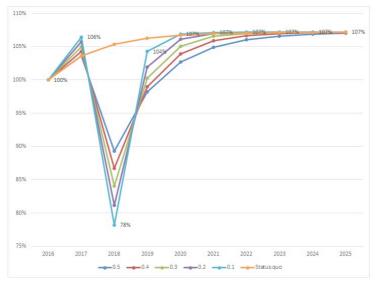


Figure 1. Influence of one-year drop in components values on the level of funding depending on different transmitted factor. (source: own elaboration)

# Transmitted factor as a stability influencer

The higher the transmitted factor is the longer is the time that university has to prepare itself for the changes that are to come. Figure 1. shows also that strength of the impact on level of funding in certain years after decision was made is dependent on the value of transmitted factor. Without transmitted factor it would be hard for university to accommodate the decrease in funding level of 30%.

Possible losses are much bigger when the transmitted factor is lower. Table 1. shows 5. and 10. percentile values of year-on-year changes: between 2015 and 2016, between 2016 and 2017. The 10. percentile change between 2015 and 2016 is -14 113.49 for 0.1 transmitted factor versus positive change of 3 511.06 for 0.9 transmitted factor. This means that in worst 5% cases the universities would be losing 14.1 million PLN or more if the transmitted factor was 0.1. If transmitted factor was 0.9 the chance of losing money would be very low, because the 5. percentile worst case is still positive. The changes between 2016 and 2017 were even bigger. The reason for that was the change in the funding formula itself that added the uncertainty and risk in the environment, so the stability of results was harder to maintain.

1 676.12

1 368.14

0.9

on uniterent transmitted factors.						
Change between 2016 and 2017			Change between 2015 and			
	(thousands PLN)		2016 (thousands PLN)			
Transmitted		10.				
factor	5. percentile	percentile	5. percentile	10. percentile		
0.1	- 22 660.20	- 14 576.33	- 14 113.49	- 10 808.78		
0.2	- 16 564.39	- 10 054.92	- 11 343.43	- 7 733.67		
0.3	- 12 543.27	- 5 487.07	- 8 573.37	- 5 569.82		
0.4	- 8 522.15	- 3 727.81	- 5 576.47	- 3 698.52		
0.5	- 4 908.39	- 1 735.26	- 2 352.97	- 1 964.07		
0.6	- 1 353.26	- 266.40	- 575.17	- 251.32		
0.7	355.96	1 241.86	168.48	705.61		
0.8	1 166.58	2 708.05	259.68	1 433.70		

**Table 1.** Percentiles of changes between years 2015-2016 and 2016-2017 depending on different transmitted factors.

Negative changes are limited with high transmitted factors so there is less risk of universities going bankrupt, but at the same time, positive changes are limited so the motivation to change is influenced as well (see details in the next chapter).

3 511.06

350.88

Stabilizing mechanisms used in Ireland and England limit the changes in the funding level more rigorously than the transmitted factor introduced in Poland. To prove that we compared the influence that transmitted factor has with the ranges that are imposed in Ireland and England (Table 2). For 2% range there are many universities that are below lower band of the range (from 25 with transmitted factor 0.1 to 1 with transmitted factor 0.9). For the transmitted factor used by Polish government currently (0.5) there are still 18 universities below the band, which is above 25% of public universities in Poland. For the 5% range the number of universities below the lower band is significantly smaller (only 5 universities when transmitted factor is 0.5).

Table 2. Number of schools below lower boundary of ranges (2% and 5% from the average sector change)

average sector change)									
transmitted									
factor	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
2% range	25	23	23	21	18	15	12	5	1
5% range	13	12	8	5	5	2	1	1	0

Transmitted factor is influencing stability in a different way than the regimes introduced in Ireland and England. Transmitted factor has an impact on stability of each university based on its performance from previous years (stability of single agent throughout the years) and the regimes are focused on the stability of the system generally. Compared to regimes described, transmitted factor is not forcing universities that are doing extremely well or have very bad performance to move along the sector average. Universities are rewarded and penalized for their own decisions with a specific lag of the effects, but there is no external influence on the funding level. Transmitted factor seems not to decrease the motivation of the universities as strongly, but the exact influence will be further examined.

#### Influence of transmitted factor on motivation

The higher is the transmitted factor the lower is the motivation of the universities to move towards strategic goals set by the government. Figure 2. shows the effects a 1% increase in number of students has on the funding level in first 3 years and the following years (with use of 5% discount rate). It is visible that for small transmitted factors pay-off is accumulated in first few years (3 years). We see that the pay-off received within the first three years is decreasing when the transmitted factor is increasing. Total pay-off is also diminishing due to discount rate.

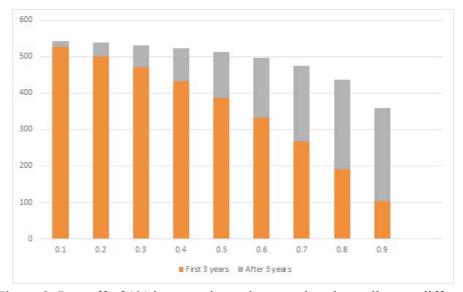


Figure 2. Pay-off of 1% increase in student number depending on different transmitted factor values (source: own elaboration)

#### **Conclusions**

The transmitted factor is a very simple, but at the same time efficient, stabilizing mechanism. The government can change the system quite easily by changing only one parameter. It is worth noting that the subsidy of each university is performance-based, because even the stable part is based on performance in the past years.

There are limits of the approach that we have taken. The probability of loss was calculated in a simplistic manner by calculating the 5. or 10. percentile as a reflection of VaR. Probability of loss could have been estimated by prognosing the trend using econometrics models that could be more and more sophisticated. Another issue is that we look at public sector, where the rules that were set and the final result – funding level - can be changed by the government. It has specific provisions and other tools that it can use to change the subsidy for universities (especially those in need).

The above argument motivates new research opportunities regarding stabilizing mechanisms. Further research should focus on comparing different stabilizing mechanisms or parameters in other countries to find the most efficient one.

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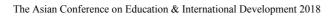
#### **Polish decrees**

Rozporządzenie Ministra Nauki i Szkolnictwa z dnia 27 marca 2015 r. w sprawie sposobu podziału dotacji z budżetu państwa dla uczelni publicznych i niepublicznych.

Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dnia 7 grudnia 2016 r. zmieniającym rozporządzenie w sprawie sposobu podziału dotacji z budżetu państwa dla uczelni publicznych i niepublicznych.

Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dnia 11 kwietnia 2017 r. w sprawie sposobu podziału i trybu przekazywania dotacji podmiotowej na dofinansowanie zadań projakościowych.

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# Key Performance Indicators for Higher Education: Lessons from Poland

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#### **Abstract**

It has been argued that quantitative KPIs for academics can create perverse incentives. By narrowing the attention of academia to measurable outcomes rather than its broader mission, they can be a distraction from maximizing universities' positive impact on society. Quantitative assessments are nonetheless required, among others by governments which finance or co-finance the higher education institutions in many countries. This work presents an analysis of past regulations concerning the evaluation of universities and their impact on the Polish higher education sector. Quantitative as well as qualitative aspects are discussed. The results illustrate the Goodhart's law stating: "When a measure becomes a target, it ceases to be a good measure." However in some aspects the case study of Poland also shows how the absence of quantitative assessments is likely to result in undesired outcomes.

Keywords: higher education, evaluation, key performance indicators, Goodhart's law

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#### 1. Introduction

Key performance indicators (KPIs) can be defined as (quantitative) performance measurements used to evaluate the success of a particular activity (project, program, product) or of an organization, a team, or an individual in fulfilling a task or advancing in a certain area. Suitable KPIs have the following characteristics: they cover key strategic goals or areas, and the formulas used to calculate their values have desired mathematical properties.

Quantitative measurements are used for decision-making processes related to funding in higher education both by governments as well as students and their families. KPIs are used in the process of granting government funding to Higher Education Institutions (HEIs) because they are transparent and resistant to bias of the evaluator. Students and their parents also consult quantitative measures (e.g. rankings) because it allows them to reduce the complex reality of nearly unlimited educational choices to an understandable figure. The position of a HEI in rankings is also a signaling tool to future employers. The interdependence of funding, effects, and evaluation in higher education is illustrated in Figure 1.

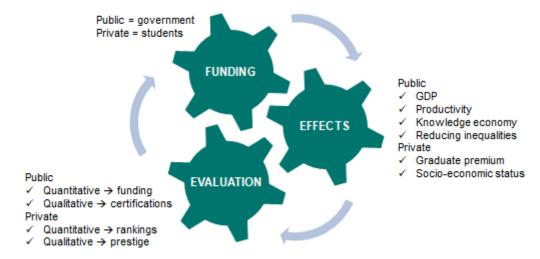


Figure 1. Funding, evaluation, and effects in higher education. Source: own elaboration.

Constructing a mathematical model of reality requires simplifications. When these simplifications are significant and decision-making is based mainly on the model (e.g. a set of KPIs), the incentives to game the system (or even cheat) are strong. This can be summarized by the Goodhart's Law, stating: "When a measure becomes a target, it ceases to be a good measure" (Goodhart, 1975). Multiple illustrations of perverse incentives as well as reports of cheating in the environment of hypercompetition for funding in academia are provided by Edwards and Roy (2016).

While Edwards and Roy (2016) argue for regulators to support science by deemphasizing output and instead promoting "altruistic and ethical outcomes", we aim at drafting a framework for assessments of sets of KPIs used for funding, in particular for government formula-based funding. We apply the preliminary framework to analyze a case study of Poland, precisely an algorithm used by the Polish government since 2007 for determining the level of subsidies for didactic and maintenance purposes for public HEIs. Special focus is given to pro-quality KPIs dependent on the student-staff ratio.

# 2. Preliminary assessment framework

The problem of assessment of sets of KPIs used for government funding amounts to verifying the two following umbrella hypotheses:

- A/ The KPIs are a significant driving force behind the evolution of the higher education sector (in other words: the higher education sector develops in the direction set out by the set of KPIs);
- B/ The areas not covered by the KPIs used by governments suffer stagnation or deterioration if government funding is a significant part of HEIs' revenues.

The framework we propose consists of three stages:

1/ Defining the scope of analysis, 2/ Mathematical *ex ante* analysis, 3/ Empirical *ex post* analysis.

## 3. Research methodology

First step of stage 1/ (Defining the scope of analysis) is specifying the subject, i.e. providing enough criteria that an exact list of HEIs under examination can be deduced. The group of HEIs should be regulated with the same set of KPIs. The timeframe of the analysis has to be specified as a second step. It should be a period when the regulations (set of KPIs) were relatively steady and it should be long enough for the HEIs to have enough time to develop adjustment strategies. Next, strategic goals within the sector need to be identified. They can be sourced from strategic documents published by the government or the sector's regulating body. In absence or insufficiency of such official documents, strategic areas can be indicated by the researcher through literature review or review of official documents by other countries. Finally, the KPIs need to be listed. It is crucial to state for which stream of revenues the specific set of KPIs is used. The share of the stream in total sector's revenues should be indicated or estimated.

The goal of the mathematical *ex ante* analysis, to be performed as stage 2, is to determine the direction and strength of incentives implied by KPIs. In most cases, this can be performed by analyzing derivative functions of the KPIs' formulas with respect to key inputs which are within the HEIs' control. The structures of incentives can be divided into four categories:

<sup>&</sup>lt;sup>1</sup> Edwards, M. A., & Roy, S. (2017). Academic research in the 21st century: Maintaining scientific integrity in a climate of perverse incentives and hypercompetition. Environmental Engineering Science, 34(1), p. 51.

<sup>&</sup>lt;sup>2</sup> The Regulations adopted by the Minister of Science and Higher Education mention that the subsidy is for didactic and maintenance purposes, however the money is not "tracked", i.e. the HEIs' authorities have discretionary powers in allocating the funds in the best interests of the HEIs.

- Rewarding the progression of a certain area (e.g. the more students participate in a student exchange abroad, the better),
- Rewarding the elimination of certain actions or events (e.g. the smaller dropout rate, the better),
- Rewarding reaching a reference level / punishing moving away from a reference level (e.g. a reference level of student-to-staff ratio),
- Others: there are endless possibilities of the structure of KPIs' incentives (e.g. non-linear, multi-modal functions).

It is important to note that in some cases, assumptions will need to be made because of lacking or insufficient data. It is crucial to comment on what these assumptions are and to what extent they can sensitize the findings.

The last stage (Empirical *ex post* analysis) aims at tracking the evolution that HEIs made during the period of time specified by the analysis' timeframe. Determining to what extent HEIs did eventually progress in the direction set out by the regulator via the set the KPIs used for funding allows to verify hypothesis A. Verification of hypothesis B is more challenging and potentially less conclusive, since it requires assessment of areas which were in most instances not monitored by national statistical offices or are simply difficult to measure. Although the findings might be less conclusive, available information and expert judgment from the sector's stakeholders should be taken in consideration.

# 4. The case study of Poland 2007-2017

Since 2007, Poland has had an algorithmic formula for dividing funds for didactic and maintenance purposes between public universities. The share of the fund for didactic and maintenance purposes in all government funding for public universities has been oscillating between 81% and 86% and its share in total revenues between 55% and 63%. The KPIs and their weights used in the funding formula during the period of 2007-2017 are presented in Table 1 and Figure 2, respectively. In an absence of an official document outlining the strategic objectives of the Polish higher education system as of 20073, we assume that the KPIs reflected the government's objectives.

**Table 1.** KPIs used in the funding algorithm in years 2007 – 2017. Source: own elaboration.

	2007 - 2012	2013-2014	2015-2016	2017 - now			
KPI 1°	Students and PhD candidates						
KPI 2°		Internationalization					
KPI 3°	Academic staff						

<sup>&</sup>lt;sup>3</sup> Fulton, O., Santiago, P., Edquist, C., El-Khawas, E., & Hackl, E. (2007). OECD reviews of tertiary education. *Danvers, MA: Organization for Economic Cooperation and Development Publishing*.

KPI 4°	Research				
KPI 5°	Certi	n/a			
KPI 6°	Sustainable development	Availability of academic staff	Proportional development of teaching	n/a	

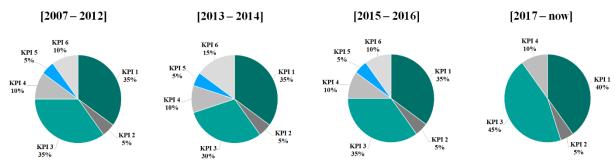


Figure 2. Weights attributed to KPIs (2007-2017). Source: own elaboration.

Since the subsidy has been the dominant source of revenue for Polish public HEIs for over a decade, it is natural to state the hypothesis of the formula's KPIs having a strong impact on the decision-making of HEIs. This hypothesis can be broke down into two research questions. First, the KPIs used in the formula are going to be analyzed critically to verify whether the KPIs effectively incentivize the desired effects. Second, the choice of key areas and strategic goals will be investigated – whether the pursuit of key areas will satisfy public and private demand.

All KPIs are represented as a fraction:

$$KPI_i = \frac{v_i}{\sum_{j=1}^n v_j}$$

where  $KPI_i$  stands for the value of the KPI for *i*-th HEI,  $v_i$  stands for the value of the KPI-specific nominator of the *i*-th HEI, and *n* stands for the total number of HEIs. Therefore, by definition, the value of any KPI for any HEI has to be within the range of [0%;100%], and the value for all HEIs altogether is always 100%.

The KPIs can be categorized into additive and non-additive. The additive KPIs have the following property:

$$v_{i+j} = v_i + v_j$$

where  $v_i$  is the value of the KPI-specific nominator of the *i*-th HEI, and  $v_{i+i}$  is the value of the KPI-specific nominator of the *i*-th and *j*-th HEIs, treated as one HEI (as if the HEIs had been merged). Some KPI-specific nominators will be analyzed in detail below 4

We make a simplifying assumption when interpreting the incentive structure of the KPIs. Instead of taking the derivatives of the KPIs, we only take the derivatives of

<sup>&</sup>lt;sup>4</sup> For more details, please consult the Regulations issued by the Minister of Science and Higher Education (see Literature).

their nominators. This largely simplifies interpretation as well as calculation, while the error resulting from the simplification is negligible when dealing with small changes. For example, if an *i*-th HEI increases the value of its nominator by 1% of the denominator, *ceteris paribus*, we assume that the KPI of the *i*-th HEI will also increase by 1,0%. However, in reality, the KPI of the *i*-th HEI will increase by 0,99%. Therefore the error amounts to 0,01%. The smaller the change, the smaller the error. Since we mostly analyze changes much smaller than 1% of the denominator (e.g. increasing the number of students by 1% of the denominator would mean increasing the number of students by more than 60% for an average academic public HEI, which is unrealistic on a year-to-year basis), the error can be omitted. However, if a case study of a specific, especially bigger, HEI was to be analyzed, it should be taken into account.

# 4.1. Additive KPIs used in the funding formulas

Additivity of a KPI's nominator has profound consequences for the structure of incentives implied by the KPI, as well as the easiness of its interpretation. Values of additive KPIs can be calculated not only for individual HEIs but also for subgroups of HEIs, e.g. polytechnics or schools of economics. This also implies that the absolute change in the denominator can be interpreted as progress (or regress) of the entire system.

# KPI 1° Students and PhD candidates (2007-2016)

Before 2017, the nominator of the KPI 1° was a weighted sum of stationary5 students and PhD candidates. HEIs receive pre-defined number of "points" for each: student, PhD candidate, and foreigner taking preliminary courses to later undertake studies in Polish. A HEI received between 1 and 3 points for each student, depending on his/her study area. Within study areas, PhD candidates are "worth" up to 5 times more points than bachelor/master students.6 For illustration purposes, the distribution of KPI 1° values in 2015 are presented in Figure 3.

# 6% 5% 4% 3% 2% 100%

Distribution of KPI 1° values in 2015

<sup>&</sup>lt;sup>5</sup> Stationary studies in public HEIs in Poland are free of tuition fee. Public HEIs in Poland are also allowed to offer non-stationary studies; in such a case participants need to pay tuition fees.

<sup>&</sup>lt;sup>6</sup> Some conditions for receiving points were omitted for simplicity. For more details, please consult the Decrees issued by the Minister of Science and Higher Education (see Literature).

Figure 3. Distribution of KPI 1° values in 2015 (KPI values of all 67 public academic HEIs in Poland which were awarded subsidy from the fund for didactic and maintenance purposes).

Source: own elaboration. Data: Ministry of Science and Higher Education.

The derivative function of the nominator with respect to each type of student / PhD candidate took the following form7:

$$\frac{\partial KPI}{\partial x_i} = p_i * x_i$$

Therefore, increasing the number of any type of students was beneficial to all HEIs. This was true both in the case of stationary students and non-stationary students. The enrollment of non-stationary students are subsidized indirectly: the real costs of enrolling a non-stationary student in a public HEI are lower than for a private HEI because the former can utilize to this end the resources (i.e. academic staff, infrastructure, administration) which are already paid for through public money (including the fund for didactic and maintenance purposes).

Indicating exactly how much money is rewarded for one point in every KPI is not straightforward. Moreover, it is also only possible to calculate it backwards. Firstly because the total amount of the fund is different every year, but most importantly because of the uncertainty surrounding the developments at other HEIs.8

As part of the empirical *ex post* analysis, we inspect the growth of number of students and PhD candidates (see Figure 4). The number of (stationary) students increased 9% during the analyzed decade. This growth occurred while the population of 19-year-olds9 in Poland fell by 33% from 2006 to 2017. Increasing the number of students when the population of high school graduates is falling is a challenge. In terms of KPI 1°, the same growth can be achieved with either growing the number of students or PhD candidates and it seems HEIs were much more successful with growing the number of PhD candidates (73% increase from 2006 to 2016).

Where  $\mathbb{Z}_2$  stands for the number of students of type *i* enrolled at a HEI, and  $\mathbb{Z}_2$  stands for the number of points awarded for every students of type *i*.

<sup>&</sup>lt;sup>8</sup> In the case of KPI 1° however, the uncertainty stemming from the unpredictability of management decisions by other HEIs was somewhat reduced in 2013, with the introduction of penalties for increasing the number of stationary students by more than 2%. In such circumstances, reasonable assumptions can be made about the evolution of the denominator from one year to another.

<sup>&</sup>lt;sup>9</sup> Most Poles are 19-year-old when graduating from high school.

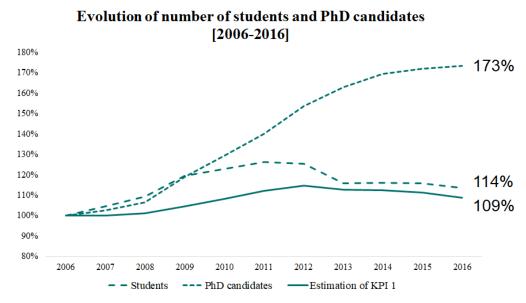


Figure 4. Estimation of KPI 1° is based on the assumption that PhD candidates are equivalent to 5 students. Source: own elaboration. Data: Central Statistical Office (GUS).

In 2017, a HEI-specific multiplier was added to address the issue of indirect costs incurred by the enrollment of non-stationary students. Thus the KPI became non-additive and will be further discussed in the section on non-additive KPIs. However as the multiplier is applied only after the weighted sum has been calculated, the above description of the procedure of awarding points still holds.

#### **KPI 2° Student exchange / Internationalization (2007-2017)**

In years 2017-2016, HEIs received points for every (own) student or PhD candidate who participated in a student exchange abroad (1 point), and for every foreign student or PhD candidate who participated in a student exchange at the HEI (3 points). In 2017, the indicator was renamed to Internationalization. One new category was added: 3 points are now awarded for every foreign student or PhD candidate completing full-cycle studies at the HEI.

Polish public HEIs experienced very rapid internationalization (at least in terms of the student body) during the last decade. However, the fact that the growth in number of foreign students was higher at non-public HEIs suggests that the main driving force behind the internationalization might be the general increasing attractiveness of Poland as a study destination, not necessarily the incentives implied by KPI 2°.

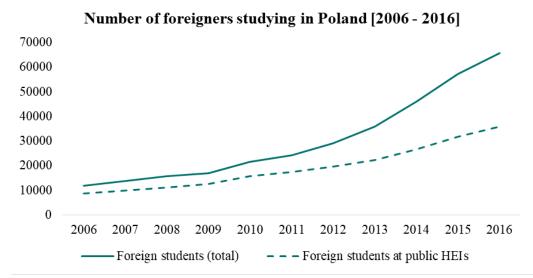


Figure 5. The number of international students at public HEIs increased by more than 300% from 2006 to 2016. When non-public HEIs are included, the increase is 460%. Source: own elaboration. Data: Central Statistical Office (GUS).

# KPI 3° Academic staff (2007-2016)

In years 2007- 2016, HEIs received a pre-set number of points for each: full professor, lecturer with a PhD and a habilitation, lecturer with PhD title only, assistant professor, foreign visiting professor. As shown on Figure 6, the number of academic staff was rising until 2011, after which HEIs struggled to increase employment. Full-time professors were the main driver of growth in KPI 3°.

In 2015, to account for the fact that many academics were being employed by more than one HEI, points were cut by 50% for all staff for which the HEI was not the primary employer. In 2017, a HEI-specific multiplier was added. Thus the KPI became non-additive and will be further discussed in the section on non-additive KPIs.

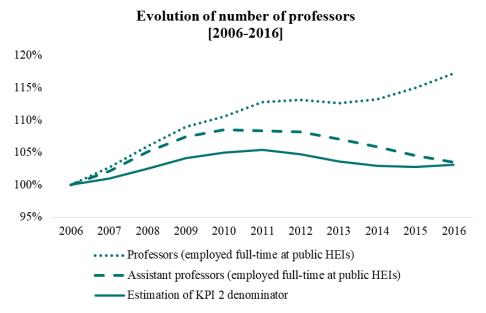


Figure 6. The number of full-time professors at public HEIs increased by 17% from 2006 to 2016. Weighted sum of academic staff increased by 3% in the same period. Source: own elaboration. Data: Central Statistical Office (GUS).

# **KPI 4° Research (2007-2017)**

In years 2017-2012, HEIs received 1 point for each research project carried out by the HEI and financed (or co-financed) by the Ministry of Science and Higher Education. In 2013, the number of points was raised to 2 for international projects. In 2015, the indicator was made much more sophisticated: differentiating between national projects, international projects, and project financed from Horizon 202010, as well as between HEIs being leaders or participants of a project. ½ point was awarded for merely participating in a national project, while 4 points were awarded for HEIs being leaders of a Horizon 2020 project. Since 2017, the differentiation between leaders and participants was abandoned, which might turn beneficial by reducing rivalry for the leader's role between HEIs.

As the fund is not the sole source of funding for research, the KPI could be also considered as a proxy for quality of the didactic process at the HEIs since it could be argued that academic staff who is more successful in the dimension of research is also able of creating more value in terms of teaching.

#### KPI 5° Certifications to issue diplomas (2007-2016)

In years 2007-2016, HEIs received: 1 point for each study area in which they were certified to issue PhD titles, and 2 point for each study area in which they were certified to issue habilitation tittles. The KPI was dropped in 2017.

<sup>&</sup>lt;sup>10</sup> See: https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020 (accessed on March 24<sup>th</sup> 2018).

# 4.2. Non-additive KPIs used in the funding formula

Throughout the analyzed period, one indicator was consistently non-additive: KPI 6°, which was modified the most times, to be eventually incorporated into KPI 1° (*Students and PhD candidates*) in 2017, thus making it also non-additive.

The changing names of the KPI have a common denominator: they suggest that the aim of the KPI is to avoid uncontrollable growth of HEIs (Sustainable development, Proportional development of teaching) by the means of emphasizing healthy proportions between the number of academic teachers and the number of their students (Availability of academic staff). All variants of the KPI are non-linear functions of the number of students and PhD candidates, and the number of academic staff. Therefore for comparability and interpretation purposes, in the analysis of these formulas we present their derivatives as functions of the SSR. As SSR can be considered a proxy for quality of teaching, it is highly likely that the KPI was intended as a pro-quality measure.

# KPI 6° Sustainable development (2007-2012)

The first version of the KPI was calculated according to the following formula:

$$KPI\_6\_v1_i = \frac{\sqrt{(2prof_i + 1.5lec_i) * (stu\_PhD_i)}}{\sum_{i=1}^n \sqrt{(2prof_i + 1.5lec_i) * (stu\_PhD_i)}}$$

where  $prof_i$  stands for the number of professors employed by the *i*-th HEI,  $lec_i$  stands for the number of lecturers employed by the *i*-th HEI (these two groups are mutually exclusive), and  $sta_iPhD_i$  stands for the number of (stationary) students and PhD candidates enrolled at the HEI.

When taking the derivative of the KPIs nominator, we assume that only professors are employed11. The KPI-specific nominator can be then represented with the following formula

$$KPI\_6\_n1_i = \sqrt{(2 * prof_i) * (stu\_PhD_i)} = \sqrt{2} * \sqrt{prof_i} * \sqrt{stu\_PhD_i}$$

It can be noted that the value of the nominator increases with increasing numbers of students, PhD candidates and professors. The strength of this increase differs depending on the starting levels of these aggregates, which can be illustrated through derivative functions.

$$\frac{\partial KPI\_6\_n1_i}{\partial stu\_PhD_i} = \sqrt{2}/2 * \sqrt{\frac{prof_i}{stu\_PhD_i}} = \sqrt{2}/2 * \sqrt{\frac{1}{SSR_i}} = \sqrt{2}/2 * \frac{1}{\sqrt{SSR_i}}$$

<sup>&</sup>lt;sup>11</sup> For reasons of simplicity. The simplification does not undermine the findings, since professors are interchangeable with lecturers (a lecturer is worth 3/4 of a professor and a professor is worth 4/3 of a lecturer).

$$\frac{\partial KPI\_6\_n1_i}{\partial prof_i} = \sqrt{2}/_2 * \sqrt{\frac{stu\_PhD_i}{prof_i}} = \sqrt{2}/_2 * \sqrt{SSR_i}$$

In the above formulas,  $SSR_i = stu_i PhD_i/prof_i$  stands for student-to-staff ratio at the *i*-th HEI.

The resulting derivative functions are illustrated in Figure 7. The higher the SSR, the higher the reward for employing a new professor or lecturer. In other words, this KPI incentivized increasing the body of academic staff more at HEIs which performed worse in terms of SSR. However it also provided an additional incentive for enrolling new students, even when the values of SSR was very high. While the non-linear shape of incentives related to the number of professors is justified, it seems superfluous to provide additional (even if low) incentives for growing the student body when the SSR is already very high.

# Increase of KPI 6° (Sustainable development, 2017-2012) in reaction to increase of student body or academic staff

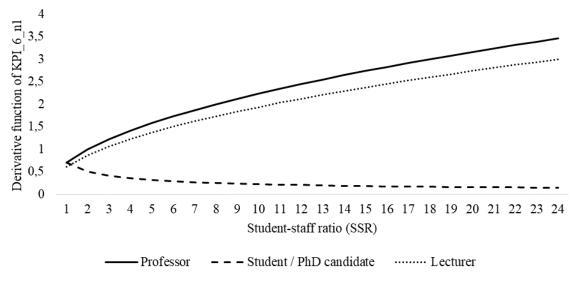


Figure 7. Derivative functions of KPI 6° (*Sustainable development*, 2007-2012), with respect to numbers of professors, number of students and PhD candidate, number of lecturers.

# KPI 6° Availability of academic staff (2013-2014)

In 2013, the KPI was changed to the following formula, where  $SSR_{ref}$  stands for the reference student-to-staff ratio which was indicated by the Regulation to be 13.

$$KPI\_6\_n2_i = \frac{(stu\_PhD_i)^{2/g}}{stu\_PhD_i + prof_i * SSR_{ref}} * \sqrt{prof_i}$$

To inspect the properties of this rather complex formula, derivatives were taken with regards to the numbers of students and professors.

$$\begin{split} \frac{\partial \breve{KPI}\_6\_n2_i}{\partial stu\_PhD_i} &= \sqrt{prof_i} \\ &* \left( \frac{3}{2} * \frac{\sqrt{stu\_PhD_i}}{stu\_PhD_i + prof_i * SSR_{ref}} + \left( stu\_PhD_i \right)^{3/2} \right. \\ &* \frac{-1}{\left( stu\_PhD_i + prof_i * SSR_{ref} \right)^2} \right) \\ \frac{\partial \breve{KPI}\_6\_n2_i}{\partial prof_i} &= \frac{\left( stu\_PhD_i \right)^{\frac{3}{2}}}{stu\_PhD_i + prof_i * SSR_{ref}} \\ &* \left( \frac{1}{2 * \sqrt{prof_i}} - \frac{\sqrt{prof_i} * SSR_{ref}}{stu\_PhD_i + prof_i * SSR_{ref}} \right) \end{split}$$

Then, the positivity/negativity of the derivative function was further inspected in order to determine which actions of HEIs were rewarded and which were punished by this version of KPI 6°.

$$\begin{aligned} &\frac{\partial KPI\_6\_n2_i}{\partial stu\_PhD_i} > 0 &\leftrightarrow stu\_PhD_i > 0 \\ &\frac{\partial KPI\_6\_n2_i}{\partial prof_i} > 0 &\leftrightarrow \frac{stu\_PhD_i}{prof_i} > SSR_{ref} \end{aligned}$$

# Increase of KPI 6° (Availability of academic staff, 2013-2014) in reaction to increase of number of academic staff

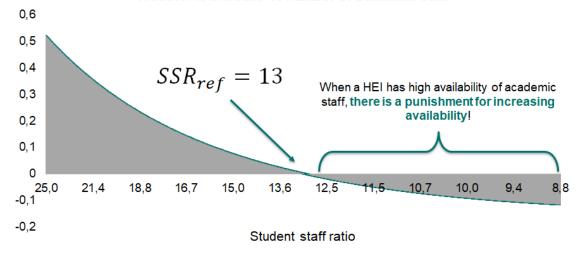


Figure 8. Derivative function of KPI 6° (Availability of academic staff, 2013-2014), with respect to numbers of professors. Assumed values of students (stu PhD<sub>i</sub> = 15 000) and SSR<sub>ref</sub> = 13.

Source: own elaboration.

The name of the KPI (Availability of academic staff) turned out to be somewhat contradictory to the properties of the function. First of all, increasing the number of students was always rewarded – although in reality it decreases the availability of academic staff. At the same time, increasing the number of academic staff is only rewarded when the HEI's SSR exceeds the reference level. When a HEI has high availability of academic staff (less than 13 students per professor), there is a punishment for increasing availability (as illustrated in Figure 8).

The contradictory name of the KPI and properties of this version of the KPI suggests that either the Ministry was in fact targeting a specific student-staff ratio (instead of just lower SSRs), or it was simply a mistake on behalf of the author of the KPI's formula.

## KPI 6° Proportional development of teaching (2015-2016)

In year 2015-2016, the KPI was again changed to a formula strongly resembling the one from 2007-2012. The new nominator took the following form.

$$KPI_6 n3_i = \sqrt{(full\_time_i + part\_time_i) * (stud\_PhD_i)}$$

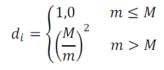
The most important differences between *Sustainable development* and *Proportional development of teaching* is that the latter takes into account all academic staff (not only the senior staff, i.e. professors and lecturers), differentiating only between full-time staff employed at the *i*-th HEI (full time;) and part-time staff (part time;). These changes were introduced to address the growing problem of double employment. This issue was also simultaneously addresses in KPI 3° *Academic staff*. Some issues were still unresolved however. Most importantly, as HEIs use public resources for both stationary and non-stationary programs, non-stationary programs are being subsidized indirectly. While this is not necessarily a negative thing, not accounting for non-stationary students in the KPIs distorts the result. These issues were finally addressed in 2017, when KPI 6° was incorporated into KPI 1°.

# KPI 1° Students and PhD candidates (2017)

In 2017, a new multiplier called 'indicator of didactic availability' ( $\mathbf{d}_i$ ) was introduced to KPI 1°. The nominator for each HEI is now calculated according to the following formula.

$$KPI_{-}1_{-}n_i = v_i * d_i$$

The indicator is a function of SSR, where *m* is the HEI-specific SSR and takes into account both stationary and non-stationary students. *M* is the reference SSR, set to be 13 for academic public HEIs. The indicator does not differentiate the HEIs which have better SSR than 13 but strongly affects the HEIs which exceed the reference level (see formula below and Figure 9).



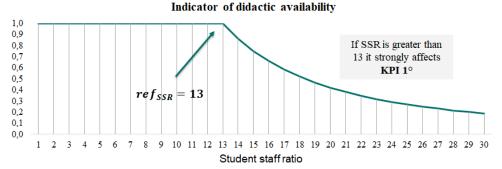


Figure 9. Indicator of didactic availability. Source: own elaboration.

## **KPI 3° Academic staff (2017)**

In 2017, a multiplier called 'indicator of academic potential' was introduced to KPI  $3^{\circ}$ . Its calculation bases on academic categories which are assigned by the Committee for the Evaluation of Scientific Units. As such, it is a purely pro-quality indicator. The new HEI-specific nominator is calculated according to the following formula ( $p_i$  stands for indicator of academic potential).

$$KPI_{-}3_{-}n_{i} = v_{i} * p_{i}$$

## 4.3. Pro-quality measures introduced in 2017

In 2017, a pro-quality stream was introduced in the funding-formula. The funds from this stream are awarded for two types of achievements. The first one is for departments with a stationary program which received a merit grade from the State Accreditation Committee. A non-intuitive feature of this reward is that the level of the award depends on the number of all students enrolled in the department.12 The second is awarded for newly-enrolled students who scored a maximum of points at the maturity exams. If a Student A scores a maximum of points in three elective subjects and Student B in one elective subject, the HEI will receive three times more money for enrolling Student A.13

#### 4.4. Discussion

From the beginning, the funding formula stressed the quantitative dimension of higher education. In all linear KPIs, increasing the scale of activity was always rewarded, even if weights were in place in order to differentiate between e.g. international and national research projects. After a decade, the empirical analysis confirms that HEIs were doing their best to increase the scale of their activity even in an environment of a

<sup>&</sup>lt;sup>12</sup> Therefore if Department A has one program with a merit grade and 100 enrolled in it, it will receive the same amount as Department B which has two programs in total, with 10 student enrolled in the program with a merit grade and 90 students enrolled in the other program.

<sup>&</sup>lt;sup>13</sup> HEIs typically require one or two elective subjects to be passed at the maturity exams.

demographic decline. Unfortunately, this approach proved to be rather unproductive. While the denominator of KPI 1° increased during the period (mainly due to the drastic increase of PhD students), the enrollment rate in tertiary education did not increase over the period (net enrolment rate was 38% in the academic year 2005/2006 and 37% in 2016/2017)14.

In the meantime, the significance of Polish higher education sector on the international arena does not seem to have risen significantly. Only two Polish HEIs are included in the Top 500 list of the Shanghai Ranking (University of Warsaw and Jagiellonian University) and both have been oscillating between the 300th and 450th placements.15

#### 5. Conclusions

KPI-based funding is a practical way of distributing funding for HEIs. It allows the regulator to make funding-allocation decisions without the need to discuss and negotiate with each of the 69 HEIs individually16. However it comes with challenges, and the case study of Poland illustrates many of them.

The most important lesson which can be derived from the Polish experience is that a smaller set of more sophisticated KPIs is more effective than a bigger set of simpler KPIs. Dropping KPI 5° (which did not serve any strategic objective) and incorporating the student-to-staff ratio into KPI 1° (*Student and PhD candidate*) were positive steps towards making the set of KPIs clearer and strengthening its impact on the shape of the sector of academic public HEIs in Poland. The proposed assessment framework has led us successfully in analyzing the case study of Poland, but of course it has some limitations, most importantly the costs associated with the incentivized actions have not been taken into account.

The challenge that the Polish regulator is facing is to effectively incentivize the increase in quality and importance of the Polish higher education sector. In that sense, the demographic decline can be seen as an opportunity for the HEIs, not a threat. However, the presented case study illustrates how strong of an inspiration the KPIs used in the funding formula are for HEIs. Therefore true quality measures are needed to incentivize HEIs to grow in that dimension. SSR is itself a proxy and so is the second pro-quality measure introduced in 2007 (see Section 4.3.)

Further research should focus on what would be suitable measurements of quality. In the context of the Polish higher education sector, developing more KPIs assessing output instead of input would be desirable. That presents a challenge, as output of higher education is more difficult to measure in comparison to input. In 2016, the Polish government launched Polish Graduate Tracking System, which aims at monitoring careers of graduates by merging employment and enrollment data. This

<sup>&</sup>lt;sup>14</sup> Central Statistical Office (GUS) (2017). Higher Education Institutions and their Finances in 2016. *Statistical information and elaborations*. Warszawa: Central Statistical Office.

<sup>&</sup>lt;sup>15</sup> http://www.shanghairanking.com, accessed on March 24<sup>th</sup> 2018.

<sup>16 69</sup> public academic HEIs received the subsidy from the fund for didactic and maintenance purposes in 2017, 67 HEIs in 2015 and 2016.

data provides significant research opportunities, however it will probably take time before the results can be incorporated to funding formulas.

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Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dnia 9 maja 2008 r. w sprawie zasad podziału dotacji z budżetu państwa dla uczelni publicznych i niepublicznych

Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dnia 9 kwietnia 2010 r. zmieniające rozporządzenie w sprawie zasad podziału dotacji z budżetu państwa dla uczelni publicznych i niepublicznych

Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dnia 25 maja 2011 r. zmieniające rozporządzenie w sprawie podziału dotacji z budżetu państwa dla uczelni publicznych i niepublicznych

Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dnia 8 lutego 2012 r. w sprawie sposobu podziału dotacji z budżetu państwa dla uczelni publicznych i niepublicznych

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Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dnia 7 grudnia 2016 r. zmieniające rozporządzenie w sprawie sposobu podziału dotacji z budżetu państwa dla uczelni publicznych i niepublicznych

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# Roles of Administrators in Supporting to Science Study for Basic Education of Secondary Educational Office Bangkok

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#### **Abstract**

The purposes of this research were to study factors that affects the development of science study and the roles of administrators in supporting science study in basic education of Secondary Educational Office Bangkok. The sampling groups are the school directors and head of science departments or science teacher of secondary educational office Bangkok total 400 questionnaires and 15 person for interview. The research tools were interview form and 5-level questionnaires. Statistic tools used in analysis are frequency, percentage, mean, standard deviation, factor analysis and content analysis. The results of the study were as follows: 1) Factors that influence the development of science study were the education institute, scientific skills, course management, and student factors. 2) Role of administrators in supporting science study are 2.1 manage course to efficiently improve scientific learning skills by focusing on learning activities and teaching innovation in accordance to scientific learning skills, problem solving skills, and analytical skills of students. 2.2 develop students' competencies along with science course management in relevance to measurement and evaluation. 2.3 design course by focusing on knowledge application skills so that students have scientific attitude and scientific learning skills to apply in daily life and 2.4 to give importance and encourage science study course continuously.

Keywords: Roles of administrators, Science Study, Basic Education



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#### Introduction

Science is important roles in our lives and work, because nowadays science is relevant to everyone in everyday, as well as the technology, tools, appliances and productivity. These are the result of scientific knowledge to combine with creativity and other science. Science has helped mankind develop the ideas, thinking, creative, critical thinking, skills of research, problem solving systematically with a variety of information. (Ministry of Education, 2008, Online)

At present, scientific and technological progress is widespread and rapid. It is also a tool to raise the standard of living of the people. Knowledge of science also enhances economic development and competition in the world. One of the important elements is the education that prepares people for society, science and technology, both for the producer and the consumer. It is reliable (Ministry of Education, 2008, p. 92). The future development of the country depends on knowledgeable people. Scientific and technological capabilities must be considered that cultivate interest in science is the most important.

Basic science learning learn to understand, appreciate and see the importance of nature and environment. The study of Thai children is worrisome. The average knowledge of Thai children is weakened, especially in the education of science. The quality of the output is not required by the labor market and the global community. According to the World Economic Forum (WEF) data, a total of 144 countries have indicated the quality of basic education in Thailand. leading to the 31st rank in the world and third in ASEAN, behind Singapore.

In terms of quality of basic education in Thailand, 2014 was 7th ranked in ASEAN (6th ranked in 2013) and the quality of the higher education system 8th ranked, although mathematical capabilities - science is quite good at 5th ranked. When analyzing that, Thailand is the third richest country in ASEAN (GDP per capita). But poorer countries can better manage their education.

The reason and support mentioned above. It's time for Thai children to improve their skills and develop their learning process, to step up to be the leading alternative to the labor market in the future. Assessments have raised the standard of quality of education. The learning process will necessarily involve the involvement of both public and private sectors in the skills needed to develop. Thai children, by way of arrangement, learning and teaching, the environment, attitude change, skills and processes will be change and develop of full potential learning that is essential to the learning process of students who are the future of the nation in preparation for recognition in the regional and global labor market.

#### **Objectives**

- 1) to study factors that affects the development of science study in basic education of Secondary Educational Office Bangkok.
- 2) to study the roles of administrators in supporting science study in basic education of Secondary Educational Office Bangkok.

## Methodology

The population used in this study was the school directors and head of science departments or science teacher of secondary educational office Bangkok. The sample size of this study were 400 for questionnaires and 15 person for interview. The instruments used in this research were 1) questionnaire consisting of 4 topics, namely, the teaching and learning management of science teachers. The questionnaire is divided into 3 episodes, part 1: on the general status of the respondents, part 2: discusses the factors influencing science teaching, it is a 5-level rating scale 80 items, part 3: attitudes towards the learning process in science education in basic education, under the Office of the Secondary Education Service Area Bangkok. 2) interview form about the roles of administrators in supporting science study.

Data collection, for the convenience of collecting data, 410 questionnaires were sent to sampling and the 400 questionnaires were returned, accounting for 97.56%. Statistic tools used in analysis are frequency, percentage, mean, standard deviation, Pearson's Product Correlation Coefficient, Content Analysis, And Confirmation Analysis. Confirmation factor analysis by using LISREL program.

#### Research results

The current status of science teaching practice management was found to be in accordance with the four science-based teaching principles consists of course management factor, student factor, education institute factor and scientific skills factor. In each factor, there were 2 sub factors in each, course management factor consist of science learning management, learning activity arrangement, and measurement and assessment criteria. Student factor consist of learner competency, science attitude and skill from science learning. Education institute factor consist of role of school principle, learning center and curriculum. Scientific skills factor consist of skill of problem solving, synthesis analysis skill and knowledge skills applied consecutively.

The state of teaching science in basic education in secondary education, Bangkok The results are shown in the following table.

Table 1: Mean and standard deviation of factors affecting the development of teaching skills in science. In the management of basic secondary education. In the whole of Bangkok.

Factors affecting skill development. Instructional Science	X	S.D.	Meaning
Course management factor	4.11	.481	high
Student factor	4.01	.565	high
Education institute factor	4.13	.496	high
Scientific skills factor	4.23	.361	high
Total	4.12	.424	high

From the table 1, it was found that the factors affecting the development of teaching skills in science in the management of basic secondary education in Bangkok, the overall was high ( $\bar{x}$ =4.12,S.D.=.424). Scientific skills factor was at the high level ( $\bar{x}$ =4.23,S.D.=.361). Education institute factor was at the high level

 $(\overline{x}=4.13, S.D.=.496)$ . Course management factor was at the high level  $(\overline{x}=4.11, S.D.=.481)$  and student factors was at the high level  $(\overline{x}=4.01, S.D.=.565)$  respectively.

Table 2: Results of the relationship analysis of factors affecting the development of teaching skills in science, in the management of basic secondary education, in Bangkok.

Factors affecting skill	Course	Student	Education	Scientific
development.	management	factor	institute	skills factor
Instructional Science	factor		factor	
Course management factor	1.000	.809	.814	.646
Student factor		1.000	.721	.578
Education institute factor			1.000	.737
Scientific skills factor				1.000

<sup>\*\*</sup> statistically significant at 0.01.

From the table, it was found that Pearson's product moment correlation coefficient (r) of factors influencing the development of teaching skills in science, in the management of basic secondary education, in the metropolitan area, course management factor have a positive relationship at a high level with the education institute factor, the correlation coefficient is .814. There is a high level of positive relationship with student factors, the correlation coefficient is .809 and the Education institute factor have a positive relationship at a high level with scientific skills factors, the correlation coefficient was .737. Student factor have a positive relationship at a high level with the Education institute factor, the correlation coefficient is .721. Course management factor have a positive relationship at a high level with scientific skills factor, the correlation coefficient is .646 and the student factor have a positive relationship at a high level with scientific skills factor, the correlation coefficient was .578, respectively, at the 0.01 level of significance.

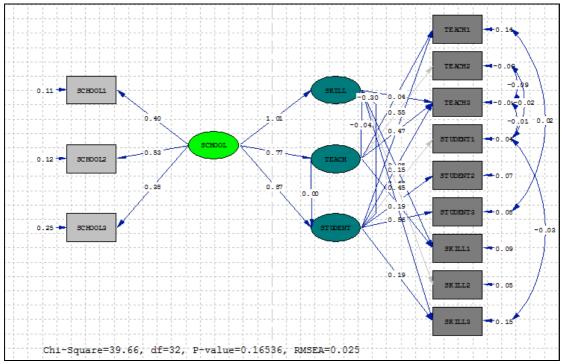


Figure 2 The results of hypothesis analysis.

The causal models of direct correlation coefficients are (1) the education institute factor and the observation variable in three variables, namely, the curriculum (SCHOOL1), the learning center (SCHOOL2) and The role of school principle (SCHOOL3) (2) Scientific skills factor (SKILL) the internal observation variables of the three variables: namely skill of problem solving, synthesis analysis skill and knowledge skills applied consecutively SKILL1, SKILL2 and SKILL3. (3) the course management factor with 3 observation variables, namely, science learning management, learning activity arrangement, and measurement and assessment criteria TEACH1, TEACH2, TEACH3.

From the picture, the causal models of direct correlation coefficients are (1) SCHOOL1, SCHOOL2 and SCHOOL3. (2) SKILL and TEACH3 direct to SKILL1, SKILL2 SKILL3 (3) TEACH direct to TEACH1, TEACH2, TEACH3 and TEACH3 are also directly related to SKILL1 and (4) STUDENT factors direct to STUDENT1, STUDENT2 and SKILL. In addition, there is a direct correlation between TEACH1 and TEACH3 and have a direct correlation with SKILL3.

Role of administrators in supporting science study in basic education of Secondary Educational Office Bangkok for the development of science learning skills in basic education management at the secondary level in Bangkok are as follows.

- 1) Learning management can increase students' ability to learn science effectively organized by the focus on activities and design learning. Related to the skill of learning science. Problem solving skills (1) to focus on the practical experience of learning by doing and self-learning; (2) to undertake the inquiry-based learning (3) collaborative learning for greater knowledge sharing. (4) Project-based learning. (5) Problem-based learning (PBL). (6) Brain-based learning. (7) Learning management and (8) educational management focusing on the integration of science, technology, engineering And mathematics (STEM), focusing on the use of knowledge to solve real life problems.
- 2) Develop students' competencies along with teaching and learning science were related to measurement and evaluation.
- 3) Teaching and learning management focuses on the application of knowledge give students a scientific attitude and the skills of learning science can be used in daily life. Guidelines for the management of science teaching students are effective. This is because of different learners. (1) Teachers focus on the importance of the learner or individually. (2) Focus on the students to get the most out of the practical experience. (3) Group the students to practice together. They are divided into different groups for students with different aptitudes. (4) Flexible learning management. (5) Provide a variety of modern issues related to the daily life of the students. (6) Focus on practical examination rather than theoretical. (7) Use modern teaching materials. (8) Ask questions and engage students in teaching and learning activities. (9) Reduce learning time, learn time in activities that are appropriate for students.

Guidelines for developing science skills. (1) To encourage the production of teaching and learning materials that are more modern and diverse. (2) Promote the development and examination of scientific experimentation equipment and (3) develop research resources access to the media or teaching resources is easy.

#### **Conclusion and Discussions**

1) Factors that influence the development of science study were the education institute, scientific skills, course management, and student factors. 2) Role of administrators in supporting science study are 2.1 manage course to efficiently improve scientific learning skills by focusing on learning activities and teaching innovation in accordance to scientific learning skills, problem solving skills, and analytical skills of students. 2.2 develop students' competencies along with science course management in relevance to measurement and evaluation. 2.3 design course by focusing on knowledge application skills so that students have scientific attitude and scientific learning skills to apply in daily life and 2.4 to give importance and encourage science study course continuously.

### Acknowledgements

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# Trend to Development Learning and Teaching for Music Student to Become Music Business Owners

Yutakorn Sarikkaganon, Suansunandha Rajabhat University, Thailand

The Asian Conference on Education & International Development 2018 Official Conference Proceedings

#### **Abstract**

This research is qualitative research collecting data by in-depth interview with four entrepreneurs from music store in Bangkok to study instrument type, musical equipment, as well as the individuality qualities or personality for a good music entrepreneur, and guidelines for developing curriculum in Suan Sunandha Rajabhat University for this to be a career focus for bachelor degree students.

The research results trend to development learning and teaching materials for bachelor degree students at SSRU. To be music entrepreneur, it was found that student should play various basic musical instruments and should be able to demonstrate sound knowledge to customers , able to define in each musical instrument and each equipment such as wind , brass , string , percussion and Keyboard instrument include music equipment such as mouthpiece , reed , string , peg. In depth knowledge of each instrument is required, along with IT ability, and the skill to communicate effectively in English, honest and punctual.

Keywords: Music entrepreneur, Music student, Bachelor, Suan Sunandha Rajabhat University



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#### 1.Introduction

The present there are many universities in Thailand had to focus on musical subject and opened to the bachelor's degree majors in many universities, the popular musical subject in Thailand today are four major branches is a music composition, music performance, music education and musicology. (by this detail) Music composition can refer to an original piece of music, the structure of a musical piece, or the process of creating a new piece of music. People who practice composition are called composer. Music performance in the performing art generally comprises an event in which a performer or group of performers present one or more work of art to an audience. Music education is a field of study associated with the teaching and learning of music. It touches on all learning domains, including the psychomotor domain (the development of skills), the cognitive domain (the acquisition of knowledge), and, in particular and significant ways, the affective domain (the learner's willingness to receive, internalize, and share what is learned), including music appreciation and sensitivity. Music training from preschool through post-secondary education is common in most nations because involvement with music is considered a fundamental component of human culture and behavior. Music, like language, is an accomplishment that distinguishes humans as a species.

**Musicology** is the scholarly analysis of, and research on, music, a part of humanities. A person who studies music is a musicologist and musicology study about classical music or western music. The department of music of Suan Sunandha Rajabhat University under the faculty of fine and applied art had the curriculum for bachelor is music performance in the performing art generally comprises an event in which a performer or group of performers present one or more work of art to an audience. It shown the students study them major instrument but music establishments must know many kinds of music and how to teach student have ability in various of music. For developing curriculum in the future.







# 2. Objectives

- Study the good characteristics for music student to be music establishments.
- To propose the way for curriculum development from learning to working.

# 3. Methodology

This research is qualitative research, collecting data by in-depth interview with four entrepreneurs from music company in Bangkok include:

PMS Music Academy (Central Plaza Pinklao Bkk.)





The Band Music School company (Karnjana-Pisek Rd. Bkk.)

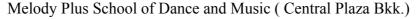




YAMAHA Music Company (Pratumwan District Bkk.)











Data analysis is based on analyzing qualitative data by synthesizing four places entrepreneur by the topic how to prepare students to become music establishments or entrepreneur in the future. For developing curriculums to standard specification at our department of music by summarizing the interview.

#### 4. Results

The research results found that individuality ,qualities and personality match with a career about music establishments was:

- Should play a various basic musical instrument particular popular instrument such as Guitar, Piano and Percussion at least able demonstration to customer.
- Able define identity in each musical instrument and each equipment.
- Able communicate effectively in English with foreign customer at least the price and instruction in each instrument or equipment.
- IT ability such as grouping product or searching big data by website. Realize honest and punctual to customer.

### 5. Conclusion

This research is qualitative research, collecting data by in-depth interview in four establishments in Bangkok from the entrepreneur of them, for studying the good characteristics to be music worker or music entrepreneur to be adjusting curriculum in the future.

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## Pipat Ensemble Management for Music Teacher in Secondary School

Prasan Briboonnanggoul, Suansunandha Rajabhat University, Thailand

The Asian Conference on Education & International Development 2018 Official Conference Proceedings

#### **Abstract**

The objective of this qualitative research was to study about Pipat ensemble for music teacher in secondary school in skill and knowladge. The research tool was an in-depth interview of music teacher in secondary school. The samples in this research include 17 persons who were a music teacher in secondary school in Bangkok. The results of the study revealed that skill and knowledge which important in Pipat ensemble for music teacher in secondary school management consist of 1. Basic knowledge for each music instrument in Pipat ensemble such as Ra-Nad Ake, Ra-Nad Tum, Kong-Wong Yai, Pee Nai, Ta Poon etc. 2. Understand in the piece that used in various festivals, for example: wedding ceremony, ordination ceremony, and house warming ceremony 3. Understand how to control the Pipat ensemble, especially main melody and rhythm.

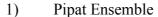
Keywords: Pipat ensemble, Music teacher, Secondary school



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#### Introduction

Thailand is a prosperous nation for a long time. To accumulate and transfer value of Thai wisdom to the present. Many values represent the national identity, especially, the arts, culture, performances and music. Thai music is a cultural expression that reflects one's way of life. Most of Thai people societies are fun, calm, and polite in practice. Music has been developing for a long time and help to society in many ways worldwide. Now, the society, economy, politic, and entertainment are developing and getting bigger. Thai music qualified for all four categories. There are three kind of Thai music ensemble;





2) Krueng Sai Ensemble



# 3) Mahori Ensemble



One of the most important is Pipat ensemble. Pipat ensemble takes the important role in Thai society many different ways, such as, the birth ceremony or the death ritual. In Education, the importance of development and conservation is recognized in both inside or outside the education system. There are Thai music classes in the Pipat Band from elementary school to higher education. Therefore, the teaching and development of Thai music ability in the Pi Pat band are the things the be in concern and paying attention.

Therefore, it is necessary to find a way to improve skills and the Pipat ensemble management. For the instructor, who in are in class need to be qualitative and consistent with particular knowledge of the high school levels. They need to also preserves and develops the national culture of music.

# **Objective**

The objective of this qualitative research was to study about the skill and knowledge in Pipat ensemble management for music teacher in secondary school.

# Methodology

The research tool was an in-depth interview of music teacher in secondary school. The samples in this research are including 17 persons that were a music teacher in secondary school in Bangkok.

Scope Question for Interview

- 1) Skill and knowledge in Pipat ensemble for music teachers
- 2) Pipat ensemble management for music teacher in secondary school

#### **Conclusion and Discussion**

The results of the study revealed that skills and knowledge, which important in Pipat ensemble management for music teacher in secondary school that consist of :

- 1. Basic knowledge for each music instrument in Pipat ensemble such as
  - Ra-Nad Ake
  - Ra-Nad Tum
  - Kong-Wong Yai
  - Pee Nai
  - Ta Poon etc.
- 2. Understand the song that used in various festivals, for example: wedding ceremony, ordination ceremony and house warming ceremony
- 3. Understand how to control the Pipat ensemble, especially the main melody and the rhythm, which are part of Pipat ensemble management for music teacher in secondary school, such as topic as followed;
  - 1) Teaching musical instruments in Pipat ensemble
  - 2)Teaching music rhythm
  - 3) Teaching Thai music theory
  - 4)To manage Pipat ensemble
  - 5)To perform in other opportunity

# Acknowledgements

Prasarn Boriboonnanggoul thanks Suansunandha Rajabhat University for financial support for the research project

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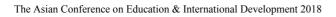
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Official Conference Proceedings

## Technique of Thai Singing for Thai Musicians

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The Asian Conference on Education & International Development 2018 Official Conference Proceedings

#### **Abstract**

The purpose of this research is to conduct a study of Thai Singing technique for musician. The research tool was an interview by question which was created by the researcher. The question in the interview sought information on their viewpoints concerning the importance of Thai Singing technique for musician. The samples of this research used were 15 Thai musicians.

The results of the research revealed that the important technique were comprised of 1.Knowing piece in the various type of music such as: Plang Tab, Plang Taoi, Plang Pasa, Plang for literature play etc. 2.Understand in Thai music rhythm, For example: Ching and Na Tub, Plang Sarm Chan, Plang Song Chan and Plang Chan Deaw 3.Knowing about skill for singing "Auan" style (Auan style is voicing in melody switch with lyrics 4.Understanding in Thai singing skill, such as singing punctuation, breathing and falsetto etc.

Keywords: Thai singing, Thai musicians, Thai song



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#### Introduction

Thai music is the one of culture in Thailand. There are many kinds of Thai music, include instruments, bands, and songs. There are 4 groups of instruments and a lot of instruments in each group, for example, Jakae, Pin, Krajubpi are string instruments that play by picking, Saw Dueng, Saw-U, Saw Sam Sai are string instruments that play by using bow, Ranad, Kong are percussion instruments that play by hit it, Klui play by blowing, etc.

There are 3 ensembles in Thai bands: Pipat, Krung Sai and Mahori. Pipat include percussion instruments, Krung Sai Pipat include string instruments and Mahori ibclude all kinf of instruments.

There are a lot of Thai Music Song form such as Plang Tub, Plang Taow, Plang Phasa, and Plang for literature play. In each songs, if the songs are melody and poem, the musician must expert in playing and singing that songs. Thai singing musician must know many technique in perform that is important to study Technique of Thai singing for Thai musicians.

# **Objectives**

- 1) to conduct a study of Thai Singing style in Thai songs form
- 2) to study technique and methods of singing for musician

# Methodology

This research is Qualitative Research. This study collected data by in-depth interview from Thai music teachers and Thai singing musicians totally 15 persons to be selected by specific persons who has experience in Thai singing more than 10 years. Scope of questions include: Thai songs form, Thai music rhythm, Technique of Thai singing and how to sing well.

#### Research results

Thai songs form consist of Plang Tub, Plang Taow, Plang Phasa, Plang for literature play etc. Plang Tub is the set of songs that combine many songs together by playing each song continuous. In each Plang Tub was selected the songs from goal of Plang Tub that can be 2 or 3 songs to more than 10 songs. Plang Taow are the song of many rhythm by starting from slow rhythm to fast rhythm. Plang Phasa are many style of nature, for example: Lao, China, etc. Plang for literature play are the song for playing performance.

There are 2 kinds of musical instruments: Ching and Klong (drum). The pattern of Thai music rhythm (basic rhythm) are 3 chan, 2 chan and Chan deaw. 3 chan is slow rhythm, 2 chan is faster than 3 chan and chan deaw is faster than 2 chan. Drum have 2 rhythmic pattern that call Na Tub consist of Prob Kai and Song Mai.



Figure 1 Ching https://www.youtube.com/watch?v=g5ADF6EIHG4



Figure 2 Klong (Ton Rummana) https://www.pantipmarket.com/mall/sapaya/?node=products&id=288291

There are a lot of special Technique of Thai Singing Style, for example "Auen". The sound for "Auen" are au, aui, aung,etc. that is a technique of pronunciation in Thai music. The melody of Thai song are difference in song form, so singing musicians must know the melody and understand in each song for singing style. More than that, the poem for singing are very difficult language, singing musicians must have clear punctuation so that it can be melodious and combination between Auan and melody. For singing clear and correct, Thai musician used note for learning and practice. Note for singing are very specific more than the other note of instruments.



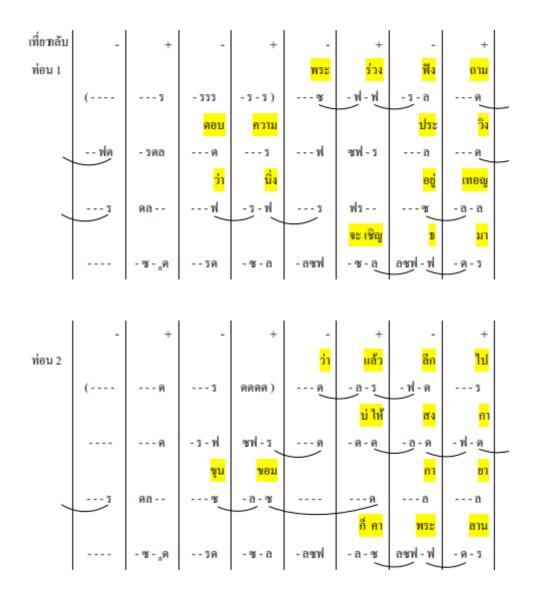


Figure 3 Note of singing melody http://58.181.147.16/bitstream/ssruir/348/1/068-53.pdt.pdf

#### **Conclusion**

The results of the research revealed that the important technique were comprised of 1.Knowing piece in the various type of music such as: Plang Tab, Plang Taoi, Plang Pasa, Plang for literature play etc. 2.Understand in Thai music rhythm, For example: Ching and Na Tub, Plang Sarm Chan, Plang Song Chan and Plang Chan Deaw 3.Knowing about skill for singing "Auan" style (Auan style is voicing in melody switch with lyrics 4.Understanding in Thai singing skill, such as singing punctuation, breathing and falsetto etc.

Language are important in singing, Thai singing musician must know Thai music very well, must have skill about pronunciation, singing melody, and understanding in singing punctuation, breathing, emotion and falsetto etc.

#### **Discussion**

Thai musicians must know about Thai songs, all of Plang Tab, Plang Taoi, Plang Pasa, Plang for literature play, Thai Music Rhythm and technique of Thai singing. Thai singing musicians must know about identity of Thai music, more than that, they studied about Thai words, intonation mark, pitch in Thai language and Thai singing musicians must must know the emotion of the songs, must sing "Auen" in many pattern and practice a lot in everyday.

# Acknowledgement

The research was conducted under the policy of Suan Sunandha Rajabhat University. The researcher would like to thanks Suan Sunandha Rajabhat University, the Music Department, and more importantly, Asst. Prof. Dr.Sansanee Jasuwan and all of faculty members of the music departments.

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# Research into Metaphor-type Art Teaching

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The Asian Conference on Education & International Development 2018 Official Conference Proceedings

#### Abstract

In the description of metaphor, the western Metaphor Theory is applied to the word "the wicker swaying in the wind is the lithe and graceful dance" and its allusion is transformed into linguistic phenomenon in the idiom, but it implies the more meaningful mental phenomena (Wang, 2011). The means of metaphor is used as the art teaching mode and it is expected that the art has the function of conveying thematic meaning and artistic conception by virtue of "metaphor" in rhetoric.

This research adopted literature exploration method to discuss Metaphor Theory and rhetoric and applied questionnaire survey to analyze the effect of students in Art Department on metaphor-type creative teaching. The research objectives are shown as below: possibility to apply Conceptual Metaphor Theory to art teaching.

- 1. To research Conceptual Metaphor Theory and analyze the possibility to apply Conceptual Metaphor theory to art teaching.
- 2. To set up the teaching method where visual elements are converted into creation contents
- 3. To apply the figures of speech of metaphor to develop art teaching mode having the metaphor effect.

The method where visual elements are converted into creation contents is sought from the metaphor and combination skills and the combination contains the creation methods of concept formation, material expression and symbolic implication to construct the metaphor art form constituted by tenor, vehicle and comparative word. This innovative teaching method integrating metaphor and combination should have the innovative significance to art teaching and creation.

Keywords: Metaphor, Art teaching, ceramic, creation, rhetoric



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#### Introduction

Due to the rapid development of science and technology and the development of the Internet and mobile technology, student's learning is no longer limited to classroom teaching. According to the investigation by PEW research center, during the period from September 12 to September 18, 2014, into 1,066 users who are over 18 years old and have access to the Internet and smartphone, 87% online interviewees in the U.S. indicated that the Internet and mobile phone can improve their ability to learn new knowledge and skills (STPI Technology Industry Information Room, 2014). Thus, it is important issue for flipped classroom to teach students applying the new tools and methods to face the new interdisciplinary knowledge in the diverse learning.

In various fields, intelligent learning is a new wave since the starting of the new knowledge based economy on the Internet. Hands-on practices in classrooms or mere description of the outdoor landscape can no longer meet the evolution of modern society. In particular, the depiction methods of cultural contents are deficient.

In modern times when the culture creativity is demanded, how to extract the cultural core value and improve the learning effectiveness have become the new challenge of the art teaching. In this research, the method of metaphor is used to seek for the cultural contents. For instance, as described by the book *Metaphors We Live By* George Lakoff & Mark Johnson (1980), those metaphors generated through cultural inheritance and have shaped our thinking contents and thinking methods. In other words, our understanding of culture is mostly defined by metaphors, which has also opened the new era for metaphorical language cognition (Ou, 2012).

In order to achieve the new cultural and interdisciplinary learning method, this research attempted to use the metaphor effect of rhetoric and Conceptual Metaphor Theory (CMT) to discuss the semantic transformation. Through the alternative approaches of metaphor, the abstract cultural meaning can become the real description. As for the students in drawing course, the metaphor method can be realized in the cultural creation and description through this teaching procedure and the thematic interpretation for culture can be formed.

## Literature Review

This research applied metaphor effect of rhetoric and CMT to the drawing teaching, which has the innovation effect on the scene of art education and can be helpful to the applications in other fields of disciplines. In face of the cultural analysis and course teaching of creativity performance, the drawing culture and traditional knowledge can be reused to make the research more significant.

CMT was proposed by cognitive linguists George Lakoff and Mark Johnson in 1980. Compared with the traditional metaphor theory, the main contribution of CMT is its explanatory ability in the systematization of general non-literary language. Moreover, one of its key points is the use of metaphor is unconscious and its operation is to understand the indirect and abstract world based on the body direct experience (Shie, 2006).

CMT means that human's use of action and thinking concepts is systematically the

metaphorical performance. In the understanding, CMT can rely on some concrete and practical shapes or characteristics to understand the abstract and incomprehensible concepts. The metaphor is pervasive in people's daily life. Not by choice, people tend to use the conceptual system having the metaphor characteristics to construct the world perceived (Yang, 2002). The cultural connotation is constructed according to this theoretical basis and the cultural phenomenon is explained according to the semantic expression.

In this research, "metaphor" of rhetoric was used as the cultural analysis skill. Metaphor is composed of 3 parts: tenor, comparative word, and vehicle. Tenor refers to something or somebody to be described; vehicle refers to something or somebody in other areas having the common similar characteristics with the tenor, and it is used to draw an analogy or describe the tenor. Comparative word refers to the words connecting tenor and vehicle (Guan, 1993).

Metaphor refers to a figure of speech of "understanding one object by using another object" in the philology. Since ancient times, the metaphor of "expressing the meaning by relying on objects" has been widely applied and developed (Yen, 2011). The words that are commonly used in Chinese language are metaphors. When the two objects are originally irrelevant, people attempt to make them equal to each other due to their similarities, it is called the metaphor (Chao, 2009).

#### **Research Content**

In order to achieve the cultural discussion and interdisciplinary teaching framework, this research took the historical site as the subject. The teaching method contains 4 steps. The symbolic elements of culture and historical sites were extracted, so as to further train the students in art and design to use smartphones and drawing system to depict the cultural value of historical sites.

In terms of research framework, the materials of historical sites were collected and the photos of historical sites were sorted out and integrated to look for the representative objects and reflect the hidden cultural characteristics, so as to further "rely on the object to express the meaning" to choose the drawing contents and draw them into the visual composite image. Thus, this picture can be used to replace the original impression of this historical site.

As for the historical sites, this research selected the historical site officially recognized by Taiwan – Yunxu Building. Yunxu Building is the junior high school house built in 1968 and its building style is based on the uniform schoolhouse design drawing provided by the Ministry of Education of Taiwan. In 1989, this junior high school handed over the campus of Yunxu Building, and it became one of the newly established university campuses.

Nowadays, Yunxu Building has not been used effectively, so it is expected that this historical site can be used for cultural analysis and drawing to further become the data of reuse of historical site in the future. It is one of the objectives of this research how to look for the value of Yunxu Building from the appearance, internal decoration or equipment.

The research framework and contents are shown as below:

Introduction Teaching method of innovative art Interdisciplinary learning method Literature Review Conceptual Metaphor Theory Means of metaphor of rhetoric (metaphorical presentation) Research Content Material collection Theme analysis Metaphor method Constructional drawing Questionnaire Analysis Conclusion

Table 1. Research Structure

#### 1. Data collection

In the research, 41 freshmen in Design Department of the university were chosen to go through the 4-week learning procedure. In the first week, students experienced the architecture of Yunxu Building, and used smartphones to take pictures and made sketches. The drawings were transferred into files, and uploaded to the Facebook group, so as to share the feelings toward historical site and discuss the contents of the pictures.

## 2. Theme analysis

During the visit, students were required to establish the data in the form of characters, symbols, pictures and sketch for the historical site. They then analyzed the key words related to the theme from the data contrast, and chose the building objects or contents to describe this historical sit. The pattern must be related to the theme and can represent the cultural significance and sense of beauty of this historical site.

## 3. Metaphor method

Students quoted the above-mentioned materials to choose the pictures corresponding to the theme and applied the means of metaphor so that the collected picture data can be used to present the imagination and vision for this historical site. For instance, the characteristics of the building stairs are described as below: "The stair is the road to the history". In this metaphor, stair is the tenor, "is" is the comparative word and "the road to the history" is the vehicle. In the image, the stair composition is stressed and it links the entire picture, so that the historical site can present the cultural information by means of metaphor.

## 4. Constructional drawing

The collected data were used to find the image which is the best for the theme drawing according to the group discussion. The metaphors and images were classified into main visual map, minor visual map and the additional visual map. The theme description was combined in the picture to form the creative drawing having the aesthetic culture and imagination.

## Questionnaire analysis on teaching achievements

In order to verify students' change before and after the learning, questionnaire survey was adopted to test the teaching achievements. There are mainly 3 scopes in the questionnaire items: (1) background; (2) drawing learning effectiveness; (3) degree of preference. This questionnaire adopted the closed selective questionnaire (fixed-alternative questions), namely multiple answers were listed and the interviewees were required to freely choose 1 correct answer from the 5 answers. The scores for each answer are shown as below: 5 scores for "Strong", 4 scores for "Moderate", 3 scores for "Basic", 2 scores for "None" and 1 score for "Absolutely none". After the scoring and average analysis, the degree of answers or effectiveness analysis could be determined.

There were totally 41 investigated samples. In terms of gender, males account for 35% and females account for 65%. In terms of education background, senior high school accounts for 54% and higher vocational school accounts for 46%. 41 questionnaires were collected and the response rate was 100%. Under the anonymous questioning, there were 37 valid questionnaires and 4 invalid questionnaires and the effective rate was 90.24%. The scoring for the questionnaire on integrated learning effectiveness is shown as below:

Table 2. Scoring for the questionnaire on learning effectiveness

Question	Answer	Score	Vote	Total score	Average	Percentage
	Strong	5	2	10		5.40
	Moderate	4	4	16		10.81
1. Previous drawing	Basic	3	14	42	2.59	37.84
creation concepts	None	2	11	22	2.55	29.73
	Absolutely none	1	6	6		16.22
	Strong	5	2	10		5.40
	Moderate	4	7	28		18.92
2. Current drawing	Basic	3	19	57	3	51.35
creation concepts	None	2	7	14		18.92
	Absolutely none	1	2	2		5.40
	Strong	5	3	15		8.108
	Moderate	4	2	8		5.40
3. Previous drawing	Basic	3	12	36	2.57	32.43
technique	None	2	17	34		45.95
	Absolutely none	1	2	2		5.40
	Strong	5	3	15	3.03	8.11
	Moderate	4	3	12		8.11
4. Current drawing	Basic	3	23	69		62.16
technique	None	2	8	16	3.03	21.62
	Absolutely none	1	0	0		0
	Strong	5	1	5		2.70
	Moderate	4	4	16		10.81
5. Previous theme	Basic	3	13	39	2.62	35.14
constitution ability	None	2	18	36		48.65
	Absolutely none	1	1	1		2.70
	Strong	5	1	5		2.70
	Moderate	4	4	16		10.81
6. Current theme	Basic	3	19	57	2.81	51.35
constitution ability	None	2	13	26		35.14
	Absolutely none	1	0	0		0
7. Previous ability to	Strong	5	0	0		0
transfer the cultural	Moderate	4	2	8	2.27	5.40
elements into design	Basic	3	10	30		27.03

	None	2	21	42		56.76
	Absolutely none	1	4	4		10.81
	Strong	5	0	0		0
O Current chility to	Moderate	4	5	20		13.51
8. Current ability to transfer the cultural	Basic	3	19	57	2.76	51.35
elements into design	None	2	12	24	2.70	32.43
_	Absolutely none	1	1	1		2.70
	Highly helpful	5	3	15		8.11
9. Helpful to your	Very helpful	4	12	48	3.3	32.43
creation concepts	Helpful	3	17	51		45.95
	Not helpful	2	4	8		10.81
	Absolutely not helpful	1	0	0		0
	Highly like	5	4	20		10.81
10. Like the	Quite like	4	3	12		8.11
metaphorical or	Like	3	25	75	3.16	67.57
combined teaching	Dislike	2	5	10	] 3.10	13.51
type	Highly dislike	1	0	0		0

According to the analysis results of the questionnaire in Table 2, the highest score is for "current drawing technique", which is 3.03, meaning that 37 respondents have improved their drawing ability after the teaching. Compared with "Current drawing technique", which has the highest score, the score of "Previous ability to transfer the cultural elements into design" is 2.27, which is lower than the average of 3. In other words, students should first improve their understanding and application of cultural elements.

As a whole, the average of drawing ability after the learning (questions 2, 4, 6, 8) is 2.90, which has been increased compared with the average (2.51) of previous drawing ability (questions 1, 3, 5, 7). It shows that the learning module in the research can significantly improve students' drawing ability.

As for questions 9 and 10, the average score of the degree of preference for the drawing teaching is 3.24, which is obviously higher than the average score of 3. Therefore, generally speaking, the metaphor used as the drawing teaching method is recognized by students.

### Conclusion

Drawing in art has been taught by sketching for students to learn technique and cultivate creation. Under the advancement of digital technology and the demand for interdisciplinary culture, the traditional teaching approach cannot cope with the

diverse and changing manifestation of drawing. Under the design demand, the drawing system with themes and cultural values needs creative teaching contents.

In this research, metaphor and CMT were used to transfer the depicted objects into constructional image with expressive imagination and sense of beauty. According to the research results, 65% of the respondents could improve their ability in drawing and constructional image through this method. Students saw the depicted scene, and discussed the planning to introduce the historical value of site to the public. Historical sites cannot express themselves, but the cultural context can be presented in the history and the cultural sweetness can be appreciated through the analysis and transformation of cultural elements.

Interdisciplinary cultural content is a dilemma faced by the modern education because its scope is broad, covering fields of history, politics, society and market. The complicated factors cannot be expressed by mere depiction. The methods of metaphor and constructional type such as the exploration of metaphorism in psychology, thought and experience are used as the constructional and situational artistic creation forms (Metaphor Art Net, 2017). When this form is combined with the idea of flipped classroom, it is helpful to the analysis of future culture and art contents to further deduce the creative art teaching type. This is the development expected by this research.



Figure 1: The upper left picture is the students' record of historical site and the rest are the students' drawing achievements

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# Developing Statistical Reasoning and Thinking Assessment for Engineering Students: Challenges and New Direction

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#### **Abstract**

In this paper, an assessment for students' ability in critical thinking within statistics content is discussed. Despite instructors' awareness on critical thinking as one of essentials 21<sup>st</sup> century skills, it remains unclear about how to develop the instructional framework for teaching, learning and assessing critical thinking in statistics domain. Moreover, there is an urgency to reform statistics classroom include; the way instructor teach statistics, the way students learn statistics and how to assess statistics learning outcomes to support critical thinking. In order to identify and design the critical thinking framework, the objectives of this study are; 1. To highlights issues related to assessing statistical reasoning and thinking for educators instructional strategies. 2. To provide a framework for assessing statistical reasoning and thinking.

3. To develop instructional design for teaching thinking in statistics classroom. The implications for classroom teaching will be explored through final examination results. The challenges are identified and new directions for promoting critical thinking in statistics classroom are identified.

Keywords: critical thinking, higher order thinking, statistics education, thinking routines



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#### Introduction

Improving teaching and learning statistics has been extensively discussed in several literatures (e.g., Ben-Zvi & Garfield, 2005; Chance, 2002; English & Watson, 2015; Garfield & Chance, 2000; Garfield & Ben-Zvi, 2007; Jones et al., 2001; Pfannkuch & Wild, 2004; Sedlmeier, 2000; Tishkovskaya & Lancaster, 2012) and the research in statistics educations is continuously demanding especially in the current technology advancement and new challenge such as in the area of data science and big data.

Teaching statistics with emphasize on statistical thinking, use more data and concepts, and fostering active learning were proposed by Cobb (1992). Such areas appear particularly important with the exponential increase demand for data analytics due to data collection capabilities in the era of big data. For such reason, the traditional teaching and learning practices are unpromising in helping student's to think with data (McNamara, 2015). For example, Finzer (2013) suggested integration of data science into content area can be important consideration to inculcate learners with data as the habits of mind. The role of data is also discussed by Neuman et al. (2013) in which real-life data is important for illustrating statistical concepts, practice calculations, and application of statistics.

Statistical investigation is known as the process of conducting investigations from data collection, to exploring data, to statistical inference, to drawing appropriate conclusions (Chance et al., 2015). Moore (1990) pointed out that data should be viewed as numbers with context. The interpretation of statistical result should be delivered into its context or else students are not learning the process of statistical investigations. Moreover, integrating context of a problem with its statistical results increase the opportunities of students to interact, interpret and draw conclusions about data (Pfannkuch & Wild, 2003).

Learning statistics means learning to communicate using the statistical language, solving statistical problems, drawing conclusions, and supporting conclusions by explaining the reasoning behind them (Garfield, 1995). One reform has focused on content and pedagogy, shifting the focus from computation and procedures to an emphasis on statistical reasoning and thinking (Moore, 1997).

Clarifying statistical learning outcomes can help statistics instructors better to design and use appropriate assessment to align with the learning goals highlighted and value by current research in statistics education. These outcomes refer to statistical literacy, statistical reasoning and statistical thinking. In this paper, an assessment of students' ability in statistical reasoning and thinking skills are presented and discussed. For this purpose a selected topic for final examination evaluation is constructed according to framework developed by DelMas (2002b).

### **Problem Statement**

The need to reform statistics classroom includes; the way instructor teach statistics, the way students learn statistics and how to assess statistical learning outcomes specifically statistical reasoning and thinking. In addition to using lecture-and-listen format predominantly, many such courses heavily rely on having students do assignments in textbooks or in computer labs, and take multiple choice or traditional

tests emphasizing formulae, rote memorization skills and procedural knowledge, as opposed to conceptual knowledge of statistics (Garfield, 1995).

This is why students often see the content as a sequential set of tools and procedures and do not see how the concepts are interrelated (Garfield & Ben-Zvi, 2009). Ben-Zvi & Garfield (2015) highlighted that the main argument about statistics education is the traditional approaches of teaching statistics focus on procedures and computations skills which do not expose students to reason and think statistically. For example, as presented by Friel, et al. (2006) many students are taught mean, median, mode, and graphs with an emphasis on how to construct them rather than how to use them to think with data. An emphasis on students' development of conceptual understanding rather than a focus on procedural knowledge are highlighted by Garfield & Chance (2002).

On the other hand, higher order thinking skill requires learner to embrace critical, reflective, metacognitive and creative thinking. Specifically in statistics education, reflecting about data, interpreting it and making decision are one of essential processes in statistical investigations. Therefore, using data to extract meaning and insight about real context and real situation should be an important outcome in statistics classroom. However, it can only achievable if the instructors are motivated to go beyond procedures and computations.

Hence, we believed that the ability to develop statistical investigations process through reasoning and thinking are more crucial rather than ability to grasp merely on the statistical procedures. Currently, such skills are not reflected as the learning outcomes in a statistics classroom. We would expect greater learning outcomes as suggested in Friedrich et al. (2000) to teach statistics that highlight reasoning, understanding and interpretation of data rather than merely computation of statistical formulas.

Assessment alone may not sufficient to inform instructor about students' disposition in statistical reasoning. Those with poor statistical reasoning disposition can still do well in final examination (Chance & Garfield, 2001). Therefore, an on-going research study is conducted in order to discover ways for developing effective culture of thinking in statistics classroom in transferring and strengthening statistical literacy skills, ability to think and reason statistically among engineering students at Universiti Malaysia Perlis. Therefore, to achieve the educational goal, the objectives of this study are; 1. To highlights issues related to assessing statistical reasoning and thinking for educators instructional strategies. 2. To provide a framework for assessing statistical reasoning and thinking. 3. To develop instructional design for teaching thinking in statistics classroom

## Statistical Literacy, Reasoning and Thinking

The definition of statistical reasoning and thinking is not defined in common. There are a lot of definitions given in the literatures. Among the definition is; it may be defined as the way people reason with statistical ideas and make sense of statistical information (Garfield, et al. 2003). To understand how statistical literacy, reasoning, thinking have been described in the literatures, we presented the definitions in the following sub-section.

## Statistical Literacy

"Statistical literacy is defined as the ability to interpret, critically evaluate, and if needed communicate about statistical information, arguments, and messages" (Gal, 2002, p.1). In Garfield et al. (2003) it includes "understanding words and symbols, being able to read and interpret graphs and terms" (p.3). Meanwhile, Wallman (1993) "argued that statistical literacy is the ability to understand and critically evaluate statistical results that permeate daily life, coupled with the ability to appreciate the contributions that statistical thinking can make in public and private, professional and personal decisions" (as cited in Gal, 2002, p.2).

## Statistical Reasoning

"Statistical reasoning may be defined as the way people reason with statistical ideas and make sense of statistical information" (Garfield & Gal, 1999, p.2). It can be interpreted as ability to use sets of data for making interpretations, how to represent data, or summarizing data with statistical measures (Garfield et al., 2003). Garfied et al. (2003) added that connecting statistical concept such as measure of central tendency with spread would help to deepen understanding and increase ability to explain statistical process and interpret statistical results.

## Statistical Thinking

"Statistical thinking involves an understanding of why and how statistical investigations are conducted and the "big ideas" that underlie statistical investigations" (Garfield et al., 2003, p.8). Moreover, statistical thinkers should be able to solve a given problem or statistical study through analyzing, synthesizing and evaluating the results and critique (Garfield et al., 2003). Chance (2002) defined that statistical thinking is beyond the literacy and ability to reason such that the statistical process can be seen as a whole which include the capability of answering 'why', to understand the relationship and meaning of variation in a process.

Apart from the definition of statistical literacy, reasoning and thinking, an appropriate assessment of those skills are extremely important. The assessment methods are often focus on the application of correct formulas, correct statistical computations and the choice of graphical presentations as well as lack of evaluating statistics content with context (Garfield & Gal, 1999). Students' should be able to interpret statistical information or arguments. However, is not adequate if the questions constructed focus on "right or wrong", and therefore limited reflection on students' reasoning and thinking processes abilities (Gal & Garfield, 1997). Therefore, an appropriate assessment method are required for evaluating statistical reasoning, that reveal students' thinking as they choose and apply statistical tools, when they make sense of data, interpret results, and draw conclusions (Garfield & Gal, 1999).

Although statistical literacy, reasoning and thinking may best be assessed through classroom activities, communication with students (e.g., interviews or observations) or by examining students work from a statistics project, a well- prepared and designed paper-and-pencil instruments can be used to gather some limited indicators of students' nature of thinking process.

## Relationship between Statistical Literacy, Reasoning and Thinking

The concepts of statistical literacy, reasoning, thinking can be interpreted as three instructional domains and can be overlap DelMas (2002b). DelMas (2002b) focused on what students can do with the content rather than the content itself. Figure 1 shows the three domains illustrated in DelMas (2002b). Statistical literacy plays an important foundation to statistical reasoning and thinking.

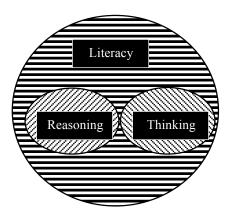


Figure 1: Outcomes of statistics education: Reasoning and thinking within literacy.

DelMas (2002b) proposed words used to distinguish the goals of statistical literacy (SL), reasoning (SR) and thinking (ST). The list of words is given by Table 1.

Table 1: List of words use to distinguish three instructional domains

Basic Literacy	Reasoning	Thinking
Identify	Why?	Apply
Describe	How?	Critique
Rephrase	Explain the	Evaluate
Translate	process	Generalized
Interpret	_	
Read		

In the following section, we presented the revised Bloom's taxonomy. This taxonomy was used as the basis for developing assessments instruments. Our objective is to establish appropriate assessment instruments through combination of revised Bloom's taxonomy and SL, SR and ST skills.

## **Revised Bloom's Taxonomy**

The revised Bloom's taxonomy by Anderson & Krathwohl (2001) as in (Forehand, 2010) used verbs instead of noun for the cognitive domain. The cognitive levels are as follows:

Table 2: Revised Bloom's taxonomy for learning, teaching and assessing

Remember	Retrieving, recognizing, and recalling relevant knowledge.
Understand	Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing,
	inferring, comparing, and explaining.
Apply	Carrying out or using a procedure through executing, or implementing.
Analyze	Breaking material into constituent parts, determining how the
	parts relate to one another and to an overall structure or purpose
	through differentiating, organizing, and attributing.
Evaluate	Making judgments based on criteria and standards through
	checking and critiquing.
Create	Putting elements together to form a coherent or functional whole;
	reorganizing elements into a new pattern or structure through
	generating, planning, or producing.

## **Comparative Thinking**

Higher possibility of learning is expected when students are able to make comparisons Silver (2010). According to Silver (2010) comparison technique helps students to strengthen their ability to recall and remember main idea through analyzing pairs of idea and capturing the similarities and differences. This method can be helpful in classroom situations such as introducing concepts or recall prior knowledge that is related to new content. There are four phases of compare and contrast strategy introduced by Silver (2010) for a classroom phase; there are description, comparison, conclusion, application.

The advantage of comparative thinking through capturing similarities and differences provides a deeper thinking about concepts and can be used to trigger questions which required students to reason and think critically. Therefore, question such as "What is (are) evidence does (do) you have to support your conclusion?" could develop thinking as a habit of mind and deepen their learning. Moreover, questioning technique improves engagement and the opportunities to reflect develop students' metacognitive skills.

In the following section, the assessment of SL, SR and ST within revised Bloom's taxonomy using similarities and differences method are discussed. The implications for improving classroom practices will be explored.

## Methodology

In this study, a quantitative method was applied. Students' final examination scores served as indicators to evaluate their thinking process with respect to SL, SR, ST.

## **Participants**

The participants were 1022 engineering students from eighteen engineering programs. The Engineering Statistics (EQT271) course is the only required statistics course. This course was scheduled during their second year of study.

#### Instrumentation

There were five topics in the subject; Basic to Engineering Statistics, Probability Distributions, Statistical Inference (Single and Two Populations), Analysis of Variance (ANOVA) (One-Way ANOVA, Randomized Complete Block Design, Two Factor Factorial Design) and the last chapter is Simple Linear Regression. The examination paper consists of five questions (Q1,Q2,Q3,Q4,Q5) and the composition of the examination component is 50%.

Table 3: Course outcomes (CO) and cognitive level based on revised Bloom's Taxonomy

CO1	Remember,	Ability to understand, apply and explain the
	Understand, Apply	basic concepts of statistics.
CO2	Remember,	Ability to solve problems using suitable
	Understand, Apply,	statistical inference.
	Analyze	
CO3	Remember,	Ability to construct the model and analyze
	Understand, Apply,	the result from ANOVA table and simple
	Analyze	linear regression.
CO4	Remember,	Ability to apply the basic methodology of
	Understand, Apply	nonparametric statistics to solve engineering
		problems.

Table 4: Topics evaluated in EQT271 final examination paper

Question	Topic
Question 1 (Q1)	Simple Linear Regression
Question 2 (Q2)	Two-Way Analysis of Variance With Replication
Question 3 (Q3)	Randomized Complete Block Design
Question 4 (Q4)	Statistical Inference for Two Populations
Question 5 (Q5)	Non-Parametric Test

To assess SL, SR, ST outcomes, we choose the topic of simple linear regression as shown in Figure 2.

#### Question 1 [Soalan 1]

The output of a certain product could get off-target as machine is used over long periods of time. Machine A and B are used to produce the products. The data of machines used, x (in hours) and the off-target size, y (in mm) are collected. Output 1.1 and Output 1.2 are the regression analysis performed to both data sets.

NOVA Tab	<u>le:</u>					Regression	Coefficients:
Source of Variation	<b>d.f</b>	SS	MS	F	p-value		Coefficients
Regression	1	1.059	1.059	57.74	6.31E-05	Intercept	0.024
Residual	8	0.147	0.018			X1	0.045
Γotal	9	1.205					
INOVA Tab	le:	Outp	ut 1.2: Re	gression	Analysis for		n Coefficients
NOVA Tab							n Coefficients
NOVA Tab Source of Variation	le: df	Outp	ut 1.2: Re	egression F	n Analysis for p-value		Coefficie
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Source of Variation	<b>d</b> f	SS	MS	F	p-value		Coefficie

Figure 2: Questions designed to assess SL, SR, and ST were constructed using simple linear regression learning outcomes

Seven sub-questions or items were constructed based on given statistical problem (Question 1) as in Figure 2. Two different outputs from two types machines (Machine A and B) were given. From the given linear regression outputs, questions assessed students' SL, SR and ST skills are shown in Figure 3.

### Based on the Output 1.1 and 1.2, answer the following questions:

- (a) This statement "The line describes by the regression equation attempts to minimize the number of points it touches" is wrong. Write the correct statement.
- (b) Compute  $r^2$  for both regression analysis.
- (c) Sketch the possible scatter plots for machine A and B data sets. Interpret the relationship between the variables.
- (d) Is there any significance linear relationship between hours of machine used and the size of off-target at  $\alpha$ = 0.10 for machine A? Perform the appropriate hypothesis test and state your conclusion.
- (e) Comment on the regression model adequacy for both machines.
- (f) Determine when the product will be 2 mm off-target for both machines?
- (g) Suggest which machine you want to use? Support your answer by evaluating your findings in (e) and (f).

Figure 3: Statistical literacy, reasoning and assessment

Therefore, we mapped each question based on the revised Bloom's Taxonomy given by Table 3.

Question	Revised Bloom's	The expected outcomes: Students should be
	Taxonomy	able to:
a	Understand	<i>recognize</i> that the statement is wrong based on
		the keywords "minimize the number of points it
		touches".
		rewrite the correct statements by using the
		concept of least squares method.
b	Annly	compute of coefficient of determination.
	Apply	
c	Analyze	connect and extend statistical information
		using <i>Question b</i> , Output 1 and 2.
	Apply	interpret coefficient of determination.
		•
d	Evaluate	<i>perform hypothesis test</i> _and <i>evaluate</i> the result
		to make <i>conclusion</i> .
e	Analyze	recognize, relate and compare statistical results
		provided by Output 1 and 2.
		and water appropriate statistical regults and make
	Evaluate	evaluate appropriate statistical results and make
		conclusion about model adequacy.
f	Understand	identify and write the regression equation.
		use the regression equation for the given
	Apply	problem.
		proofen.
g	Analyze	relate and judge statistical information from
		Question $e$ and $f$ .
	Evaluate	aina raasanina according to decision made
		give reasoning according to decision made.

Meanwhile, Table 4 shows the example of applications of the three instructional domains based on DelMas (2002b). We applied the domains to assess statistical literacy, reasoning and thinking.

Table 5: Mapping the three instructional domains based on DelMas (2002b)

Question	Domain	Keywords
a	SL	identify and rephrase to correct statement.
b	SL	carry out simple <i>computations</i> .
c	SL,SR, ST	Using statistical information, students should reflect
		their <i>understanding</i> about relationship between
		variables and how to construct scatter plot.
d	SL,SR, ST	evaluate result from the hypothesis procedures
e	SL,SR, ST	evaluate model adequacy based on given statistical
		information and results from hypothesis test.
f	SL	carry out simple <i>computations</i> .
g	SL,SR	use suitable information to make decision and justify
		reasoning.

## **Data Analysis**

The students' score for each of the questions were compared. Their SL, SR and ST abilities were compared throughout engineering background. In addition, Question 5 tested focused on procedures and computations and used to identify the gap between computational abilities and SL, SR and ST abilities.

#### **Results**

Table 6 shows the descriptive statistics. Question 1 gives the lowest average scores. On the other hand, Question 5 is the highest average score.

Table 6: Descriptive statistics for each question

Descriptive Statistics	Q1	Q2	Q3	Q4	Q5
Average	3.518	5.358	5.213	4.874	6.394
Standard Deviation	0.758	0.717	0.647	0.682	0.576

Table 7 shows the heat map for all eighteen engineering program (RK). The results showed that students' were not able to apply simple linear regression concepts tested in Question 1. On the other hand, they performed well in Question 5. This is clearly due to computation based assessment items. In contrast, Question 1 requires understanding about the concepts before students were able to determine the solution. In addition, there are sub-questions in Question 1 which require them to analyze statistical information before they would able to make justification. Therefore, based on the scores, it shows the inability of students to use statistical knowledge (SL, SR and ST) and apply to new situation.

Table 7: Heat map for each final examination questions

Table 7. Heat ma	Q1	Q2	Q3	Q4	Q5
Engineering	CO3	C03	CO3	CO2	CO4
Programme	10%	10%	10%	10%	10%
RK01	1070	1070	1070	1070	1070
RK05					
RK07					
RK08					
RK12					
RK13					
RK23					
RK24					
RK28					
RK32					
RK45					
RK56					
RK84					
RK85					
RK86					
RK89					

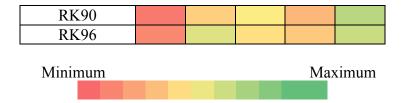


Table 8: Heat map to compare between engineering programs

Engineering	Q1	Q2	Q3	Q4	Q5
Engineering	CO3	C03	CO3	CO2	CO4
Programme	10%	10%	10%	10%	10%
RK01					
RK05					
RK07					
RK08					
RK12					
RK13					
RK23					
RK24					
RK28					
RK32					
RK45					
RK56					
RK84					
RK85					
RK86					
RK89					
RK90					
RK96					
Minimum				N.	<u> </u>

We use the heat map to compare performance between the engineering programs. Based on Table 8, RK28 (Bioprocess Engineering) was the top performer. Meanwhile RK45 (Electrical Industries Engineering) and RK84 (Product Design Engineering) were the bottom two. The performance based on engineering programs could be affected by their academic background and qualifications.

## **Discussion: Challenges and New Direction**

The primary goal in statistics education is to enable students to produce reasoned descriptions, judgments, inferences and opinions about data (Garfield, 1998). (Garfield & Ben-zvi, 2005) suggest that several assessing reasoning using variability. Therefore, it can be applied through identifying patterns of variability in a regression model. For this purpose, we use comparative thinking to observe the patterns of variability from two different data sets (regression outputs). This allows students to identify; compare, explain, evaluate and make connections between the outputs. Such process of thinking requires them to think and reason statistically.

However, based on the examination scores, the low achievement from higher order thinking questions and inability to linking concept to context were identified. Therefore, an action research should be conducted by the instructors to design classroom practices with appropriate instructional strategies to support SR and ST. It is clear that students need to be supported with thinking routine activities and appropriate thinking tools while in the statistics classroom. In addition, students' process of reasoning and thinking skillful should be visible. It allows instructors to plan and create culture of thinking classroom environment and innovative approaches for achieving the course learning outcomes to guide students' metacognitive process.

The thinking routine activities and making thinking visible technique were implemented throughout SEMESTER II 2017/2018. This was our first step to inculcate culture of thinking classroom. With the initiatives and continuous monitoring, we hope that the new learning approach helps to enrich students experience in learning statistics, developing statistical competency, SL, SR, and ST skills. However, there are few limitations identified. The following are the new challenges need to be further explored:

- 1. Students' and instructors' should aware of the crucial needs to innovate from traditional classroom to culture of thinking classroom environment
- 2. The traditional teaching (teacher-centered) approach need to be replaced to student-centered and active learning to support development of SL, SR, and ST.
- 3. Encouragement from the management. The management and instructor should show that their value thinking and SL, SR, and ST as the learning outcomes of statistics course over computation or procedures focus in classroom environment and assessment.
- 4. A well-structured teaching plan, approach, technique and tools are necessary for the instructor to bring appropriate statistics content to the thinking routine activities that support development of SL, SR, and ST.
- 5. The examination oriented system shape students attitude towards learning. Thinking routine activities were not successful due to the long-term educational training which focused on memorization and computation. Some of the group activities were not actively involved by the group members and failed to reflect their understanding of content, reasoning and thinking skills.
- 6. To assess SR and ST, the questions constructed minimize computations and focused more on students' ability to use statistical information provided. This type of questions was found with lowest average marks.

Therefore, we believed more action research projects need to be carefully designed to determine the best model of instructional practices in developing SL, SR and ST. Few directions of the research study were identified:

- 1. Game-based learning to support understanding of statistical concepts.
- 2. Blended-learning approach can be implemented so that the more time in the classroom can be allocated to the process of skillful thinking within statistics learning outcomes-making students' thinking visible should be encourage and valued, allow thinking time and peer to peer learning, use questioning strategy to deepen understanding, major focus is students' the learning process not for learning for examination purpose.

3. Statistics instructors should work together to plan and reflect upon the outcomes or feedbacks obtain from the action research projects. It is part of instructor professional development.

#### Conclusion

Statistics course has been and will be continuously benefited to engineering students. While many of statistics education literatures are increasingly put into efforts to defined and suggest ways to develop SL, SR and ST, implementing the three domains in our higher education institution is a challenging task. In this paper, we presented our experience in the implementation of SL, SR and ST in statistics classroom. Apart from students' readiness and awareness to move from traditional setting of teacher-centered classroom and learning statistics as they learnt mathematics, these obstacles may need extra focus and work from the instructors to innovate statistics classroom. University management must promote innovation and acknowledge instructors who are willing to give effort, time and energy to enrich students' learning experience.

It is an important remark that promoting culture of thinking within statistics classroom is impossible when instructors act as the source of information. The role of instructor has changed from that of "source of information" to "facilitator of learning" (Garfield 1993). In addition, instructor motivation and understanding the 'why' behind SL, SR and ST skills is essential before any thinking routines activities are implemented. Other theory of learning for example constructivist learning approach can be adopted for developing SL, SR and ST skills.

We adopt the revised Bloom's taxonomy as the foundation to statistics assessment and the taxonomy is also in accordance to Outcome Based Education implemented here in our institution, UniMAP. However, putting revised Bloom's in the context of statistics content and outcomes would not be directly implemented. This is our challenge and currently continuous projects are being monitored to integrate the taxonomy within statistics content and pedagogy. By using revised Bloom's taxonomy and three instructional statistical cognitive domains (literacy, reasoning and thinking), we hope that it could be used as basic framework to guide instructional designs. In addition, the current educational technology advancement through learning management system such as Moodle or UniMAP e-learning will be an advantage for instructors to determine other factors that may affect students' cognitive and behaviorism towards statistical reasoning and thinking. This is our next research direction, to explore the most effective instructional techniques and to develop models of how students shape their statistical understanding.

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## Education Attainment As a Determinant of Economic Growth in African Countries

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#### Abstract

In the light of educational policies in developing countries being strongly influenced by the Millennium Development Goals and foreign aid programmes, the role of education and human capital accumulation in the economic development of African countries is examined. The Solow model and the augmented Solow model including human capital were estimated using the most recent data on African countries (from the International Monetary Fund and the World Bank). The shares of the working population with three different levels of education attainment were used as alternative proxy variables for human capital. The results confirm the validity of the two models for African countries, however they also reveal some interesting discrepancies with the purely theoretical models. Out of three education levels, tertiary education attainment in the working population is the best predictor of income per capita, and the sum of secondary and tertiary education attainment is the proxy variable leading to the most credible results. Potential educational policy implications of the results are discussed.

Keywords: Millennium Development Goals, educational policy, education attainment, human capital, augmented Solow model



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#### 1. Introduction

The Millennium Development Goal (MDG) Target 2, calling for 100% primary education enrolment globally<sup>1</sup>, has been criticized in literature in the context of African countries. Easterly (2009) argues that MDG, including Target 2, were unfair to Africa<sup>2</sup>. First of all, because it was an absolute instead of a relative measure, which put many African countries at a disadvantage in comparison to other developing regions. Easterly (2009) argues that no other region progressed so fast when they were developing their primary school systems.<sup>3</sup> The pressure to catch up might have led to some undesired consequences, namely deterioration of quality, e.g. due to rapid increases of class.

In parallel, Bloom et al. (2006) demonstrate how the "international development community has encouraged African governments' relative neglect of higher education." The shift of focus to primary education can be tracked down to before the MDG's announcement in 2000. As Bloom et al. (2006) calculated, "from 1985 to 1989, 17 per cent of the World Bank's worldwide education-sector spending was on higher education. But from 1995 to 1999, the proportion allotted to higher education declined to just 7 per cent."

This paper looks at the appropriateness of the target to the situation of African countries from the perspective of economic growth theory. Many studies have looked at how education statistics can help understand differences in economic development of countries. The specifications provided by Mankiw, Romer, and Weil (1992) are a starting point for many authors, <sup>6</sup> just as they are in the current study.

Mankiw, Romer, Weil (1992) introduced an augmented version of the neo-classical Solow model (Solow, 1956) in which they incorporated human capital to production function. The two others determinants (physical capital, and the labour force size) can be directly measured, as opposed to human capital. The unobservability of human capital requires proxy variables for the models to be empirically tested.

Although many studies were aimed at comparing which variables serve as best proxies of human capital, there are important limitations. As the level of accumulated human capital increases, the variance of once suitable measures (e.g. literacy rates) decreases and they gradually become useless in differentiating affluent and middle-income countries. As education systems progress globally and education attainment reaches nearly 100% in developed countries, other measures (secondary education attainment, average years of

<sup>&</sup>lt;sup>1</sup> Un.org. (2015). United Nations Millennium Development Goals Report 2015.

<sup>&</sup>lt;sup>2</sup> Easterly, W. (2009). How the millennium development goals are unfair to Africa. *World development,* 37(1), 26-35.

<sup>&</sup>lt;sup>3</sup> *Ibidem*, p. 26.

<sup>&</sup>lt;sup>4</sup> Bloom, D. E., Canning, D., & Chan, K. (2006). *Higher education and economic development in Africa* (Vol. 102). Washington, DC: World Bank, p.iii.

<sup>&</sup>lt;sup>6</sup> Baum, M. A., & Lake, D. A. (2003). The political economy of growth: democracy and human capital. *American Journal of Political Science*, 47(2), p. 334.

schooling, etc.) have to be used. Glewwe, Maiga and Zheng (2014) summarize the most important studies that estimated the influence of education on economic growth.<sup>7</sup>

Within a highly diverse group of countries, one measure of human capital might be more suitable for those with high levels of high income per capita and another one for the ones lagging behind. There are two important implications. First of all, it is justified to analyse sub-groups of countries, as performed in this study. Second of all, there can never be a universal proxy for human capital.

The paper follows the following structure. First, results of estimating the original Solow model and the augmented Solow model are described, followed by choosing the best proxy for the stock of human capital. Second, the potential of primary education attainment in explaining cross-country differences in terms of income per capita is inspected. Finally potential policy implications, limitations of the adopted approach, and areas for further research are discussed.

### 2. Econometric modelling

The most important source for the data on education attainment is the Barro-Lee Education Attainment Dataset. The dataset was constructed with the objective to provide a measure of the *aggregate stock* of human capital, and therefore to complement the data on school enrolment ratios or literacy rates, which can serve as proxies for human capital *accumulation rate*. It is important to note that the measure of education attainment of a certain level encompasses people who have completed this stage of education *and* did not complete a higher one (e.g., university graduates are *not* included in secondary attainment rate). The newest version of the dataset contains estimates for 146 countries, including 37 African countries, for the period 1950-2010. The information on country-level data availability is provided in the Appendix. The International Monetary Fund's World Economic Outlook Database April 2018 is the source of economic data used in this study.

Basing on the available data, the variables are constructed analogically to Mankiw et al. (1992). Some simplifications were performed due to lack or inconsistency of data. First of all, the total population size is used instead of the working population size. As in many African countries people start to work at a very young age, and as the working population is hard to distinguish from the non-working because of the informality of the labour market, the assumption should not excessively sensitize the results.

<sup>&</sup>lt;sup>7</sup> Glewwe, P., Maiga, E., & Zheng, H. (2014). The contribution of education to economic growth: A review of the evidence, with special attention and an application to Sub-Saharan Africa. *World Development*, *59*, Table 1.

## The Original Solow Model

The first estimated model is the original Solow model. The empirical specification is the same as the one of Mankiw et al. (1992). In the formula below: Y stands for output, L for labour force (approximated by total population), A for a constant related to technology, resource endowments, climate, institutions, etc.,  $\alpha$  for the capital's share in income, s for savings rate (gross national savings as percent of the GDP), n for natural growth, g for knowledge advancement,  $\delta$  for capital depreciation, and  $\epsilon$  for a country-specific shock relative to A.

$$\ln(\frac{Y}{L}) = A + \frac{\alpha}{1 - \alpha} \ln(s) - \frac{\alpha}{1 - \alpha} \ln(n + g + \delta) + \epsilon$$

After Mankiw et al. (1992), I assume  $(g + \delta)$  to equal 0,05. I also assume that s and n are independent of  $\in$ , which allows for estimating the parameters of the model with OLS<sup>9</sup>.

The original Solow model was estimated for 2 different samples. The first one included 42 (out of 54) African countries, for which data on GDP per capita, savings rate, and population growth was available. The second one included only those countries for which education attainment data was also available (32 countries), in order to allow for comparability between the original Solow model and the augmented Solow model (which required the education attainment data). Both models were estimated with and without imposing a restriction that the coefficients on savings rate and population growth are equal in absolute value. The results are reported in Table 1.

<sup>&</sup>lt;sup>8</sup> Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, 70(1), 65-94.

<sup>&</sup>lt;sup>9</sup>Ordinary Least Squares.

<sup>&</sup>lt;sup>10</sup> The list of countries belonging to each sample is provided in the Appendix.

Table 1. Results of estimating the original Solow model for two sub-groups of African countries (2010).

	The original Solow model								
	Bigger sample	Smaller sample							
Observations	42	32							
Model without restrictions									
Constant (p-value)	9,69 0,002***	12,77 <0,001***							
<b>ln(s)</b> ( <i>p</i> -value)	1,16 <0,001***	0,99 <0,001***							
<b>ln(n+p+d)</b> ( <i>p</i> -value)	-2,30 0,095*	-3,63 0,014**							
R2 / Adjusted R2	51,3% / 48,9%	61,5% / 58,9%							
Model with restriction									
Constant (p-value)	7,36 <0,001***	7,34 <0,001***							
$\frac{\ln(s) - \ln(n+g+d)}{(p-\text{value})}$	1,23 <0,001***	1,14 <0,001***							
R2 / Adjusted R2	50,5% / 49,2%	57,1% /55,7%							
Test of restriction (F) (p-value)	0,65 0,42	2,28 0,08*							
Implied $\alpha$	0,55	0,53							

The results of estimations (gathered in Table 1) allow to examine "whether real income is higher in countries with higher savings rate and lower in countries with higher values of  $(n + \mu + \delta)^{n+1}$  in the case of African countries, and therefore to verify the validity of the Solow model for this group of countries.

As the coefficients on savings rate and population growth are both dependent on the value of  $\alpha$ , it is crucial that their estimates are equal in absolute value. However, this restriction is rejected in the smaller sample, indicating that the data does not confirm that the Solow model accurately explains differences in income per capita within this group of countries. The restriction holds in the bigger sample, therefore allowing for interpretation of  $\alpha$  (also, the implied values of  $\alpha$  are almost the same in both samples). The value of  $\alpha$  represents both capital's share in income and its marginal product (as it is assumed that capital and labor are being paid their marginal products<sup>12</sup>). The estimated coefficients imply that capital's share in income is 55%.

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<sup>&</sup>lt;sup>11</sup> Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The quarterly journal of economics, 107*(2), p. 410.

<sup>12</sup> *Ibidem.* 

## **The Augmented Solow Model**

Mankiw et al. (1992) proposed two alternative specifications of the augmented Solow model. Due to the characteristics the education attainment data, the model with the *level* of human capital is estimated rather than the *rate* of human capital accumulation. It is represented by the following formula (where  $h^*$  is the steady-state level of human capital,  $\beta$  is the return on human capital and the meanings of other symbols remain unchanged).

$$\ln\left|\frac{Y(t)}{L(t)}\right| = A + yt - \frac{\alpha}{1-\alpha}\ln(n+y+\delta) + \frac{\alpha}{1-\alpha}\ln(s) + \frac{\beta}{1-\alpha}\ln(h+s) + \in$$

The aim of these estimations was to inspect whether education attainment is an appropriate proxy variable for the stock of human capital, and if yes, which education levels are the most useful in explaining the inter-country differences in income per capita. The modelling scenarios therefore assumed different proxy variables for the stock of human capital accumulated in the country. The model was estimated in six variants:

- *Model 1.* Primary, secondary and tertiary attainment,
- *Model 2*. Only primary attainment,
- Model 3. Only secondary attainment,
- *Model 4*. Only tertiary attainment,
- *Model 5.* Primary and secondary attainment,
- *Model 6.* Secondary and tertiary attainment.

The estimation results are provided in Table 2.

Table 2. Results of estimating the augmented Solow model with the level of human capital accumulation for 32 African countries (2010).

	The augmented Solow model										
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6					
Model without restrictions											
Constant	7,28	11,7	9,55	12,07	7,69	8,89					
(p-value)	0,010**	<0,001***	0,004***	<0,001***	<0,009***	0,005***					
ln(s)	0,70	0,89	0,82	0,79	0,74	0,78					
(p-value)	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***					
ln(n+p+d)	-2,76	-4,21	-2,31	-3,07	-2,87	-2,06					
(p-value)	0,018**	0,003***	0,101	0,015**	0,018**	0,127					
ln(h*)	1,16	0,72	0,41	0,37	1,10	0,49					
(p-value)	<0,001***	0,023**	0,014**	0,001***	<0,001***	0,004***					
R2 / Adjusted R2	77,4% /	68,1% /	69,1% /	73,4% /	75,8% /	71,7% /					
R2 / Adjusted R2	73,0%	64,7%	65,7%	70,6%	73,2%	68,6%					
		Model wit	h restriction								
Constant	2,86	5,42	6,48	7,39	3,13	6,15					
(p-value)	0,008***	<0,001***	<0,001***	<0,001***	0,005***	<0,001***					
ln(s) - ln(n+g+d)	0,80	1,08	0,87	0,91	0,84	0,82					
(p-value)	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***					
ln(h*)	1,21	0,57	0,46	0,39	1,15	0,54					
(p-value)	<0,001***	0,082*	0,004***	0,001***	<0,001***	<0,001***					
R2 / Adjusted R2	74,8% /	61,4% /	67,8% /	70,2% /	73,0% /	70,7% /					
R2 / Aujusteu R2	73,1%	58,8%	65,6%	68,2%	71,1%	68,7%					
Test of restriction (F)	3,23	5,79	1,13	3,38	3,23	0,91					
(p-value)	0,083*	0,023**	0,297	0,077*	0,083*	0,348					
Implied $\alpha$	0,45	0,52	0,47	0,48	0,48	0,45					
Implied $\beta$	0,67	0,27	0,25	0,20	0,62	0,30					
Implied $(\alpha + \beta)$	1,12	0,79	0,71	0,68	1,08	0,75					

There are two alternative assumptions which can be made about the relationship between the level of human capital and the level of education attainment, and the choice between them determines the type of conclusions which can be drawn from the results. If education attainment is assumed to be proportional to the stock of human capital (further referred to as *linearity assumption*), then the proportionality factor positively biases only the estimate of the constant. In this case, the estimated coefficient on human capital variable is not biased, which means that it is interpretable and  $\beta$  can be derived from the coefficient if the remaining coefficients produce a consistent estimate of  $\alpha$ .

However, if it is assumed that the natural logarithm of the stock of human capital is proportional to the natural logarithm of education attainment (further referred to as *log-linearity assumption*), then the estimated coefficient is a product of multiplying  $\frac{\beta}{1-\beta}$  by

the unknown proportionality factor (f). In that case, to find  $\beta$ , one would need to solve the following equation:  $f * \frac{\beta}{1-\alpha} = y_{HC}$ , where  $y_{HC}$  stands for the estimated coefficient on the level of human capital. The equation, however, has two unknowns  $(\beta \text{ and } f)$ , which makes it impossible to identify  $\beta$ . Adopting the log-linearity assumption prohibits interpreting the respective estimated coefficient and therefore does not lead to finding the estimate for the return on human capital. However, it does not invalidate the use of the proxy. Therefore measures such as the goodness-of-fit and p-values (of the coefficient on human capital) can still be interpreted and used in order to discriminate between stronger and weaker proxies.

## Finding the best proxy variable for the stock of accumulated human capital

The models which succeed<sup>13</sup> in producing consistent<sup>14</sup> values of  $\alpha$  are Model 3 and Model 6. The restriction on the coefficients on savings rate and population growth is rejected in the four other cases (significance level of 10%). The  $\alpha$  implied by the two successful models is around 10 percentage points lower compared to the original Solow model. The differential suggests that not accounting for human capital in the production function leads to overestimating the marginal product of capital. The bias is even greater in the case of the implied marginal product of labor, which is equal to  $(I - \alpha)$  in the original Solow model, and to  $(I - \alpha - \beta)$  in the augmented model<sup>15</sup>. While it is estimated to be 0,45 in original Solow model, it is only 0,29 (Model 3) or 0,25 (Model 6) in the augmented version, which is a difference of up to 20 percentage points.

As the restriction is crucial (its rejection invalidates the production function and therefore any interpretation of the marginal products of production factors), only Model 3 and Model 6 will be considered in this section. While both models comply with the restriction, Model 6 produces a slightly higher goodness-of-fit, and the estimated coefficient on the level of human capital is significant at a more rigid significance level (the *p*-value is 0,4% in case of Model 6 and 1,4% in case of Model 3). Therefore the proxy variable for the stock of human capital used to estimate Model 6, i.e. the percentage of population of at least 15 years of age with secondary or tertiary education, is the best proxy for the level of human capital in African countries. The results of Model 6 (with restriction) will be discussed and interpreted in more detail below. The model is further referred to as *the best augmented model*.

The best augmented model explains 13,6 percentage points more of the variance in income per capita across the sample of 32 African countries in comparison to the original Solow model (with restriction). The model implies that the elasticity of income per capita with respect to the saving rate is 0,8 and -0,8 with respect to natural growth. That means that a 1% increase in the savings rate increases the expected income per capita by 0,8% in

<sup>&</sup>lt;sup>13</sup> The *p*-values of the F-test for restriction on the coefficients on savings rate and population growth are higher than 10%.

<sup>&</sup>lt;sup>14</sup> I.e. the restriction that the coefficients on savings rate and population growth are equal in absolute value is not rejected.

<sup>&</sup>lt;sup>15</sup> The marginal product of labor for the augmented Solow model can only be calculated under the linearity assumption.

the long term. Analogically, a 1% increase in the population growth rate decreases the expected income per capita by 0,8% in the long term. The 'long-term' refers to the steady state. The speed of convergence to the steady state is a function of  $\alpha$ ,  $\beta$ , the natural growth rate. Plugging in the estimated values of  $\alpha$  and  $\beta$  from the best augmented model, followed by the lowest and highest population growth rate observed in the sample (0,86% for Mauritius and 3,72% for the Gambia), allows to arrive at a number of years the economy takes to move halfway towards the steady state, which is between 5,2 and 5,5 years. 17

When it comes to the coefficient on the level of human capital, it equals 0,54 in the best augmented model. That means that a 1% increase in the stock of human capital increases the steady state income per capita by 0,54%. Under a strong assumption that manipulating the proxy is equivalent to influencing the stock of human capital (with proportionality factor equal to 1), that means that increasing the percentage of adult population with completed at least secondary education by 1% increases the steady state income per capita by 0,54%. In the case of Tanzania, which has the lowest secondary and tertiary education attainment in the sample, this would be equivalent to increasing the figure from 2,89% to 2,92%, i.e. by around 12 thousand people. At the same time, for South Africa, which has the highest secondary and tertiary attainment in the sample, this would mean that almost 300 thousand people (0,6% of the population) would have to migrate from the 'no education' or 'primary education only' category to a higher education attainment level, by completing at least secondary education. These discrepancies clearly illustrate the decreasing returns to human capital.

# The explanatory power of primary education attainment as a proxy of human capital

The model which used primary education attainment as the proxy variable (Model 2) returned the lowest R-squared out of the six models. As the coefficient on population growth in the non-restricted model equaled -4,21, while it was only -1,08 according to the restricted model, the restriction on the coefficients on savings rate and natural growth was rejected (p-value = 2%). One could argue however that this measure is fundamentally flawed, as it excludes those who completed not only primary, but also secondary or secondary and tertiary education.

The models which take into account all adults who completed primary education (Model 1) or all adults who completed primary or secondary education but not tertiary education (Model 5) in fact produce a goodness-of-fit which is higher than for the best augmented model. However, these models can only be considered under the log-linearity assumption (which entails non-interpretability of  $\beta$ ), as the sums of the implied values of  $\alpha$  and  $\beta$  exceed 1. More importantly, the test of restriction in the case of these two models

 $<sup>^{16}\</sup>lambda$  (n + g +  $\delta$ )(1  $\alpha$   $\beta$ ), see: Mankiw, Romer, and Weil (1992), p. 422

<sup>&</sup>lt;sup>17</sup> Again, this estimation is only valid under the linearity assumption.

<sup>&</sup>lt;sup>18</sup> This violates one of the assumptions of the augmented Solow model, which states that there are decreasing returns to all capital. When this assumption is violated, there is no steady state in the model. At the same time, empirical estimation of the parameters of the production function is only possible if it is

returns p-values of 8%, which suggests that the coefficients of these models do not imply equal values of  $\alpha$  and therefore are inconsistent with the production function ( $\alpha$  can no longer be interpreted as the capital's share in income or marginal product of capital). When adults with only primary education attainment are excluded from the data, Model 1 becomes Model 6, and Model 5 becomes Model 3. In both cases, the restriction starts holding and the coefficients on human capital start implying acceptable levels of  $\beta$ .

In conclusion, including the adults who only completed primary education in the proxy of human capital accumulation deteriorates estimation results.

#### **Conclusions**

"When a measure becomes a target, it ceases to be a good measure," states the Goodhart's Law. Although the Millennium Development Goals have been a driver of positive change in many ways, the framework's story is one of measures becoming targets. The purpose of this study was to empirically verify whether achieving universal primary education in 15 years was an appropriate development target for African countries from the perspective of economic growth theory.

The econometric analysis indicates that primary education attainment is not the best proxy variable for the level of human capital. In fact, excluding primary education attainment from the measurements of human capital allows for obtaining results which are consistent with economic theory (which do not violate the assumption of decreasing returns to all capital). Out of the three education attainment statistics, tertiary education holds the most explanatory power in terms of cross-country differences in income per capita, and the sum of secondary and tertiary education attainment produces the most trustworthy results.<sup>19</sup>

There are several reasons for which investment in higher education can have a more lasting effect on income per capita than investment in primary education. While all levels of education produce private returns to education (such as higher productivity, translating to higher salaries and higher GDP per capita), higher education particularly increases the country's capacity to further invest in human capital. Human capital mostly consists of education and health (both of which allow individuals to produce more output) and the cost of investing in education and health depends on the size and quality of the country's talent pool, especially teachers and doctors.

Moreover, a more comprehensive approach to education systems in developing countries seems to bring more sustainable results. Using the Qualitative Comparative Analysis method to examine the effectiveness of aid for primary education in developing countries, Birchler and Michaelowa (2016) find that one of the conditions for improving

assumed that countries are in their steady states, or that their distance from the steady states is random. See: Mankiw, Romer, and Weil (1992), p. 416.

<sup>&</sup>lt;sup>19</sup> Model 4 (tertiary education) with restriction is characterized by the R-squared of 70,2%, while Model 3 (secondary education) and Model 2 (primary education) reach 67,% and 61,4% respectively (see Table 2 for more details).

*quality* in primary education also requires investments in other areas, such as secondary and tertiary education, or vocational training.<sup>20</sup> Potential access to higher levels of education likely motivates primary school students to put more effort into their learning process, therefore reducing drop-out rates and improving overall outcomes.<sup>21</sup>

Limitations of the results can be categorized by their origin: the specifics of Africa as a region, and the method of analysis. First of all, extensive brain drain was not taken into account. A 2013 joint UN and OECD report stated that over 10% of university graduates born in African countries resided in OECD countries. For some countries the figure was considerably higher, e.g. 43% for Zimbabwe, or 36% for the Republic of Congo. This phenomenon potentially further undermines the applicability of the results. If 50% of university graduates leave their home country to work abroad, then the approximate numbers of graduates needed to increase the stock of human capital by 1%, provided in the previous section, are largely underestimated. In the previously mentioned example of Tanzania, the estimated number of 12 thousand doubles to 24 thousand under the assumption that half of graduates leave.

Another issue which is not accounted for in the econometric analysis is the variation in the quality of education. This is especially pertinent to the analyzed case, as the MDG framework stimulated the exceptional 20 percentage point increase in primary education net enrolment rate in only 15 years.<sup>23</sup> Taking into account the natural growth that took place in this period, the number of children enrolled in primary school increased by 140%, from 62 million in 2000 to 149 million pupils in 2015.<sup>24</sup> Although consistent data allowing to track education quality in African countries is scarce, it is unlikely that such rapid increase in quantity did not have any detrimental effect on quality of education. Indeed, several studies demonstrate that the learning outcomes are very poor in many African countries, e.g. one study found that in most Sub-Saharan countries the ability to read a short written text is below 50% even for those who completed as much as 5 years of primary education.<sup>25</sup>

The main limitation of the method applied in this study is that education attainment is only a proxy of human capital. While the proxy is assumed to be highly correlated with

<sup>&</sup>lt;sup>20</sup> Birchler, K., & Michaelowa, K. (2016). Making aid work for education in developing countries: An analysis of aid effectiveness for primary education coverage and quality. *International Journal of Educational Development*, 48,

p. 47. <sup>21</sup> Birchler, K., & Michaelowa, K. (2016). Making aid work for education in developing countries: An analysis of aid effectiveness for primary education coverage and quality. *International Journal of Educational Development*, 48,

p. 48. <sup>22</sup> UN-DESA, O. E. C. D. (2013). World migration in figures. *A Joint Contribution by UN-DESA and the OECD to the United Nations High-Level Dialogue on Migration and Development*, p. 4.

Un.org. (2015). United Nations Millennium Development Goals Report 2015, p. 4.
 Un.org. (2015). United Nations Millennium Development Goals Report 2015, p. 25.

<sup>&</sup>lt;sup>25</sup> Birchler, K., & Michaelowa, K. (2016). Making aid work for education in developing countries: An analysis of aid effectiveness for primary education coverage and quality. *International Journal of Educational Development*, 48, p. 38.

the analyzed variable, it should not be expected that manipulating the proxy is equivalent to manipulating the latent variable itself. In other words, increasing education attainment will surely increase the stock of human capital, but an unknown proportionality factor likely applies.

The results of this study strongly suggest that the Millennium Development Goal concerning primary education was ill-designed. The authors of the framework unwillingly created misguided incentives (neglect of secondary and tertiary education), which likely influenced the evolution of the African education system. Further research should concentrate on the challenge that these results poses to policymakers: how to effectively incorporate quality measures into development frameworks, in a way that satisfies both the theoretical (evidence of causality on economic growth) and practical (simplicity, understandability) considerations.

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## Appendix. Data

Countries included in both samples

Countries included in the bigger sample but not in the smaller sample

Countries included neither in the bigger sample nor in the smaller sample

Natural logarithm of:	$A^{26}$	B <sup>27</sup>	C <sup>28</sup>	1 <sup>29</sup>	$2^{30}$	3 <sup>31</sup>	4 <sup>32</sup>	5 <sup>33</sup>	6 <sup>34</sup>
Algeria	9,45	3,53	1,98	4,11	3,47	3,10	1,90	3,99	3,36
Angola	8,68	3,04	2,11	NA	NA	NA	NA	NA	NA
Benin	7,49	2,56	2,10	3,68	2,89	2,97	0,70	3,63	3,07
Botswana	9,46	3,62	2,00	4,49	4,02	3,43	0,70	4,46	3,49
Burkina Faso	7,24	2,48	2,03	NA	NA	NA	NA	NA	NA
Burundi	6,57	1,70	2,03	3,59	3,41	1,70	-0,62	3,57	1,79
Cabo Verde	8,70	2,94	1,91	NA	NA	NA	NA	NA	NA
Cameroon	7,94	2,88	2,06	4,14	3,79	2,82	0,49	4,11	2,91
Central African Republic	6,78	1,63	1,97	3,65	3,31	2,33	-0,19	3,63	2,41
Chad	7,69	2,02	2,06	NA	NA	NA	NA	NA	NA
Comoros	7,28	2,44	1,98	NA	NA	NA	NA	NA	NA
Congo; Dem. Rep.	6,33	2,17	2,08	3,45	2,89	2,56	-0,78	3,43	2,60
Congo; Rep.	8,74	3,21	2,06	3,98	3,81	2,01	-0,45	3,96	2,09
Cote	7,86	2,26	2,11	3,86	3,57	2,30	0,76	3,81	2,49

<sup>&</sup>lt;sup>26</sup> Gross domestic product per capita in 2010, current prices, U.S. dollars (source: IMF).

<sup>&</sup>lt;sup>27</sup> The ratio of gross national savings in current local currency and GDP in current local currency in 2010

<sup>&</sup>lt;sup>28</sup> Average population growth is calculated basing on population in million persons between the years 1980 - 2010 (source: IMF). Then 0.05 is added (knowledge advancement and capital appreciation, which are assumed to be constant across countries).

<sup>&</sup>lt;sup>29</sup> Percentage of population age 15+ with primary, secondary or tertiary schooling, Completed Primary, Secondary or Tertiary in 2010 (source: Barro-Lee).

<sup>&</sup>lt;sup>30</sup> Percentage of population age 15+ with primary schooling, Completed Primary in 2010 (source: Barro-

<sup>&</sup>lt;sup>31</sup> Percentage of population age 15+ with secondary schooling, Completed Secondary in 2010 (source: Barro-Lee).

<sup>&</sup>lt;sup>32</sup> Percentage of population age 15+ with tertiary schooling, Completed Tertiary in 2010 (source: Barro-

<sup>&</sup>lt;sup>33</sup> Percentage of population age 15+ with primary or secondary schooling, Completed Primary or

Secondary in 2010 (source: Barro-Lee).

34 Percentage of population age 15+ with secondary tertiary schooling, Completed Secondary or Tertiary in 2010 (source: Barro-Lee).

d'Ivoire									
Djibouti	7,84	NA	NA	NA	NA	NA	NA	NA	NA
Egypt	9,29	2,97	1,98	4,18	3,31	3,45	1,89	4,08	3,64
Equatorial Guinea	10,72	3,01	2,19	NA	NA	NA	NA	NA	NA
Eritrea	7,09	NA	NA	NA	NA	NA	NA	NA	NA
Ethiopia	7,01	2,47	2,08	NA	NA	NA	NA	NA	NA
Gabon	9,64	3,54	2,03	4,31	3,69	3,33	1,84	4,22	3,53
Gambia; The	7,38	2,24	2,17	3,62	3,44	1,68	-0,09	3,60	1,84
Ghana	8,04	2,22	2,07	4,18	3,79	2,98	0,36	4,16	3,05
Guinea	7,33	2,07	NA	NA	NA	NA	NA	NA	NA
Guinea- Bissau	7,29	1,88	1,96	NA	NA	NA	NA	NA	NA
Kenya	7,87	2,70	2,08	3,93	3,93	3,44	2,79	1,22	3,86
Lesotho	7,85	3,43	1,85	3,80	3,80	3,41	2,62	-0,27	3,79
Liberia	7,02	NA	NA	3,76	3,76	3,29	2,67	0,64	3,72
Libya	10,34	NA	2,00	4,29	3,52	3,31	2,48	4,11	3,67
Madagasc ar	7,22	2,02	2,08	NA	NA	NA	NA	NA	NA
Malawi	6,88	2,08	2,07	3,51	3,23	2,08	-1,90	3,51	2,10
Mali	7,51	3,00	2,02	2,96	2,63	1,52	-0,25	2,92	1,68
Mauritania	8,18	NA	NA	3,91	3,86	2,20	-0,03	3,89	2,30
Mauritius	9,64	3,99	1,77	4,24	3,01	3,86	0,63	4,21	3,90
Morocco	8,77	3,17	1,90	3,97	3,45	2,78	1,68	3,87	3,07
Mozambiq ue	6,80	2,66	1,99	3,18	3,01	1,28	-1,35	3,17	1,35
Namibia	9,06	NA	NA	4,05	3,69	2,82	-0,27	4,04	2,87
Niger	6,76	2,22	2,14	3,02	2,77	1,35	-0,67	2,99	1,47
Nigeria	8,54	NA	2,05	NA	NA	NA	NA	NA	NA
Rwanda	7,21	1,84	2,04	3,88	3,70	1,99	-0,63	3,87	2,06
Sao Tome and Principe	7,84	NA	1,99	NA	NA	NA	NA	NA	NA
Senegal	7,67	2,23	2,05	3,32	3,15	1,19	0,22	3,28	1,51
Seychelles	9,88	2,72	1,82	NA	NA	NA	NA	NA	NA
Sierra Leone	7,10	0,84	1,95	3,56	3,24	2,15	0,20	3,53	2,28
Somalia	NA	NA	NA	NA	NA	NA	NA	NA	NA
South Africa	9,38	2,99	1,93	4,42	3,20	4,06	-1,14	4,42	4,07
South Sudan	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sudan	8,33	2,07	2,03	3,78	3,63	1,44	0,63	3,74	1,81
Swaziland	9,02	2,75	1,98	3,78	3,59	1,83	0,49	3,75	2,07

Tanzania	7,67	2,86	2,06	4,15	4,10	0,93	-1,02	4,14	1,06
Togo	7,09	1,94	2,13	4,06	3,83	2,35	0,41	4,03	2,49
Tunisia	9,24	3,04	1,90	4,22	3,66	3,08	2,00	4,12	3,37
Uganda	7,56	2,82	2,13	3,75	3,53	1,95	0,21	3,72	2,12
Zambia	8,07	2,62	2,07	4,32	4,05	2,83	-0,71	4,31	2,86
Zimbabwe	7,40	NA	1,93	4,41	4,31	1,97	-0,97	4,41	2,03



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