RESEARCH ARTICLE   **WWW.PEGEGOG.NET**

Applying the UTAUT Model to Understand Factors Affecting the Use of Learning Management System for Learning Pedagogical Education

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Abstract

This study aims to identify factors that can influence students when using the learning management system (LMS) in learning educational pedagogy. The LMS that we mean in this study is Pedagogi.id Platform. The design model in the study uses the UTAUT model. Questionnaires with five UTAUT variables, namely performance expectancy, effort expectancy, social influence, facilitating condition, behavioral intention, and use behavior, were distributed to students at one of the universities in Bandung. Hypothesis testing or data analysis of this study using the Structural Equation Model (SEM) approach with the help of the SmartPLS application. The results showed that the entire hypothesis was accepted or had a significant influence between variables. The most potent factors shown based on the results of the magnitude of influence are the variables facilitating conditions on student usage behavior and performance expectancy on student behavior intention. Therefore, this study recommends learning by utilizing technology, especially in universities, to improve students' knowledge and skills, one of which is using the Pedagogi. id Platform

Key words: UTAUT model, learning management system, pedagogy education

Introduction

Student-centered learning and teachers as facilitators have begun to be enlivened since the birth of the 2013 curriculum in Indonesia. However, learning is no longer only teacher-centered; it can utilize relevant media to support learning materials or relate them to everyday phenomena (Karimah et al., 2021). Learning like this makes students dig for more information to support and develop their learning process (Ayu, 2020). Many media can be used to dig into information more broadly, one of which is the internet. The existence of an internet network can make it easier for students to obtain any information anytime and anywhere. This is relevant to the demands of 21st-century skills in the world of education, which requires academics to be proficient in digital literacy skills.

Some higher education institutions are already utilizing digitalization in the learning process. For example, the teacher gives instruction online so students can complete the instruction independently or interact with fellow students by forming a learning environment, thus creating interactive and participatory learning with a strong sense of community (Davidson-Shivers et al., 2018; Bradley, 2020). This is one way to grow digital literacy skills, especially for prospective teachers. Then this can be implemented in the future for their students so that learning is more active and influential.

Learning instructions will be more straightforward if they are equipped to implement assessments. In addition to managing learning in a structured manner, lecturers can conduct assessments during the learning process and at the end of learning at once. This requires the right platform so that everything is carried out comprehensively. One of the platforms that can be used in learning is the Learning Management System (LMS). LMS was first used in learning in higher education. LMS is software that functions for the administration, documentation, tracking, reporting, and delivery of everything related to learning (Rahman et al., 2019). The results showed that LMS is effectively used in learning in higher education because it is easy to use and flexible in its implementation, which can be done anywhere and anytime without a place and time (Lopes, 2015).

LMS strengthens the learning process through an online classroom environment (Bradley, 2020) so that it is used to improve the learning experience and the construction of student understanding of certain materials (Kasim & Khalid, 2016). Learning mathematics, science, social, and even the arts can use LMS to support the learning process. Pedagogical

material is one of the lessons prospective teachers need as a teaching provision. Lecturers have used LMS to explore prospective teachers' pedagogical abilities in the learning process. If many studies show that using LMS by lecturers during the learning process is effective, then not many have studied what factors influence students in using LMS, especially in learning educational pedagogy. This study used Platform Pedagogi.id as an LMS.

This research will examine what factors can influence students in utilizing the Pedagogi.id Platform to support their learning. These factors will be known through the UTAUT model, which will provide information related to personal and situational characteristics that may affect students. In UTAUT, attitude is entirely replaced by an evaluative concept that is more related to experience in the form of performance expectations, effort expectations, social influences, and condition facilities on LMS (Platform Pedagogi.id) in educational pedagogy learning (Etinger & Orehovacki, 2018).

The UTAUT model has four exogenous variables, namely Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) (Wijaya et al., 2022) (Awanto et al., 2020). PE can inform students' degree of confidence that using the Platform Pedagogi.id can improve their pedagogical abilities (Venkatesh et al., 2012). This is to research showing that PE is significant to BI in using ICT for educational purposes (Halili & Sulaiman, 2019). Based on this explanation, researchers have a hypothesis 1 (H1): PE influences BI to use Pedagogi.id Platform in learning educational pedagogy.

EE can explain the level of ease of using the Pedagogi.id Platform (Venkatesh et al., 2003). Furthermore, the results showed that EE could predict BI using ICT (Attuquayefio & Addo, 2014). Based on this explanation, the researcher's hypothesis 2 (H2): EE influences BI to use the Pedagogi.id Platform in learning educational pedagogy.

SI informs the degree of trust of students who feel that essential people around them should use the Pedagogi.id Platform (Venkatesh et al., 2003) The results showed that SI influences BI, meaning that higher education academics need technology learning (Bervell & Umar, 2017). Based on this explanation, the third hypothesis by researchers, namely hypothesis 3 (H3): SI influences BI to use the Pedagogi.id Platform in learning educational pedagogy.

The FC explains the student's belief that the environment supports using the Pedagogi.id Platform (Venkatesh et al., 2003) The results showed that FC has a significant effect on UB or the use of ICT needs to include campus academy environments in other faculties (Attuquayefio & Addo, 2014). Based on this explanation, the researcher has a fourth hypothesis, namely hypothesis 4 (H4): FC influences UB to use the Pedagogi.id Platform in learning Educational pedagogy.

The endogenous variables in the UTAUT model consist of Behavioral Intention (BI) and Use Behavior (UB). BI in using the Platform Pedagogi.id informs students' plans to utilize and use technology (Venkatesh et al., 2003). In this UTAUT model, exogenous variables can affect BI except for FC because FC can only possibly influence UB. Therefore, this study will test which exogenous variables can affect BI so that BI has a positive influence on UB. Based on this explanation, the researcher has a hypothesis 5 (H5): BI influences UB to use the Pedagogi.id Platform in learning educational pedagogy.

Based on this explanation, this research question is what factors influence the use of the Pedagogi.id Platform by students. This can be seen by using the UTAUT model. There are several hypotheses to answer the research question as follows:

H1: PE influences BI to use the Platform Pedagogi.id in learning educational pedagogy.

H2: EE influences BI to use Platform Pedagogi.id in learning educational pedagogy.

H3: SI influences BI to use the Platform Pedagogi.id in learning educational pedagogy.

H4: FC influenced UB to use the Pedagogi.id Platform in learning educational pedagogy.

H5: BI influences UB to use Platform Pedagogi.id in learning educational pedagogy.

Method

Research Design

This research uses the UTAUT model to discover the factors influencing students using the Pedagogi.id Platform to learn educational pedagogy. The previous studies modified UTAUT questionnaire models (Venkatesh et al., 2003; Mikalef et al., 2016). The items in the questionnaire can be seen in Table 1.

Data Collection & Tools

The items in the questionnaire can be seen in Table 1.

Data collection uses the help of questionnaires that are distributed to randomly selected students. Exist 589 Students participated in the study. Instrumen was used using the Likert scale with scores and answer choices, namely scale: 1 = strongly disagree, 2= disagree, 3=neutral, 4= agree, and 5 = strongly agree. In addition, the instrument goes through a validation process so that the instrument is feasible to measure and determine the factors that influence the use of the Pedagogi.id Platform by students.

Data Analysis

The data analysis used in this study used a Structural Equation Model (SEM) approach to test the hypothesis s. The analysis process was assisted using the Smart PLS application.

<div align="center">**Table 1**: Personal Characteristics of Teachers</div>

Items	Variables	References
	Performance expectancy (PE)	
PE1	In my opinion, Pedagogi.id Platform can help students learn many things with practical and flexible time	
PE2	This Pedagogi.id platform already meets my expectations as a user	(Mikalef et al., 2016; Venkatesh et al., 2003)
PE3	I think this Pedagogi.id platform can meet the expectations of other friends	
EP 4	It will be easier to get the ability/competence for me when using the Pedagogi.id Platform	
EP 5	I think this Pedagogi.id platform is relatively easy to use in colleges and schools	
	Effort expectancy (EE)	
EE1	In my opinion, Pedagogi.id Platform can be easily connected to what I need	
EE2	I think, Pedagogi.id Platform can not only be used for specific learning	(Mikalef et al., 2016; Venkatesh et al., 2003)
EE3	I already understand to operate the Pedagogi.id Platform	
EE4	I see Pedagogi.id Easy Platform for college students who use it	
	Social Influences (SI)	
SI1	In my opinion, teachers/lecturers are happy to use the Pedagogi.id Platform because it is easy	
SI2	I think Pedagogi.id platform can give a good impression if I use it	(Venkatesh et al., 2003)
SI3	When using the Pedagogi.id Platform I feel like interacting directly with other students	
SI4	Sometimes I feel like using Pedagogi.id Platform is like an in-person interaction	
	Facilitating condition (FC)	
FC1	All my devices can access the Pedagogi.id Platform	
FC2	My campus supports by providing Wi-Fi facilities to use Platform Pedagogi.id in my classroom	
FC3	To make good use of the Pedagogi.id Platform, my campus provides adequate Building facilities	(Venkatesh et al., 2003)
FC4	I use Platform Pedagogi.id a lot because it is easy to access	
FC5	I often use Pedagogi.id because it can be accessed anywhere	
	Behavior intention (BI)	
BI1	I will be using the Pedagogi.id Platform in the future	
BI2	Shortly, if I learn another course, I recommend Platform Pedagogi.id	(Venkatesh et al., 2003)
BI3	I see the Platform Pedagogi.id not boring for college students in class, so that it will be used frequently	
	Use behavior (UB)	
UB1	I use Platform Pedagogi.id for pedagogy learning	
UB2	The Pedagogi.id platform became part of my learning	(Venkatesh et al., 2003)
UB3	I wish all learning using the Platform Pedagogi.id	

FINDINGS

Analysis UTAUT model has three analysis results in stages: descriptive statistics of the measurement instruments are presented, analysis of the measurement model are presented, analysis of the structural model is presented, and hypotheses examination is presented.

Descriptive Statistic (Table 2

Measurement Model

The analysis results in the measurement model produce a path model that is being developed as a path model. The path model has a loading factor value on each relationship between variables. The measurement model can be seen in Figure 2.

The results of model measurements in Figure 2 show that each variable's loading factor has a good value with a range of 0.716 to 0.956. The loading factor is said to be good if the value is >0.7. In addition to the loading factor, model measurements also have results, namely t-value, internal consistency, Cronbach's alpha, and AVE (Average variance Extracted), which are presented in Table 3.

The results in Table 3 show that each indicator's factor has a good influence. The consistency results show that each variable has a good reliability with a coefficient of >0.7, from 0.825 to 0.910 (Bashooir & Supahar, 2018). In addition, the validity of the construct shown from the AVE value informs that the indicator has explained the variables assessed, which are >0.5

Table 2: *Descriptive Statistics*

| Latent Variable	Item	Mean	Standard Deviation	Excess Kurtosis	Skewness
Performance expectancy	PE1	3.284	0.507	-0.097	0.242
	PE2	3.160	0.503	0.831	0.191
	PE3	3.178	0.485	0.411	0.415
	PE4	3.183	0.525	0.830	0.037
	PE5	3.154	0.572	0.599	-0.169
Effort expectancy	EE1	3.195	0.488	1.233	0.238
	EE2	3.187	0.497	1.179	0.176
	EE3	3.302	0.515	-0.699	0.251
	EE4	3.289	0.516	0.320	0.098
Social influences	SI1	3.188	0.491	0.275	0.384
	SI2	3.241	0.491	-0.223	0.450
	SI3	2.951	0.640	-0.124	-0.112
	SI4	3.015	0.607	0.035	-0.099
Facilitating condition	FC1	3.345	0.513	-0.523	0.159
	FC2	3.066	0.695	0.369	-0.485
	FC3	3.138	0.619	0.422	-0.313
	FC4	3.053	0.694	0.355	-0.468
	FC5	3.053	0.558	1.363	-0.275
Behavior intension	BI1	3.105	0.517	1.588	-0.079
	BI2	3.104	0.529	2.000	-0.240
Use behavior	UB1	3.440	0.555	0.304	-0.479
	UB2	3.423	0.521	-1.347	0.023
	UB3	3.438	0.548	-0.137	-0.373
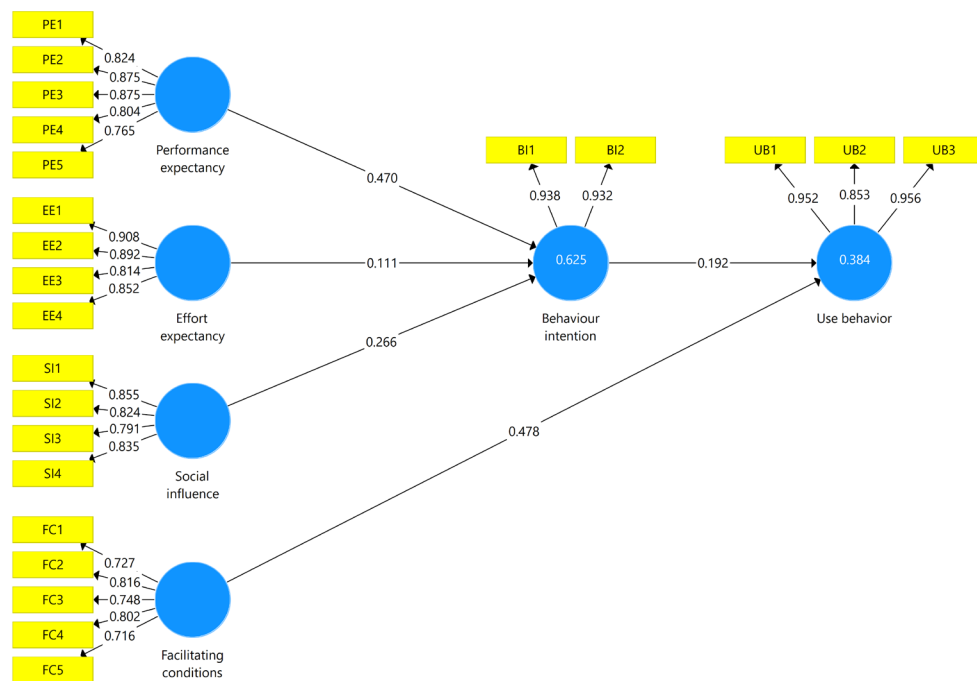
Fig. 2:. Path Model

Table 3: Loading Factor, Validity, and Reliability

Variables	Item	Loading factor	t-value	Cronbach's Alpha	Composite Reliability	AVE
Performance expectancy	PE1	0.824	46.01			
	PE2	0.875	63.12			
	PE3	0.875	69.767	0.886	0.917	0.689
	PE4	0.804	41.176			
	PE5	0.765	28.337			
Effort expectancy	EE1	0.908	73.737			
	EE2	0.892	51.591	0.889	0.924	0.752
	EE3	0.814	32.089			
	EE4	0.852	52.04			
Social influence	SI1	0.855	56.647			
	SI2	0.824	45.453	0.846	0.896	0.683
	SI3	0.791	37.052			
	SI4	0.835	49.853			
Facilitating conditions	FC1	0.727	31.549			
	FC2	0.816	35.898			
	FC3	0.748	30.37	0.825	0.874	0.582
	FC4	0.802	31.62			
	FC5	0.716	26.66			
Behavior intention	BI1	0.938	113.001	0.856	0.933	0.874
	BI2	0.932	87.304			
Use behavior	UB1	0.952	129.641			
	UB2	0.853	55.109	0.910	0.944	0.850
	UB3	0.956	168.431			

Table 4.:Discriminant Validity (Fornell-Larcker Criterion Results)

	Behavior intention	Effort expectancy	Facilitating conditions	Performance expectancy	Social influence	Use behavior
Behavior intention	0.935					
Effort expectancy	0.653	0.867				
Facilitating conditions	0.645	0.688	0.763			
Performance expectancy	0.768	0.757	0.639	0.83		
Social influence	0.721	0.698	0.691	0.803	0.826	
Use behavior	0.5	0.622	0.602	0.572	0.492	0.922

(Santosa, 2018). Other measurement models are also shown based on the discriminant validity results presented in Table 4.

The discriminant validity on each variable has a good result. Based on the Fornell-Larcker Criterion Result value of > 0.8 for a tested instrument, this can be seen. Therefore, it can be interpreted that each variable in the developed model has different characteristics. The results show that the model under development is of good quality and can explain the model already formed. Because the requirements for measuring model analysis have been met, the following analysis can be carried out: a structural model analysis.

Structural Model

Evaluation of structural models can be known based on the path coefficient and the significance value of the path size. For example, the path coefficient and the significance value of the path size in the p-value can be seen in Figure 3.

Based on Figure 3 shows that the entire path on each variable has a positive coefficient value. This positive relationship means that there is harmony between variables. For example, if PE has a positive coefficient value, BI will have a positive impact and vice versa. The significance of such relationships can be seen in Table 6.

In Table.6, we can see the significant value of the p-values. The effect is significant if the p-value has a price of < 0.05. These results show that all hypotheses are accepted or have a significant influence between variables. The magnitude of influence between variables is shown through t-statistics. The magnitude of the most significant influence or factor that influences students in using the Pedagogi.id Platform is the PE and FC variables. The magnitude of the influence can be explained more deeply based on the results of the standardization of effects for the model that has been produced. Such information is presented in Table 7 as follows:
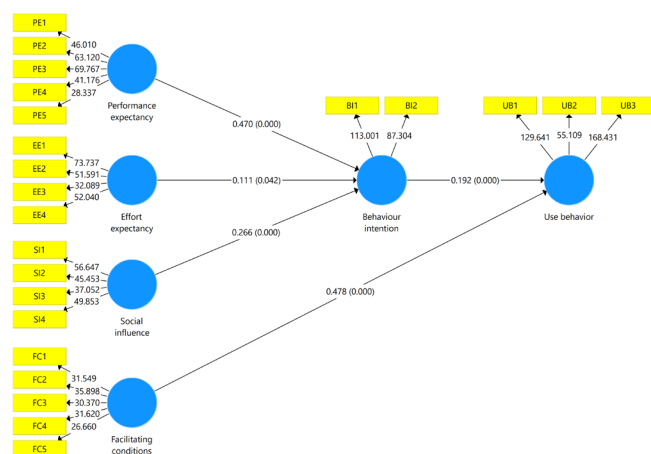

Fig. 3: Structural Model

Effect standardization for models provides information on the magnitude of influence between direct and indirect variables. The amount of influence is relatively large if the resulting p-value is >0.05. For example, in Table 7, each variable has a relatively significant influence on factors except the EE variable because it has a p-value price of <0.05. The most significant influence is the FC variable on UB. This is relevant to the initial explanation of the UTAUT model, where the FC variable is likely to influence UB more than other exogenous variables. Although PE and SI variables also have an influence, they occur indirectly.

Discussion

This study identifies what factors play a role in using the platform Pedagogi.id in learning educational pedagogy for students. Based on the results of research using the UTAUT model shows that the entire hypothesis is accepted with significant influence. This is relevant to the research results using ICT-based-instructions where all hypotheses significantly influence (Kim & Lee, 2020). The most significant influence is FC on UB, followed by PE on BI. This is in line with research that uses technology in learning through whiteboard acceptance (Wong et al., 2013) and ICT (Halili & Sulaiman, 2019); (Attuquayefio & Addo, 2014), where the variables PE and FC are the most influential factors. Other variables, EE on BI, SI on BI, and BI on UB, have relatively few different influences but are far below FC on BU and PE on BI.

Table 5: Results of the Significance of Relationships Between Variables

Hypothesis	Relationship	Original Sample	Sample Mean	Standard Deviated	T statistics	P Values
H1	Performance expectancy -> Behavior intention	0.470	0.470	0.062	7.530	0.000
H2	Effort expectancy -> Behavior intention	0.111	0.110	0.055	2.034	0.042
H3	Social influence -> Behavior intention	0.266	0.268	0.056	4.745	0.000
H4	Facilitating conditions -> Use behavior	0.478	0.483	0.042	11.359	0.000
H5	Behavior intention -> Use behavior	0.192	0.189	0.048	3.996	0.000

Table 6.: Standardized Effect for Model

		T statistics		
Factor	Determinant	Direct effect	Indirect effect	Total effect
Behavior intention (R2= 62.5)	Performance expectancy	7.350	-	7.350
	Effort expectancy	2.034	-	2.034
	Social influence	4.745	-	4.745
Use behavior (R2 = 38.4)	Performance expectancy	-	3.309	3.309
	Effort expectancy	-	1.727	1.727
	Social influence	-	3.405	3.405
	facilitating conditions	11.359	-	11.359
	Behavior intention	3.996	-	3.996

As the most influencing factor, the FC variable indicates the conditions that can facilitate students using the Pedagogi. id Platform. This shows that students already have the tools to apply the Pedagogi.id Platform, get training on how to use it, can operate it independently, and know solutions for difficulties or errors in using the Pedagogi.id Platform. These facilities affect the learning style of students who think that the Pedagogi.id Platform has become a part that can support the learning process. This is relevant to the facilities in e-learning that use Moodle (Abbad, 2021; Altalhi, 2021). Students will use Moodle when the necessary resources and technical support are available.

The next factor that influences students in using Platform Pedagogi.id is the PE variable. This variable shows students' confidence in using the Platform Pedagogi.id will improve learning performance. Students feel that with the Learning Pedagogi.id Platform becomes more effective and productive and can improve pedagogical skills. So that with this sense of trust encourages students to continue to be able to take advantage of the Pedagogi.id Platform in the learning and teaching process in the future and can be recommended to their colleagues to use the Pedagogi.id Platform as a support for the learning process. This is in line with research using ICT in learning (Liebenberg et al., 2018; Raman et al., 2014). Results imply that if students utilize technology, their performance will improve, and the quality of their work will improve.

The role of SI in influencing BI shows that colleagues believe in using Platform Pedagogi.id in pedagogical learning. Although it has an influence that is not as large as the FC and PE variables, students believe that the campus supports learning by using Platform Pedagogi.id. Likewise, support from fellow students who can later improve social skills or cooperate in the learning process. This aligns with research utilizing interactive whiteboards where SI strongly influences BI (Šumak & Šorgo, 2016). However, this contradicts the use of ICT in learning, where SI does not significantly influence BI for students (Attuquayefio & Addo, 2014). This requires faculty and campuses' support to utilize technology in the learning process.

Another factor is the EE variable that influences BI by showing students confidence that the Platform Pedagogi.id easy to use in the learning process. Although the influence is lower than that of SI, students consider that the Pedagogi.id Platform is easy to use, straightforward to understand, easy to operate, and understands how to operate it to learn. This supports students to use it as a learning support tool and recommendation for their colleagues in the future. Hasil, this research is relevant to research that uses e-learning in the learning process of higher education environments in developing countries (El-Masri & Tarhini, 2017; Gunasinghe et al., 2020).

The last factor is a BI variable that can significantly affect UB. These results show that BI and UB Platform Pedagogi. id by students encourage stakeholders in universities to use technology appropriately to support learning and improve student knowledge and skills. In addition, with the Pedagogi. id platform, students are more inclined to learn independently, form a learning environment, and cooperate in learning educational pedagogy.

Conclusion

This research will identify what factors can influence students in using the Pedagogi.id Platform when learning educational pedagogy. The study results show that performance expectancy, effort expectancy, and social influence can significantly affect student behavior intention. Then the variables facilitating conditions and behavior intention can significantly affect student usage behavior. The amount of influence shows that the most potent factors are facilitating conditions for student usage behavior and performance expectancy on student behavior intention. Therefore, seeing the effects caused using technology in learning, the campus must support lecturers to carry out learning using technology, one of which is using the Pedagogi. id Platform. Campuses should facilitate and ensure the tools needed are available to enhance student's abilities and skills.

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