Structural Equation Modeling Factors That Influence Online Course Acceptance in University Students

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Abstract

Online courses are currently growing rapidly, influenced by various factors, especially among college students. This study uses the Technology Acceptance Model, by adding the variable of facilitating conditions. This study aims to determine the effects of perceived ease of use, perceived usefulness, and facilitating conditions on the actual use of online courses, mediated by intention to use. This study is the first conducted on students in university in South Sumatra, Indonesia, who have used or are currently using online courses. The data collection was carried out from June 24, 2024, to August 9, 2024. The research instrument used was a questionnaire based on a 5-point Likert scale. The sampling technique used in this study was purposive sampling, targeting students at universities under the Higher Education Service Institution Region II in Indonesia. A total of 360 students participated as respondents. The questionnaire results were analyzed using Structural Equation Modeling – Partial Least Squares (SEM-PLS). Data analysis was conducted using the SmartPLS software, version 4.1.1.2. The results showed that perceived ease of use had a significant influence on intention to use (path coefficient = 0.281, T-statistic = 6.642, P-value = 0.000), and perceived usefulness also had a positive influence on intention to use (path coefficient = 0.155, T-statistic = 4.545, P-value = 0.000). Facilitating conditions also had a positive influence on intention to use (path coefficient = 0.476, T-statistic = 8.880, P-value = 0.000), and intention to use significantly influenced actual use (path coefficient = 0.452, T-statistic = 10.490, P-value = 0.000). These findings highlight the important role of perceived ease of use, perceived usefulness, and facilitating conditions—mediated by intention to use—in significantly influencing the actual use of online courses among students, particularly at universities under the jurisdiction of the Higher Education Service Institution Region II in Indonesia.

Keywords: Online Course, Perceived Ease Of Use, Perceived Usefulness, Facilitating Conditions, Intention To Use, Actual Use

1. Introduction

The development of information and digital technology has transformed the paradigm of learning on a global scale. One of the most significant innovations is the implementation of online learning, which enables flexible access to education via the internet. Online learning provides the opportunity to study from anywhere in a more interactive manner [1]. Online learning enables more flexible access to education through the internet, allowing students to overcome geographical limitations [2]. In addition, this system offers various facilities that make it possible to study from anywhere, with a more interactive and adaptive approach to learners' needs [3]. Thus, online learning provides an effective alternative to support students' active engagement in the learning process [4]. During the COVID-19 pandemic, online teaching and learning were adopted by nearly all schools and universities. Teachers, lecturers, and students had to adapt to learning without face-to-face interaction. Students were expected to master learning materials by utilizing technological advancements [5].

This situation required educators, both teachers and lecturers, to shift their teaching methods to digital-based approaches without direct face-to-face interaction [6]. Moreover, students were required to be more independent and proactive in mastering learning materials by using the available technological tools [7]. The use of technology became not only a learning aid but also an essential component in supporting the success of the learning process in today's

digital era [8]. As time has passed since the COVID-19 pandemic, online learning continues to be widely used, both in formal and non-formal education, such as online courses. To this day, many online courses offer various types of training that can support individuals in the professional world.

Platforms such as Udemy, based in San Francisco, California, United States, have approximately 70 million students from various countries [9]. Other platforms, such as edX, provide a wide range of online courses in various fields such as computer science, engineering, economics, arts, and more [10]. Online courses are increasingly popular because they not only make learning more accessible but also offer free courses and provide certificates for various levels [11]. The availability of various online course platforms also exists in Indonesia. Online courses such as Skill Academy offer a variety of classes across different categories, Dicoding focuses on training in programming, machine learning, and similar areas, meanwhile Diotrainning focuses in Civil Engineering [12]. Online courses allow individuals to choose materials according to their interests, talents, and needs [13]. Furthermore, online courses can be accessed flexibly, allowing participants to learn at their own convenience. They provide affordable learning opportunities, and sometimes even free of charge. The requirements for participating in an online course are relatively simple—prospective participants only need to fill out online registration forms and make payments if required [13].

During the pandemic, online courses became the primary choice as learning had to be conducted online. In addition, there are several factors that contributed to the popularity of online courses, such as Perceived Ease of Use, Perceived Usefulness, and Facilitating Conditions [14]. Other factors include flexible course content and well-organized learning management [15]. Furthermore, as discussed earlier, reasons such as flexibility in time and location, access to global materials, affordable costs, regularly updated content, and certifications that can be used for personal portfolios have also contributed to the continued popularity of online courses across various groups [16]. However, in the post-pandemic period, with the availability of both offline and online learning options, it is important to understand students' interest in participating in online courses. Therefore, it is necessary to conduct research on the factors that influence students' intention to enroll in online courses [17].

Many studies on online courses were conducted during the COVID-19 pandemic when online courses were often the only option. However, in-depth discussions on online course acceptance among university students in the post-pandemic context—where hybrid learning is now available—are still limited. Furthermore, most studies utilizing the Technology Acceptance Model (TAM) or similar models have been conducted in developed countries, while Indonesia still faces challenges related to internet access and technological readiness [18]. Internet access in Indonesia is still uneven across different regions and in addition, teachers' competence in information and communication technology remains very low [19].

Previous studies that applied the TAM focused on the core variables of online courses Perceived Ease of Use (PeoU) and Perceived Usefulness (PU) but have not extensively integrated external factors such as social influence and facilitating conditions in the context of online courses [20]. In this study, we extend the TAM model by incorporating the variable of facilitating conditions. Perceived ease of use, perceived usefulness, and facilitating conditions can be crucial factors that influence individuals to continue using or plan to use an online course, which in turn may affect how long they engage with the platform.

This study is the first to be conducted on university students in South Sumatera, Indonesia, particularly those at institutions under the jurisdiction of the Higher Education Service Institution Region II, in the post-pandemic era where both online and offline learning are accessible. The aim of this research is to develop a new conceptual framework in an empirical study on online course usage, influenced by perceived ease of use, perceived usefulness, and facilitating conditions, with intention to use as a mediating variable. This study is systematically structured as follows: Section 2 presents the literature review and hypothesis development; Section 3 explains the research methodology; Section 4 discusses the research findings; and Section 5 concludes with a summary of the results, limitations, and suggestions for future research.

2. Literature Review and Hypotheses Development

2.1. Literature Review

The technology the TAM introduced by Davis in 1989 [21], remains one of the most influential frameworks in technology adoption research. This model posits two main constructs: PU and PEoU. PU refers to the belief that using a certain technology will enhance job performance. Perceived ease of use, on the other hand, refers to the degree to which a person believes that using a particular technology will be free of effort. These two constructs influence users' attitudes toward the technology, which in turn affect behavioral intention to use and ultimately actual usage behavior [22].

Although TAM has been widely used, the model has also faced criticism for its simplicity, which may not capture the full complexity of factors influencing technology acceptance. To address these limitations, various extended models have been developed. Therefore, some studies have added external variables such as facilitating conditions to explore the role of conditions that support users' habits in learning systems in Indonesia [23]. Another study expanded TAM by incorporating facilitating conditions, perceived enjoyment, and subjective norms as factors influencing the intention to use E-learning in Indonesia [24].

Numerous studies have employed the TAM across various sectors. One study examined the use of Line Pay in Taiwan, showing that perceived usefulness, ease of use, and promotional incentives significantly shaped user attitudes and behavioral intentions to use the platform [25] Another study investigated factors influencing mobile device adoption in China and the United States, revealing that perceived benefits and ease of use positively impacted innovation perception [26]. The TAM has also been used in research on pharmaceutical company websites managing drug distribution to pharmacists and hospitals in Bandung, Indonesia, where findings showed that PEoU and usefulness positively affected user attitudes and intentions, benefiting the surrounding communities [27]. Additionally, some studies have integrated the Technology Readiness Index (TRI) with TAM, highlighting how subjective norms and self-efficacy moderate the adoption of advanced technologies in financial institutions [28].

The The success of online learning depends on many factors. During the COVID-19 pandemic, there was a significant global increase in online learning. Studies found that PEoU and PU had a strong influence on the use of online learning platforms [29]. For instance, research at a university in China showed that PEoU and usefulness significantly affected the use of Learning Management Systems (LMS) [30]. Similarly, a study In Vietnam, another study revealed that perceived ease of use, perceived usefulness, information quality, and system quality were key factors influencing online course usage [31]. In Ghana, PEoU and usefulness also showed a positive impact on the adoption of online courses [32]. In Saudi Arabia, researchers explored the competencies needed for online teaching during the pandemic, finding that ease of use and usefulness of digital tools positively influenced faculty's intention and behavior toward online teaching [33]. In Selangor, Malaysia, PEoU and PU significantly affected the use of Massive Open Online Courses (MOOCs) [34].

In addition, in addition to PEoU and usefulness, other external factors such as facilitating conditions also influence the success of online learning. A study in China found that performance expectancy, effort expectancy, social influence, and facilitating conditions significantly impacted the use of MOOCs [35]. Similarly, in India, research highlighted that facilitating conditions, along with PU and course flexibility, were strong predictors of students' intentions to use MOOCs [36]. Based on the description above, research in several countries is summarized in the following table 1.

Table 1. Summary of Research in Several Countries

No	Country	Focus	Model	Finding / Result
1	Taiwan	Adoption of Line Pay Usage	Extended TAM	Ease of use, usefulness, promotion have a big influence, while privacy and security do not have a significant influence on attitudes and behavior in using Line Pay [25] .
2	China and United Stated	Adoption of Mobile Device Usage	Extended TAM	Perceived usefulness, technological capability, and pattern changes have a positive influence on

				the perception of innovation in the use of mobile devices [26].
3	Indonesia	Pharmacy Website Adoption	TAM	Ease of use, usefulness has a significant influence on the intention to use a pharmaceutical website [27].
4	Indonesia	Adoption of Online Learning	Own Model	Facilitating conditions and User Habits have a positive influence on Behavioral Intention to Use Online Learning [23]
5	Indonesia	Adoption of E-Learning	Extended TAM	Ease of use, usefulness, subjective norms, facilitating conditions have a significant influence on the use of E-learning [24]
6	China	Adoption of Learning Management System	Extended TAM	Students' previous online learning experiences can increase acceptance of LMS technology [30].
7	Vietnam	Adoption of Online Courses	Extended TAM	Easeof use, usefulness, system and information quality mempunyai peran penting terhadap adopsi online learning [31].
8	Ghana	Adoption of Online Courses	Extended TAM	Ease of use, usefulness, system and information quality have an important role in the adoption of online learning [32].
9	Saudi Arabia	Adoption of Online Teaching	Extended TAM	Ease of use, usefulness has a direct positive impact on self-efficacy for online teaching [33].
10	Malaysia	Use of Massive Open Online Course (MOOCs)	TAM	Ease of use, usefulness have a significant influence on MOOC use [34].
11	China	MOOCs	UTAUT	Performance expectancy, effort expectancy, social influence, facilitating conditions have a positive influence on the use of Moocs [35].
12	India	MOOCs	Extended TAM	Facilitating conditions, usefulness, flexibility, and job relevance have a positive influence on the intention to use MOOCs [36].

2.2. Hypotheses Development

2.2.1. Perceived Ease of Use

PEoU refers to an individual's belief about how easy a technology or system is to use, particularly in terms of the effort required to operate it [37]. In the context of this study, PEOU influences a person's intention to use an online course platform. A study involving 17246 students from Universities in Vietnam showed that PEOU had a positive impact on the use of e-learning systems [38]. In a study involving online doctoral students in the United States, PEoU and PU both of which are technological factors—were found to have a positive influence on the success of online learning [20]. Another study conducted in Saudi Arabia in 2023, which involved 384 respondents, revealed that ease of use had a significant influence on the adoption model of the Internet of Things (IoT) for e-learning [39]. According to the study by [39], PEoU of Use significantly influences the Intention to Use the Internet of Things for E-Learning.

Hypothesis 1: Perceived Ease of Use has a significant effect on Intention to Use.

2.2.2. Perceived Usefulness

Alongside ease of use, PU is a key factor influencing an individual's decision to use a particular technology or system. PU is defined as the extent to which a person believes that using an online course will improve their competencies in a specific field [21]. In this study, PU reflects students' belief that online courses can enhance their academic skills. Studies conducted in China and the United States have shown that PU and PEoU of technology have a positive

influence on innovation perception [26]. Another study conducted at the University of Ghana found that PEoU and PU positively affect the use of online courses [32]. A study involving 265 students at University of Hail in Suadi Arabia showed that PU had significant influences on the intention continue using e-learning [40]. Similarly, research in Taiwan involving 248 students using platforms like Zoom, Webex, and Microsoft Teams showed that PU had a positive effect on their continued intention to use online learning tools [41]. Based on research [40] PU significantly influences the Intention to Use Massive Open Online Courses.

Hypothesis 2: Perceived Usefulness has a significant effect on Intention to Use.

2.2.3. Facilitating Conditions

Facilitating Conditions (FC) refer to the resources and support systems available to enable effective access and use of a technology [42]. In the context of online courses, this includes the availability of smartphones or computers and reliable internet connections. The better the technological infrastructure and access, the better the online learning experience [43]. A previous study involving 204 students in Ghana found that the use of MOOCs was influenced by facilitating conditions [44]. Based on the research [44] facilitating conditions give significant influenced toward intention to use Massive Open Online Course.

Hypotheses 3: Facilitating Conditions have a significant effect on Intention to Use.

2.2.4. Intention to Use

Intention to Use refers to an individual's planned or future use of a specific technology [45]. In this study, it represents students' intent to actively engage with online courses. When individuals have a strong intention to use online courses, they are more likely to adopt and integrate them into their academic or personal development. Factors such as user satisfaction and prior experiences play a crucial role in shaping this intention [46]. A study involving 369 medical students in Pakistan confirmed that intention to use is a key factor in online course adoption [47]. Based on the research [47] intention to use give significant influence toward actual use using online course.

Hypotheses 4: Intention to Use has a significant effect on Actual Use.

Based on the hypotheses above, the model for online course acceptance in this study applies the Technology Acceptance Model, which examines how Perceived Ease of Use, Perceived Usefulness, and Facilitating Conditions mediated by Intention to Use—affect the Actual Use of online courses among university students within the scope of the Higher Education Service Institution Region II in Indonesia. The online course accepted model can be seen in figure 1 below:
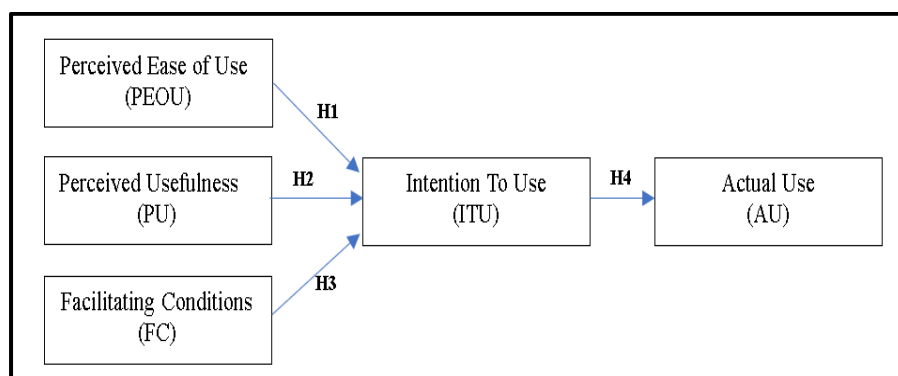

Figure 1. Online Course Accepted Model

3. Methodology

This Research is a quantitative study employing a causal-comparative approach, which analyzes the influence of perceived ease of use, perceived usefulness, and facilitating conditions on the actual use of online courses, mediated by intention to use. The object of this study is university students enrolled at institutions under the coordination of the

Higher Education Service Institution (LLDIKTI) Region II Sumatera Selatan, Indonesia. The respondents in this study were specifically students who had experience using online courses.

3.1. Sampling

The Sampling technique used in this study is purposive sampling, a non-random sampling method based on specific criteria [48]. This method was chosen because it allows the researchers to intentionally select respondents who meet particular criteria—namely, students who have taken or are currently taking online courses. As such, the data collected is more relevant, in-depth, and aligned with the objectives of the study, compared to random sampling of the general student population, some of whom may not have used online courses. The final sample consisted of 360 respondents, which meets the minimum requirement of 10 respondents per questionnaire item [49]. Since this study involved 35 questionnaire items, the minimum sample required was 350 respondents.

3.2. Measurement

The research instrument was a questionnaire using a 5-point Likert scale, with response options ranging from Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), to Strongly Disagree (SD) [50]. The questionnaire consisted of two sections: The first section collected demographic data, including gender, education level, field of study, and semester. The second section measured each research variable. Items for PEoU and PU were adapted from Davis [21] and Warsono [37]. Items for Facilitating Conditions were adapted from Venkatesh [42] and Aldraiweesh [45].Items for Intention to Use and Actual Use were also adapted from previous studies [21], [37]. Measurement instrument can be seen in table 2.

Table 2. Measurement Instrument

Construct	Items	Question / Statement	Sources
Perceived Ease of Use	PEOU1	Registering and starting this online course is easy to do.	[21], [37].
	PEOU2	The user interface of this online course is easy to use.	
	PEOU3	The materials or features are easy for me to access.	
	PEOU4	Navigation and settings in the online course are very easy to understand	
	PEOU5	Attending this online course does not require much effort from me	
	PEOU6	My interaction using with online platform is easy to beunderstood	
	PEOU7	interaction with online course platform does not need very long time	
Perceived Usefulness	PU1	Using this online course increases my learning effectiveness.	[21], [37]
	PU2	This online course is beneficial to me.	
	PU3	This online course improves my productivity in learning.	
	PU4	This online course helps me understand the material better	
	PU5	Attending this online course improves the quality of my learning.	
	PU6	Online course can give easy to study	
	PU7	Online course gives additional achieve to academic development value	
Facilitating Conditions	FC1	I have a source to use online course	[42], [45]
	FC2	I have good knowledge to use Online course	
	FC3	Internet network is supported for online course	
	FC4	Technical helps available when I got a problem in using online course	
	FC5	my environment give support when I use Online course	
	FC6	Online Course is compatible with my device	
	FC7	I don't have any obstacle in accessing online course	
Intention To Use	ITU1	I intend to use online course in the future	[21], [37]
	ITU2	I Intend to always use online course if it is available	
	ITU3	I have strong intention to use online course	
	ITU4	I plan to use Online course in every semester	
	ITU5	I intend to use online course often in frequence	

	ITU6	I'am sure to use Online course routine in the future	
	ITU7	I am still using online course even though there's another alternative	
Actual Use	AU1	I use routine online course	[21], [37]
	AU2	I use online course without any help	
	AU3	I use most all the feature in the Online Course Application	
	AU4	online Course become an important part in my study	
	AU5	I feel comfortable using online course to study	
	AU6	I use Online course to do assignment and study	
	AU7	I use Online Course in a very need of study project	

3.3. Data Collection

The data was collected via an online questionnaire using Google Forms, which was directly completed by the respondents. The data collection period lasted 32 working days, from June 24, 2024, to August 9, 2024. Respondents were students from universities under the coordination of LLDIKTI Region II Sumatera Selatan, Indonesia. Based on the demographic data table: The gender distribution was 187 male and 173 female students. The majority of respondents were undergraduate (strata I) students (356 respondents), with 3 diploma students and 1 master's student. Demographic data can be seen in table 3 below:

Table 3. Demographic Data

	Measurement	N=360	%
Gender	Man	187	51.94
	Woman	173	48.06
Level of Education	Master's Degree	1	0.28
	Bachelor's Degree	356	98.89
	Diploma Program	3	0.83
Study Program	Accounting	3	0.83
	Digital Business	23	6.39
	Visual Communication Design	3	0.83
	Informatics	134	37.22
	Management	25	6.94
	Informatics Management	1	0.28
	Information Systems	160	44.44
	Computer Engineering	11	3.06
Semester	2	57	15.83
	4	97	26.94
	6	130	36.11
	8	75	20.83
	Others	1	0.28

3.4. Analysis

The study This study uses the Partial Least Squares - Structural Equation Modeling (PLS-SEM) method, a multivariate analysis technique that combines factor analysis and multiple regression. This method allows researchers to examine the relationships between variables simultaneously [51]. Data analysis was conducted using SmartPLS Version 4.1.1.2. SmartPLS was chosen for several reasons: namely because this study only has a few respondents and can overcome data distribution. Another reason is because Smart PLS provides a Bootstrapping feature that can be used to test statistical significance and support mediation and moderation analysis. And no less important is Smart PLS User Friendly and can build models and analysis results visually [52].

Two types of measurement models were assessed: (1) One of the Outer Models aims to measure whether the model has met the elements of validity and reliability. Evaluation of the measurement model using Convergent Validity by looking at the expected loading factor value > 0.7, Discriminate Validity by looking at the cross loading value > 0.7 and Internal Consistency seen from the composite Reliability value must have a value > 0.7 can be seen from the Crobach Alpha coefficient [51]. (2) Inner Model aims to predict the relationship between Latent variables by using the R-square value for endogenous constructs and the t-statistic value from the path coefficient test. Definition of Rsquare; Range of R-square and t-statistic> 1.96, p<0.05 [51].

4. Results and Discussion

The PLS-SEM method was used to test the proposed research model. PLS-SEM has become a dominant approach in information systems research due to its ability to handle small sample sizes and complex models with formative and reflective constructs.

4.1. Measurement Model

The initial stage involved testing validity and reliability through outer loadings, which assess the correlation between indicators and their constructs. The general threshold is: Outer loading ≥ 0.70 = good convergent validity. Outer loading ≥ 0.50 = acceptable in small sample studies. Outer loading < 0.50 = considered weak and subject to removal [51]. Outer loadings also contribute to calculating: Average Variance Extracted (AVE): measures convergent validity. Composite Reliability: measures internal consistency. Additionally, standard deviation values were analyzed to assess variability within responses. A small standard deviation indicates responses clustered around the mean, while a large one suggests more dispersed data. The test results for the mean value, standard deviation, outer loading, and AVE can be seen in table 4 descriptive statistic and convergent validity below.

Table 4. Descriptive Statistic and Convergent Validity

Construct	ITEM	Mean	Standard Deviation	Outer Loading	Delete Item	AVE
Perceived Ease of Use	PEOU1	4.258	0.709	0.810	PEOU2, PEOU3, PEOU4	0.862
	PEOU2	4.428	0.782	0.240		
	PEOU3	4.206	0.720	0.331		
	PEOU4	4.372	0.778	0.435		
	PEOU5	4.125	0.822	0.770		
	PEOU6	4.397	0.646	0.790		
	PEOU7	4.340	0.630	0.817		
Perceived Usefulness	PU1	4.122	0.824	0.941	PU2, PU3, PU4, PU7	0.635
	PU2	4.261	0.710	0.460		
	PU3	4.419	0.785	0.234		
	PU4	4.206	0.720	0.350		
	PU5	4.364	0.777	0.904		
	PU6	4.122	0.824	0.941		
	PU7	4.394	0.637	0.233		
Facilitating Conditions	FC1	4.339	0.758	0.844	FC3, FC6, FC7	0.720
	FC2	4.292	0.588	0.794		
	FC3	4.333	0.715	0.420		
	FC4	4.311	0.594	0.870		
	FC5	4.174	0.726	0.883		
	FC6	4.331	0.714	0.233		
	FC7	4.333	0.573	0.360		
Intention To Use	ITU1	4.278	0.757	0.426	ITU1, ITU2	0.706
	ITU2	4.283	0.561	0.233		
	ITU3	4.222	0.731	0.843		

	ITU4	4.194	0.564	0.848		
	ITU5	3.958	0.731	0.862		
	ITU6	4.228	0.686	0.748		
	ITU7	4.036	0.765	0.894		
	AU1	4.261	0.710	0.825		
	AU2	4.419	0.785	0.828		
	AU3	4.206	0.720	0.869		
Actual Use	AU4	4.364	0.777	0.233	AU4, AU5	0.691
	AU5	4.122	0.824	0.430		
	AU6	4.394	0.637	0.809		
	AU7	4.350	0.623	0.833		

The mean values ranged from 3.958 to 4.28, and standard deviation values ranged from 0.564 to 0.824 indicating well-distributed data and positive agreement toward the constructs. Items with outer loading < 0.50 were removed, including: PEOUS2, PEOU3, PEOU4 PU2, PU3, PU4, PU7 FC3, FC6, FC7 ITU1, ITU2 AU4, AU5 All constructs achieved AVE > 0.50, confirming good convergent validity [53]. Validity testing is done through discriminant validity and convergent validity, while reliability is measured through composite reliability and Cronbach alpha values. The results of the measurement model testing can be seen in table 5 and table 6.

Table 5. Discriminat Validity and Reliabilty

	AU	FC	ITU	PEOU	PU	Composite Reliability
AU	**0.831**					0.901
FC	0.675	**0.849**				0.881
ITU	0.452	0.636	**0.840**			0.903
PEOU	-0.105	-0.214	-0.390	**0.797**		0.809
PU	0.713	0.646	0.477	-0.050	**0.929**	0.995

Discriminant validity indicates that indicators of one construct are not highly correlated with other constructs. In the context of PLS-SEM, discriminant validity means that a construct has higher indicator variables on its own construct compared to other constructs. As seen in the table above, all diagonal values (bold) are greater than the correlation between constructs, so discriminant validity is met.

Table 6. Construct Validity and Reliability

Construct	Cronbach's alpha	rho_A	Composite Reliability	AVE
Actual Use	0,889	0,901	0,901	0,691
Intention To Use	0,895	0,903	0,903	0,706
Facilitating Conditions	0,871	0,881	0,881	0,720
Perceived Usefulness	0,925	0,995	0,995	0,635
Perceived Ease of Use	0,809	0,809	0,809	0,862

As discussed previously, all constructs have AVE values above 0.50, indicating good convergent validity values. The table above also shows that the composite reliability value and Cronbach alpha value also exceed 0.70, indicating high reliability for all constructs. Thus, all constructs in this model meet the criteria for further analysis.

4.2. Structure Model

After removing weak items, bootstrapping was re-run to test the structural model. Results are shown in figure 2, table 6 and table 7.
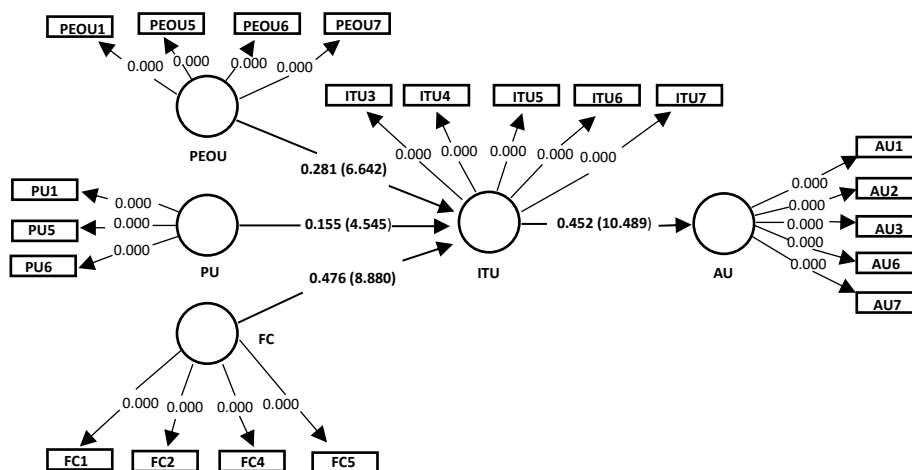
Figure 2. Result of PLS Analysis

As seen in the image above. The image of the research model contains the P Value for each latent variable, the path coefficient value and the T-Statistic value and the R-Square value. Based on the inner model, analysis of variance (R2) or determinate test to determine the effect of independent variables on dependent variables. The determination coefficient can be seen in table 7 below.

Table 7. R-square Value

	R Square
Actual Use	0.204
Intention To Use	0.486

The R-Square value for the actual use variable of 0.204 indicates that 20.4% of the variability of actual use can be explained by the intention to use, while the remaining 79.6% is influenced by other factors outside the model. Furthermore, the R-Square value for the intention to use variable of 0.486 indicates that 48.6% of the variability of intention to use can be explained by the influence of perceived ease of use, perceived usefulness, facilitating condition, the remaining 51.4 is influenced by other factors outside the model. Furthermore, to see the path coefficient and p value and t-statistic, the hypothesis testing process is carried out by carrying out the bootstrapping process. The hypothesis testing value in this study can be seen in table 8 below.

Table 8. Hypotheses Testing

Hypotheses	Path	Path Coefficient	T-Statistic	P-Value	Result
H1	PEOU --> ITU	0.281	6.642	0.000	Supported
H2	PU --> ITU	0.155	4.545	0.000	Supported
H3	FC --> ITU	0.476	8.880	0.000	Supported
H4	ITU --> AU	0.452	10.490	0.000	Supported

The first hypothesis examines the effect of PEoU on intention to use. The path coefficient is 0.281, T-Statistic 6.642 and P-Value 0.000 which states that the first hypothesis is accepted. These results indicate that PEoU has a significant effect on intention to use. These results indicate that the user interface, navigation, and easily accessible materials on the online course platform have a positive effect on the intention to use online courses. The results of this study are in line with research [39] which states that ease of access has a positive effect on the adoption of IoT for e-learning in Saudi Arabian higher education institutions.

The second hypothesis is to see the impact of PU on intention to use. The path coefficient is 0.155, T-Statistic 4.545 and P-Value 0.000 which states that the second hypothesis is accepted. These results indicate that PU has a positive effect on intention to use. The results of this study show that the benefits of online courses, such as improving understanding of the material and academic abilities, as well as saving study time, have a significant influence on the

intention to use online courses. The results of this study are in line with research [40]. which states that PU has a significant influence on the intention to continue using massive open online courses.

The third hypothesis to examine the impact of facilitating conditions on intention to use. The path coefficient is 0.476, T-Statistic 8.880 and P-Value 0.000 which states that the third hypothesis is accepted. These results indicate that facilitating conditions have a positive influence on intention to use. The results of this study indicate that the facilities owned, internet access available and support from the environment have a positive influence on the intention to use online courses. The results of this study are in line with research [44] which states that facilitating conditions have a positive influence on the intention to use massive open online courses.

The fourth hypothesis to examine the impact of intention to use on actual use. The path coefficient is 0.452, T-Statistic 10.490 and P-Value 0.000 which states that the fourth hypothesis is accepted. These results indicate that intention to use has a positive influence on actual use. The results of this study indicate that using online courses actively in each semester or certain period even though other learning alternatives are available has a significant influence on using online courses. The results of this study are in line with research [47] which states that intention to use has a positive influence on actual use of the e-learning platform.

5. Conclusion

The findings of this study indicate that the factors of perceived ease of use, perceived usefulness, and facilitating conditions have an indirect positive influence on the actual use of online courses through the mediation of intention to use. First, PEoU contributes to increasing individuals' intention to use online course platforms. When users find the system easy to understand and operate, they are more likely to be interested and motivated to use it. Second, PU also plays an important role. If users believe that using an online course can help them achieve their learning goals more effectively and efficiently, their intention to use the platform will be stronger. Third, facilitating conditions—such as the availability of technological devices, stable internet access, and supportive technical and learning environments provide a solid foundation for individuals to feel confident in using online courses. These conditions reinforce user intention because they reduce barriers to access and usage. Intention to use was proven to be a significant mediating variable. The three aforementioned factors not only affect actual use directly but also strengthen users' intentions, which ultimately lead to actual decisions to use online courses. In conclusion, enhancing perceptions of ease of use, usefulness, and supportive conditions increases users' intention to adopt online learning platforms, which in turn positively affects actual usage rates.

In further research, it is recommended to involve more institutions or different regions to increase the generalizability of the research results. In addition, a combination of quantitative and qualitative methods will provide a deeper understanding, especially to explore psychological, social, or emotional factors that influence the intention and use of online courses. Further research can consider additional variables such as the quality of learning materials, user engagement, and trust factors in technology, in order to obtain a more comprehensive picture. To understand changes in usage behavior over time, it is recommended to conduct a longitudinal study to capture factors that influence retention and sustainability of online course use.

6. Declarations

6.1. Author Contributions

Conceptualization: Y., F.S.H.; Methodology: Y., E.H.; Software: Y.; Validation: F.S.H., Y.A.; Formal Analysis: Y.; Investigation: Y.; Resources: F.S.H., Y.A.; Data Curation: Y.; Writing – Original Draft Preparation: Y.; Writing – Review and Editing: F.S.H., E.H., Y.A.; Visualization: Y.; All authors have read and agreed to the published version of the manuscript.

6.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.3. Funding

6.4. Institutional Review Board Statement

Not applicable.

6.5. Informed Consent Statement

Not applicable.

6.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] Z. Adeel, S. J. Smith, K. Brown, and S. Williams-habibi, "Student Engagement Tracks with Success In- Person and Online in a Hybrid-Flexible Course." *The Canadian Journal for The Scholarship of Teaching and Learning*, vol. 14, no. 2, pp 1-26, 2023,

[2] I. Bingöl, "Factors for Success and Course Completion in Massive Open Online Courses through the Lens of Participant Types," *Open Praxis* vol. 12, no. 2, pp. 223–239, 2020.

[3] Z. Robinson and T. Uys, "Determinants of graduate economics student preparation in an online environment Determinants of graduate economics student preparation in an online environment," *Cogent Educ.*, vol. 10, no. 1, pp 1-13, 2023, doi: 10.1080/2331186X.2023.2179835.

[4] J. Chung, S. Mckenzie, and A. Schweinsberg, M.E.Mundy, "Correlates of Academic Performance in Online Higher Education: A Systematic Review," *Frontier Education* vol. 7, no. February, pp. 1-22, 2022, doi: 10.3389/feduc.2022.820567

[5] S. J. Acebes, J. Melitante, N. Tuble, C. Mae, and D. Toquero, "Hopes , goals , hindrances , and solutions of students on forced digitalization of course learning amid pandemic," *Journal Pedagogical Sociology and Psychologi* vol. 4, no. 2, pp 144 –167, 2022. Doi : 10.33902/JPSP.202218002

[6] I. Nedeljković, D.R Petrovic, "Investigating critical factors influencing the acceptance of e-learning during," *Strategic Management* vol. 27, no. 4, pp. 30–40, 2022, doi: 10.5937/StraMan2200019N.

[7] I. Simm, U. Winklhofer, T. Naab, and A. N. Langmeyer, "How Children and Adolescents Perceive Their Coping With Home Learning in Times of COVID-19 : A Mixed Method Approach," *Sec. Educational Psychology,* vol. 12, no. November, pp1-17, 2021, doi: 10.3389/fpsyg.2021.733428.

[8] B. Duffy, R. Tully, and A. V Stanton, "An online case - based teaching and assessment program on clinical history - taking skills and reasoning using simulated patients in response to the COVID - 19 pandemic," *BMC Med. Educ*, vol. 23 no.4, , pp. 1–11, 2023, doi: 10.1186/s12909-022-03950-2.

[9] H. M. Šola, F. H. Qureshi, and S. Khawaja, "AI-Powered Eye Tracking for Bias Detection in Online Course Reviews: A Udemy Case Study," *Big Data Cogn. Comput.*, vol. 8, no. 11, pp 1-22, 2024, doi: 10.3390/bdcc8110144.

[10] D. Volchek, A. Romanov, and D. Mouromtsev, "Towards the Semantic MOOC : Extracting , Enriching and Interlinking E-Learning Data in Open edX Platform*," Conference Paper in Communications in Computer and Information Science · October 2017*, vol. 2017, no. Oct., pp 295–305, 2017, doi: 10.1007/978-3-319-69548-8

[11] N. Nakasujja, F. Nawagi, B. T. Aujo, and A. Ajambo, "Equipping undergraduate medical and nursing students with elderly health care assessment skills at Makerere University, College of Health Sciences, Uganda," *BMC Geriatr.,* vol. 23, no. 1, pp 1-6, 2023, doi: 10.1186/s12877-023-04561-2.

[12] H.R. Cahyawan, A.Djunaedi, A.Subarsono, D.H.Susilastuti, "Factorc Affecting MOOC and LMS Acceptance in Basic Trainning of newcomer civil servants in Indonesia," *Indonesian Journal of Electrical Engineering and Computer Science* vol. 36, no. 2, pp. 1002-1011, 2024, DOI: 10.11591/ijeecs.v36.i2.pp1002-1011

[13] C. Cobanoglu, M.Cavusoglo, G.Turktarhan, "A beginner ' s guide and best practices for using crowdsourcing platforms for survey research : The case of Amazon Mechanical Turk (MTurk)," *Journal of Global Business Insight,* vol. 6, no. 1, pp. 92–97, 2021. Doi : 10.5038/2640-6489.6.1.1177

[14] E. Kelly, J. Colella, and A. Sottosanti-kusnir, "Student Perceptions of Effective Educators in Online Learning," *Online Learning* , vol. 28, no. 1, pp. 372–397, 2024, doi: 10.24059/olj.v28i3.3534.

[15] C. M. D. Hart , M.Hill, E.Alonso, Di Xu, " I Don ' t Think the System Will Ever be the Same ": Distance Education Leaders ' Predictions and Recommendations for the Use of Online Learning in Community Colleges Post-COVID " *The Journal of Higher Education*, vol. 96, no.3, pp 436–460, 2025, doi: 10.1080/00221546.2024.2347810.

[16] H. Madanat, R.A.Rashid, U.M.Hashmi, M.A.Alqaryouti, M.Mohamed, and O.A. Al Smadi, "Heliyon Jordanian English language educators ' perceived readiness for virtual learning environment," *Heliyon*, vol. 10, no. 4, pp 1-12, 2024, doi: 10.1016/j.heliyon.2024.e25766.

[17] S. Tzimiris, S. Nikiforos, and K. Lida, "Post - pandemic pedagogy : Emergency remote teaching impact on students with functional diversity, " *Journal Education and Information Technologies* vol. 28, no. 8. pp 10285–10328, 2023. doi: 10.1007/s10639-023-11582-2.

[18] C. Wu, X. Gong, L. Luo, Q. Zhao, S. Hu, and Y. Mou, "Applying Control-Value Theory and Unified Theory of Acceptance and Use of Technology to Explore Pre-service Teachers ' Academic Emotions and Learning Satisfaction," *Frontier in Psychology* vol. 12, no. March, pp 1-13, 2021, doi: 10.3389/fpsyg.2021.738959.

[19] R.Almareta, Paidi, "Information and Communication Technology (ICT) knowledge of biology teachers in senior high school based on teaching experience Information and Communication Technology (ICT) knowledge of biology teachers in senior high school based on teaching experience," *Journal of Physics : Conference Series*, vol. 2021, no. Oct., pp 1-8 2021, doi: 10.1088/1742-6596/1806/1/012146.

[20] H. Lee, H. Chang, and L. Bryan, "Doctoral Students ' Learning Success in Online-Based Leadership Programs : Intersection With Technological and Relational Factors," *International Review of Research in Open and Distributed Learning*. January vol. 2020, no. Jan., pp 1–23, 2020, doi: 10.19173/irrodl.v20i5.4462.

[21] F. D. Davis and F. Davis, "Perceived Usefulness , Perceived Ease of Use , and User Acceptance of Information Technology," *MIS Quarterly*,vol.13 no.3, pp 319-340 1989, 2015, doi: 10.2307/249008

[22] W. Suh, S.Ahn, "Development and Validation of a Scale Measuring Student Attitudes Toward Artificial Intelligence," *Sage Journal* April – June , vol. 2022, no. 1, pp 1-12 , 2022, doi: 10.1177/21582440221100463.

[23] R. Ambarwati, Y. D. Harja, and S. Thamrin, "The Role of Facilitating Conditions and User Habits : A Case of Indonesian Online Learning Platform ," *Journal of Asian Finance, Economics and Business* vol. 7, no. 10, pp. 481–489, 2020, doi: 10.13106/jafeb.2020.vol7.no10.481.

[24] D. R. Jovanka, "Determinants of e-Learning Services : Indonesian Open University Determinants of e-Learning Services : Indonesian Open University," *Cogent Educ*., vol. 10, no. 1, pp 1-17, 2023, doi: 10.1080/2331186X.2023.2183703.

[25] Y. Tri Prasetyo, J.W Chen, K.C.Susanto, Y.X.Zahang, K.H.Chuang, O.P.Benito, R.T Yin, Z.J.Belmonte, R.Nadlifatin, M.K Gunasing, "Acta Psychologica Factors influencing the perceived usability of line pay : An extended technology acceptance model approach," *Acta Psychol. (Amst.)*, vol. 255, no. Nov., pp. 1-24, 2025, doi: 10.1016/j.actpsy.2025.104924.

[26] J. S. Kim, "An empirical comparison between China and USA market on smartphone adoption An empirical comparison between China and USA market on smartphone adoption," *Cogent Bus. Manag.*, vol. 9, no. 1, pp 1–18, 2022, doi: 10.1080/23311975.2022.2036309.

[27] M. H. Widianto, "Analysis of Pharmaceutical Company Websites using Innovation Diffusion Theory and Technology Acceptance Model," *Advances in Science, Technology and Engineering Systems Journal* vol. 6, no. 1, pp. 464–471, 2021. doi: 10.25046/aj060150

[28] A. Mahmood, M. Imran, and K. Adil, "Modeling Individual Beliefs to Transfigure Technology Readiness into Technology Acceptance in Financial Institutions," *Sage Journal, January - March*, vol. 2023, no. 1, pp. 1–19, 2023, doi: 10.1177/21582440221149718.

[29] H. Outada, H. Belaouidel, A. Jaddar, A. Chetouani, and A. Dafali, "E-Learning Acceptance in the Post COVID-19 Period: A Case Study," *J. High. Educ. Theory Pract.*, vol. 23, no. 4, pp. 211–221, 2023, doi: 10.33423/jhetp.v23i4.5901.

[30] Y. Dai, X. Lin, and L. Li, "Technology acceptance of lms—do previous online learning experiences matter?," *J. Educ. Technol. Dev. Exch.*, vol. 14, no. 2, pp. 75–90, 2021, doi: 10.18785/jetde.1402.04.

[31] L. D. Le and T. Giang, "Factors Affecting the Undergraduate Student ' s Satisfaction in Short-Term Online Courses : A Case Study of Vietnamese Pedagogical Students," *European Journal of Contemporary Education*, vol. 12 no. 1, pp. 105-117, 2024, doi: 10.13187/ejced.2023.1.105.

[32] V. Arkorful, K. A. Barfi, N. O. Baffour, V. Arkorful, K. A. Barfi, and N. O. Baffour, "Factors affecting use of massive open online courses by Ghanaian students Factors affecting use of massive open online courses by Ghanaian students," *Cogent Educ.*, vol. 9, no. 1, pp 1–12, 2022, doi: 10.1080/2331186X.2021.2023281.

[33] M. A. Almulla, "Using Digital Technologies for Testing Online Teaching Skills and Competencies during the COVID-19 Pandemic," *Sustainability (Switzerland)*, vol. 14, no. 9, pp 1-18, 2022, doi: 10.3390/su14095455.

[34] Y. H. Woon, "Students' Perception about Learning using MOOC," *International Journal of Emerging Technologies in Learning*, vol. 14, no. 18, pp. 203–208, 2019, doi: 10.3991/ijet.v14i18.10802.

[35] Y. Li and M. Zhao, "A Study on the Influencing Factors of Continued Intention to Use MOOCs: UTAUT Model and CCC Moderating Effect," *Front. Psychol.*, vol. 12, no. 1, pp 1–13, 2021, doi: 10.3389/fpsyg.2021.528259.

[36] S.Singk, "Examining Higher Education Students ' Intention of Adopting MOOCs : An Empirical Study," *International Journal of Technology and Human Interaction* , vol. 18, no. 1, pp. 1–18, doi: 10.4018/IJTHI.299358.

[37] H. Warsono, T. Yuwono, and I. Riswanti, "Analyzing technology acceptance model for collaborative governance in public administration : Empirical evidence of digital governance and perceived ease of use," *International Journal of Data and Network Science* vol. 7 no.1, pp. 41–48, 2023, doi: 10.5267/j.ijdns.2022.12.008.

[38] V.K.l. Nguyen, T.M.Hanh, T.N.M.Duong, T.S.Nguyen, T.T.Hien Lie, T.T Huong Nguyen,"Assessing Student's Adoption of E-Learning an Integration of TAM and TPB Framework," *Journal of Information Technology Education Research* vol. 21, no. June, pp 297-335, 2022, doi : 10.28945/5000

[39] J. Ali S.H.Hussain Madni, M.S.Ilyas Jahangeer, and M.A.Ahmed Danish, "IoT Adoption Model for E-Learning in Higher Education Institutes : A Case Study in Saudi Arabia," *Sustainability*, vol. 15, no.12, pp. 1–19, 2023. Doi: 10.3390/su15129748

[40] S.H.Alshammari, M.H.Alshammari , "Modelling the Effects of Emotional Engagement and Peer Interaction on the Constinous Intention to Use Asynchronius e-learning," *PeerJ Computer Science,* vol. 2024, no. April, pp 1-12, 2024.

[41] C. Huang, "Exploring the Continuous Usage Intention of Online Learning Platforms from the Perspective of Social Capital," *Information,* vol. 12, no. 4, pp 1-14, 2021. Doi : 10.3390/info12040141

[42] V. Venkatesh, James.Y.L. Thong, Xin Xu "Consumer Acceptance and Use of Information Technology : Extending The Unified Theory," *MIS Quarterly,* vol. 33, no. 1, pp. 157–178, 2012.

[43] Khalid B , S. Chaveesuk and W. Chaiyasoonthorn, "Moocs adoption in higher education : A management perspective," Polish *Journal of Management Studies,* vol. 23 no. 1, pp. 239-256, 2021, doi: 10.17512/pjms.2021.23.1.15.

[44] E.Fianu, C.Blewett, G.O Ampong, and K.S.Ofori, "Factors Affecting MOOC Usage by Students in Selected Ghanaian Universities," *education sciences*, vol. 8, no. 2, pp 1-15, 2018, doi: 10.3390/educsci8020070.

[45] A. Aldraiweesh, U.Alturki, "Exploring Factors Influencing the Acceptance of E-Learning and Students ' Cooperation Skills in Higher Education," *stainability,* vol. 15, no. 12, pp. 1-22, 2023. Doi : 10.3390/su15129363

[46] Z. Osman and M. Yatam, "Fostering Continuous Intention to Use E-learning Platforms among Students of Open Online Flexible Distance Learning Higher Education Institutions," *International Journal of Academic Research in Business and Social Science* vol. 16, no. 6, pp. 1854-1871, 2024, doi: 10.6007/IJARBSS/v14-i6/21646.

[47] I.Mushtaque, H. Waqas and M. Awais-e-yazdan, "The effect of technostress on the teachers ' willingness to use online teaching modes and the moderating role of job insecurity during COVID-19 pandemic in Pakistan," *International Journal of Educational Management,* vol.36 no.1, pp 63-80, 2021, doi: 10.1108/IJEM-07-2021-0291.

[48] H. Ames, C. Glenton, and S. Lewin, "Purposive sampling in a qualitative evidence synthesis : a worked example from a synthesis on parental perceptions of vaccination communication," *BMC Medical Research Methodology* vol. 19, no.1, pp. 1–9, 2019. Doi : 10.1186/s12874-019-0665-4

[49] A. Wutich, M. Beresford, and H. R. Bernard, "Sample Sizes for 10 Types of Qualitative Data Analysis : An Integrative Review , Empirical Guidance , and Next Steps," *Sage Journal* vol. 23, no. 1, pp. 1–14, 2024, doi: 10.1177/16094069241296206.

[50] C.:.Mantero, C. Pedrosa-jesu, C. Leo, and A. Maz-machado, "Measuring attitude towards mathematics using Likert scale surveys : The weighted average," *Plos One* vol.15 no.10, pp. 1–15, 2020, doi: 10.1371/journal.pone.0239626.

[51] J. F. Hair, C. M. Ringle, and M. Sarstedt, G.Thomas M.Hult, N.P.Danks, S.Ray, " Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R," *Springer*, vol. 2022, no. July, pp. 1-21, 2022,doi : 10.1007/978-3-030-80519-7

[52] I. Muda, "In fl uence of Manufacture of Textiles , Clothing , and Leather and Manufacture of Paper , Printing , and Publishing on Economic Growth," *Emerald Insight* vol. 1, no. May, pp. 107–113,2018, doi: 10.1108/978-1-78756-793-1-00048.

[53] E. Hartono, C. W. Holsapple, K.-Y. Kim, K.-S. Na, and J. T. Simpson, "Measuring perceived security in B2C electronic commerce website usage: A respecification and validation," *Decision Support System*, vol. 62, no. June, pp. 11–21, 2014, doi: 10.1016/j.dss.2014.02.006