The Relationship of Active Learning and Academic Achievement among Provincial University Students in Thailand

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ABSTRACT

Thailand is facing challenges with the tradition of passive learning which has led to concerns that Thailand will be ready launch what they call "Thailand 4.0." The government is promoting active learning yet there are disparities in the quality of education when comparisons are made between Bangkok and the provinces of Thailand. Therefore, the purpose of this study was to examine the relationship between active learning and academic achievement among provincial university students in Thailand. A descriptive correlational design employing Likert Scales for the measurement of the variables perceptions of academic achievement and perceptions active learning was employed. The analysis included the use of t-test, ANOVA, and multiple regression. This study found that a stratified sample size of 100 students based on gender and recruited from Asia-Pacific International University preferred active learning. In addition, the regression analysis indicated that there was a strong association between active learning and academic achievement when controlling for demographic variables. This implied that the use of active learning concepts was linked with positive increases in students' attitudes toward their academic achievement.

KEYWORDS: Active Learning, Academic Achievement, Students' Perceptions

Introduction

In Thailand, there has been frequent criticism of the educational system (Fernquest, 2011; Fernquest, 2017). Examples of the criticism include concerns with low national and international test scores, a huge budget with little results, centralized control, and a gap in performance between rich and poor schools (Fernquest, 2017; Khuvasanond, 2013). One criticism in particular that has

gained attention is the teacher-centered style of instruction that is favor by the majority of Thai teachers (Stone, 2017).

This approach to teaching has such negative consequences as producing students who are unprepared for higher education as students lack the ability to make decisions and think critically (Khuvasanond, 2013). This can further exacerbate the ability to obtain employment as employers are on record stating that they desire workers who can think (Yoon, 2018). Therefore, the continued use of teacher-centered passive learning is crippling the ability of Thailand to achieve what it calls "Thailand 4.0" which involves improving economic prosperity, social well-being, raising human capital, and protecting the environment (Royal Thai Embassy-Washington D.C., 2015).

In response to this, the Thai government has encouraged the adoption of active learning principles (Cheunsuang, 2017). However, many teachers, particularly in the provincial areas outside of the Bangkok metropolitan area, have shown indifference to the reforms and continued to use teacher-centered approaches (The Economist, 2017). As such, for the typical provincial university they can do little about passive learning at the K-12 level. Yet, assessing the use of active learning at the tertiary level can provide insights into the benefits of this learning style among young adults in a context in which traditional styles of teaching may persist.

Active learning is an umbrella term and is broadly defined as anything in class in which the students is doing something rather than receiving a one-way transmission of knowledge from the teacher (Mizokami, 2018). The concept of active learning is derived from constructivism, which is a philosophy that students use prior knowledge to make sense and understand current learning experiences (Schunk, 2012). This concept of developing knowledge actively is the heart of active learning. Examples of active learning include problem-based learning, flipped classrooms, and classroom discussion.

Problem-based learning involves students investigating a central question through the development of a project (Bass & Krauss, 2014). Common problem-based learning experiences at the tertiary level include writing research papers/ articles and presenting research. A flipped classroom involves the students reading the lecture material before class and then doing activities related to the lecture material in the classroom (Chua & Lateef, 2014). This "flips" the time when students are active from their own personal study time to during the traditional lecture time in class. In Southeast Asia, the flipped classroom is actively used in Singapore (Chua & Lateef, 2014).

Lastly, classroom discussion is the dialog that takes place between teacher and students as well as between students (Thomas, 2010). Classroom discussion involves the sharing of opinions and the development of critical thinking skills. However, this form of active learning is not traditionally a part of the Asia classroom learning experience as passive

listening is normally the cultural expectation (Thomas, 2010).

Active learning has been found to improve academic performance particularly in small classes of less than 50 students (Freeman, et al., 2014). In particular, the use of the flipped classroom has also been found to improve attitudes towards learning (Roach, 2014). However, another study found that there is nothing special about the flipped classroom as long as some form of active learning is employed in the learning experiences of the students (Jensen, Kummer, & Godoy, 2015).

Despite the benefits of active learning, there are some concerns. For example, active learning places an emphasis on group work. This is culturally relevant in Asia; however, group work can contribute to social loafing in which some students do not do their share of the work (Cacioppo & Freberg, 2013). In addition, the focus on being active in active learning can lead to a lack of theoretical knowledge in a given subject (Consul-Giribet & Medina-Moya, 2014). This could lead to challenges in assessing students as all students have constructed slightly different knowledge from the active learning experience.

In the context of Thailand education, rote-learning is a predominate strategy (Fernquest, 2016). As in other parts of Asia, a teacher-centered approach is common as well (Noom-ura, 2013). Furthermore, Swatevacharkul (2014) found that learner autonomy was missing among students and indicated that students, Thai culture, the educational system, and teacher were to blame for this. The effects of this is a workforce unprepared to think critically, which is a threat to the economic growth of Thailand (Khuvasanond, 2013; Royal Thai Embassy-Washington D.C., 2015)

Academic achievement is a measure of a student's knowledge or mastery of a subject. Walberg (1980) found that academic achievement can be explained by prior success, age, motivation, amount of instruction, classroom climate, home environment, peer group, and exposure to mass media (Walberg, 1980). However, for dormitory students the influence of the home environment may be negligible at the tertiary level of education. Furthermore, Walberg (1980) completed his work years before active learning was being supported with rigorous research. Therefore, the amount of instruction concept of Walberg (1980) is viewed from an active learning perspective in this study.

Academic achievement has been linked with self-regulation, which means that people with self-control normally perform better academically (Schunk, 2012). In addition, people with a more positive perception of their self-efficacy also tend to perform better academically (Schunk, 2012). Girls usually outperform boys academically (Stoet & Geary, 2015). Academic performance is critical to college completion and students who struggle are much more likely not to finish (Thomas, 2014).

In Thailand, standardized testing constantly reveals significant concerns with academic achievement (Mala, 2016). One study it a provincial setting in Thailand found that university students are not highly motivated to read which could affect academic achievement (Kitjaroonchai & Kitjaroonchai, 2012). A second study, conducted in the southern part of Thailand confirmed low motivations to study at the college level and in the conclusion it was suggested that a variety of teaching methods should be implemented to help students (Hayikaleng, Nair, & Krishnasamy, 2016). One potential method that can be employed is active learning, which the authors did not mention. Therefore, understanding the association between active learning and academic achievement may provide support as to whether active learning is a potential alternative method for use in Thailand.

The purpose of this study is to assess students' perceptions of active learning and academic achievement in order to describe this phenomenon quantitatively. Assessing active learning in a provincial setting in tertiary education will provide insights for teachers and administrators into the benefits of active learning and its influence upon academic achievement.

Research objectives:

I. Determine the students' perception of their ability to learn actively as well as their perception of their academic achievement

II. Determine if there are differences in active learning and academic achievement based on the demographic variables of this study.

III. Ascertain if the demographic variables modify the relationship between active learning and academic achievement.

Hypothesis

1. There is a significant difference by class level, gender, and or major in terms of active learning or academic achievement for provincial university students in Thailand.

2. There is a significant relationship between active learning and academic achievement among provincial university students in Thailand.

Data Collection

The researcher collected the data at the university. Before completing the instrument, all respondents were informed of the purpose of the study, the protection of their anonymity, as well as their right to decline participation. Respondents completed all sections of the survey.

The response rate was nearly 100% for the surveys that were distributed. The survey were returned immediately to the researcher upon completion.

Population and Sample

This study targeted students at Asia-Pacific International University, Saraburi, Thailand a private university located in a non-metropolitan provincial setting.

A sample of 100 students was selected using stratified sampling based on gender. Stratified sampling involves dividing the population into subgroups and maintaining these proportions in the sample. Of all participants, 44% were freshman, 20% were sophomore, 19% were juniors, and 17% were seniors. For gender, 64% of the students were female and 36% were male. The majority of the students were from faculty of arts and humanities at 28% followed by nursing (25%), business administration (24%), religious studies (9%), education and psychology (8%), and science (6%) respectively. Lastly, 55% were from the international program and 45% were from the Thai program.

Instruments

The research design of this study was descriptive correlational design with the use of a survey. The survey instrument was comprised of two sections. Section 1 addressed the demographic variables of gender, program, major, and class level. Section 2 consisted of 23 Likert-type statements, which measured the student's perception of active learning and academic performance. The Likert scale employed in this study was a 4-point scale with 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree. The four point Likert scale is known as a "forced choice" scale as it did not allow the student to be neutral towards the statements in the survey (Minkov, 2013).

The active learning scale and the academic achievement scale was adapted from Tuan, Chin, and Shieh (2005). Sample statements from the scale for active learning include "when new concepts that I have learned conflict with my previous understanding, I try to understand why" and "during the learning processes, I attempt to make connections between the concepts that I learn." The Cronbach alpha for the 13-item scale of active learning scale was 0.83.

The academic achievement scale was adapted from Dionne et al. (2012). Sample statements from the scale for academic achievement session include "whether the content is difficult or easy, I am sure that I can understand it" and "it is important to have the opportunity to satisfy my own curiosity when learning." The Cronbach alpha for the 10-item scale was 0.86.

Data Analysis

Descriptive statistics were analyzed in this study. The means and standard deviations for the variables as well as for individual survey items were derived from the observed data. t-test and ANOVA were used to assess differences across various demographic groups on each variable. For differences involving ANOVA a Tukey Post-Hoc test was conducted to determine where the difference was specifically. Pearson's correlation was calculated for the relationship between academic achievement and active

learning. Lastly, multiple regression was used to determine the association between active learning and academic achievement when controlling for the demographic variables of the study.

In terms of the results for active learning, as displayed in Table 1, the overall overview of the student perceptions was positive (*M* = 3.11, *SD* = 0.42). However, the students indicated in item 9 that they disagreed that class debating is one of their favorite class activities (*M* = 2.70, *SD* = 0.90). Students also disagreed with items 8 and 13 that when they do not understand a concept, they find relevant resources that will help them (*M* = 2.96, *SD* = 0.78) and that they are willing to participate in a class because the teacher uses a variety of teaching methods (*M* = 2.98, *SD* = 0.78). In addition, students agreed in relation to item 3 that when they make a mistake, they try to find out why (*M* = 3.25, *SD* = 0.67). They also agreed with items 6 and 7 that when they meet concepts that they do not understand, they still try to learn the concepts (*M* = 3.23, *SD* = 0.69) and that when learning new concepts, they attempt to understand the concepts (*M* = 3.15, *SD* = 0.69).

In relation to academic achievement, as displayed in Table 2, the overall overview of the student perceptions is positive (*M* = 3.11, *SD* = 0.45). However, the students indicated in items 14 and 16 that they disagreed whether the content is difficult or easy, I am sure that I can understand it (*M* = 2.67, *SD* = 0.64) and that they are sure that they can do well on tests (*M* = 2.67, *SD* = 0.70).

Furthermore, students agreed in relation to item 22 that they feel most fulfilled when they are able to solve a difficult problem (*M* = 3.35, *SD* = 0.63). They also agreed with items 18 and 19 that they think that it is important to learn to solve problems (*M* = 3.34, *SD* = 0.70) and that they think that learning is important because it stimulates their thinking (*M* = 3.30, *SD* = 0.6*).*

Table 1 Mean (M) and Standard Deviation (SD) of Survey Items on Active Learning

No.	Item	M	SD	95%CI
1	I am very comfortable when teachers let us discuss in groups.	3.12	0.73	2.97 – 3.26
2	When new concepts that I have learned conflict with my previous understanding, I try to understand why.	3.04	0.76	2.88 – 3.19
3	When I make a mistake, I try to find out why.	3.25	0.67	3.11 – 3.38
4	During the learning processes, I attempt to make connections between the concepts that I learn.	3.14	0.57	3.02 – 3.25
5	When learning new concepts, I connect them to my previous experiences.	3.04	0.63	2.91 – 3.16
6	When I meet concepts that I do not understand, I still try to learn them.	3.23	0.69	3.09 – 3.36
7	When learning new concepts, I attempt to understand them.	3.15	0.69	3.01 – 3.28
8	When I do not understand a concept, I find relevant resources that will help me.	2.96	0.78	2.80 – 3.11
9	Class debating is one of my favorite class activities.	2.70	0.90	2.52 – 2.88
10	I love to do activities in the class rather than to sit and listen to the lectures.	3.14	0.80	2.98 – 3.29
11	When I do not understand a concept, I would discuss with the teacher or other students to clarify my understanding.	3.09	0.70	2.95 – 3.22
12	I am willing to participate in a class because the students are involved in discussions.	3.01	0.69	2.87 – 3.15
13	I am willing to participate in a class because the teacher uses a variety of teaching methods.	2.98	0.78	2.82 – 3.13
	Active Learning	3.11	0.42	2.98 – 3.14

Table 2 Mean (M) and Standard Deviation (SD) of Survey Items on Academic Achievement

No.	Item	M	SD	95%CI
14	Whether the content is difficult or easy, I am sure that I can understand it.	2.67	0.64	2.54 – 2.79
15	During a course, I feel most fulfilled when I attain a good score in a test.	3.11	0.75	2.96 – 3.25
16	I am sure that I can do well on tests.	2.67	0.70	2.53 – 2.80
17	It is important to have the opportunity to satisfy my own curiosity when learning.	3.18	0.72	3.03 – 3.32
18	I think that it is important to learn to solve problems.	3.34	0.70	3.20 – 3.47
19	I think that learning is important because it stimulates my thinking.	3.30	0.69	3.16 – 3.43
20	I think that learning is important because I can use it in my daily life.	3.20	0.77	3.04 – 3.35
21	I feel most fulfilled when I feel confident about the content in a course.	3.15	0.69	3.01 – 3.28
22	I feel most fulfilled when I am able to solve a difficult problem.	3.35	0.63	3.22 – 3.47
23	I feel most fulfilled when the teacher accepts my ideas.	3.15	0.76	2.99 – 3.30
	Academic Achievement	3.11	0.45	3.02 – 3.20

The results of the analysis based on the subgroups of gender, program, class level, and faculty indicated the following. For active learning, in terms of gender, no difference was found between men (n = 36, M = 3.06, SD = 0.45) and women (n = 64, M = 3.07, SD = 0.40) conditions; t (99) = 0.05, p = 0.95. Neither was a difference found by program between Thai program (n = 45, M = 3.08, SD = 0.39) and the International program (n = 55, M = 3.04, SD = 0.44) conditions; t (99) = -0.043, p = 0.97. No difference was found by class level as indicated in tables 3 and 4 or by faculty as indicated in tables 5 and 6.

Table 3 Mean (M) and Standard Deviation (SD) by Class for Active Learning

Class	*n*	M	SD
Freshman	44	3.02	0.46
Sophomore	20	2.97	0.42
Junior	19	3.15	0.37
Senior	20	3.19	0.31

Table 4 Fixed-Effects ANOVA results using Active Learning as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p-value*	partial η^2	partial η^2 90% CI [LL, UL]
(Intercept)	401.56	1	401.56	2300.08	0.000		
Class	0.68	3	0.23	1.29	0.282	0.04	[0.00, 0.09]
Error	16.76	96	0.17				

Table 5 Mean (M) and Standard Deviation (SD) by Faculty for Active Learning

Faculty	*n*	M	SD
Business	24	3.08	0.35
Education	8	3.17	0.31
English	28	2.97	0.47
Nursing	25	3.12	0.41
Religion	9	3.05	0.59
Science	6	3.00	0.27

Table 6 Fixed-Effects ANOVA results using Active Learning as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p-value*	partial η^2	partial η^2 90% CI [LL, UL]
(Intercept)	229.12	1	229.12	1269.86	0.000		
Faculty	0.48	5	0.10	0.53	0.755	0.03	[0.00, 0.05]
Error	16.96	94	0.18				

The results of the analysis for academic achievement based on the subgroups of gender, program, class level, and faculty indicated the following. In terms of gender, no difference was found between men (n = 36, M = 3.05, SD = 0.49) and women (n = 64, M = 3.14, SD = 0.43) conditions; t (99) = 0.94, p = 0.35. Neither was a difference found by program between Thai program (n = 45, M = 3.11, SD = 0.45) and the International program (n = 55, M = 3.11, SD = 0.47) conditions; t (99) = 0.06, p = 0.95. No difference was found by class level as indicated in tables 7 and 8 or by faculty as indicated in tables 9 and 10.

Table 7 Mean (M) and Standard Deviation (SD) by Class Level for Academic Achievement

Class	*n*	M	SD
Freshman	44	3.11	0.50
Sophomore	20	3.00	0.43
Junior	19	3.13	0.44
Senior	20	3.23	0.37

Table 8 Fixed-Effects ANOVA results using Academic Achievement as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p-value*	partial η^2	partial η^2 90% CI [LL, UL]
(Intercept)	424.70	1	424.70	2045.95	0.000		
Class	0.52	3	0.17	0.83	0.480	0.03	[0.00, 0.07]
Error	19.93	96	0.21				

Table 9 Mean (M) and Standard Deviation (SD) by Faculty for Academic Achievement

Faculty	*n*	M	SD
Business	24	3.11	0.35
Education	8	3.30	0.31
English	28	2.98	0.51
Nursing	25	3.22	0.46
Religion	9	3.11	0.49
Science	6	3.02	0.56

Table 10 Fixed-Effects ANOVA results using Academic Achievement as the criterion

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p-value*	partial η^2	partial η^2 90% CI [LL, UL]
(Intercept)	231.26	1	231.26	1126.45	0.000		
Faculty	1.15	5	0.23	1.12	0.356	0.06	[0.00, 0.10]
Error	19.30	94	0.21				

Active learning and Academic Achievement were found to have a strong association when bivariate correlation was calculated r (100) = 0.73, $p < 0.05$, 95%CI [0.62 - 0.81]. When the demographic control variables (Gender, Program, and Faculty) were included the relationship remained unchanged B = 0.72, conditions; F [11, 88] = 10.37, $p < 0.01$, R^2 = 0.56, $R^2_{Adjusted}$ = 0.51. Table 11 shares the results for regression.

Table 11 Regression Coefficient Results for Academic Achievement

	Estimate (*b*)	Std. Error	t	p-value
Active learning	0.72	0.07	9.79	<0.01
Gender: Male	-0.21	0.17	-1.28	0.20
Class: Junior	-0.04	0.23	-0.21	0.84
Class: Senior	0.05	0.27	0.20	0.84
Class: Sophomore	-0.01	0.23	-0.03	0.97
Program: Thai	-0.34	0.22	-1.56	0.12
Faculty: Education	0.15	0.30	0.51	0.61
Faculty: English	0.05	0.23	0.23	0.82
Faculty: Nursing	0.39	0.32	1.20	0.23
Faculty: Religion	0.11	0.31	0.35	0.72
Faculty: Science	-0.13	0.33	-0.40	0.69

Conclusion

The results of this study imply the following. First, students prefer the use of active learning strategies in the classroom. This is consistent with Roach (2014) who found that active learning changes perceptions towards learning positively.

The association between active learning and academic achievement can be explained by the concept that students

learn by doing. This was a concept strongly supported by John Dewey whom he also referred to as experiential learning (Dewey, 1997). Therefore, students who perceive that they are learning through action will often perceive their academic achievement in a more positive manner.

Second, there were no differences found by the subgroups based on demographics. This is in contrast to the work of (Stoet & Geary, 2015) who found differences by gender for academic achievement. This discrepancy that Stoet and Geary (2015) may be because their study looked at academic performance while this study looked at a student's perception of their academic performance.

The lack of difference may be contributed to cultural reasons. Komin (1991) found that it was common for students in Thailand to not value education in a similar manner as other cultures. Furthermore, Komin (1991) suggested that high achievement was not as important as harmonious relationships with others. Therefore, there may be less cultural incentive for various subgroups to have different perceptions of active learning or academic achievement as these variables are educational constructs.

Lastly, active learning had a strong association with academic achievement that changed little with the addition of the control variables in the model. This indicates that a learning environment of discussion, participation, and projects is linked with having students a more positive perception of their ability to do well academically.

Recommendation

Based on these results the following recommendations are given. First, Active Learning should be included at the tertiary level and can be accomplish using discussion, projects, debates, group work, flipped classroom, and problem based methods (Bass & Krauss, 2014; Chua & Lateef, 2014). Generally, teachers should minimize lecture style teaching which is a predominate method at the tertiary level.

Second, educators at the university level should provide teachers with opportunities to develop active learning teaching approaches. The results of this study indicate that this could have a strong effect on student's performance. What is missing in the context of this study is how to teach actively.

For further study, it would be beneficial to conduct a larger study across several provincial schools to assess the stability of the results. In addition, a longitudinal study would allow researchers to determine if student's perception of active learning changes over time. Lastly, a study that identifies specifically which form of active learning has the strongest effect on academic performance would help teachers to know which tools are most appropriate for a given context.

The limitations of this study include the reliance on self-reporting which assumes honesty. In addition, at times the sample sizes

of the subgroups were small which can make the results unstable. Lastly, correlation does not imply causation and there always factors in any regression model that are not included due to the need for parsimony.

Benefit of Research

The findings of this study can lead the teachers at Asia-Pacific International University as well as the teachers from other institutions to see the important of the use of active learning in the classroom and how it correlate with students' academic achievement. The teachers would have better understanding about the effectiveness of using active learning method and may adapt using active learning in their teaching methods.

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