# Antecedents Affecting Blended Learning Satisfaction: A Comparative Study in Technologically Enhanced Environments between Students in the Philippines and Thailand

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*Abstract*—The search for a more flexible learning method still is persistent, especially with the intervention of the COVID-19 pandemic where modern-day students are mandated to study away from their physical classrooms. This research seeks to understand blended learning's effectiveness through factors: course flexibility, social interaction, instructors' timely response, perceived ease of use, device and internet infrastructure, and learning environment as determinants to satisfaction of the pedagogy. A survey was conducted for both the Philippines and Thailand with 453 respondents coming from undergraduate and graduate programs to compare the behavior of both countries on such learning approach. All of which were analyzed through the SPSS software to have a systematic view on their background and their behavior towards the subject by utilizing statistical methods namely 1) descriptive analysis 2) reliability analysis 3) factor analysis 4) correlation analysis, and 5) multiple regression analysis. The results revealed that students in the Philippines and Thailand perceive both Course Flexibility and Social Interaction vital towards their satisfaction in blended learning. Filipino respondents have also added the significance of Perceived Ease of Use to their satisfaction on the learning method. It implies the importance of cooperation between educational institutions and government agencies from both developing countries to make this learning approach effectively delivered.

*Index Terms*—Blended learning satisfaction, antecedents affecting, factors influencing, the Philippines, Thailand

## I. INTRODUCTION

In today's day and age, technology has disrupted a lot of things in this world. One of its breakthroughs is on how it constantly changes the lives of humanity with its overwhelming conveniences, and one of them is on how it improves the delivery of education. Several methods and approaches in learning have been introduced, but during the COVID-19 pandemic, blended learning became one of the most feasible approaches to holding classes given the restrictions set by the Philippine and Thai government. With the advantages of combining both virtual and face to face classes, such pedagogy leads students to having flexibility on their overall learning experience. Instructors may diversify the time allotted for both online and classroom classes

depending on their instructional goals. However, users may not meet on the same wavelength when it comes to their views on blended learning considering their preferences, economic background, and their overall experiences with blended considering the gap that has to be filled between the students and instructors. This nature of blended learning highlights the importance of having a deeper understanding of what is unknown in the utilization of blended learning in the Philippines and Thailand; including how users view such pedagogical method as part of the future of education.

Gaol and Hutagalung purport that in developing countries such as the ASEAN, the demand for technological interventions in the field of education is needed with the rapid increase of population as opposed to developed nations [1]. The education sector will have to keep up with its soaring demand together with the myriad of uncertainties that humanity facing through time. In reality, the growth of the population and the demand for quality education go hand in hand together. The Office of the Higher Education Commission of Thailand reported a total number of 1,641,865 students studying under bachelor's degree and master's degree for the academic year 2019–2020 [2]. On the other hand, the Philippines accounts for 1,786,654 of the same academic year as provided by the Commission on Higher Education [3]. Blended learning in this case is a pedagogical method that is yet to be fully embraced by both the learners and the educators coupled with a constant search of development to have it delivered effectively and efficiently.

## II. LITERATURE REVIEW

Past researches, particularly those that relate to the integration of technology into the delivery of classes, were considered by the proponents. Social Cognitive Theory, Technology Acceptance Model, and the Theory of Transactional Distance were also included alongside these researches to further help in structuring the study.

### A. Social Cognitive Theory

The Social Cognitive Theory has relevance in this study as it will help in supporting the endless behaviors that a human may possess in the long run. As stated by Bandura, social and environmental factors should not be taken out of the context in learning as it heavily influences one's behavior and how one responds to a particular instance [4]. With blended learning in place, the need to investigate a learner's self-efficacy and the expectation of one learner has for his or

her performance along the process of this learning approach is important. As defined by Wu & Liu, Self-efficacy refers to how students evaluate themselves and their differing capacities to execute activities within this learning approach to come up with a desired outcome [5].

They added that the second component, performance expectation, directs to the rewards that comes after an action.

### B. Technology Acceptance Model

The Technology Acceptance Model was coined by Davis [6] which supports the idea that if an individual is more embracing of the technological advancements, this individual becomes less prejudiced and less hesitant in learning things that are perceived unfamiliar and complicated. The proponent later added that an individual's intention to use a new system is determined by two factors which are the perceived ease of use and perceived usefulness. Perceived Ease of Use refers to how easy an individual can adapt and up to how much effort one must give to fully understand how to use a new system. With Perceived Usefulness, it mentions that a user only gets convinced in using a new system if he or she sees it as beneficial to his or her being or to some other factors which are perceived as urgent or important. In relation to this study, this Technology Acceptance Model will help readers understand how blended learning will be utilized and exploited given the different nature among its users.

### C. Theory of Transactional Distance

The theory of transactional distance was coined by Michael G. Moore nearly five decades ago. It supports that distance learning widens the gap between students and instructors which leads to potential misinterpretations of inputs provided by both sides. Moore [7] suggested from his theory of transactional distance that with the complacency in dealing with the pliability of learners' time and space in distance learning, the chance of having a healthier interaction with others becomes a drawback. Subsequently, Moore further expounded his statement that this distance would escalate miscommunication among learners and between learners and instructors [8]. To illustrate, whenever students have concerns or if they need to interact with their classmates, that transactional distance becomes a barrier which leads people to the imperfect reputation of blended learning.

### D. Related Researches

Several researches have been made with Blended Learning as a subject. Most of them were done in an education perspective seeking for models that would improve the implementation and effectivity of such learning approach considering students' cognitive and social aspects.

In the Republic of China, a research study has been conducted concerning the level of satisfaction of over 300 undergraduate and graduate students in an English as Foreign Language (EFL) Blended Learning course in Dalian University of Technology (DUT). Wu & Liu discovered from their research that majority of the students manifested enthusiasm towards the offering of EFL Blended Learning, a majority of which come from those who are studying in graduate programs [5]. The proponents in this research added that the students' satisfaction is greatly influenced by the learning atmosphere, enjoyment, usefulness, interconnections, functions and features of the system, and learning outcomes, thus raising the suggestion that there should be a collaborative effort for both the students and instructors to make this modality conducive for learning.

In addition, another pertinent research that has a direct influence towards this study was included. This research was conducted by Sun *et al.* in 2008 to investigate the critical factors influencing learner satisfaction in e-learning [8]. By far, this model presented by the latter is one of those models that convincingly covers relevant dimensions that might affect students' overall satisfaction on the delivery of e-learning. Six dimensions were covered in this study elaborately the Learner Dimension, Instructor Dimension, Course Dimension, Technology Dimension, Design Dimension, and Environmental Dimension. All of which are independent variables that directly affect the perceived satisfaction of students in an e-learning environment. Moreover, after Sun *et al.*, have generated their results, it exhibits that satisfaction in e-learning is significantly affected technology anxiety, instructors' behavior towards the e-learning course, the overall course flexibility, course quality, usefulness, ease of use, and the variety of assessments manifested by the e-learning environment [8]. They later suggested that all of these factors should be given comprehensive solutions to fully maximize what e-learning has to offer.

With a spotlight directed towards the difference between traditional and virtual classrooms, a study about the use of Blended Synchronous Classroom (BSC) approach in promoting learning performance in rural areas by Yang *et al.* was included [9]. This research was aimed to have a deeper understanding on the probability of making rural education be at pace with the superior quality of learning that urban students are receiving through conducting virtual synchronous classes. Yang *et al.* [9] have seen significant improvements in the academic performance of students living in the provinces after conducting the BSC approach through the help of highly qualified instructors from the urbanized areas of China. The proponents also found out that despite the gap between the remote and local students, the BSC approach brought no barriers for these learners to freely communicate with their counterparts and even with their teachers. These findings are directed towards the impact of transactional distance to students' performance if they are physically remote from their classmates and teachers.

## III. RESEARCH METHODOLOGY

### A. Conceptual Framework

Fig. 1 shows this study's composition of six independent variables that are presumably considered to have a direct impact on the satisfaction of students studying under a blended learning setting which is deemed to be this study's dependent variable. To further succeed in this study, the hypothesis was collectively orchestrated from the previous researches conducted by Wu and Liu in 2013 [5] and Sun *et al.* in 2008 [8]. Through these researches, an emphasis was given on students' level of contentment with the emergence of blended learning, particularly on the gap between their

learning needs and the integration of technology along the learning process.

Based on the conceptual framework, hypotheses of this study were as follows:

*1) Course flexibility*

Course Flexibility in this research refers as to how comfortable students are studying under Blended Learning considering the demands of their personal life. Sun *et al*. [8] elucidates that it may be most applicable to those students who struggle in juggling both their career and academic life along with each other, making it easier for them to pursue further studies. They further added that the integration of the technological component in blended learning stimulates more flexibility and more opportunities for each student to pace themselves according to their own desire. As an example, the accessibility and efficiency of blended learning is exhibited through "lecture capture" which enables students to view lecture videos based on their preferential time and pace as stated by Bryan and Volchenkova [10].

*H1a = Course flexibility has a positive relationship on Filipino students' satisfaction in Blended Learning*

*H1b = Course flexibility has a positive relationship on Thai students' satisfaction in Blended Learning*

*2) Social interaction*

As defined by Wu and Liu [5], Social Interaction is a collective interaction among students, and between students and their instructors, in pursuit of productivity within their learning environment. Such definition connotes that the social circle of a learner should not be detached from the context as it executes a vital role in his or her academic journey.

*H2a = Attributes of social interaction has a positive relationship on Filipino students' satisfaction in Blended Learning.*

*H2b = Attributes of social interaction has a positive relationship on Thai students' satisfaction in Blended Learning.*

*3) Instructors' timely response*

Instructors' Timely Response refers to how quick students receive feedbacks from their respective instructors whenever they need help or clarifications which might affect their performance in the succeeding parts of their academic journey as defined by Sun *et al*. [8]. In support to the aforementioned statement, it merely stresses that instructors are partly held accountable as to how each student progresses in the program considering that each learner has different working behavior and different level of coaching needs. Students can swiftly make improvements in their respective requirements if instructors are rigorously checking on them in a timely manner as mentioned by Martin *et al*. [11].

*H3a = Instructors' timely response positively affects Filipino students' satisfaction on blended learning*

*H3b = Instructors' timely response positively affects Thai student's satisfaction on blended learning*

*4) Perceived ease of use*

Despite the countless benefits brought by the integration of technology in the world of education, there is still divergence among users when it comes to their behavior and literacy towards technology. This must be taken into account

considering its adverse effect on one's productivity and efficiency in utilizing the technological component of blended learning, thus affecting one's overall satisfaction with this learning approach. Sun *et al*. [8] affirms that if a certain learner has low self-esteem in performing tasks through the use of technology, this will inevitably affect his or her learning performance. According to Wu & Liu [5], Ease in Using Technology refers to how user-friendly blended learning isas perceived by the students, most especially in the technological aspect of it.

*H4a = Perceived Ease of Use has a positive relationship on Filipino Students' satisfaction in Blended Learning*

*H4b = Perceived Ease of Use has a positive relationship on Thai Students' satisfaction in Blended Learning*

*5) Device and internet infrastructure*

Differing economic standings among these two countries will be taken into account considering that this has a direct influence towards the availability and performance of the internet, and also the capacity of students to acquire devices that are adequate to succeed in a blended learning program. A good technological infrastructure signals optimism to the future practices in education. Acharaya and Lee [12] claims that the education sector will be ameliorated in a more creative manner considering the pedagogical benefits brought by the integration of technology. However, this will only be fully exploited if there is a superior service from network providers and if learners have the adequate electronic devices suitable for studying online. Sun *et al*. [8] further supports that the overall learning experience of each student is directly influenced by the performance of technology and also the transmission speed of the network.

For an individual to have a holistic view of what blended learning is, one must investigate the technological aspect with no prejudice as all countries differ with their technological infrastructure.

*H5a = Device and Internet Infrastructure has a positive relationship with Filipino students' satisfaction in Blended Learning*

*H5b = Device and Internet Infrastructure has a positive relationship with Thai students' satisfaction in Blended Learning*

*6) Learning environment*

It can be assumed that students under blended learning will inevitably have differing reactions considering the constant change of environment having both the traditional and virtual components of such learning approach as mentioned in Sun *et al*. [8] supports that studying in online platforms requires students to have an intensified degree of concentration compared to learning in a brick-and-mortar classroom.

To further elucidate, students may have differing degrees of concentration when studying away from a learning-intensive environment of a school campus which might influence students' comprehension and retention.

*H6a = Learning Environment has a positive relationship with Filipino students' satisfaction in Blended Learning*

*H6b = Learning Environment has a positive relationship with Thai students' satisfaction in Blended Learning*
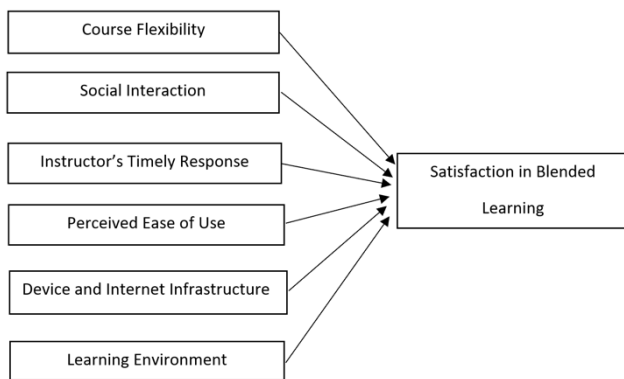


Fig. 1. Conceptual model of factors affecting students' satisfaction in blended learning.

### B. Data Collection

By exploiting the benefits brought by online survey platforms, the survey questionnaire used in this study was created through surveymonkey.com. The survey link, together with its QR code, were spread to students in Thailand and the Philippines who have the experience being in undergraduate and graduate programs conducted through Blended Learning. Out of 511 responses, only 453 have successfully accomplished the survey at the end of the data collection period with 235 respondents coming from the Philippines, and the other 218 coming from Thailand. The survey created by the proponent is composed of a total of 39 questions which were aimed to explore factors that affect students' satisfaction when studying under a blended learning program and an additional question which inquires students' desirable blended learning proportion. All these questions were constructed based on the dependent variables included such as Course Flexibility, Learning Environment, Social Interaction, Device and Infrastructure, Instructors' Timely Response, Perceived Ease of Use and Perceived Usefulness. All of which were presumed to have a direct influence towards this study's independent variable.

### C. Research Instrument and Variable Measurement

To explore this study's objectives, the questionnaire was designed through a multiple choice and scale format. Given its scope, the proponent made this questionnaire available not just in English, but also in Thai Language to further penetrate the targeted population. This questionnaire was then distributed to at least 200 respondents for each country through a web link together with its QR Code. All in all, it would take a respondent 10–15 minutes to accomplish the survey composed of five segments which will be discussed below:

*Personal Information* is comprised of eight questions that require single answer to ensure that all respondents who answer this survey questionnaire belong to the desired population and that they subsequently supplement their personal information such as sex, age, country, and information pertaining to the respondents' educational status and the proportion of blended learning that they belong to.

*Factors Influencing Students' Satisfaction in Blended Learning* consists of seven main questions that represent each of the independent variable and were measured using the five-point Likert Scale. Each of these main questions has five sub-questions that are deemed to support the variable with pertinent answers. The Course Flexibility, which is the first variable, was designed to understand students' perception on how helpful blended learning is in allowing them to perform in the program effectively and efficiently. Next, The Learning Environment aims to explore the likelihood of each student to be distracted given the transactional distance they have to go through if they study off-campus. The Social Interaction was substantially considered given the students' probability of not being efficacious if they are physically away from their classmates and professors. The proponent also added the Device and Infrastructure given that the nations included within the scope are labeled as emerging countries. With the constant complains against the internet service provided and with the insufficient devices impoverished students have in these two countries, it would be necessary to recognize up to what extent these two countries are satisfied with the technological infrastructure aspect in blended learning. Next, the Instructors' Timely Response will have teachers and professors as the focal point on how vital they are in a student's academic journey. For one, students find it difficult to progress if it requires them to wait for a period of time before they could get a response pertaining to their concerns within the course. Lastly, with the intervention of technology in the blended learning, Technology Acceptance Model (TAM) was also included to understand the ease of using blended learning's virtual component of this learning approach. The questions included alongside the Perceived Ease of Use were orchestrated to understand if students find it easy to go through their devices and virtual academic tools without asking for substantial help. All of which require students' level of agreement whether they concur to the given statements or not.

The questions were measured in a five-point Likert Scale which will all be identified as (Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly Agree = 5). It will then be interpreted with its score range (Strongly Disagree = 1.00–1.80, Disagree = 1.81–2.60, Neutral = 2.61–3.40, Agree = 3.41–4.20, and Strongly Agree = 4.21–5.00).

*Satisfaction with Blended Learning* serves as one the culminating group of questions in relation to the above-mentioned variables. Measured through a five-point Likert scale, this part composed of five questions were aimed to receive a holistic answer from the respondents with their experience in blended learning.

In addition, this part also examines the respondents' optimism or pessimism if blended learning will persist as an effective learning pedagogy for the students in the future.

*Additional Questions* is a section intended to give further depth on how instrumental government and educational institutions are in the operation of blended learning in Thailand and the Philippines. A respondent will be examined based on his or her level of agreement to the statements provided by the proponent based on a five-point Likert scale. This set consisting of seven questions, based on the students'

judgement, aims to provide insights of the technological infrastructure given the effort exerted by the Philippine and Thai government. Furthermore, educational institutions will partially be investigated through these questions given that schools serve as direct agencies which plans and expedites the whole learning pedagogy. Provided blended learning's mechanism of having both online and offline learning, these questions were also constructed to allow assessment on the school's performance in executing both learning methods and on how it puts an effort to strengthen the learning community despite the given transactional distance. Lastly, the proponent had included one question directed towards students' opinion if blended learning would persist in the future as a learning alternative even without the presence of a global crisis such as the COVID-19. Despite blended learning's existence even before the infamous pandemic, it is undeniable that such learning approach became more widespread and practical in continuing global education. With this, a query that would partially answer blended learning's existence in the future is beneficial despite its popularity during the surge of the COVID-19 Pandemic.

The questions were measured in a five-point Likert Scale which will all be identified as (Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly Agree = 5). It will then be interpreted with its score range (Strongly Disagree = 1.00–1.80, Disagree = 1.81–2.60, Neutral = 2.61–3.40, Agree = 3.41–4.20, and Strongly Agree = 4.21–5.00).

*Desirable Proportion in Blended Learning* serves as the endmost part of the questionnaire. This question will help readers recognize these two countries preference on their satisfaction on blended learning. This will also help in removing factors that do not have any significance to the subject pertaining to this research.

## IV. RESEARCH FINDINGS

After collecting the primary data done by spreading survey questionnaires to the chosen respondents, the responses will be analyzed and interpreted through the use of IBM's Statistical Package for the Package of the Social Sciences software or SPSS. Composed of five parts: 1) Personal Information, 2) Factors Influencing Students' Satisfaction in Blended Learning, 3) Satisfaction in Blended Learning, 4) Additional Questions, and 5) Desirable Proportion in Blended Learning which were all assumed to have an influence towards the satisfaction among Thai and Filipino students on the learning approach. The preliminary part of this chapter is intended to calculate the data separately between Thai and Filipino respondents.

It aims to sort out qualified respondents considering that he or she manifests an adequate experience with blended learning and the ability to supplement answers in relation to the study.

### A. Descriptive Analysis

Given the comparative nature of this study, the respondent's nationality was deemed prioritized among the questions included in the personal information section.

As a result, the proponent was able to diverge 453 valid answers into two with 235 respondents coming from the Philippines and 218 from Thailand. In this section, the following tables will exhibit each sub-question belonging to a respondent's personal information as enumerated; Table I shows the Age of the Respondents, Table II shows the Type of College or University, Table III presents the Year Level of Respondents, and Table IV shows the Students' Average Proportion in Blended Learning. All of which will be presented in columns separating both countries together with their respective frequencies and percentages.

TABLE I: AGE OF THE RESPONDENTS

| | The Philippines | | Thailand | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Less than 18 | 1 | 0.4 | 3 | 1.4 |
| 18–22 | 159 | 67.6 | 139 | 63.9 |
| 23–26 | 45 | 19.1 | 45 | 20.7 |
| 27–30 | 16 | 6.7 | 20 | 9.1 |
| 31–34 | 7 | 3.1 | 10 | 4.4 |
| 35–44 | 7 | 3.1 | 1 | 0.5 |
| Total | 235 | 100 | 218 | 100 |

TABLE II: TYPE OF COLLEGE OR UNIVERSITY OF THE RESPONDENTS

| | The Philippines | | Thailand | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Public | 8 | 3.6 | 148 | 67.8 |
| Private | 227 | 96.4 | 70 | 32.2 |
| Total | 235 | 100 | 218 | 100 |

TABLE III: YEAR LEVEL OF THE RESPONDENTS

| | The Philippines | | Thailand | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Freshman | 60 | 25.7 | 9 | 4.3 |
| Sophomore | 43 | 18.2 | 15 | 6.7 |
| Junior | 55 | 23.6 | 72 | 33.2 |
| Senior | 25 | 10.7 | 70 | 31.8 |
| First Year of Graduate Degree | 15 | 6.2 | 10 | 4.8 |
| Second Year of Graduate Degree | 37 | 15.7 | 42 | 19.2 |
| Total | 235 | 100 | 218 | 100 |

TABLE IV: STUDENTS' AVERAGE PROPORTION IN BLENDED LEARNING

| | The Philippines | | Thailand | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| 50% Online and 50% Offline | 75 | 32.0 | 78 | 35.6 |
| 60% Online and 40% Offline | 18 | 7.6 | 22 | 10.1 |
| 70% Online and 30% Offline | 29 | 12.4 | 43 | 19.7 |
| 80% Online and 20% Offline | 26 | 11.1 | 18 | 8.2 |
| 90% Online and 10% Offline | 69 | 29.3 | 32 | 14.9 |
| Others | 18 | 7.6 | 25 | 11.5 |
| Total | 235 | 100 | 218 | 100 |

## B. Reliability Analysis

TABLE V: INTERNAL CONSISTENCY OF VARIABLE

| Variables | The Philippines | | Thailand | |
|---|---|---|---|---|
| | Cronbach's Alpha | Number of Items | Cronbach's Alpha | Number of Items |
| Course Flexibility | 0.89 | 9 | 0.91 | 9 |
| Social Interaction | 0.86 | 6 | 0.90 | 6 |
| Instructors' Timely Response | 0.71 | 3 | 0.78 | 3 |
| Perceived Ease of Use | 0.75 | 4 | 0.80 | 4 |
| Device and Internet Infrastructure | 0.72 | 3 | 0.69 | 3 |
| Learning Environment | 0.62 | 2 | 0.63 | 2 |
| Satisfaction in Blended Learning | 0.91 | 5 | 0.94 | 5 |

The variables included pertaining to this research were analyzed to measure their respective reliability of how each variable is related to one another through Table V. According to the data among Filipino respondents in Table V, six out of seven variables have Cronbach's alpha Value over 0.7. The highest value was derived from the satisfaction in blended learning with 0.91. It was then followed by course flexibility, social interaction, perceived ease of use, device and internet infrastructure, and instructors' timely response with scores of 0.89, 0.86, 0.75, 0.72, and 0.71 respectively. The lowest value which did not exceed 0.7 was garnered by learning environment with 0.62.

The data obtained from Thai respondents almost had a similar result with that of the Philippines with five out of seven variables exceeding the value of 0.7. The highest value also came from the dependent variable, satisfaction in blended learning with 0.94 followed by course flexibility, social interaction, perceived ease of use, and instructors' timely response with scores of 0.91, 0.90, 0.78, and 0.78 respectively. The lowest Cronbach's alpha value were from device and internet infrastructure with 0.69 and learning environment with 0.63.

## C. Factor Analysis

The questions in this study's survey questionnaire were created by the proponent himself due to the limited research focused on the satisfaction on blended learning. As a result, factor analysis was used to verify whether each question matches the variable where it was deliberately assigned or not. This will be shown on Table VI.

Based on the result generated by the factor analysis, it illustrates that the questions made within the variables pertaining to this research were grouped according to how the proponent constructed the questionnaire. In addition, all of the questions met the standard which was set at 0.50 of factor loading.

Subsequently, Table VI shows that the variables included in this research exceeded the desired number of Eigenvalue which should be >1 and that they should also have a number higher than 0.50 on factor loading. The first component on the table is course flexibility with factor loading ranging from 0.76-0.54 and Eigenvalue of 4.97. It was then followed by interaction (0.78-0.53; 3.67), instructors' timely response (0.70–0.62; 2.83), perceived ease of use (0.75–0.54; 2.35), device and internet infrastructure (0.84–0.67; 2.15), and learning environment (0.78–0.61; 1.63).

TABLE VI: FACTOR ANALYSIS SUMMARY OF FACTOR ANALYSIS RESULT

| Construct | No. of Items | Factor Loadings | Rotation Sums of Squared Loadings | |
|---|---|---|---|---|
| | | | Total | % of Variance |
| Course Flexibility | 9 | 0.76–0.54 | 4.97 | 18.41 |
| Social Interaction | 6 | 0.78–0.53 | 3.67 | 13.60 |
| Instructors' Timely Response | 3 | 0.70–0.62 | 2.83 | 10.50 |
| Perceived Ease of Use | 4 | 0.75–0.54 | 2.35 | 8.71 |
| Device and Internet Infrastructure | 3 | 0.84–0.67 | 2.15 | 7.97 |
| Learning Environment | 2 | 0.78–0.61 | 1.63 | 6.02 |

## D. Correlation Analysis

The correlation analysis was used to verify possible multicollinearity problem that might exist among the independent variables included in this research.

According to Table VII, correlation analysis for respondents in the Philippines was used to analyze possible pairs of correlation. The table shows that the correlation values are positive with course flexibility being the factor that has the highest correlation towards students' satisfaction in blended learning at 0.80. The lowest correlation was seen from the device and internet infrastructure with 0.23.

TABLE VII: CORRELATION ANALYSIS FOR THE PHILIPPINES

| | CF | SI | ITR | PEU | DAII | LE | SBL |
|---|---|---|---|---|---|---|---|
| CF | 1 | 0.59 | 0.64 | 0.61 | 0.34 | 0.49 | 0.80 |
| SI | | 1 | 0.51 | 0.43 | 0.15 | 0.36 | 0.59 |
| ITR | | | 1 | 0.52 | 0.26 | 0.37 | 0.50 |
| PEU | | | | 1 | 0.45 | 0.35 | 0.56 |
| DAII | | | | | 1 | 0.23 | 0.23 |
| LE | | | | | | 1 | 0.43 |
| SBL | | | | | | | 1 |

(Note: CF=Course Flexibility, SI=Social Interaction, ITR=Instructors' Timely Response, PEU=Perceived Ease of Use, DII=Device and Internet Infrastructure, LE=Learning Environment)

The strongest relationship among the variables occurred on course flexibility and instructors' timely response with 0.64 followed by course flexibility and perceived ease of use with 0.61. These close relationships among the dependent variables imply that there is a possibility of multicollinearity. The results generated from the collinearity diagnose test will be illustrated on Table IX.

TABLE VIII: CORRELATION ANALYSIS FOR THAILAND

| | CF | SI | ITR | PEU | DAII | LE | SBL |
|---|---|---|---|---|---|---|---|
| CF | 1 | 0.71 | 0.68 | 0.57 | 0.17 | 0.62 | 0.82 |
| SI | | 1 | 0.74 | 0.46 | 0.05 | 0.56 | 0.65 |
| ITR | | | 1 | 0.49 | 0.08 | 0.58 | 0.59 |
| PEU | | | | 1 | 0.51 | 0.54 | 0.54 |
| DAII | | | | | 1 | 0.22 | 0.13 |
| LE | | | | | | 1 | 0.58 |
| SBL | | | | | | | 1 |

(Note: CF=Course Flexibility, SI=Social Interaction, ITR=Instructors' Timely Response, PEU=Perceived Ease of Use, DII=Device and Internet Infrastructure, LE=Learning Environment)

Table VIII presents the correlation analysis for respondents based in Thailand to verify possible correlations among the variables. Similar to that of the Philippines, all of the values are positive with course flexibility being the highest in correlation towards students' satisfaction in blended learning valued at 0.82. The lowest correlation wasgarnered by device and internet infrastructure with 0.13.

Both social interaction and instructors' timely response got the closest relationship with 0.74 followed by course flexibility and social interaction which garnered 0.71. These strong relationships among the dependent variables will be investigated through collinearity diagnose test on Table IX.

### E. Collinearity Diagnosis Test

Due to the high correlation values discovered among some dependent variables, collinearity diagnose test on Table IX was performed to verify the multicollinearity problems.

Six independent variables were further analyzed for tolerance and Variance Inflation Factor (VIF) as derived from the results generated from Table IX. As illustrated by Table IX, the VIF values are less than 5 which means that multicollinearity problems are non-existing for both Filipino and Thai respondents.

TABLE IX: COLLINEARITY DIAGNOSIS

| Variable | The Philippines VIF | Thailand VIF |
|---|---|---|
| Course Flexibility | 2.51 | 2.70 |
| Learning Environment | 1.64 | 2.80 |
| Social Interaction | 1.85 | 2.61 |
| Device and Infrastructure | 1.87 | 2.22 |
| Instructors' Timely Response | 1.29 | 1.46 |
| Perceived Ease of Use | 1.34 | 1.90 |

### F. Multiple Regression Analysis

Based on the hypothesis, a total of five independent variables were analyzed using multiple regression analysis to investigate factors that have an affect towards the respondents' satisfaction on blended learning. The analysis was separately performed for respondents based in the Philippines and Thailand for the purpose of comparison.

According to the model summary of multiple regression analysis on Table X, the independent variables collectively has relation on students' satisfaction in blended learning for respondents in the Philippines with an adjusted R square value of 0.67.

TABLE X: MODEL SUMMARY OF MULTIPLE REGRESSION ANALYSIS FOR THE PHILIPPINES

| Variable | R | $R^2$ | Adjusted $R^2$ |
|---|---|---|---|
| Satisfaction in Blended Learning | 0.83 | 0.68 | 0.67 |

Table XI illustrates the stepwise multiple regression for respondents in the Philippines. The result shows that there are three factors deemed to have a significant influence on students' satisfaction in blended learning which are course flexibility ($\beta = 0.69$, $p = 0.00$), social interaction ($\beta = 0.18$, $p = 0.00$) and perceived ease of use ($\beta = 0.13$, $p = 0.00$). All of these variables are statistically significant with 95%

confidence level. The multiple regression model for Filipino respondents is illustrated on Fig. 2.

TABLE XI: MULTIPLE REGRESSION MODEL OF SATISFACTION IN BLENDED LEARNING FOR THE PHILIPPINES

| Variable | Unstandardized Coefficients | | Standardized Coefficient | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | $\beta$ | | |
| Constant | −0.15 | 0.22 | | −0.70 | 0.50 |
| CF | 0.84 | 0.07 | 0.69 | 11.38 | 0.00 |
| SI | 0.2 | 0.05 | 0.18 | 3.68 | 0.00 |
| ITR | −0.12 | 0.06 | −0.10 | −1.89 | 0.06 |
| PEU | 0.15 | 0.06 | 0.13 | 2.55 | 0.00 |
| DAII | −0.08 | 0.05 | −0.07 | −1.63 | 0.10 |
| LE | 0.03 | 0.05 | 0.03 | 0.73 | 0.47 |

(Note: CF=Course Flexibility, SI=Social Interaction, ITR=Instructors' Timely Response, PEU=Perceived Ease of Use, DII=Device and Internet Infrastructure, LE=Learning Environment)
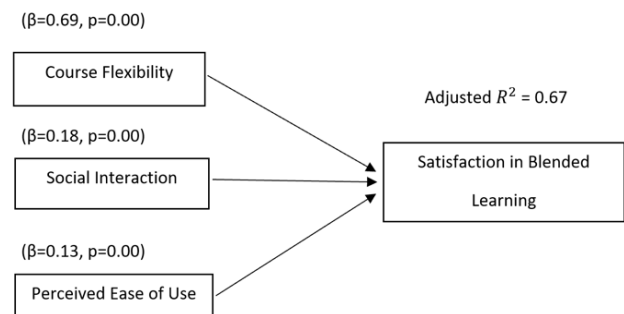


Fig. 2. Multiple regression for Filipino respondents.

According to the result given by the multiple regression analysis, there are three significant factors which have direct influences toward students' satisfaction in blended learning for respondents based in the Philippines. These three influential factors are course flexibility, social interaction, and perceived ease of use. In contrast, three other variables were omitted from the list namely instructors' timely response, device and internet infrastructure, and learning environment. All of which directed this research to remove *H3a, H5a,* and *H6a* as part of the hypothesis.

The model summary of multiple regression analysis for Thailand on Table XII exhibits that the adjusted R square value is 0.68.

TABLE XII: MODEL SUMMARY OF MULTIPLE REGRESSION ANALYSIS FOR THAILAND

| Variable | R | $R^2$ | Adjusted $R^2$ |
|---|---|---|---|
| Satisfaction in Blended Learning | 0.83 | 0.69 | 0.68 |

The multiple regression model on Table XIII illustrates that there are two predictors derived from the multiple regression of Thai respondents.

These two variables are course flexibility ($\beta = 0.65$, $p = 0.00$) and social interaction ($\beta = 0.13$, $p = 0.00$), both of which having significant influences toward students' satisfaction in blended learning. The multiple regression model for Thai respondents will be further illustrated on Fig. 3.

TABLE XIII: MULTIPLE REGRESSION MODEL OF SATISFACTION IN BLENDED LEARNING FOR THAILAND

| Variable | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | −0.14 | 0.25 | | −0.55 | 0.58 |
| CF | 0.80 | 0.08 | 0.65 | 9.97 | 0.00 |
| SI | 0.14 | 0.07 | 0.13 | 1.90 | 0.00 |
| ITR | −0.06 | 0.08 | −0.05 | −0.79 | 0.43 |
| PEU | 0.14 | 0.08 | 0.11 | 1.84 | 0.07 |
| DAII | −0.07 | 0.06 | −0.06 | −1.15 | 0.25 |
| LE | 0.10 | 0.06 | 0.09 | 1.69 | 0.09 |

(Note: CF=Course Flexibility, SI=Social Interaction, ITR=Instructors' Timely Response, PEU=Perceived Ease of Use, DII=Device and Internet Infrastructure, LE=Learning Environment)
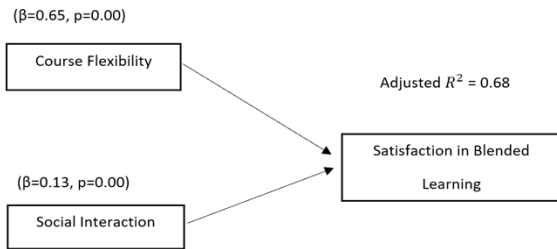


Fig. 3. Multiple regression for Thai respondents.

As obtained from the result of the stepwise regression analysis for Thai respondents on Fig. 3, it can be concluded that only two out of the six factors have significant impact on students' satisfaction in blended learning as determined by the respondents in Thailand. These two factors are course flexibility and social interaction which omits the four remaining factors from the list. instructors' timely response, perceived ease of use, device and internet infrastructure, and learning environment were treated insignificant, thus omitting hypothesis *H3b, H4b, H5b,* and *H6b.*

## V. DISCUSSION

This research was conducted to further investigate and explore the differences among Filipino students and Thai students' satisfaction on the current operation of blended learning in their respective countries. The conceptual framework of this research consists of six independent variables namely Course Flexibility, Social Interaction, Instructors' Timely Response, Perceived Ease of Use, Device and Internet Infrastructure, and Learning Environment which were all presumed to have an influence on students' satisfaction in blended learning.

### A. Factors Influencing Students' Satisfaction in Blended Learning

As elicited from the descriptive analysis done by the proponent, results have shown that the Device and Internet Infrastructure had received the highest mean score for respondents in both the Philippines and Thailand. It implies that generally, respondents from both countries are equipped with electronic devices and are subscribed to internet providers to be able to study in the virtual world.

On the other hand, if multiple regression is considered, it shows that three factors have significant impact on Filipino respondents' satisfaction in blended learning which includes Course Flexibility, Social Interaction, and Perceived Ease of Use. It can be presumed that due to its overwhelming high correlation towards students' satisfaction in blended learning, Course Flexibility has the strongest influence towards the dependent variable. However, Filipino respondents disregarded three other variables namely Instructors' Timely Response, Device and Internet Infrastructure, and Learning Environment as determinants on their satisfaction towards blended learning.

Respondents based in Thailand also possessed similar results with that of the Filipino respondents. According to the analysis performed, two out of the six independent variables have direct influence on Thai students' satisfaction in blended learning which are Course Flexibility and Social Interaction. While receiving the highest correlation towards the subject, respondents based in Thailand have determined Course Flexibility as the most dominant factor to be satisfied under a blended learning course. It can be implied from the result that Instructors' Timely Response, Perceived Ease of Use, Device and Internet Infrastructure, and Learning Environment have no significance towards their overall satisfaction in the learning approach.

The results show that blended learning, as how it is known, puts Course Flexibility on top of its benefits. Similar to the research findings obtained by Sun *et al*. [8], the numerous benefits brought by the flexibility on online learning, regardless if it is synchronous or asynchronous, possessed a significant impact on the satisfaction of students given the integration of technology on the pedagogy. In support to that, Horn and Staker [13] states that this is directly caused by the control students have over their space and time on where and when they prefer to open their course materials, thus implying students to progress through freely pacing themselves along their academic demands.

Social interaction also has a significant bearing on the satisfaction in blended learning for both respondents in the Philippines and Thailand. Similar results were given from the study conducted by Wu and Liu [5], where social interaction played a vital role in making students satisfied with the delivery of blended learning.

As supported by Yang [14], Asian learners are characterized by having high regards to the ones in authority which puts teachers on top of the hierarchy. He added that due to this ingrained manifestation among Asian students, dependency plays a huge role in helping students stay on track within their academic performance. The Social Cognitive Theory by Bandura [15] also puts emphasis on how important social interaction amongst students is to better their academic performance. This can also be related with the Theory of Transactional Distance by Moore [7] where students tend to be indifferent with their academic activities when they are away from the vicinity of their respective universities. The occasional detachment among learners causes them a loss of momentum to participate in the activities provided within the course as transactional distance increases. Lastly, Hofstede's Cultural Dimension [16] supports that Asians are socially dependent and attached where Philippines and Thailand scores low on the dimension of individualism. Despite its absence among the general respondents in Thailand, Filipino respondents on the other hand, additionally appended on

Perceived Ease of Use as an important factor in getting themselves satisfied in the delivery of blended learning. According to Davis [6], Perceived Ease of Use refers to how easy operating a certain technology is which means that if users perceive blended learning's technological aspect easy to utilize, then they will be more convinced to be in this pedagogical method. As suggested by Miller *et al.* [17], ICT is still a new concept among developing countries which makes it difficult for students living in these countries to deviate from their accustomed relationship to traditional teaching methods. However, the potential downside of the technological aspect of blended learning can be reduced if users holistically understand its dynamics. Westerlaken *et al.*, supports that the impact of the possible drawbacks brought by this learning method can be minimized through the proper alignment of both the offline and online components which is believed to bring more effectiveness in learning most especially when it is coupled with group discussions even in the online component [18].

## VI. CONCLUSION

As what the nature of blended learning entails, respondents from both the Philippines and Thailand affirm that they have better task management on and off campus according to their personal needs brought by the flexibility this pedagogical method brings. It can be derived from the result that these students consider blended learning beneficial to their educational growth considering that they were affected by the government mandates brought by the pandemic and that a significant number of these respondents are working professionals. This flexibility must stay intact to make sure that the benefits of blended learning are fully utilized, most especially for students who need it most.

Secondly, the result accentuates the significance of social interactions in this learning pedagogy through the constant filling of the gap among students and with their instructors. This will help students keep track of their academic performance, both theoretical and practical, regardless of where these interactions take place. Subsequently, educational institutions should constantly learn the dynamics of blended learning so that the increase in positive outcomes coming from the students' academic performance are achieved. This may be through appropriate designing of blended instructions which supports collaboration and engagement among students and instructors.

Finally, Perceived Ease of Use also must be taken into consideration considering its relevance among the Filipino respondents.

As a result, regardless of the students' literacy, briefings must be held prior to the commencement of their respective classes to ensure that students are knowledgeable and well-aware of blended learning's complexities, particularly on its virtual component.

With blended learning's prevalence in modern-day education, students are still yet to discover what it has to offer for both present-day and future learners. This reveals what kind of duty relevant agencies have in improving blended learning's delivery so that it becomes more beneficial for the future of higher education.

## VII. SUGGESTION FOR FUTURE RESEARCH

In pursuit of exploring more factors that affect satisfaction in blended learning, further research must be conducted to holistically understand the subject matter.

Blended learning is on its emerging stage which means that users are yet to explore factors that might potentially be integrated into such learning approach. In order to understand the complexities of the needs of both learners and educators, there should also be a constant search on how to improve blended learning through in-depth interviews or dialogue. Secondly, the proponents should have a better understanding on up to what extent blended learning could be beneficial or a detriment to one's academic journey based on the technology each field manifests. Lastly, future researchers on the satisfaction in blended learning must consider other variables that might add more value in exploring factors that affect students' satisfaction on this pedagogy. Through this, readers and researchers would gain knowledge on how to have a better view of the learning approach which encompasses all areas, may it be from the side of the educational institutions or the students themselves.

## CONFLICT OF INTEREST

The authors declare no conflict of interest

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