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E-LEARNING ACCEPTANCE ANALYSIS USING TECHNOLOGY ACCEPTANCE MODEL (TAM) (CASE STUDY: STMIK MIKROSKIL)

[1]ANGELA, [2]CHATRINE SYLVIA, [3]HANDOKO, [4]EDI ABDURACHMAN
[1,2,3,4]Information System Management, School of Information System, Bina Nusantara University, Jakarta, 11530, Indonesia
E-mail: [1]angela_woen@hotmail.com, [2]chatrinesylvia@gmail.com, [3]handoko_wu@hotmail.com, [4]edia@binus.edu

ABSTRACT

E-learning system is one of technology that can increase the competitiveness of STMIK Mikroskil. E-learning system usage will be less than optimal if students refuse or cannot use the system. Therefore, an understanding of student acceptance behavior toward the system is also important in order to improve online learning environment. This study measures the acceptance of e-learning system using the extended Technology Acceptance Model (TAM). This study aims to determine the relationship between self-efficacy, subjective norm, and experience as exogenous constructs to perceived ease of use and perceived usefulness as endogenous construct followed by testing to determine the relationship between perceived ease of use and perceived usefulness toward behavioral intention to use on e-learning system usage in STMIK Mikroskil Medan. Questionnaire data was collected from 354 active students and analyzed with structural equation modeling (SEM) using AMOS 24. The result of this study showed that self-efficacy, subjective norm, and experience has significant positive effect on perceived ease of use. Perceived ease of use has significant positive effect on perceived usefulness. Perceived usefulness has significant positive effect on behavioral intention to use, but perceived ease of use has no significant effect on behavioral intention to use. This finding improves the understanding of student acceptance behavior toward e-learning system that can help improve the service of STMIK Mikroskil e-learning system and can be used as reference for doing other similar research.

Keywords: *E-Learning, Perceived Ease of Use, Perceived Usefulness, Structural Equation Modeling, Technology Acceptance Model*

1. INTRODUCTION

The rapid development of technology makes using technology essential by universities to be able to compete and survive. STMIK Mikroskil, one of private universities in Medan, adopts e-learning system to improve the quality of educational service. Student Centered e-Learning Environment (SCeLE) is an online learning environment centered on learners to facilitate electronic learning activities. Its e-learning system uses Moodle as a learning management software for online learning and teaching activities. Moodle is a content management system that aims to provide tools for lecturers to provide materials for students to engage in collaborative and cooperative learning activities. Lecturers can also take advantage of customization features to manage their courses [1].

Currently in the STMIK Mikroskil e-learning system, there are 138 courses with the following details: 64 courses of Informatics Engineering, 60 courses of Information Systems, and 14 courses of Information Management. Through e-learning system, students can obtain lecture materials, submit assignments and view evaluation results, take online quiz, get notifications about deadline submission of assignments/quizzes, see the news and announcements, interact and discuss with fellow students and lecturers in forums provided via the Internet, anytime and anywhere without any geographical or time barriers.

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Even though there are various courses in the e-learning system, not all courses have been used by students in assisting their study so that the use of e-learning system in STMIK Mikroskil is still less than optimal. Until now, there is no research that measures the level of STMIK Mikroskil students' acceptance of e-learning system so its factors are not clear yet.

Information technology has great potential to help students in their education, but its effectiveness will depend on the level of acceptance and use of students [2], [3]. The goals of online learning will not be achieved if students refuse or cannot use the system. Therefore, in addition to improving the online learning systems functionality, an understanding of student acceptance behavior towards the system is also important for universities in order to implement and develop a better online learning environment.

To understand students' acceptance behavior toward technology, this research used Technology Acceptance Model (TAM) developed by Davis. This model is an adaptation of the Theory of Reasoned Action (TRA). Davis explains that individual acceptance of computer technology is based on two variables, namely: perceived usefulness, the extent to which a person believes that the use of a particular technology / system will improve performance and perceived ease of use, the level at which a person believes that using technology is easy and requires no great effort to be able to use it. Both of these variables will affect behavioral intention to use and this variable will affect the actual system use [4].

In addition to perceived usefulness and perceived ease of use, there are other factors that also affect user acceptance of the system. Because of numerous studies with the TAM model, especially in the field of e-learning using various factors, some researchers study literatures to find the most frequently used external factors and these factors are represented in the General Extended Technology Acceptance Model for E-Learning (GETAMEL). In the model, we found a relationship between self-efficacy, subjective norm, and experience with perceived ease of use and perceived usefulness of e-learning [5], [6].

Although many studies have used TAM to measure the level of user acceptance of the system, the research findings have not been consistent that there are differences in outcomes between one study and another. These differences can be explained by the existence of cultural differences so that the model relevance needs to be further examined in developing countries like Indonesia [2], [7], [8].

Therefore, this research will answer following questions, whether self-efficacy affects perceived ease of use? Does self-efficacy affect perceived usefulness? Does subjective norm affect perceived ease of use? Does subjective norm affect perceived usefulness? Does experience affect perceived ease of use? Does experience affect perceived usefulness? Does perceived ease of use affect perceived usefulness? Does perceived ease of use affect behavioral intention to use? Does perceived usefulness affect behavioral intention to use? Thus, all these questions will be answered in the context of e-learning adoption in Mikroskil.

2. LITERATURE REVIEW

E-learning can be defined as learning supported and facilitated by the use of Internet technology to deliver materials or information to users through computer interface in order to complement traditional learning methods (face-to-face in class meeting) [9]. Another definition states that e-learning utilizes communication, collaboration, knowledge transfer and web-based training to support active learning by its users without being inhibited by space and time constraints [7]. To meet educational goals and demands, e-learning offers a dynamic learning environment to improve the learning quality by providing learners access to resources and services, along with information exchange and collaboration to deliver lessons and gain knowledge [10], [11].

Nowadays, as internet technology grows rapidly, e-learning system has become an important part in the curriculum of universities or modern college institutions by supporting teaching and learning in higher education that focuses on improving the education services provided [9], [12], [13]. The use of e-learning has reformed the learning method by enabling instructors to provide lessons via audio, video, animation, images and text, as well as providing online learning space and feedback accessible to their students anytime and anywhere [5]. Thus, e-learning can be defined as a solution of learning and delivery of information by utilizing the Internet technology offered by universities to support active and interactive learning without being hindered by geographical and time constraints.

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Technology Acceptance Model (TAM) was adapted from Theory of Reasoned Action (TRA) by Davis to explain technology adoption behavior. In TAM, the external variables affect the two main perceptions of the user, perceived ease of use and perceived usefulness. Perceived ease of use affects perceived usefulness. Both of these perceptions affect the attitude toward using technology. Attitudes toward using affect behavioral intention to use technology and intention to use technology then determine actual system use [14].

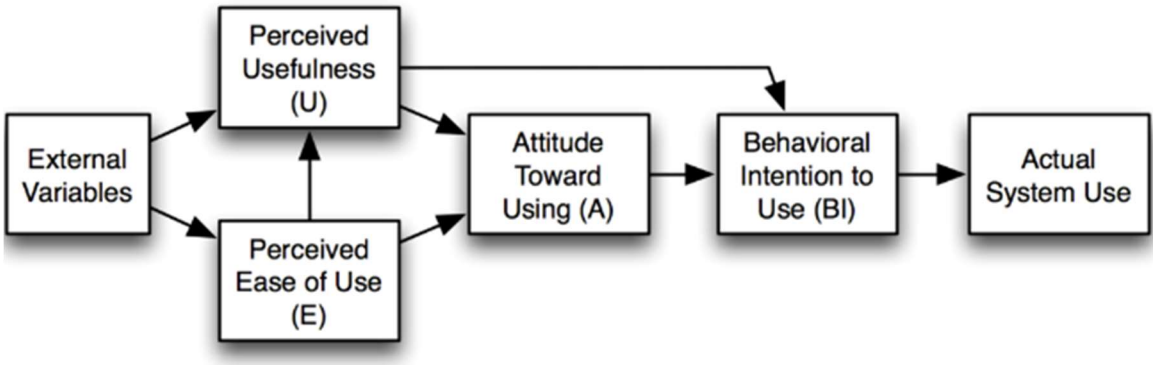

Figure 1: Technology Acceptance Model [14]

Initially, attitude toward using is a mediator between user perceptions (i.e. perceived ease of use and perceived usefulness) and behavioral intention to use, but some studies have taken attitude toward using out from their model because of its weak role in construct relationships [2], [6], [7], [12], [15], [16]. This is also supported by research results which suggesting that there is a weak relationship between perceived usefulness and attitude, but there is a strong relationship between perceived usefulness and intention so that attitude is excluded from the TAM model [14]. On the other hand, research finding suggested that attitude had no direct effect on intention [17] so that this study did not include attitude variable in the model.

There are other theories related to technological acceptance, such as Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), Diffusion of Innovation Theory (IDT), and Unified Theory of Acceptance and Use of Technology (UTAUT). Theory of Planned Behavior (TPB) discusses adoption behavior are preceded by intention to use as a function of individual attitudes, their beliefs about the extent to which they can control certain behaviors and other external factors. Social Cognitive Theory (SCT) is a framework that introducing human behavior as the result of interactions between personal factors, behavior, and the environment. Diffusion of Innovation Theory (IDT) considers the adoption of information system as social constructs that are slowly evolving through the population over time. Unified Theory of Acceptance and Use of Technology (UTAUT) states that the four main constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are major determinants of user intention and behavior [18]. Among many theories, TAM is the most commonly used theory in the e-learning acceptance literature [12] because of its acceptable explanatory power and simple structure [9].

Many researchers have been extending TAM with different external variables for more than a decade, resulting in a large number of external variables and extended TAM models in e-learning adoption studies that encourage the formation of General Extended Technology Acceptance Model for E-Learning (GETAMEL). This model was developed by reviewing 107 studies that extend and use TAM in the context of e-learning adoption. The study found that self-efficacy, subjective norm, and experience are three of five most common external variables that have been confirmed among the 152 external variables derived from 107 studies [5], [12]. These variables along with variables taken from TAM (perceived ease of use, perceived usefulness, and behavioral intention to use) influence user acceptance of e-learning system.

One of the major limitations of TAM is the exclusion of the institutional, social and personal control factors that may be influential. Cultural differences may explain some of the contradictory findings of the research results with the TAM model [2]. TAM may not be applicable in all cultures so its relevance needs to be further explored in developing countries such as Indonesia [2], [7], [8].

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Various research results show the importance of TAM's main constructs, perceived ease of use and perceived usefulness, meaning that organizations using e-learning system should take these issues seriously in the context of system adoption. Hence, it is necessary to know the factors that may affect perceived ease of use and perceived usefulness to understand more about user acceptance behavior [7], [12]. Moreover, the studies indicate that the application of e-learning system should focus on social and cultural context, not only in terms of technology alone thus variables like subjective norm, self-efficacy, and experience can be added to comprehend user decision to use e-learning system.

Variables used in this study are:

1) Perceived ease of use: the extent to which a user believes that the use of a system is easy and does not require much effort [4].
2) Perceived usefulness: the extent to which a user believes that the use of a system will improve his performance [4].
3) Behavioral intention to use: the tendency of user behavior to keep using a system [14].
4) Self-efficacy: an individual's judgment of his or her own ability to perform certain tasks using a system [12].
5) Subjective norm: a person's perception about opinions of those important to him, whether he should or should not perform certain behavior or action [12].
6) Experience: the number and type of computer skills that a person acquires over time [12].

3. METHOD

This research follows the following stages:

1) Observe the problem area
2) Literature review
3) Identify and formulate problem
4) Build research model
5) Design questionnaire
6) Collect data
7) Analyze data and interpret the result
8) Draw conclusions and suggestions

Literature review is conducted to find the relationship between variables and build research model. Here are the relationships found:

1) Self-efficacy has significant positive effect on perceived ease of use.
   The more a person believes in his ability to use the system, the easier it is to use the system that the person perceives. The relationship between these two variables is supported by the findings of study [6], [7], [12], [13], [19]–[21].
2) Self-efficacy has significant positive effect on perceived usefulness.
   The more a person believes in his ability to use the system, the greater the benefits of using the system that the person perceives. The relationship between these two variables is supported by the findings of study [16].
3) Subjective norm has significant positive effect on perceived ease of use.
   The stronger the opinion of those around him to use the system, the easier it is to use the system that the person perceives. The relationship between these two variables is supported by the findings of study [12], [20]–[22].
4) Subjective norm has significant positive effect on perceived usefulness.
   The stronger the opinion of those around him to use the system, the greater the benefits of using the system that the person perceives. The relationship between these two variables is supported by the findings of study [6], [20]–[22].
5) Experience has significant positive effect on perceived ease of use.
   The more experience a person has with the system, the easier it is to use the system that the person perceives. The relationship between these two variables is supported by the findings of study [6], [12], [13], [21], [23].
6) Experience has significant positive effect on perceived usefulness.
   The more experience a person has with the system, the greater the benefits of using the system that the person perceives. The relationship between these two variables is supported by the findings of study [6], [13], [23].
7) Perceived ease of use has significant positive effect on perceived usefulness.
   The easier it is to use the system, the greater the benefits of using the system that the person perceives. The relationship between these two variables is supported by the findings of study [7], [12], [13], [18], [19], [21]–[26].
8) Perceived ease of use has significant positive effect on behavioral intention to use.
   The more a person believes that a system is easy to use, the higher the person's intention to use

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the system. The relationship between these two variables is supported by the findings of study [2], [6]–[8], [12], [20], [21], [26].

9) Perceived usefulness has significant positive effect on behavioral intention to use.
The more a person believes that a system is beneficial, the higher the person's intention to use the system. The relationship between these two variables is supported by the findings of study [2], [6]–[8], [12], [13], [16], [18], [20]–[26].

Based on the explanation above, the research model is shown in Figure 2.

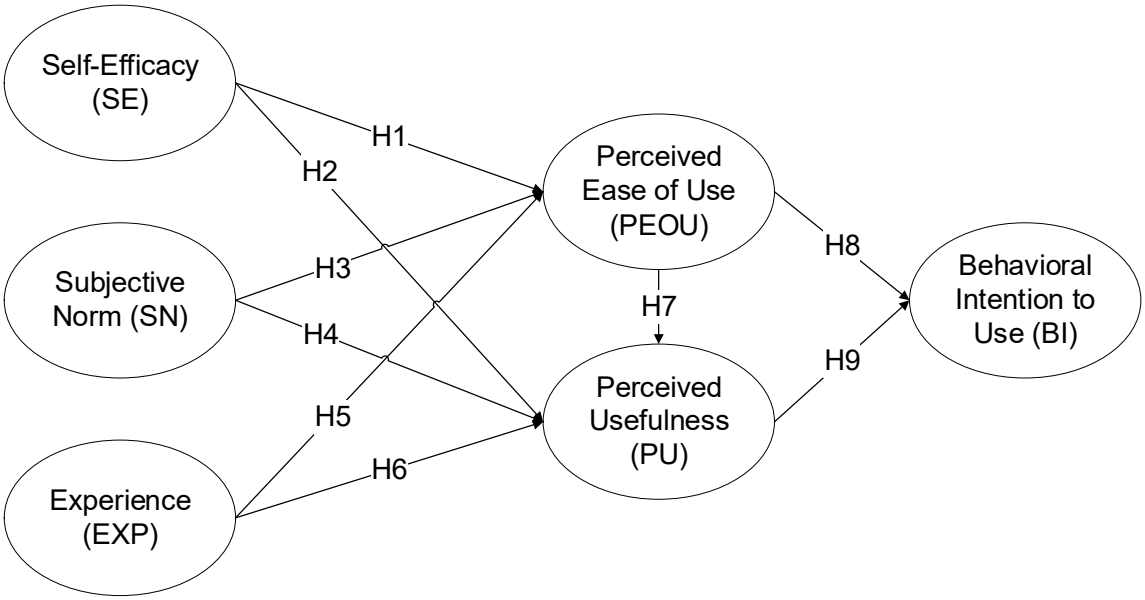

Figure 2: Research Model

The hypotheses to be tested in this study are:

H1: Self-efficacy (SE) has significant positive effect on perceived ease of use (PEOU) in the adoption of e-learning system.

H2: Self-efficacy (SE) has significant positive effect on perceived usefulness (PU) in the adoption of e-learning system.

H3: Subjective norm (SN) has significant positive effect on perceived ease of use (PEOU) in the adoption of e-learning system.

H4: Subjective norm (SN) has significant positive effect on perceived usefulness (PU) in the adoption of e-learning system.

H5: Experience (EXP) has significant positive effect on perceived ease of use (PEOU) in the adoption of e-learning system.

H6: Experience (EXP) has significant positive effect on perceived usefulness (PU) in the adoption of e-learning system.

H7: Perceived ease of use (PEOU) has significant positive effect on perceived usefulness (PU) in the adoption of e-learning system.

H8: Perceived ease of use (PEOU) has significant positive effect on behavioral intention to use (BI) in the adoption of e-learning system.

H9: Perceived usefulness (PU) has significant positive effect on behavioral intention to use (BI) in the adoption of e-learning system.

Questionnaires are distributed using stratified random sampling method to collect data from students. Students are grouped according to their major and class to get proportional samples. Respondents will be answering questions on the questionnaire by selecting options that have been prepared. The data analysis method used in this study is Structural Equation Modeling (SEM) using the application of AMOS (Analysis of Moment Structure) version 24. SEM is a combination of factor analysis and path analysis into a comprehensive statistical method. SEM consists of measurement model that links manifest variables with latent variables through confirmatory factor models and structural model that links between latent variables through simultaneous regression equations. SEM has many advantages compared to other multivariate analysis, such as SEM is able to

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test the structural model as well as measurement model, test the measurement error as well as structural errors, test model fit, test intervening variable, and suitable for the sample with the minimum amount of 200. The AMOS program is selected for data processing because of its user-friendly interface [27].

Questionnaires used in this study consist of two parts. Part one is about the demographics of surveyed students, which inquire students' major, class, gender and age. Part two comprises of 28 questions about research variables. There are 5 questions of self-efficacy, 4 questions of subjective norm, 4 questions of experience, 6 questions of perceived ease of use, 5 questions of perceived usefulness, and 4 questions of behavioral intention to use. All those questions are answered by using five-point Likert scale. One point for strongly disagree and five points for strongly agree with a particular statement.

Here are the questionnaires:

Table 1: Questionnaires

Self-Efficacy
1. I believe I can use the e-learning system even though no one else showed me how to use it. 2. I believe I can use the e-learning system even though I have never used that system before. 3. I believe I can use the e-learning system even though I only have online instructions as a reference. 4. I believe I can overcome obstacles when using the e-learning system. 5. I believe I will be able to use the e-learning system as long as I have enough time.
Subjective Norm
1. My lecturers think and expect me to use the e-learning system. 2. My college friends think and expect me to use the e-learning system. 3. My college management think and expect me to use the e-learning system. 4. In general, I will do what the lecturers expect me to do in regards of use of the e-learning system.
Experience
1. I enjoy using the computer. 2. I am fluent in using the internet. 3. I am fluent in saving and locating files. 4. I enjoy using e-mail.
Perceived Ease of Use
1. I easily learn to use the e-learning system. 2. I easily get the information I need from the e-learning system. 3. The interaction in the e-learning system is clear and easy to understand. 4. I find that the e-learning system is flexible to interact. 5. It is easy for me to become skilled in using the e-learning system. 6. The e-learning system is easy to use.
Perceived Usefulness
1. The use of e-learning system makes me complete my assignments faster. 2. The use of e-learning system improves my learning performance. 3. The use of e-learning system increases my learning effectiveness. 4. The use of e-learning system makes my learning easier. 5. I feel the e-learning system is useful for my learning.
Behavioral Intention to Use
1. I intend to use the e-learning system in preparation to study for exam and complete assignment. 2. I plan to use the e-learning system in the future. 3. I will use the e-learning system regularly in the future. 4. I will recommend others using the e-learning system.

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4. RESULTS AND DISCUSSION

Population in this study consists of 2698 active students, who are majored in Informatics Engineering, Information Systems, and Information Management. As many as 354 questionnaires can be analyzed using AMOS. Based on data collected, the following is the demographics of students based on major, class of, gender and age.

Table 2: Demographics of the Surveyed Students

Major		
Informatics Engineering	164	46%
Information Systems	173	49%
Information Management	17	5%
Class of		
2014	71	20%
2015	90	25%
2016	84	24%
2017	109	31%
Gender		
Male	228	64%
Female	126	36%
Age		
17-20	210	59%
21-24	138	39%
>24	6	2%

The overall model fit testing is related to the analysis of the goodness of fit statistics generated by the AMOS program. The results of the analysis of the overall model fit measures can be seen in Table 3.

Table 3: The Overall Model Fit Testing

Goodness of Fit	Criteria	Value	Results
χ^2	Small value	670.372	Bad
χ^2/DF	χ^2/DF < 2 (fit) χ^2/DF < 5 (reasonable)	1.966	Fit
GFI	GFI ≥ 0.90 (good fit) 0.80 ≤ GFI ≤ 0.90 (marginal fit)	0.882	Marginal Fit
RMSEA	RMSEA ≤ 0.05 (close fit) 0.05 ≤ RMSEA ≤ 0.08 (good fit)	0.052	Good Fit
AGFI	AGFI ≥ 0.90 (good fit) 0.80 ≤ AGFI ≤ 0.90 (marginal fit)	0.859	Marginal Fit
TLI	TLI ≥ 0.90 (good fit) 0.80 ≤ TLI ≤ 0.90 (marginal fit)	0.919	Good Fit
NFI	NFI ≥ 0.90 (good fit) 0.80 ≤ NFI ≤ 0.90 (marginal fit)	0.863	Marginal Fit
PNFI	Large value	0.859	Good
PGFI	Large value	0.919	Good

The numbers above show that Goodness of Fit value meets the specified minimum criteria, so the overall fit of the model is good. Even though the chi-square (χ^2) value indicates that the model is not appropriate, please note that the chi-square value is very sensitive to the number of samples. The larger the number of samples, the more significant chi-square value. This may explain the high chi-square value because the sample quantities considered large enough. Therefore, it is necessary to consider another Goodness of Fit value, such as GFI, AGFI, and RMSEA [27].

The next step is conducting measurement model fit testing. This test is performed by measuring the

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validity and reliability of each construct. A construct is valid if the value of standardized loading factor ≥ 0.50 and ideally should be ≥ 0.70 [27]. The construct has good reliability if the value of construct reliability (CR) ≥ 0.70 and average variance extracted (AVE) ≥ 0.50 [27].

Table 4: Validity and Reliability Testing

Variable	Item	Estimate	CR	AVE
SE	X1	0.707	0.839	0.510
	X2	0.708		
	X3	0.753		
	X4	0.703		
	X5	0.700		
SN	X6	0.716	0.804	0.507
	X7	0.708		
	X8	0.701		
	X9	0.723		
EXP	X10	0.722	0.804	0.506
	X11	0.702		
	X12	0.713		
	X13	0.709		
PEOU	X14	0.714	0.859	0.504
	X15	0.701		
	X16	0.710		
	X17	0.721		
	X18	0.712		
	X19	0.703		
PU	X20	0.728	0.839	0.511
	X21	0.703		
	X22	0.704		
	X23	0.716		
	X24	0.722		
BI	X25	0.718	0.807	0.511
	X26	0.709		
	X27	0.725		
	X28	0.708		

All the numbers in Table 4 show that the value of standardized loading factor ≥ 0.70, the value of construct reliability (CR) ≥ 0.70 and average variance extracted (AVE) ≥ 0.50. Therefore, each construct is valid and reliable.

Furthermore, structural model fit testing is performed which concerns the significance of the coefficients. The AMOS output gives the estimated value of coefficient, standard error, and critical ratio value (CR) for each coefficient. A relationship is significant at the 95% confidence level if the critical ratio value (CR) ≥ 1.96 or probability value (p) ≤ 0.05 [27]. Thus, the hypothesis is accepted if the value of CR ≥ 1.96 or p value ≤ 0.05, and otherwise the hypothesis is rejected if the value of CR <1.96 or p value > 0.05.

Table 5: Hypotheses Testing

Relationship	β	C.R.	P	Result
SE→PEOU	0.468	7.061	***	Accepted
SE→PU	-0.027	-0.497	0.619	Rejected
SN→PEOU	0.237	3.932	***	Accepted
SN→PU	0.079	1.642	0.101	Rejected
EXP→PEOU	0.241	3.976	***	Accepted

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EXP→PU	0.028	0.571	0.568	Rejected
PEOU→PU	0.799	9.889	***	Accepted
PEOU→BI	0.034	0.392	0.695	Rejected
PU→BI	0.959	8.400	***	Accepted

Information: *** means p ≤ 0.001

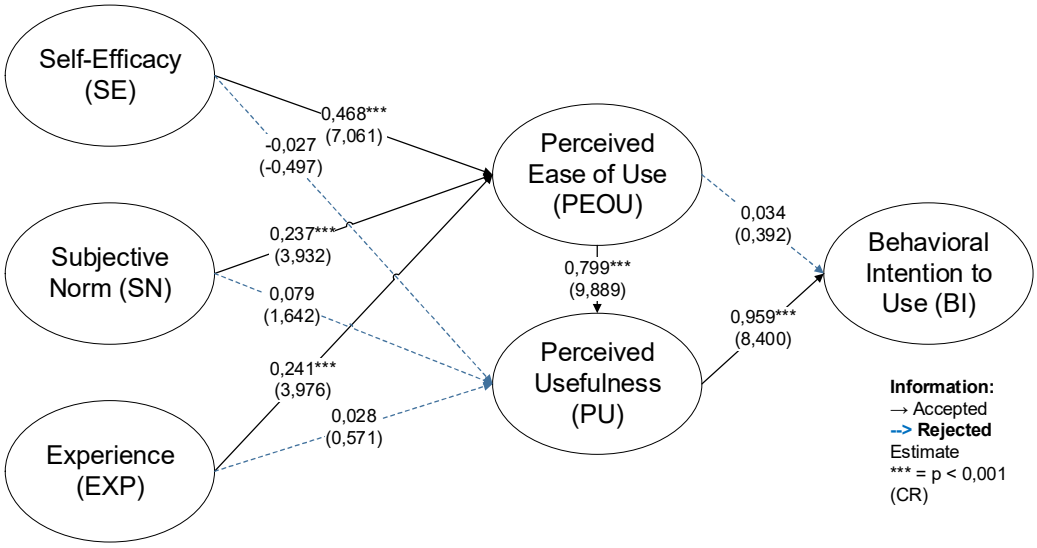

Figure 3: Hypotheses Testing

After analyzing the data, it was found that from 9 hypotheses proposed in the model, there were 5 accepted hypotheses and 4 rejected hypotheses. Behavioral intention to use is significantly affected by perceived usefulness but it is not significantly affected by perceived ease of use. Perceived usefulness is significantly affected by perceived ease of use, but it is not significantly affected by self-efficacy, subjective norm, and experience. Perceived ease of use is significantly affected by self-efficacy, subjective norm, and experience, with the strongest relationship came from self-efficacy, followed by experience and subjective norm.

Self-efficacy has significant positive effect of 46.8% on perceived ease of use in the adoption of e-learning system. The more students believe in their ability to use the e-learning system, the easier it is to use the system. The result of this study is supported by various studies such as those conducted by study [6], [7], [12], [13], [19]–[21]. Students with high self-efficacy tend to have higher expectations for using e-learning system because they feel confident in their computer skills and ability to overcome difficulties that arise so they tend to assume that e-learning system is easy to use. This indirectly leads to higher behavioral intention to use e-learning system. On the contrary, students who lack confidence in their abilities tend to avoid using e-learning system. To boost students' confidence level in their own abilities, Mikroskil may consider providing training and ensuring the availability of guidance and technical support for students to use e-learning system.

Self-efficacy has no significant effect on perceived usefulness in the adoption of e-learning system. Students' confidence in their own ability to use e-learning system did not have significant effect on the benefits of the system perceived by the student. The result of this study differ from study [16], but in accordance with study [6], [7], [12], [13], [19]–[21], [23]. This study found that students who believed in their own ability to use e-learning system did not directly assume that e-learning system was useful. One reason may be that respondents are students who study computer science so they are more familiar and have more experience on using computer and the internet. They are more confident in their own ability on using computers and internet. As a result, students may have used other technologies that have more functionalities than those offered by e-learning system. Therefore, e-learning system functionality needs to be improved. Although self-efficacy has no significant effect on perceived usefulness, self-efficacy has significant effect on perceived ease of use that is directly related to perceived usefulness.

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Subjective norm has significant positive effect of 23.7% on perceived ease of use in the adoption of e-learning system. The stronger the people's opinion around the students to use e-learning system, the easier it is to use the system perceived by the student. The results of this study are supported by various studies as conducted by study [12], [20]–[22]. Opinions of people who can influence student decisions include opinions from lecturers, other fellow students, and management. In general, students are willing to meet the expectations of the surrounding people on using e-learning system. The social environment in which students are located can influence their attitude, belief, and behavior to use e-learning system. Thus, the opinions of others can be important source of influence to increase the acceptance of e-learning system. Students tend to be sensitive to the opinions and expectations of others. If the student believes that his friends, lecturers, or staff think he should use an e-learning system, then the student will incorporate their belief into his own belief system. Students unconsciously align their perceptions and decisions to use e-learning system with the opinions of the people related with him. Due to the ongoing support of surrounding people, students tend to assume the e-learning system is easier to use.

Mikroskil can form positive subjective norm to strengthen the acceptance of e-learning system. The tricks are to provide training programs in groups, provide incentives to use discussion forums for group learning, provide support and resources needed by students, encourage lecturers to be role model for students in using e-learning system, and communicate the university policy about the use of e-learning system. This will help students gain more expertise and experience and encourage communication so that e-learning system is easier to use.

Subjective norm has no significant effect on perceived usefulness in the adoption of e-learning system. The strong opinions of people around the students to use e-learning system did not have significant effect on the benefits of using the system. The result of this study differ from the findings of study [6], [20]–[22], but in accordance with study [12], [19], [25]. In this study, the lack of link between subjective norm and perceived usefulness can be caused by the lack of expectation that e-learning system will be used for communication purpose so there is little pressure to use this e-learning system. Students may use other technologies to communicate like social network and not e-learning system. Other things to be considered may be related to the context of time, place, technology, and culture that is different in other studies.

Experience has significant positive effect of 24.1% on perceived ease of use in the adoption of e-learning system. The more experience the student has with the system, the easier it is to use the e-learning system. The results of this study are supported by various studies such as those conducted by study [6], [12], [13], [21], [23]. The acceptance of e-learning system depends not only on the technology itself, but also on the skill of students. Students who have more experience using computer and Internet tend to feel easier using e-learning system. Students will apply the knowledge gained from experience to understand the system, which in turn enhances their intention to use e-learning system. The e-learning system design must be consistent, so that student experience on using system can be passed on when using e-learning system.

Experience has no significant effect on perceived usefulness in the adoption of e-learning system. The experience that students have with the system does not have significant effect on the benefits of using e-learning system. The result of this study differ from those of study [6], [13], [23], but in accordance with the findings of study [12], [21]. The insignificant effect in this study may be caused by respondents who come from computer study background so they have more computer and internet experience. To support the acceptance of e-learning system, Mikroskil can conduct survey to gain valuable input from students' perspective.

Perceived ease of use has significant positive effect of 79.9% on perceived usefulness in the adoption of e-learning system. The more students find it easy to use e-learning system, the greater the benefits of using the system that the students perceive. The results of this study are supported by various studies such as study [7], [12], [13], [18], [19], [21]–[26]. If students feel that e-learning system is easy to use, then the system will be deemed useful by students and they will be ready to adopt e-learning system. The rationale is e-learning system can be considered useful only if students know how to use the system. Although the perceived ease of use does not have direct impact on the intention to use e-

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learning system, it has direct influence on perceived usefulness, which in turn leads to greater acceptance of e-learning system. Consequently, Mikroskil must work on this factor by providing user training and convincing the students that they will get support from the university. On the other hand, e-learning system designers should improve the ease of use through user-friendly interface design, easy access to the system, and by giving clear instructions to users. Menu, content, and information presented can be added with images, videos, or sounds to make it easier for students to understand. The design of e-learning system must meet the aesthetic, attractive, user-friendly, readable, organized, flexible, reliable, and secure aspects to match user's needs.

Perceived ease of use has no significant effect on behavioral intention in the e-learning system adoption. The result of this study differ from the findings of study [2], [6]–[8], [12], [20], [21], [26], but in accordance with research conducted by study [16], [18], [19], [22]–[25]. In this study, perceived ease of use has no direct effect on behavioral intention but has an indirect effect on behavioral intention through perceived usefulness. This shows perceived usefulness importance in e-learning system acceptance. That is, although e-learning system is difficult to use, but there are students who still want to use e-learning system because of its benefits. However, if the e-learning system is easy to use, but not useful for students, then they will not use the system. It would be wise to pay more attention to e-learning system functionality while improving its ease of use. The lack of significant effect may be due to the complicated and confusing screen display of e-learning system so that students feel less comfortable and often come across problems while using the system. Then again, this perceived ease of use may become less influential because students have considerable experience in using the system.

Perceived usefulness has significant positive effect of 95.9% on behavioral intention in the adoption of e-learning system. The more students believe that e-learning system is useful, the higher the student's intention to use the system. The results of this study are supported by many other studies such as study [2], [6]–[8], [12], [13], [16], [18], [20]–[26]. Students incline to use e-learning system because of the benefits that the system can provide. It does not matter that the system is difficult to use, as long as the system benefits are great, then the student will still use the system. However, this does not mean that the ease of use aspect can be ignored, since perceived ease of use has direct effect on perceived usefulness. Mikroskil needs to emphasize specifically on the effectiveness and functionality of e-learning system, as well as raising students awareness about the realistic goals and benefits of e-learning system. This information can be conveyed through the support of lecturers and management. They can increase students' understanding of how e-learning system improve student learning and academic performance. Mikroskil may consider involving students in implementing e-learning system by requesting feedback about the system thus it can be adjusted. To attract more users, the quality of e-learning system content must be improved by providing up-to-date content that fits students' needs. The features needed to communicate and collaborate actively such as chat, discussion forum, e-mail, social network can be proposed to be integrated into e-learning system so that the perceived usefulness increase, which will further enhance the intention of using e-learning system.

5. CONCLUSIONS

E-learning system is one of technology that can improve the quality of educational service of STMIK Mikroskil. E-learning system usage will be less than optimal if students refuse or cannot use the system. Therefore, an understanding of student acceptance behavior toward the system is also important in order to improve online learning environment. This study measures the acceptance of e-learning system using the extended Technology Acceptance Model (TAM). Although many studies have used TAM to measure the level of user acceptance of the system, the research findings have not been consistent that there are differences in outcomes between one study and another. These differences can be explained by the existence of cultural differences so that the model relevance needs to be further examined in developing countries like Indonesia [2], [7], [8]. This study aims to determine the relationship between self-efficacy, subjective norm, and experience as exogenous constructs to perceived ease of use and perceived usefulness as endogenous construct followed by testing to determine the relationship between perceived ease of use and perceived usefulness toward behavioral intention to use on e-learning system usage in STMIK Mikroskil Medan. Data was collected from 354 active students and

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analyzed with structural equation modeling (SEM) using AMOS 24.

According to the results of this study, the conclusions are:

1) Self-efficacy has significant positive effect on perceived ease of use in the adoption of e-learning system.
2) Self-efficacy has no significant effect on perceived usefulness in the adoption of e-learning systems.
3) Subjective norm has significant positive effect on perceived ease of use in the adoption of e-learning system.
4) Subjective norm has no significant effect on perceived usefulness in the adoption of e-learning system.
5) Experience has significant positive effect on perceived ease of use in the adoption of e-learning system.
6) Experience has no significant effect on perceived usefulness in the adoption of e-learning system.
7) Perceived ease of use has significant positive effect on perceived usefulness in the adoption of e-learning system.
8) Perceived ease of use has no significant effect on behavioral intention to use in the adoption of e-learning system.
9) Perceived usefulness has significant positive effect on behavioral intention to use in the adoption of e-learning system.

Mikroskil can prioritize perceived usefulness construct that has significant effect on behavioral intention to use. The next priority is the perceived ease of use construct that has significant effect on perceived usefulness. Of the three exogenous constructs that affect the perceived ease of use construct, Mikroskil can prioritize the self-efficacy construct, experience construct, followed by subjective norm construct.

It means that Mikroskil should improve the functionality of e-learning system by improving the content quality and providing up-to-date content that fits students' needs. Communicative and collaborative learning feature such as chats, discussion forums, e-mail, social networking can be integrated into the e-learning system. Students' suggestion should be taken into consideration to make e-learning system more useful.

Then Mikroskil can improve the ease of use aspect of e-learning system through user-friendly interface, easy accessibility to e-learning system, and easily understood instructions. Menu, content, and information presented can be supported with pictures, videos, or sounds to make it easier for students. The design of e-learning system should be appealing, user-friendly, easy-to-read, organized, flexible, dependable, secured, and consistent in order to match user requirements.

Furthermore, Mikroskil can provide group training and manual and technical support for students to use e-learning system effectively. Mikroskil can build positive environment for e-learning system usage by encouraging students to use discussion forums in e-learning system for group learning, providing all the support and resources needed in using e-learning systems, inspiring lecturers to become role model for students in using e-learning system, and conveying university policies about e-learning system usage.

Further research can add other variables from various existing theories, such as perceived enjoyment, computer anxiety, learning content, system accessibility, facilitating condition and so on into research model to better understand student acceptance behavior toward e-learning system. It is also recommended to take this model into further studies in other universities to validate it.

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