The Relationship between Students' Motivation and Learning Gains in Five Thai Universities.

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Abstract

This study aimed to review the relationship between students' motivation and students' learning gains in Thailand universities. Additionally, the study aimed to investigate Keller's ARCS model dimensions that were tested against students' learning gains. However, empirical research focusing on motivation in relation to students' learning gains is mostly limited to secondary schools or specific subject contexts. Five largest universities in Thailand were purposely selected as sampling units and 348 students were selected proportionately as samples of this study. A closed-ended questionnaire was administered online by sharing the link to the contact points of the five universities. Data collection was conducted for two weeks, after which participation was closed. Inferential statistics were generated to test the hypotheses. Data were analysed by a statistical analysis package. Findings from the study revealed that attention (p=0.002), relevance (p=0.000), confidence (p=0.011), and satisfaction (p=0.004) are significantly correlated and related to students' learning outcomes. It was recommended that Universities in Thailand train their faculty to use the ARCS model to enhance students' motivation and learning gains.

Keywords: Student motivation, Thai universities, Learning gains, ARCS model

Introduction

Students' learning gains in Thai universities are a sensitive issue among the education stakeholders, including students, parents, the Thai universities faculty, university administration teams, and the ministry of education. Tongsilp (2013) noted that Thailand is keen on the quality of education because it helps accelerate the country's socio-economic development. Thailand's education system allows higher education students to be self-learners and practice learner autonomy (Lavankura, 2013; Kew *et al,* 2018). Gaining from the education system requires students to have achievement motivation because it enables them to progress in their education and future occupations. As defined by Kanoksilapatham *et al* (2021), motivation includes the drive or motive that encourages a person to engage in an activity (Rosmayanti & Yanuarti, 2018). Students may not achieve the desired gains if they do not have the motivation to engage in learning (Al-Khasawneh & Al-Omari, 2015). Despite its importance in attaining student gains, past studies have not adequately investigated the relationship between students' motivation and students' learning gains in Thailand universities. One of the key challenges that Thai universities face include producing quality graduates, graduates that experience as many learning gains as possible considering that this is key to improving their employability skills as well as professional development. Education system imbalances are also a vital challenge that affects Thailand and thus important elements such as student motivation could be key to creating the desired changes.

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Thai students join universities to improve work readiness, personal and professional development, and employability skills (Hamilton *et al*, 2018). While in the university, students are expected to exhibit a desirable level of curiosity and interest in learning that drives them to study hard and achieve the desired grades to be considered qualified for a given certification (Gribble *et al,* 2017). Furthermore, improving knowledge and skills are vital gains students achieve from studying at a university. Thus, consistent with the assertion by Bakar *et al* (2010), students join universities to achieve specific gains related to student development, improved employability, work-readiness, knowledge and skills, and passing the university tests. Notwithstanding the notable efforts, the recent report by the Organization for Economic Co-operation and Development [OECD] (2020) noted that Thailand is still grappling with the education system and skills imbalances. Learner engagement in a school environment is an important condition for active learning. Ideally, success is only possible when learners' interests are taken into consideration (Le & Nguyen, 2022). Students who are highly motivated make an effort to remain engaged in school. Thus in the view of Le & Nguyen (2022), knowing a student's motivation level is critical for active engagement in the classroom. Thailand's quality of education is also low and thus it's vital to determine what best can be done to guarantee that learners get the best quality of education. Reviewing important issues such as motivation and the elements that may improve learning are key and thus the guide to developing the paper.

The available literature reveals that most of the previous studies have concentrated on the relationship between motivation and students' achievement either in English learning (Hayikaleng *et al,* 2016; Rogaten *et al*, 2020) or in students who are in secondary schools (Imsa-ard, 2020; Kitjaroonchai, 2012). This means that the aspect of students' motivation concerning their achievement with a specific consideration in university education is still limited. Moreover, models and theories of educational attainment support actions that support learner motivation toward education attainment. For example, Keller's ARCS model (Milman & Wessmiller, 2016) identifies four motivation categories that instruction should be designed to enhance. The categories include attention (A), relevance (R), confidence (C), and satisfaction (S). Attention consists of an instructor's ability to arouse student curiosity and interest (Li & Keller, 2018). Through confidence, the instructor scaffolds learners' success in meaningful tasks. Satisfaction is the ability of an instructor to build students' sense of reward and achievement (Keller *et al*, 2017).

Learning gains include the learning process outcomes that students demonstrate after engaging in tasks and activities that are part of their learning (Asvio, 2017). Boud (2018) claimed that the most basic learning gain is the acquisition of knowledge or skills developed due to engaging in the education system and conducting learning activities and tasks required for the subjects undertaken by students. The indicator of knowledge acquisition is test scores or the number grades that lecturers give to students (Roohr *et al,* 2017). Accordingly, Rogaten *et al* (2019) classified learning gains into affective, behavioral, and cognitive. Students should develop a likeness for learning, portray particular behavior, and transform their thought processes after undergoing a university study process (Rosmayanti & Yanuarti, 2018; Asvio, 2017).

Motivation has been considered one of the influential factors affecting students' learning achievement. Past studies investigating motivation in learning contexts identified that most students who fail at the university level lack the motivation to study and achieve the expected standards (Kitjaroonchai, 2012; Oranpattanachai, 2013). Rosmayanti & Yanuarti (2018) found a direct and significant relationship between students' motivation and learning achievement. Asvio (2017) noted that motivation to learn provides students with the spirit of learning, direction, and persistence in behavior. Increasing motivation to learn requires educators to satisfy specific indicators during the learning process (Tonsilp, 2013).

However, available literature has not adequately related the aforementioned aspects to students' gains, focusing on Thailand universities.

Research Objectives

1. To study how motivation affects learning gains in Thai universities and the subsequent consequences of students being motivated or otherwise.
2. To investigate the possible relationship between students' motivation and learning gains.
3. To assess how student motivation and subsequent learning gains affect quality of education in Thai universities.

Materials and Methods

Research Methodology

The study was cross-sectional because it was conducted within a short period and allowed for the collection of 'snapshot' data within the same period in the Thai universities context. A survey strategy was found the most suitable option for this study because it could facilitate asking questions to the respondents and getting their responses for analysis.

Sample Size

The population consisted of all students studying mainly in five of Thailand's 170 universities. The list of universities was obtained from the Ministry of Education. The sample size of 384 (n=384) was determined using Cochran's formula for infinite populations, $n=Z^2pq/e^2$, where n is the sample size and e is the desired level of precision. At the 95% significance level, the Z value taken was 1.96. The total number of students was determined for each university, and contacts (both email addresses and phone numbers) were retrieved.

Sampling Technique

The sampling techniques were used to select universities and individual subjects to participate in the study. A purposeful sampling technique was used to select the largest five universities in terms of the student population from the list of Thai universities. The sample was selected from each university using a simple random sampling technique because it gives equal opportunity for all students to be selected with minimal sampling bias.

Research Instrument

The questionnaire was developed based on what other researchers have used in the past to study Thai university education as well as based on the objectives highlighted in the paper. Keller's ARCS model was a foundation for the development of the research instrument because the model has the four crucial dimensions that determine student motivation. The ARCS model is presented in table 1 below.

Table 1 shows the Components of the ARCS model summary. (Keller *et al*, 2017).

Category	Meaning	Activities
Attention (A)	Arouse the curiosity and interest of the learners.	Stimulating learners' perceptions, engaging inquiry using puzzles, dilemmas, and questions, and creating varieties of examples, models, and presentation modalities.
Relevance (R)	Relate the learning content to the needs and experiences of learners.	Ensuring that learners are effectively oriented to useful goals, matching learners' motives with the content being delivered, and connecting the content being learned to familiar things in the learners' current environment.

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Table 1 (Continue)

Category	Meaning	Activities
Confidence (C)	Scaffolding learners' success of meaningful tasks.	Setting learning requirements with clear goals, standards, and criteria for evaluation, creating opportunities for success, and encouraging personal control among the students.
Satisfaction (S)	Enhance learners' sense of reward and achievement.	Supporting and creating an environment for intrinsic and natural consequences, providing for extrinsic and positive consequences, and ensuring that equity is applied in learning and assessment processes.

Quality and reliability of the questionnaire was done by first pilot testing it by having few individuals (10% of the sample size) to determine the kind of information that would be gathered and how it would be useful to develop a conclusion. Reliability analysis confirmed that the questionnaire was reliable because all items scored a Cronbach's alpha value of greater than 0.7 (Ravinder & Saraswathi, 2020). Validity was determined by expert consultation and reference to past literature's construct definitions (Keller *et al*., 2017). Hence, the questionnaire was determined to have met the quality requirements for use in the current study.

Data Collection

An online questionnaire was used for data collection the researcher got to access a widely dispersed population. Using the emails and phone numbers of the universities, an introductory letter was sent to each university accompanied by the link that the receiving universities would share with the students. A period of three weeks was allowed for participation. The online participation was switched off once a target of 384 responses were achieved.

Data Analysis

Data collected was coded and entered into the Statistical Package for Social Sciences (SPSS). The SPSS commands were used to generate results for both descriptive statistics (frequencies, means, and standard deviations) and inferential statistics (correlations and regressions). Regression analysis results were used to construct a predictive model and test hypotheses based on the 5% significance level (p=0.05). The variables that scored p-values of less than 0.05 meant the rejection of the associated null hypotheses. On the other hand, variables with p-values greater than 0.05 were not rejected.

Ethical Considerations

Approval was sought from each participating university to engage the students in the study. Informed consent was prioritised, evidenced by disclosing all the material facts about the study before engaging the participants in the study. The details of the participating universities and the respondents were kept anonymous to conceal their identities from being recognized in the final report.

Research Hypotheses

ARCS model represents four variables of students' motivation. Thus, this study investigates the relationship between four variables of students' motivation and student learning gains in Thai universities. To achieve the above aim, the study seeks to test four hypotheses, namely:

1. Attention and student learning gains in Thai universities are not significantly related.
2. Relevance and student learning gains in Thai universities are not significantly related.
3. Confidence and student learning gains in Thai universities are not significantly related.
4. Satisfaction and student learning gains in Thai universities are not significantly related.

Results

Objective One:

A study of how student learning gains is affected by motivation and subsequently determines whether students have positive or negative consequences, the paper highlights that motivation plays a key role in determining the extent of learning gains that students get in Thai universities.

Descriptive Analysis

The findings were statistically calculated from the responses to the Likert scale tool that contained five statements for each variable, which the respondents were required to rate based on the extent to which they agree and disagree with each statement using the key 1-strongly agree, 2-agree, 3-neutral, 4-disagree, 5-strongly disagree.

Table 3 shows the Variable Aggregate Means Analyzed from the Likert Scale Responses.

Variable	N	Aggregate mean	Rounded off:	Standard deviation	Location in the scale
Attention	384	2.01	2	0.99	2-agree
Relevance	384	1.23	1	0.78	1-strongly agree
Confidence	384	2.12	2	0.87	2-agree
Satisfaction	384	2.51	3	1.01	3-neutral
Learning gains	384	2.46	2	0.85	2-agree

Table 3 above indicates that most of the respondents agreed with the statements for the variable attention, as evidenced by an aggregate mean of 2.01, which, when rounded off to the nearest whole number, becomes 2 (agree). The students agreed that their lecturers present content to stimulate their perceptions, engage them in dilemmas and deep reasoning, and adopt teaching methods that feature visual stimuli.

Objective Two and Three:

Correlation and regression analysis will be utilized to help review the second objective aimed at determining whether motivation and learning gain have a significant relation for learners in Thailand. The two analyses will review the relationship between the two elements and further review some of the aspects that may affect motivation and how they end up affecting student learning gains. A study to investigate the possible relationship between students' motivation and learning gains and assess the quality of education in Thai universities considering that positive learning gains will improve the overall quality of education and skills that students get from higher education.

Correlations Analysis

The independent variable was student motivation, while the dependent variable was students' learning gains. The results from the analysis were presented using table 4 below.

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Table 4 shows the Correlation Analysis from the Datasets, dependent variable is students' learning gains.

Independent Variable of Motivation	Correlation coefficient	Significance
Attention	0.892	0.00*
Relevance	0.881	0.00*
Confidence	0.805	0.00*
Satisfaction	0.743	0.00*

*Significance at the 0.05 level

Table 4 shows that correlations between attention, relevance, confidence, and satisfaction are also significant, given that significance levels are equal to 0.00 (p=0.00; p<0.05). The results show a positive and strong correlation between students' learning gains and attention (r=0.892), students' learning gains and relevance (r=0.881), students' learning gains and confidence (r=0.805), and students' learning gains and satisfaction (r=0.743). Considering the various variables highlighted in the review, the data shows that there is a great correlation between student motivation and learning gains. The data highlights that elements such as attention, relevance, satisfaction and confidence are improved when student motivation is improved among students.

Regression Analysis

The regression analysis was conducted to analyze the relationship between students' learning gains and each independent variable for student motivation. The model showed that the four independent variables are responsible for 68.5% of the variability in students' learning gains. The remaining percentage (31.5%) is caused by other factors not part of this model. Hereby, the table 5 shows the regression analysis between dependent variable and each independent variable.

Table 5 shows the Regression Analysis from the Raw Datasets

Model	Unstandardized Coefficients	Standardized Coefficients		t	Sig.
B		Std. Error		Beta	
(Constant)	3.741	.541		6.918	.004*
Attention	.325	.418	.109	.299	.002*
Relevance	.595	.536	.244	.550	.000*
Confidence	.486	.612	.588	1.120	.011*
Satisfaction	.228	.323	4332	0.234	.004*

Predictors: attention, relevance, confidence, satisfaction

*significance at 0.05

Table 5 above shows that the regression model's constant value is 3.741. The value (3.741) implies that when the independent variable (student motivation) is zero, students' learning gains are equal to 3.741. The model shows that attention, relevance, confidence, and satisfaction coefficients are 0.325, 0.595, 0.486, and 0.228, respectively. All the variables are statistically significantly related to the independent variable given that they scored p-values of less than 0.05. Testing the null hypotheses was conducted using the significance values (p-values). All hypotheses were rejected because they scored p-values of less than 0.05. The results imply that attention, relevance, confidence, and satisfaction are

significantly related to students' learning gains in the Thailand universities. The analysis reviews the relationship between unique elements that are likely to improve student learning gains.

Discussion

In a study that investigates the possible relationship between students' motivation and learning gains, the results confirmed that students' learning gains are significantly related to student's motivation. The mean results mainly were centered on one or two, which stand for either 'strongly agree' or 'agree' with the survey instrument details. The elements of motivation, namely attention, relevance, confidence, and satisfaction, are essential in ensuring students achieve learning gains. Li & Keller (2018) emphasized the need for teachers to use a variety of stimuli and present to students the uncertain and challenging situations to crack interestingly. Tongsilp (2013) argued that universities intending to enhance students' achievements need to give more attention to the perfect match between students' interests and course content. Kokkinos & Saripanidis (2015) argue that students have varied individual differences, meaning that satisfying each student's needs may be difficult, especially when several students are pursuing different courses. Most of the previous studies, such as Milman & Wessmiller (2016) and Li & Keller (2018), have identified that students' learning and each aspect of motivation are significantly, strongly, and positively correlated. In contrast to the findings from this study, Na, Pet Sangsri & Tasir (2016) had established that only confidence is significantly associated with students' learning needs. However, limiting the study to only e-learning students might have caused a difference in the study's findings.

In a study that assesses the impact of proper motivation and learning gains improves the quality of education offered in Thai universities, the results indicate that it motivates students to get more education-based benefits. Motivation provides the impetus required for learners to increase their effort in learning (Kitjaroonchai, 2012). As per the ARCS model, educators tend to motivate students toward gaining from university education if they can arouse students' curiosity and interest, relate learning to students' experiences and needs, scaffold learners' success in meaningful ways, and develop students' sense of rewards and achievement (Keller *et al*, 2017; Li & Keller, 2018). Implementing the elements of the ARCS model in Thailand universities can significantly influence students' learning gains.

In a study that reviews how student learning gains in Thailand universities are affected by motivation and generally lead to either positive or negative ends based on the level of motivation, the results indicate that the learners believe the educators use the right tools to engage them in the class, stimulate their reasoning, engage their dilemmas as well as utilize visual stimulation to motivate them during class and thus students enjoy more learning gains and experience positive consequences.

Conclusion

Keller’s ARC model posits that attention, relevance, confidence, and satisfaction are responsible for enhancing students’ motivation in learning. Data collected from a sample of 384 students selected from the five most prominent universities in Thailand confirmed that attention, relevance, confidence, and satisfaction, which represent students’ motivation, are significantly correlated and related to students' learning outcomes. The four null hypotheses were rejected, meaning that Thai universities’ students’ learning gains are significantly influenced by attention, relevance, confidence, and satisfaction.The study revealed eliciting student attention, ensuring content relevance, inspiring confidence, and creating a sense of satisfaction are sources of proper motivation that positively impact on learning gains, quality of university education and overall experience of the learners.

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Recommendations

Based on the findings from the study, it is recommended that:

1. Thai universities embrace Keller's ARCS model in all courses to ensure that all students are motivated to learn to achieve the best possible gains from the university education.
2. Lecturers should be trained in implementing Keller's dimensions of motivation as outlined in the model.
3. Effective implementation should be done universally to ensure that all students have equitable access to education.

Despite the robustness of the results from this study, it is worth noting that the study considered only five universities in Thailand and limited the study to the dimensions of Keller's ARCS model. The sample size of 384 was also relatively small to allow for the generalizability of the findings. Future researchers may expand the reach to several universities in Thailand and compare with universities in other countries using large sample sizes. Mixed research designs should also be used to generate qualitative data that depicts respondents' true feelings, opinions, and attitudes toward student motivation and students' learning gains.

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