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Students Acceptance to Use Moodle Based LMS: Extended TAM Model

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Abstract. Online learning has become a necessity during a pandemic. Many media are used to support learning, one example: Moodle-based LMS at the University. Research has been carried out as 182 students have filled out questionnaires and analyzed using SEM SmartPLS, which aims to test student acceptance from the Perceived Enjoyment aspect of interest in technology acceptance. Of the eight hypotheses tested, seven succeeded in having a significant effect, and only one was rejected (no effect). It can be concluded that the study had a dominant impact on students' interest in using Moodle-based LMS at the University.

Keywords: Moodle, LMS, TAM model

INTRODUCTION

Education has been affected by the Covid-19 pandemic. The pandemic has forced the public to comply with the Implementation of Community Activity Restrictions (PPKM) in Indonesia. This indicates that students must learn from home. The fact that happened requires a strategy that must be applied. So, the learning process continues with the strengthening of technology and information. In essence, education must continue under any conditions. The role of IT as a strategy is a must for all elements of education [1]. This support is realized in online teaching and learning activities, evaluating and managing education [2], [3]. One of the realizations that must be done is learning evaluation. This evaluation is difficult to do with PPKM rules. Thus, the evaluation must be done in the form of an online exam.

Our lives are increasingly reliant on technology. E-learning is gaining popularity in educational settings because it allows document sharing and student-to-student interaction without time or space constraints [4]. The software that supports e-learning by designing/managing the learning environment, tracking students' progress, and distributing learning materials is called a Learning Management System (LMS) [5]. Accepting such technologies will improve students' learning experience and academic success. The TAM, e-TAM, and other derived models are used to find students' behavior towards system adoption. Finding variables of student acceptability and intention to use e-learning systems is critical to improving the learning environment and retaining students. Accepting such technology will improve students' learning experience and academic success. An extended TAM and other derived models are used to find students' behavior towards system adoption. Finding student acceptance and intention to use e-learning systems is critical to improving the learning environment and retaining students.

This model has been widely used in various domains, from business to government to education, that uses information technology in its business processes. There are already several researchers working in education who are utilizing TAM to explain user acceptance of technologies such as e-learning, multimedia learning technology, digital libraries, and e-journals. Park (2009) researched several university students in Korea to determine their interest in e-learning, which was then presented to the participants [6]. His research findings demonstrate that TAM is a unified theory for analyzing user acceptance of e-learning programs.

The TAM is the most widely used theoretical framework for analyzing users' technological acceptance by measuring perceived usefulness (PU) and perceived ease of use (PEOU). PU is when people believe utilizing a

particular technology will improve their performance, while PEOU is when they believe using a particular system will be easy. Behavioral intentions (BI) are determined simultaneously by ATU and PU, while PU is heavily influenced by PEOU. Some experts have even stated that, compared to students' cognition, PE has a higher impact on their attitude, particularly for children and teens. Age-related cognitive and social-emotional developmental differences can be attributed to distinct effects.

Perceived Enjoyment or PE is defined as consumers' perceptions or experiences of delight when utilizing technology. Some e-learning studies indicated that PE promotes university students' IT acceptance behavior and usage intentions. When students have fun using e-learning systems or services, they are more likely to think positively about the system's ease of use and utility, which increases their desire to utilize it. TAM models, like previously said, comprise five factors: perceived ease of use, perception of usefulness, attitudes toward usage, intention to use, and actual use. The TAM model was modified to include Perceived Enjoyment (PE) during its evolution.

Based on the previous literature analysis, a conceptual model was built by merging TAM with PE to study the intentions of students in primary school teacher education courses to adopt and use a moodle-based LMS.

H1: Perceived enjoyment has a substantial influence on perceived usefulness?

H2: Perceived enjoyment has a substantial influence on perceived ease of use?

H3: Perceived ease of use influences perceived usefulness?

H4: Is it true that perceived ease of use influences attitudes toward use?

H5: Does perceived usefulness affect attitudes toward use?

H6: Does perceived usefulness affect behavioral intentions?

H7: Do attitudes about use have a significant impact on behavioral intentions?

H8: Do behavioral intentions affect actual use?

METHODS

The TAM (Technology Adoption Model) assesses user acceptance of e-learning technology. The sample in this study were active students of a private university in Jakarta, Indonesia, in the primary school teacher education study program. The number of respondents who answered was 182 people. G*Power 3.0 application used in multiple regression approach to calculating suitable sample size. The number of predictors examined was set at six according to a proposed model based on the work of Cohen (1994) by [7], and the mean effect sizes, alpha, and power were .15, .05, and .95, respectively. The minimal sample size is estimated at 146.

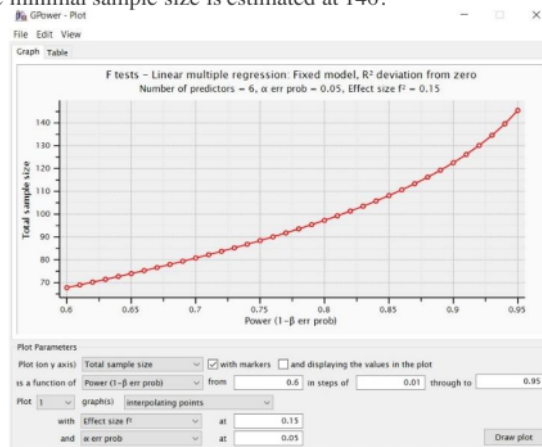


FIGURE 1. G-power 3.0

SEM is a method for assessing structural components (path model) and measurements (factor model) in one model. When the data utilized, do not match the assumptions of normalcy (multivariate), large sample size, or independence, PLS is a practical structural equation modeling approach to test the proposed model and latent variables. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. This study used Smart-PLS 3.0 [8] to investigate the construct validity and structural relationships among the dimensions. The instrument, which took the form of a research questionnaire, was developed using a Likert scale with five scales: 1 for "strongly disagree," 2 for "disagree," 3 for "neutral," 4 for "agree," and 5 for "strongly agree" (Likert scale) [9].

RESULTS AND DISCUSSION

This model's reliability, convergent validity, and discriminant validity were evaluated. Convergent validity was assessed using average variance retrieved from composite reliability (CR) (AVE). Good individual item reliability was indicated by all item loadings above the usual minimum of 0.70 (Table 1). Overall, construct dependability was acceptable, as measured by Cronbach's alpha values reaching the required threshold of 0.70 [10].

TABLE 1. Convergent Validity

Construct	Item	Outer loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
PE	PE1	0.913	0.937	0.79
	PE2	0.932		
	PE3	0.936		
	PE4	0.762		
PUS	PUS1	0.91	0.913	0.729
	PUS2	0.928		
	PUS3	0.652		
	PUS4	0.894		
PEOU	PEOU1	0.935	0.956	0.846
	PEOU2	0.937		
	PEOU3	0.945		
	PEOU4	0.859		
ATU	ATU1	0.877	0.931	0.818
	ATU2	0.924		
	ATU3	0.912		
BI	BI1	0.944	0.949	0.822
	BI2	0.923		
	BI3	0.94		
	BI4	0.815		
AU	AU1	0.948	0.956	0.879
	AU2	0.937		
	AU3	0.926		

The AVE and overall variance in the indicators accounting for each component were more significant than the specified threshold value of 0.5 (Hair et al., 2006), indicating good convergent validity. Good discriminant validity is indicated by a square root of the AVE for each component (Table 2) [11]. Convergent and discriminant validity was thus acceptable.

TABLE 2. Discriminant Validity

	ATU	AU	BI	PEN	PEOU	PUS
ATU	0.905					
AU	0.734	0.937				
BI	0.803	0.865	0.907			
PEN	0.623	0.727	0.732	0.889		
PEOU	0.773	0.805	0.795	0.836	0.92	
PUS	0.669	0.717	0.677	0.831	0.859	0.854

TABLE 3. Path coefficients

Hypothesis	Std.Betta	Std.Error	T-values	P-Values	Decision	
H1	PE -> PUS	0.373	0.099	3.786	0	Supported
H2	PE -> PEOU	0.836	0.035	23.715	0	Supported
H3	PEOU -> PUS	0.548	0.099	5.554	0	Supported
H4	PEOU -> ATU	0.756	0.103	7.336	0	Supported

H5	PUS -> ATU	0.019	0.158	0.119	0.452	Rejected
H6	PUS -> BI	0.252	0.1	2.511	0.006	Supported
H7	ATU -> BI	0.635	0.104	6.111	0	Supported
H8	BI -> AU	0.865	0.037	23.294	0	Supported

From the eight hypotheses tested in table 3 showed, it is known that as many as seven hypotheses are accepted, namely Hypothesis 1,2,3,4,6,7,8, and only H5 is rejected. The 1st hypothesis (H1) is that Perceived Enjoyment (PE) has a significant effect on Perceived Usefulness (PUS), where the T-value (3.786), while the 2nd Hypothesis (H2) is Perceived Enjoyment (PE) on Perceived Ease Of Use (PEOU) has a significant effect, where the T-value (23.715). For the 3rd hypothesis (H3), the Perceived Ease Of Use (PEOU) has a significant effect, where the T-value (5.554) and the 4th Hypothesis (H4) is the Perceived Ease Of Use (PEOU). On Attitudes To Use (ATU) has a significant effect, where the value of T-value (7,336). In the 5th hypothesis (H5), Perceived Usefulness (PUS) on Attitudes To Use (ATU) has no significant effect, with a T-value (0.119), but in the 6th hypothesis (H6) is Perceived Usefulness (PUS) on Behavior Intention (BI) has a significant effect, with a T-value (2,511). The 7th hypothesis (H7) is that Attitudes To Use (ATU) on Behavior Intention (BI) has a significant effect, with a T-value (6.111). Moreover, the 8th hypothesis (H8) is that Behavior Intention (BI) on Actual Use has a significant effect, with a T-value (23,294).

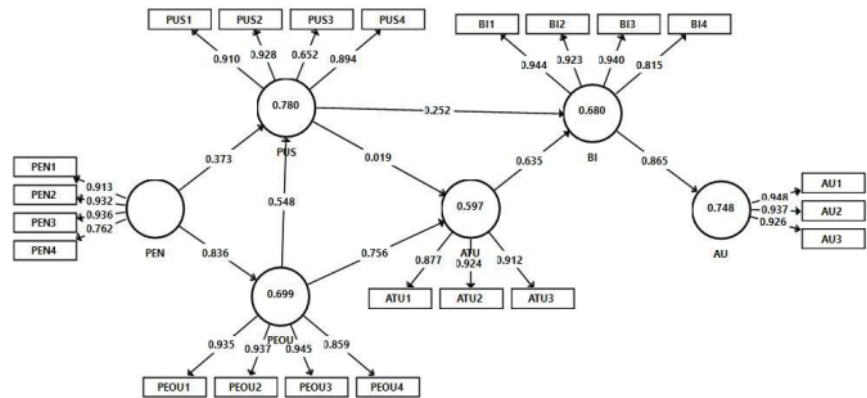


FIGURE 2. Results of structural model

Based on other studies where Perceived Enjoyment (PE) has a significant effect on Perceived Usefulness (PUS) and Perceived Ease Of Use (PEOU) by [12], where the results show that students' enjoyment of using a moodle-based LMS has an impact on interest. The finding from [12] is that the Perceived Ease Of Use (PEOU) aspect has a significant effect on the Perceived Usefulness (PUS) and Attitude To Use (ATU) of students, so it also has an impact on students' interest in using the [13] Moodle-based LMS. Meanwhile, Perceived Usefulness (PUS) only has a significant impact on Behavior Intention (BI) but has no significant effect on Attitude To Use (ATU), so it does not give results on changes in student attitudes [14]. The aspect of Attitude To Use (ATU) affects Behavior Intention (BI), according to [15], where student attitudes have an impact on student interest in using Moodle-based LMS. Lastly, Behavior Intention (BI) has a significant effect on Actual Use, by the findings by [16] that interest determines the application of using a Moodle-based LMS.

CONCLUSIONS

Based on the tests that have been carried out, it is concluded that the Perceived Enjoyment (PE) in students impacts interest in using Moodle-based LMS so that it fosters enthusiasm for learning and is expected to improve learning achievement. So it would be better to do further research with the addition of the latent variables to make it more perfect than now.

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