MIDDLE-SCHOOL INTERNATIONAL STUDENTS' PERCEIVED SATISFACTION TOWARD ONLINE EDUCATION

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Abstract

The objective of this study was to determine the factors that influence students' perceived satisfaction and learning outcomes with online learning. The study applies critical success factors that were previously advanced on university online students to secondary online students. The independent variables of extrinsic motivation, teacher-student dialogue, student-student dialogue, student-self regulation, teacher activities, and course design are examined as potential influencers of students' perceived satisfaction and perceived learning outcomes. A total of 80 secondary students with at least one year of online learning experience at an international high school in Bangkok, Thailand were used to determine the effectiveness of critical success factors. The findings indicated that student self-regulation and course design were statistically significant with perceived learning outcomes while extrinsic motivation, teacher-student dialogue, student-student dialogue, and teacher activities were not. Additionally, extrinsic motivation, teacher-student dialogue, student-student dialogue, student-self regulation, teacher activities, and course design separately showed no statistically significant relationship towards students' perceived satisfaction and learning outcomes unless combined. Finally, the findings suggest that teacher-student dialogue and student self-regulation were the strongest influencers of students' perceived satisfaction while course design and student self-regulation were the strongest influencers of perceived learning outcomes.

Keywords: Perceived Satisfaction, Perceived Learning Outcomes, Online Education

1. INTRODUCTION

The purpose of this research was to better understand the perception of secondary students, to see the effect that long-term online learning has had on them, and if they felt satisfied with the level of education received.

The research by Eom et. al. in 2016 was based on previous works, such as Bidwell's survey in 2014 which showed that an increase of people was starting to believe that e-learning would be able to provide a better quality of education. Another survey by the Babson Survey Research Group showed an exponential increase of online students throughout the year 2002 to 2012. Regardless of positive opinions or the increase in numbers, many were still skeptical of e-learning, and opinions greatly varied. Some concerns revolved around the discipline of students and low retention rates (Allen & Seaman, 2013) or the poor educational experience by learners (Eom & Arbaugh, 2011). This was followed by an extended period of individual research that focused on the predictors of successful e-learning systems.

Eom et. al. (2016) and other studies on the research of e-Learning perception and experiences were focused on a university population. However, the focus of this study would be to see if the same research and expectations could be applied to a younger demographic, mainly secondary leveled students. In 2020, e-learning has now included many students worldwide in primary and secondary schools. So far, it is not clear if their perceived satisfaction and perceived learning outcomes may be different or similar to that of tertiary students.

2. LITERATURE REVIEW

The background of the original study was influenced by the constructivist theory of learning which states that learning is constructed through the experience and knowledge of the learner. With this understanding, the characteristics of e-learning/online education can be viewed as deriving from the constructivist learning model (Eom et. al., 2016). The current research is also based on this understanding and explores the following variables that could influence students' perceived satisfaction and perceived learning outcomes (reaction to online education) in the context of middle school or secondary international students.

2.1 Motivation

Eom and Ashill classified student motivation as a psychological construct, as found by Zimmerman (2008), which activates the self-regulation process. Extrinsic motivation is displayed during times when students focus on the goals of reward and/or recognition (Ryan and Deci, 2000). According to Castillo-Merino and Serradell-Lopez (2014), motivation has the most effect on student achievement.

2.2 Student Self-Regulation

Positive learning outcomes in face-to-face learning have a direct correlation to metacognition, time management skills, and effort regulation (Richardson et.al., 2012). A similar outcome found by Pellas (2014) showed that metacognitive self-regulation and self-esteem have a direct correlation to cognitive and emotional engagement. This refers to how much a student actively participates in class to build upon their perceived knowledge through new events. The previous study based its focus on self-regulation on a review of multiple

research projects done between 2004 to 2014, revealing a positive link between metacognition, time management, effort regulation, and critical thinking with academic outcomes.

2.3 Dialogue

Bruner (1985) and Vygotsky (1978) state that while face-to-face learning involves methods such as lectures in class, collaborative learning involves group discussions and learning to construct upon learned knowledge, which also includes methods of learning such as social collaborative learning, interaction, and discovery learning. As a critical success factor, interaction helps to bridge the distance during e-learning and helps to promote a more positive learning experience (Boling et.al., 2012). Interactions between peers and instructors by students were found to have a more positive effect than in classes with little or no interaction. Moor (1997) and Muirhead & Juwah (2004) state that the development of higher-order knowledge through deep cognitive engagement is achieved through the promotion of active participation by encouraging dialogue. Dialogue is then split into two variations for the purpose of the study as perceived by students: teacher-student dialogue and student-student dialogue.

2.4 Teacher Activities

Arbaugh (2010) found that there was a positive influence on student-perceived learning outcomes and satisfaction in online MBA courses due to the role of the instructor. Arbaugh also identified the two different types of roles as the "formal" and "informal" instructor. The formal role acts as the course designer and facilitator while the informal role provides different methods of communicative behavior, such as comments and humor. Kleiji et.al. (2012) found that students reported more positive assessments when receiving immediate feedback from instructors in comparison to delayed feedback. Although Eom and Ashill admit instructor knowledge is desirable, they state that it is more important for the instructor to be a facilitator, monitor, and provide feedback while expressing a caring and responsive attitude to student concerns. For the purpose of this study, the term "instructor" may be interchanged with the term "teacher" as being more relevant in a secondary school setting.
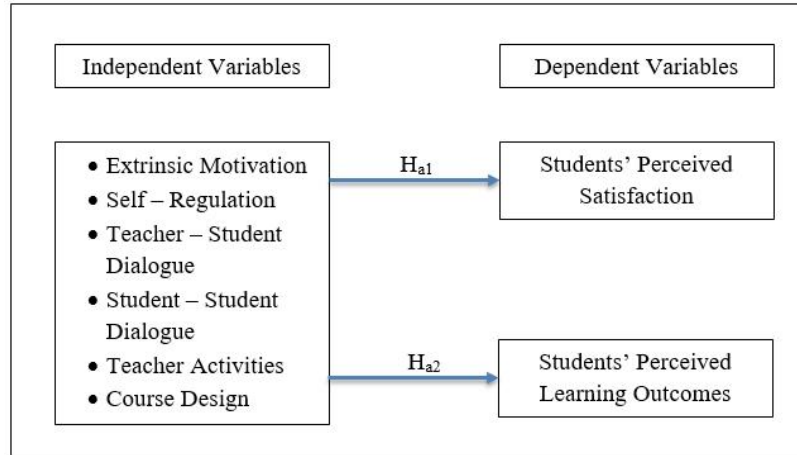
2.5 Course Design

The previous study describes the course design as the formal role in the instructor and notes Moore's (1997) explanation that the course structure "expresses the rigidity or flexibility of the program's educational objectives, teaching strategies, and evaluation methods," and describes "the extent to which an education program can accommodate or be responsive to each learner's individual needs." This is to provide a system of significant learning and assessment that will demonstrate the achievements of students.

2.6 Conceptual Framework
Based on previous researches, the following are the current research conceptual framework.

Figure 1: *The research conceptual framework*

The following are the research hypotheses for the study.

H_a1: Secondary students' perception of extrinsic motivation, self-regulation, teacher-student dialogue, student-student dialogue, teacher activities, and course design influence students' perceived satisfaction.

H_a2: Secondary students' perception of extrinsic motivation, self-regulation, teacher-student dialogue, student-student dialogue, teacher activities, and course design influence students' perceived learning outcomes.

3. RESEARCH METHODOLOGY
This study implemented a quantitative research method to identify factors influencing secondary students' perceived satisfaction and learning outcomes. The independent variables identified as critical success factors were Extrinsic Motivation, Student Self-Regulation, Teacher-Student Dialogue, Student-Student Dialogue, Teacher Activities, and Course Design. The dependent variables were students' Perceived Satisfaction and Perceived Learning Outcomes.

3.1 Population
The targeted sample population was taken from the population of grades 7, 8, 9, and 10 students at an international school in Bangkok, Thailand. The total population was approximately 320 students and ranged between lower to mid secondary grade levels. The approximate ability of the English language ranged between the A2 to C1 level on the

Cambridge English Scale as aligned to the Common European Framework of References (CEFR).

3.2 Sample Size and Sampling Method
There were four groups per grade level. Due to the fact that all groups were banded, only one group per grade level was given the survey. The total sample size was 80 participants. The purposive sampling technique was applied to acquire a sample to participate in the study. This was accomplished through the banding of students during a given lesson, during which the survey was implemented.

3.3 Research Questionnaire
The questionnaire items used in this study were a simplified version based on the ones used by Eom and Ashill (2016), which were also based on an earlier version of Eom et al. (2006). The original survey questionnaire was designed after an extensive literature review of multiple research studies. Considering that this new study was meant for a different demographic (lower secondary students instead of tertiary), a few alterations needed to be made to the wording of some questions while others needed to be removed entirely due to a lack of relevance to high school students. Other considerations were made regarding how public and private opinions could be perceived regarding some questions and the final list was updated to reflect this.

3.4 Reliability and Validity of Questionnaire
A pilot test was conducted to test the internal consistency and reliability of the research instrument. The Cronbach's alpha was set to test the internal consistency of 30 participants. Participants from the pilot test were excluded from the main study. Cronbach's alpha revealed the value of Extrinsic Motivation (EXMOT) and Student Self-Regulation (SR) as 0.784 and 0.636 respectively. Teacher-Student Dialogue (TSD) and Student-Student Dialogue (SSD) value as 0.783 and 0.734 respectively. The values of Teacher Activities (TACT) and Course Design (CD) were 0.868 and 0.727 respectively. Students' Perceived Satisfaction (PS) and Students' Perceived Learning Outcomes (LO) values are 0.804 and 0.649 respectively. Originally, an additional variable, labeled as Intrinsic Motivation, was originally included but eventually removed due to a low Cronbach's alpha value of 0.354, which is lower than the acceptable range. A reliability coefficient of ≥ 0.7 or 0.6 is considered acceptable (Taber, 2018). Construct validity was established through the use of survey questions that were adapted from previous studies.

4. RESULTS AND DISCUSSION

4.1 Hypothesis Testing

The hypotheses were tested using the Multiple Linear Regression method to determine whether Extrinsic Motivation (EXMOT), Student Self-Regulation (SR), Teacher-Student Dialogue (TSD), Student-Student Dialogue (SSD), Teacher Activities (TACT), and Course Design (CD) influences students Perceived Satisfaction (PS) and Perceived Learning Outcomes (LO). The JAMOVI software version 1.6.23.0 was utilized to analyze the multiple linear regression of the model for both hypotheses.

H_a1: Secondary students' perception of extrinsic motivation, self-regulation, teacher-student dialogue, student-student dialogue, teacher activities, and course design influence students' perceived satisfaction.

Table 1: *H_a1, Multiple Linear Regression Results*

ANOVA Omnibus tests

	SS	df	F	p	$\eta^2 p$
Model	5.3623	6	3.7443	0.003	0.235
exmot_ave	0.6453	1	0.9611	0.330	0.015
tact_ave	0.0473	1	0.0704	0.792	0.069
ssd_ave	0.8644	1	1.2874	0.260	0.090
tsd_ave	1.0883	1	1.6209	0.207	0.060
cd_ave	0.9244	1	1.3768	0.244	0.019
sr_ave	1.7927	1	2.6701	0.107	0.035
Residuals	49.0130	73			
Total	678.7784	80			

Fixed Effects Parameter Estimates

Names	Estimate	SE	95% Confidence Interval		β	df	t	p
			Lower	Upper				
(Intercept)	2.7938	0.0916	2.6112	2.976	0.0000	73	30.496	< .001
exmot_ave	−0.1291	0.1317	−0.3917	0.133	−0.1200	73	−0.980	0.330
tact_ave	−0.0433	0.1631	−0.3683	0.282	−0.0358	73	−0.265	0.792
ssd_ave	0.1470	0.1295	−0.1112	0.405	0.1444	73	1.135	0.260
tsd_ave	0.2744	0.2155	−0.1551	0.704	0.1984	73	1.273	0.207
cd_ave	0.2568	0.2189	−0.1794	0.693	0.1822	73	1.173	0.244
sr_ave	0.2484	0.1520	−0.0546	0.551	0.1983	73	1.634	0.107

The multiple regression analysis was performed with all the assumptions it complied with. The independent variables were the 6 variables consisting of Extrinsic Motivation (EXMOT), Student Self-Regulation (SR), Teacher-Student Dialogue (TSD), Student-Student Dialogue (SSD), Teacher Activities (TACT), and Course Design (CD). The linear combination was statistically significant toward the dependent variable, Perceived Satisfaction, $F(6, 73) =$

3.74, p < .001. The r2 was 0.235, which showed that approximately 24% of the variance of the dependent variables can be accounted for by the combination of the linear combination of the independent variables.

Among the independent variables, the Teacher-Student Dialogue average (identified as *tsd_ave* in *Table 1*) showed the strongest influence with B=0.1984 followed by Student Self-Regulation average (identified as *sr_ave* in *Table 1*), which has the beta value of 0.1983. These two values showed not to be statistically significant due to being more than 0.05.

H_{a2}: Secondary students' perception of extrinsic motivation, self-regulation, teacher-student dialogue, student-student dialogue, instructor activities, and course design influence students' perceived learning outcomes.

Table 2: *H_{a2}, Multiple Linear Regression Results*

ANOVA Omnibus tests

	SS	df	F	p	η²p
Model	10.287	6	3.820	0.002	0.241
exmot_ave	1.199	1	1.792	0.185	0.024
tact_ave	0.106	1	0.158	0.692	0.087
ssd_ave	1.084	1	1.620	0.207	0.048
tsd_ave	0.644	1	0.963	0.330	0.000
cd_ave	3.468	1	5.184	0.026	0.065
sr_ave	3.786	1	5.659	0.020	0.073
Residuals	48.167	72			
Total	552.204	79			

Fixed Effects Parameter Estimates

			95% Confidence Interval					
Names	Estimate	SE	Lower	Upper	β	df	t	p
(Intercept)	2.5000	0.0920	2.3166	2.6834	0.0000	72	27.167	< .001
exmot_ave	−0.1761	0.1315	−0.4382	0.0861	−0.1638	72	−1.339	0.185
tact_ave	0.0658	0.1657	−0.2645	0.3962	0.0547	72	0.397	0.692
ssd_ave	0.1648	0.1295	−0.0933	0.4228	0.1625	72	1.273	0.207
tsd_ave	−0.2112	0.2153	−0.6404	0.2179	−0.1531	72	−0.981	0.330
cd_ave	0.5005	0.2198	0.0623	0.9387	0.3548	72	2.277	0.026
sr_ave	0.3702	0.1556	0.0600	0.6803	0.2900	72	2.379	0.020

The multiple regression analysis was performed with all the assumptions it complied with. The independent variables were the 6 variables consisting of Extrinsic Motivation (EXMOT), Student Self-Regulation (SR), Teacher-Student Dialogue (TSD), Student-Student Dialogue

(SSD), Teacher Activities (TACT), and Course Design (CD). The linear combination was statistically significant toward the dependent variable, Perceived Learning Outcomes (LO), F (6, 72) = 3.82, p < .001. The r2 was 0.241, which showed that approximately 24% of the variance of the dependent variables can be accounted for by the combination of the linear combination of the independent variables.

Among the independent variables, the Course Design average (identified as *cd_ave* in *Table 2*) showed the strongest influence with B=0.35 followed by Student Self-Regulation average (identified as *sr_ave* in *Table 2*), which has the beta value of 0.29. These two values also showed a statistical significance of less than 0.05.

In conclusion, the hypotheses were tested through the use of multiple linear regression. The results of which showed that Extrinsic Motivation (EXMOT), Student Self-Regulation (SR), Teacher-Student Dialogue (TSD), Student-Student Dialogue (SSD), Teacher Activities (TACT), and Course Design (CD) significantly influenced student perceived user satisfaction and learning outcomes.

4.2 Discussion of the Results
Descriptive statistics have been applied for the analysis of the mean score for each variable. The results showed that the highest mean value of all eight variables ranging from highest to lowest were Teacher Activities (TACT) (mean = 3.84), Teacher-Student Dialogue (TSD) (mean = 3.63), Student Self-Regulation (SR) (mean = 3.62), Extrinsic Motivation (EXMOT) (mean = 3.61), Course Design (CD) (mean = 3.57), Student-Student Dialogue (SSD) (mean = 3.29), Perceived Satisfaction (PS) (mean = 2.79), and Learning Outcomes (LO) (mean = 2.51). The interpretation rate of the "Frequently" level of agreement was based on an arbitrary level, which was derived from the previous research of Eom and Ashill (2016). The results indicated that the linear combination of independent variables could influence satisfaction and learning outcomes. The low mean of 2.79 for Perceived Satisfaction and 2.51 for Perceived Learning Outcomes may result from a number of reasons: students personal preference of face-to-face classes rather than online classes, perceived experience generalized between multiple courses/teachers, or the experience of one class dominating that of all others, and etc. Secondary student perceptions, level of maturity, or personal goals might also be contributing factors. In conclusion, the combination of Extrinsic Motivation (EXMOT), Student Self-Regulation (SR), Teacher-Student Dialogue (TSD), Student-Student Dialogue (SSD), Teacher Activities (TACT), and Course Design (CD) could be used to predict the student's perceived satisfaction and learning outcomes.

The hypotheses were based on the constructivist learning model. The multiple linear regression method was used to indicate that a relationship existed between Extrinsic Motivation (EXMOT), Student Self-Regulation (SR), Teacher-Student Dialogue (TSD),

Student-Student Dialogue (SSD), Teacher Activities (TACT), Course Design (CD), and Perceived User Satisfaction (PS) and Learning Outcomes (LO).

Null hypothesis 1 states that Secondary students with a higher level of extrinsic motivation, intrinsic motivation, self-regulation, teacher-student dialogue, student-student dialogue, instructor activities, and course design will not report a higher level of perceived user satisfaction. Based on the findings of the study, higher levels of Extrinsic Motivation (EXMOT), Student Self-Regulation (SR), Teacher-Student Dialogue (TSD), Student-Student Dialogue (SSD), Teacher Activities (TACT), and Course Design (CD) significantly influences Perceived User Satisfaction. As the p-value was indicated at <0.001, which was less than the significance level of 0.05, the null hypothesis 1 was rejected.

The null hypothesis 2 states that Secondary students with a higher level of extrinsic motivation, intrinsic motivation, self-regulation, teacher-student dialogue, student-student dialogue, instructor activities, and course design will not report a higher level of perceived learning outcomes. Based on the findings of the study, higher levels of Extrinsic Motivation (EXMOT), Student Self-Regulation (SR), Teacher-Student Dialogue (TSD), Student-Student Dialogue (SSD), Teacher Activities (TACT), and Course Design (CD) significantly influences Perceived Learning Outcomes. As the p-value was indicated at <0.001, which was less than the significance level of 0.05, the null hypothesis 2 was rejected.

In summary, the result of the hypothesis testing supported the theory proposition, which postulates that the students' perceived satisfaction and learning outcomes were influenced by the combination of their Extrinsic Motivation, Student Self-Regulation, Teacher-Student Dialogue, Student-Student Dialogue, Teacher Activities, and Course Design. The findings of this survey differ from Eom and Ashill (2016) in that teacher-student dialogue (B=.1984) and self-regulation (.1983), instead of course design (B=.34) and instructor activities (B=.27), were found to be the strongest predictor of perceived satisfaction in secondary students. Additionally, course design (B=.35) and self-regulation (B=.25), instead of Eom and Ashill's finding of teacher-student dialogue (B=.24), were found to be the strongest predictor of perceived learning outcomes for secondary students.

5. CONCLUSION

In previous research, critical success factors that could influence the perceived satisfaction and learning outcomes of students were presented as possible variables and focused on the experiences of university students. In this paper, the current study adapted this work to focus on a similar concern regarding secondary students, where a large occurrence of mass online learning was taking place without any precedence. Therefore, the goal was to see if the possible critical success factors of extrinsic motivation, self-regulation, teacher-student dialogue, student-student dialogue, instructor activities, and course design could influence

secondary students' perception of satisfaction and learning outcomes. In a sample of 80 students out of a population of 320, the findings were that teacher-student dialogue and self-regulation were the strongest predictors of student perceived satisfaction while course design and self-regulation were the strongest predictors of perceived learning outcomes. In addition, only 24% of the variance of the dependent variables can be accounted for by the combination of the linear combination of all the independent variables. The independent variables were not statistically significant unless combined. There is a possibility that this is due to the small sample size of this study, but these findings would be helpful in assisting secondary schools that have just begun a new online learning program or those that are struggling to design a successful system. A larger population and sample might help to assist in reaching the power needed to achieve statistical significance for each independent variable. Future research in this field should also focus on additional critical success factors that might better influence students' perceived satisfaction and learning outcomes. Qualitative research in the form of student interviews would help to offer clearer insight into what constructs that students consider being more influential towards their perceived satisfaction and learning outcomes.

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