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Adoption of mobile learning at Universities using the extended technology acceptance model

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Abstract

This study aims to contribute to the proof of factors likely to determine the success of *M-learning* adoption based on previous research. This is done because there are many different theoretical models proposed. However, there is not yet a model that can be generally accepted as an established theoretical model for the adoption of *M-learning* in universities. This research is expected to make a significant contribution to the development of a better theoretical understanding of the determinants that influence the adoption of *M-learning* using the *Technology Acceptance Model (TAM)*. To collect the data, researchers distributed questionnaires to respondents using google forms. Forms are distributed via WhatsApp and Telegram. The data used was 515 *M-learning* users. Theoretical model research was carried out with *Structural Equation Model (SEM)* analysis, then SPSS and Amos as support for analysis. There are six factors that determine the results of acceptance of *M-learning* adoption in this study, namely *Social Influence, Perceived Enjoyment, Facilitating Condition, Self-Efficacy, Perceived Usefulness,* and *Perceived Ease of Use*. The five factors that show positive and significant relationships are *Social Influence, Perceived Enjoyment, Self-Efficacy, Perceived Usefulness,* and *Perceived Ease of Use*. *Perceived Usefulness* has the first strongest positive and significant value, and then Social Influence has the second strongest value. Each factor has a medium influence value on *Behavioral Intention*. That factor is the most influential in the application of *M-learning* in universities.

1. Introduction

Information technology is now growing rapidly [1], giving rise to many ideas and creativity in the field of science. Impact on aspects of people's lives. The growth of technology in the field of information and communication and the presence of technological devices such as laptops, wireless mobile phones, and handheld devices have changed the field of education further. One such development is in the field of information systems education, which has expanded the prospect of acquiring skills through learning strategies since the use of technology facilitates quick and easy access to electronic materials. This led to the new terminology *of Mobile Learning* (*M-learning*). *M-learning allows* learners to have access to teaching materials anytime and anywhere [2], [3].

M-learning has great benefits for students in general [3], [4]. In addition, it can help students with disabilities and motivate them to have remote study with the help of mobile devices, which support two-way learning opportunities, provide an environment for students to participate and interact and assist in supporting informal education. To create an efficient and successful learning process, learning can be adapted and applied to the needs of learners. Thus, *M-learning* has sufficient capabilities to help achieve learning objectives [2].

This research was conducted because there are still few similar studies conducted in developing countries such as Indonesia [5], and discusses specific related research questions: (a) What factors are related to influencing users to adopt an *M-learning* system? (b) The relationship among those factors (a)? and (c) the practical implications of the answers to points (a) and (b). There are many different theoretical models proposed for the adoption of *M-learning*, but there is not yet a model that can be generally accepted as an established theoretical model for the adoption of *M-learning* in universities [3]. With these conditions, this research is expected to make a significant contribution to the development of a better theoretical understanding of the determinants that influence the adoption of *M-learning* using the *Technology Acceptance Model (TAM)*. In addition, university management can use this research's results to introduce and develop *M-learning* with more effective strategies for students [6].

2. Theoretical Framework

TAM is one of the most popular technology adoption theories used for M-learning adoption studies [3]. Some existing studies have obtained positive and significant results, although there are differences in some factors and research results. Previous studies used *TAM* as a basic reference to determine respondents' acceptance of the technology. Thus, the researchers used the same reference.

This research consists of previous research related to *M-learning* in the context of using the *Technology Acceptance Model (TAM)* in analyzing theoretical model designs [2], [3], [4], [7], [8], [9], [10].

From the previous seven studies, there are similarities. There are four factors that are often used and quite influential, namely: *Social Influence*, *Perceived Enjoyment*, *Facilitating Condition,* and *Self-Efficacy*. That factor is touted as an exogenous factor that influences a person's desire to use *M-learning*. Researchers consider these factors as very important variables to study, namely four exogenous variables and three basic TAM variables so that a theoretical model is obtained as shown in Figure 1. Since there is an opinion that a factor can and cannot influence, this study is expected to provide more significant evidence.

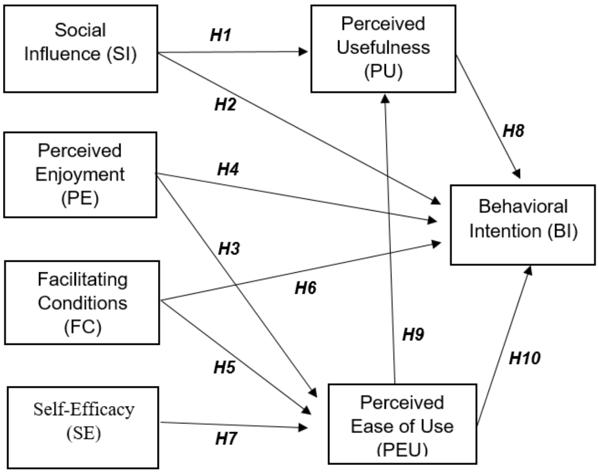

Figure 1. Theoretical Model

Based on the above model, a few hypotheses were made for proof. There are ten hypotheses that are considered to have a direct and significant influence on *Perceived Usefulness*, *Perceived Ease of Use*, and *Behavioral Intention*. The variables in the theoretical model are used as measuring instruments. The factor definitions and references of each variable are spelled out as follows:

2.1 Social Influence

Social Influence is defined as to what extent a learner believes that the person who is important to him thinks that he should use *M-learning* [3]. *Social Influence* is also known as the Subjective Norm in the Theory of Reasoned Action and the Theory of Planned Behavior or Image in the Innovation Diffusion Theory. Previous research has shown that *Social Influence* is an important factor in influencing individuals to adopt new technologies in the context of *M-learning* [11]. The influence of *Social Influence* on *Behavioral Intention* to adopt *M-learning*. has been explored with positive results. *Social Influence* has been shown to influence *Perceived Usefulness*. Therefore, *Social Influence* is expected to be a significant determinant of *Perceived Usefulness* and *Behavioral Intention* to adopt *M-learning*.
H1: *Social Influence* has a positive and significant direct influence on *Perceived Usefulness* [2], [3].
H2: *Social Influence* has a positive and significant direct influence on *Behavioral Intention* [3], [8], [10].

2.2 Perceived Enjoyment

Perceived Enjoyment is defined as to what extent a learner believes that using *M-learning* will help him to achieve gains in his learning performance[8]. *Perceived Enjoyment* allows individuals to enjoy learning activities with mobile devices. It is an example of intrinsic motivation and has been known to influence user acceptance of new technologies. Previous research has shown that *Perceived Enjoyment* is a determining factor that influences *Perceived Ease of Use* and *Behavioral Intention* to adopt *M-learning*. This study incorporates *Perceived Enjoyment* into a research model to explore its relationship with *Perceived Ease of Use* and *Behavioral Intention* to adopt *M-learning*.
H3: *Perceived Enjoyment* has a positive and significant direct influence on *Perceived Ease of Use* [3], [9].
H4*: Perceived Enjoyment* has a positive and significant direct influence on *Behavioral Intention* [3], [7].

2.3 Facilitating Conditions

Facilitating Conditions is defined as the extent to which a learner believes the organization and technical infrastructure at hand support the use of *M-learning* systems [8]. *Facilitating Conditions* covers aspects of the technological and/or organizational environment designed to remove barriers to use. In the context of *M-learning*, *Facilitating Conditions* refers to resources, knowledge, internet speed, and support personnel. Students' decisions to adopt *M-learning* are believed to be influenced by their perception of the availability of these resources to provide *M-learning*. Furthermore, *Facilitating Conditions* also have an influence on *Perceived Ease of Use*. This study combines *Facilitating Conditions* into a research model to explore the relationship between *Facilitating Conditions* and *Perceived Ease of Use, Facilitating Conditions*, and *Behavioral Intention* to adopt *M-learning*.

H5: *Facilitating Conditions* has a positive and significant direct influence on *Perceived Ease of Use* [3].

H6: *Facilitating Conditions* has a positive and significant direct influence on *Behavioral Intention* [4], [8].

2.4 Self-Efficacy

Self-Efficacy is defined as the individual confidence to work on and complete the given tasks [2]. *Self-Efficacy* was first introduced by Bandura in his social cognitive theory [12]. It refers to the beliefs of the individual about the ability and motivation of a person to perform certain tasks. It also plays an important role in shaping the feelings and behaviors of individuals. Later, this definition was adapted to the technology adoption model and is defined as an assessment of a person's ability to use information systems [13]. In the context of *M-learning*, it shows an individual's perception of his or her ability to use mobile devices to engage in learning tasks, search for and manipulate information, communicate, and collaborate using social technology [14]. The influence of *Self Efficacy* on the adoption of *M-learning* in education has been explored with positive results. *Self-Efficacy* has also been shown to have an influence on *Behavioral Intention*. Therefore, this study incorporates *Self Efficacy* into the research model to explore the relationship between *Self Efficacy* and *Behavioral Intention* to adopt *M-learning*.

H7: *Self Efficacy* has a positive and significant direct influence on *Perceived Ease of Use* [2], [3].

2.5 Perceived Usefulness

Perceived Usefulness is defined as to what extent one believes that using *M-learning* will improve their learning performance [15]. Venkatesh et al. (2003) [16] posit that *Perceived Usefulness* has similarities with performance expectations (Unified Theory of Acceptance and Use of Technology), relative advantage (Innovation Diffusion Theory), and Yield Expectations (Social Cognitive Theory). *Perceived Usefulness* in *M-learning* means that students will find that *M-learning* is useful because they can carry out learning activities more quickly, flexibly, and effectively [17]. There have been many studies related to *M-learning* using *Perceived Usefulness* in TAM-based studies known to determine *Behavioral Intention* to adopt *M-learning*. Research shows that individuals will accept if they find *M-learning* useful. Therefore, it is hoped that *Perceived Usefulness* will be a strong factor for learners to adopt *M-learning*.

H8: *Perceived Usefulness* has a positive and significant direct influence on *Behavioral Intention* [3], [4], [7], [8], [9].

2.6 Perceived Ease of Use

Perceived Ease of Use is defined as to what extent one believes that *M-learning* will be easy to use [15]. Venkatesh et al. (2003)) [16] state that *Perceived Ease of Use* has similarities with Effort Expectancy (Unified Theory of Acceptance and Use of Technology) and Complexity (Diffusion Theory of Innovation, with a negative correlation). There have been many studies in *M-learning* using *Perceived Ease of Use* in TAM-based studies known to be determinants of *Behavioral Intention* to adopt *M-learning*. *Perceived Ease of Use* is also known as the determinant of *Perceived Usefulness*. Therefore, it is hoped that *Perceived Ease of Use* will determine the *Perceived Usefulness* and *Behavioral Intention* of students to adopt *M-learning*.

H9: *Perceived Ease of Use* has a positive and significant direct influence on *Perceived Usefulness* [2], [3], [9].

H10: *Perceived Ease of Use has a positive and significant direct influence on Behavioral Intention (BI)* [3], [4], [7], [8], [9].

2.7 Behavioral Intention

Behavioral Intention is defined as a measure of how strong a person's will to use *M-learning* in the learning process [18]. *Behavioral Intention is considered the main factor of user acceptance in behavior* [16]. In the context of car learning, it measures an individual's commitment to utilizing *M-learning* if it is available to them as an option in the future. This study measures *Behavioral Intention* rather than actual use because the actual conditions of the organization in which the research was conducted for the implementation of *M-learning* are still in its early stages and in some cases, individuals are forced to use *M-learning*.

3. Research Method

This research uses *Structural Equation Modeling (SEM)*, which is a statistical analysis technique that is *cross-sectional* and is commonly used for the analysis and development of a research model. Hypothesis testing is carried out using questionnaires to measure each variable in the research model. The questionnaire will be divided into two parts. The first section contains a few questions related to the respondent's profile, such as age, gender, length of time to use *M-learning*, major where the respondent received an education, and where the respondent received an education. The second part contains a few questions related to the variables present in the research model.

The respondents in this study are students who are still actively studying in Indonesia, with a minimum respondent age of 18 years, are studying, have a mobile device with internet facilities, and have used *M-learning* for at least 1 month. The total student population of universities in Indonesia is unknown, but it exceeds 100,000. Therefore, with a target of 5 percent precision and a confidence level of 95 percent, the minimum number required is 400 respondents [19]. Data were collected using a *purposive (judgmental) sampling* method, which is suitable for collecting data from respondents with certain characteristics [20]. *Purposive sampling* is non-random sampling that takes samples from populations with certain characteristics according to research needs. Before the questionnaire is given to a massive number of respondents, the researcher will conduct a pilot study to see the feasibility and correctness of the questionnaire.

The results of the questionnaire will be entered on the SPSS worksheet, and the accuracy of data input is checked using a random selection of 10% of the entire data. Questionnaires that are not filled in completely will not be used. After all the data is entered, the *Outlier* value (the standard deviation value is more than or equal to 3) will be identified. Questionnaire data that has an *Outlier* value will not be used in this study. Principle component factor analysis will be used to test the validity (discriminant and convergent) of each indicator of all variables in the research model [21]. As for the reliability test of measuring the indicators of each variable, *Cronbach alpha* coefficients are used [22].

After going through the data preparation stage, several descriptive statistical methods (average, standard deviation, *skewness*, and *kurtosis*) were used to analyze the data from the research model. Frequency Distribution is used to analyze respondents' answers to get an idea of respondents' profiles and characteristics. Elimination of data that has an *Outlier* value is expected to produce an indicator value distribution of the variables in the research model in such a way that the *skewness* and *kurtosis* values are within the maximum limits of 3 and 7, to be eligible for SEM analysis [23]. Pearson correlation coefficients will also be used to study the relationships between variables of the research model.

SEM analysis was performed using Amos computer software. All SEM Analysis procedures follow the guidance of Kline (2016) [23]. The statistical significance of direct effects was reported using Amos software, while the statistical significance of indirect effects was determined using heuristics from Cohen and Cohen (1983) [24]. Several fit statistics (Normed Chi-Square, RMR, GFI, AGFI, NFI, CFI, IFI, and RMSEA) were used to assess the extent to which the characteristic values of the research model determined from the estimated parameters and structure of the model corresponded to the estimated characteristic values from the sample data.

4. Results and Discussion

4.1 Respondent Profile

All respondents who took part in this study were students who were active and were studying in higher education.

4.1.1 Age

Respondents aged 18 to 23 years were found to be the most dominant, namely 493 or 95.7% of the total respondents.

Table 1. Age

Age	Frequency	Percentage	Cumulative Percent
18	98	19.0	19.0
19	162	31.5	50.5
20	127	24.7	75.1
21	70	13.6	88.7
22	26	5.0	93.8
23	10	1.9	95.7
24	3	.6	96.3
25	1	.2	96.5
26	3	.6	97.1
28	2	.4	97.5
29	2	.4	97.9
30	1	.2	98.1

32	1	.2	98.3
33	1	.2	98.4
35	3	.6	99.0
36	1	.2	99.2
37	1	.2	99.4
38	1	.2	99.6
43	1	.2	99.8
45	1	.2	100.0
Total	515	100.0	

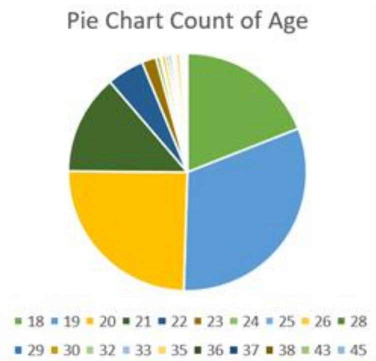

Figure 2. Age Chart

4.1.2 Gender

Female respondents dominated the data collection process for the study. 76.1% of respondents were female, and 23.9% were male.

Table 2 Gender

Gender	Frequency	Percentage	Cumulative Percent
Male	123	23.9	23.9
Female	392	76.1	100.0
Total	515	100.0	

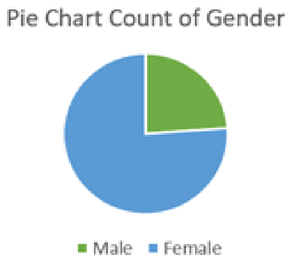

Figure 3. Gender Chart

4.1.3 Course

Science and Technology is the dominating major, with 73.8% of respondents.

Table 3. Courses

Course	Frequency	Percentage	Cumulative Percent
Economics	76	14.8	14.8
Science and Technology	380	73.8	88.5
Art	25	4.9	93.4
Social	34	6.6	100.0
Total	515	100.0	

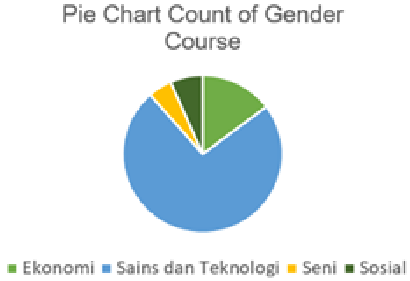

Figure 4. Course Chart

4.2 Data Preparation

After collecting 607 respondents' data, as many as ten percent of the questionnaires were randomly examined, then checked the accuracy of data input to SPSS worksheets. The result is good. No errors were found. The next step is to eliminate the data based on the outlier check. The study found a total of 92 data had at least outlier values on model variables. The associated data or questionnaires were removed from the sample, resulting in the final sample reaching 515 data. This number already meets the minimum number of research samples needed. Factor analysis is then performed to test the validity of the construct (looking at discriminants and convergent). The results of each group of indicators have a loading factor (the magnitude of the correlation between the indicator and its latent construction [25]) with a minimum magnitude of 0.4 and an eigenvalue of at least 1 [21].

If the indicator cannot show the discriminant and convergent positions, then it is eliminated. The factor analysis stage is then repeated until all indicators show discriminant and convergent positions, as shown in Table 4.

Table 4. Factor Analysis Results.

Indicator	Latent Variables						
	Behavioral Intention	Perceived Enjoyment	Perceived Ease of Use	Perceived Usefulness	Self-Efficacy	Facilitating Conditions	Social Influence
BI4	.847						
BI3	.838						
BI2	.825						
BI1	.787						
PE4		.865					
PE1		.848					
PE3		.805					
PE2		.795					
PEU3			.827				
PEU2			.808				
PEU4			.806				
PEU1			.776				
PU2				.834			
PU3				.813			
PU4				.808			
PU1				.803			
SE4					.807		
SE2					.805		
SE3					.777		
SE1					.756		
FC3						.843	
FC1						.837	
FC2						.818	
SI1							.810
SI3							.778
SI2							.734
SI4							.530

The results of the Factor Analysis in table 4 above show that each group of indicators can show its position, that is, to achieve a discriminant and convergent position. Because in the process of factor analysis in this study, there are indicators that are eliminated. Thus, the Reliability Test, as a subsequent step, is carried out using the result of the validity of the construct after the relevant indicators are eliminated. Each group of indicators was analyzed using the Cronbach Alpha coefficient to measure the extent of the consistency of respondents' answers. The minimum value for an acceptable *Cronbach alpha* is 0.7, following the guidelines from George and Mallery [22].

There are three interpretations produced through the *Reliability Test* with *Cronbach alpha* coefficients, namely "Acceptable", "Good", and "Very Good". In the *Reliability Test* with *Cronbach's Alpha* Coefficient, two values were found on the *Social Influence* indicator, namely SI4 and SI3. The total value of *Cronbach Alpha* was higher than the Reliability Statistics value, so both indicators were removed. Starting from SI4 is deleted, then after subsequent testing, the same condition is found again in SI3, so SI3 is removed.

Table 5. Reliability Test Results with Cronbach Alpha Coefficient

Latent Variables	Indicator	Alpha	Interpretation
Social Influence	SI1, SI2	.856	Good
Perceived Enjoyment	PE1, PE2, PE3, PE4	.945	Very Good
Facilitating Conditions	FC1, FC2, FC3	.894	Good
Self-Efficacy	SE1, SE2, SE3, SE4	.929	Very Good
Perceived Usefulness	PU1, PU2, PU3, PU4	.938	Very Good
Perceived Ease of Use	PEU1, PEU2, PEU3, PEU4	.944	Very Good
Behavioral Intention	BI1, BI2, BI3, BI4	.946	Very Good

Based on the results of the reliability analysis as shown in table 5 above, all latent variables have a good interpretation, with a minimum value of "Good". The highest Alpha value is owned by the *Behavioral Intention* factor, which is 0.946, and the lowest value at 0.856 is included in the *Social Influence*. At the stage of reliability tests with *Cronbach alpha,* although there are two indicators that are eliminated, since all the resulting alpha values are still at the limit that is still accepted and considered feasible, the number of latent variables at this stage does not undergo changes in the theoretical model from the previously proposed one.

4.3 Descriptive Analysis

In Table 6, in addition to the statistics for each of the indicators for the latent variable, the latent variable has been reduced to a single scale interval formulated at the calculation (1). Each latent variable in the theoretical model is calculated on average through groups of indicators of each latent variable. The variable is then labeled as "Av". For example, for each respondent, the value of the variable labeled Av PE, which corresponds to the latent variable *Perceived Enjoyment*, is then determined by the following Equation 1.

$$Latent\ Variables = \frac{\sum_{i=1}^{N} \text{groups of latent variable indicators}}{\text{N groups of latent variable indicators}} \quad (1)$$

The result is a valid and reliable average value of the indicator group size for the latent *Perceived Enjoyment* variable. An example of calculation using the above formula is as follows:

- Using *Perceived Enjoyment as* an example of a latent variable
- The number of indicators on the latent *Perceived Enjoyment* variable is four (4), namely, PE1, PE2, PE3, and PE4. So, the implementation is (PE1+PE2+PE3+PE4)/ 4.

Table 6 Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
			Social Influence			
SI1	1	5	3.17	.711	.225	.721
SI2	1	5	3.23	.754	.145	.351
Average	1	5	3.2	.732	.185	.536
			Perceived Enjoyment			
PE1	1	5	3.41	.729	.333	.199

PE2	2	5	3.52	.709	.214	-.266
PE3	1	5	3.53	.736	.257	-.177
PE4	2	5	3.50	.707	.442	-.232
Average	1.5	5	3.49	.720	.311	-.119
Facilitating Conditions						
FC1	2	5	3.53	.706	.146	-.269
FC2	2	5	3.63	.708	.199	-.429
FC3	2	5	3.57	.698	.139	-.290
Average	2	5	3.58	.704	.161	-.329
Self-Efficacy						
SE1	2	5	3.39	.655	.565	.163
SE2	2	5	3.34	.662	.551	.309
SE3	2	5	3.47	.692	.472	-.146
SE4	2	5	3.37	.690	.528	.140
Average	2	5	3.39	.675	.529	.116
Perceived Usefulness						
PU1	2	5	3.74	.725	.172	-.638
PU2	2	5	3.69	.777	.158	-.660
PU3	1	5	3.55	.793	.247	-.394
PU4	2	5	3.61	.767	.244	-.547
Average	1.75	5	3.64	.765	.205	-.560
Perceived Ease of Use						
PEU1	2	5	3.50	.739	.251	-.302
PEU2	2	5	3.53	.725	.327	-.334
PEU3	2	5	3.64	.697	.303	-.520
PEU4	2	5	3.66	.717	.267	-.546
Average	2	5	3.58	.720	.287	-.425
Behavioral Intention						
BI1	2	5	3.57	.719	.429	-.452
BI2	2	5	3.54	.708	.389	-.342
BI3	1	5	3.52	.725	.422	-.158
BI4	1	5	3.52	.736	.378	-.017
Average	1.5	5	3.54	.722	.404	-.242

The results of descriptive statistical analysis of latent variables along with indicators from theoretical models show that the values of skewness and kurtosis are still within the limits of values 3 for skewness (minimum -3 and maximum 3) and 7 for kurtosis (minimum -7 and maximum 7). This justifies the estimation of the maximum probability in the SEM analysis as directed by Kline [23].

4.4 Model Analysis

Methods used in determining statistical significance [23], [26], *the magnitude of effects* [27], and *model fit statistics* [28] will determine the magnitude of the influence and the statistics of the suitability of the model. After the model has been analyzed through the stages of factor analysis and reliability testing, the theoretical model is analyzed using AMOS software and calculated by SEM analysis. Theoretical models are drawn on AMOS software and processed to produce calculations that support decision-making. The calculation is based on SPSS software data that has been compiled through several previous procedures. Statistical data on the results of calculations can be seen in Table 7.

Table 7. Statistical Data of Theoretical Models

Indicator			Estimate	S.E.	C.R.	P	Hypothesis
PE	--->	PEU	,296	,048	6,161	***	H3
SE	--->	PEU	,517	,056	9,163	***	H7
FC	--->	PEU	-,015	,064	-,238	,812	
PEU	--->	PU	,431	,039	11,159	***	H9

SI	--->	PU	,306	,041	7,502	***	H1
SI	--->	BI	,216	,047	4,590	***	H2
PU	--->	BI	,246	,049	4,973	***	H8
PEU	--->	BI	,126	,045	2,782	,005	H10
FC	--->	BI	,037	,052	,719	,472	
PE	--->	BI	,181	,049	3,734	***	H4

Table 7 shows quite satisfactory statistical results. Of the ten hypotheses, two hypotheses show a position that is not statistically significant. The H10 hypothesis has significance on "**" since the value of P .005 is below the significance value (0.01) [23].

Table 8. Regression of Statistical Standards for Final Models

Indicator			Estimate
SI	--->	PU	,329
SI	--->	BI	,238
PE	--->	PEU	,282
PE	--->	BI	,190
FC	--->	PEU	-,012
FC	--->	BI	,033
SE	--->	PEU	,475
PU	--->	BI	,252
PEU	--->	PU	,464
PEU	--->	BI	,139

Table 8 gives an overview of the magnitude of the effect of each indicator in Figure 5 as described by Cohen [27] the magnitude of the effect namely: The coefficient of a standard path with an absolute value of less than or equal to 0.1 may indicate a "small" effect (S); absolute values between 0.1 and 0.5 are "typical" or "medium" effects (M), and the "large" effect (L) can be indicated by a coefficient of magnitude greater than or equal to 0.5 [27]. The interpretation of the results of the calculation of Amos is presented in Figure 5.

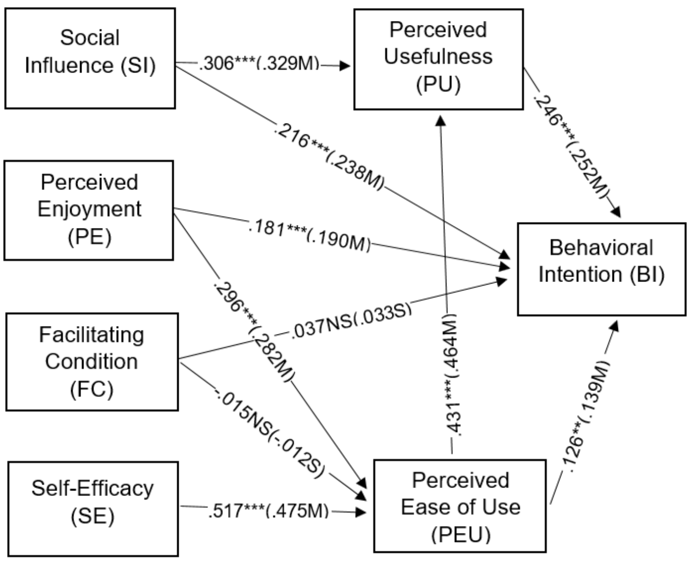

Figure 5. Direct Effect on a Theoretical Model

In Figure 5, there are two causal effects that show a relation that is not statistically significant. First, *Facilitating Condition* against *Perceived Ease to Use* and then *Facilitating Condition* against *Behavioral Intention*. Second, the insignificant direct effect variable also has a small magnitude of effect value. Other direct effects (eight direct effects) show a statistically minimal significance at a minimum of "**" and a magnitude of effects of minimal medium (M) [27]. Then in Table 9 below, it is a statistical fit owned by a theoretical model.

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Table 9. Fit Statistical Theoretical Models

N	NC(χ2 / Df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
515	688,1/259 = 2.657	,027	,899	,874	,947	,966	,966	,057
	R^2 : PEU (.434), PU (.437), BI (.440)							

Table 9 of the fit statistical results shows that the proposed theoretical model is quite precise and quite good, although the corresponding statistics on GFI and AGFI can still be improved. But, on the whole, each of them is within the range of acceptable fit values, following the direction of Kline (2016) [23].

The value of R2 describes the strength of the latent variables of the theoretical model against each endogenous variable. *Perceived Ease of Use* at a value of 0.434 (43.4%), *Perceived Usefulness* at a value of 0.437 (43.7%), and *Behavioral Intention* at a value of 0.440 (44%). All these figures show that the latent variables in this theoretical model have only a 43.4% influence on *Perceived Ease of Use*, 43.7% on *Perceived Usefulness*, and 44% on *Behavioral Intention*.

4.5 Discussion of Findings

A total of ten hypotheses formulated with references from previous studies [2], [3], [4], [7], [8], [9], [10] have a role in the behavior of an individual to adopt *M-learning*. Through a series of analyses on exogenous latent variable groups: *Social Influence*, *Perceived Enjoyment*, *Facilitating Condition,* and *Self-Efficacy,* as well as endogenous latent variable groups: *Perceived Usefulness, Perceived Ease of Use*, and *Behavioral Intention*.

The findings in this study are 8 (eight) hypotheses that have a positive and significant influence like the previous study, each magnitude of medium (M). The hypothesis can be seen in Figure 5, confirming the importance of the direct effect of (a) *Social Influence* and *Perceived Ease of Use* on *Perceived Usefulness*; (b) *Perceived Enjoyment*, Self-Efficacy to *Perceived Ease of Use*; and (c) *Social Influence*, *Perceived Enjoyment*, *Perceived Usefulness* and *Perceived Ease of Use* towards *Behavioral Intention*.

Meanwhile, there are two hypotheses from the research results that are not in line with the results of previous studies, with the magnitude of each small (S) effect. First, *Facilitating Condition does* not have a positive and significant direct influence on the *Perceived ease of use*. This is the opposite of the research results owned (Pramana, 2018) [3]. Thus, the results of this study can also emphasize that *Facilitating Condition* is not an important factor in its role of encouraging a person to adopt *M-learning*, through the point of view of *Perceived Ease of Use*. Second, *Facilitating Condition* does not have a positive and significant direct influence on *Behavioral Intention*. This is contrary to proprietary research (Naveed, Nature, and Tairan, 2020; Masrek and Samadi, 2017) [4], [8]. Of the two findings, it is likely that most users experience problems such as internet connection, especially if they are outside the home or who live far from the city.

It was found that the latent variable, which had the strongest positive and significant influence on *Perceived Ease of Use*, showed the significance of *medium magnitude* (M) at the *** level, namely *Self Efficacy*. In line with research (Buabeng-Andoh, 2021; Pramana, 2018) [2], [3]. It is an ongoing relationship between factors that one's high self-confidence in handling tasks, which is related to the ease and convenience of using computers and the internet, can encourage one to want to adopt *M-learning.*

Perceived Usefulness is the strongest positive and significant influence on *Behavioral Intention* with a *medium magnitude* (M) at the *** level. This result is in line with prior research (Pramana, 2018; Naveed, Nature and Tairan, 2020; Al-rahmi et al., 2021; Masrek and Samadi, 2017; Mutambara and Bayaga, 2021) [3], [4], [7], [8], [9]. If users can find that using *M-learning* is easy and has sufficient experience in operating similar systems, the individual's confidence level will increase, and encourage them to be more willing to use *M-learning* in their routine activities.

5. Conclusion

This study aims to contribute to the substantiation of the factors that tend to determine the success of *M-learning* adoption by developing and testing theoretical models based on the analysis of significant and insignificant factors from previous studies. In this study, there were six factors that determined the results of acceptance of M-leaning adoption, namely *Social Influence, Perceived Enjoyment, Facilitating Condition, Self-Efficacy, Perceived Usefulness, and Perceived Ease of Use*. As a result, there are five determining factors that show a significant relationship with the value of the Medium (M) effect, namely: *Social Influence*, *Perceived Enjoyment*, *Self-Efficacy*, *Perceived Usefulness* and *Perceived Ease of Use*.

- *Social Influence, Perceived Ease of Use* had significant effects on *Perceived Usefulness*.
- *Perceived Enjoyment, Self-Efficacy* had significant effects on *Perceived Ease of Use.*

- *Social Influence, Perceived Enjoyment*, *Perceived Usefulness* and *Perceived Ease of Use* had significant effects on *Behavioral Intention*.

One determining factor is insignificant and has a small value, which is *Facilitating Conditions*.

- *Facilitating Conditions* is not significant to *Perceived Ease of Use*
- *Facilitating Conditions* is not significant to *Behavioral Intention*.

Perceived Usefulness and *Social Influence* are the two most important factors that influence *Behavioral Intention*. This suggests that the successful adoption of *M-learning* at the University requires a person in charge as a decision maker to ensure students know *M-learning* is useful and it is necessary to create a learning environment at the University that involves professors, lecturers, and all students especially senior students for *M-learning adoption.*

In this study, respondents came from public and private universities in Indonesia. There are limitations in this study. The number of respondents in each University is uneven.

Notation

Av Variabel laten= The average of a latent variable.
N = Many indicators are owned by a latent variable.
∑(i=1) ^ N = SUM from the group of indicators a latent variable.

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