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Exploration of Acceptance Factors of Online Learning Platforms: A Theory of Planned Behavior Perspective

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Abstract

E-learning is acknowledged as a form of education enabled by the use of information and communication technologies. Its effective implementation is contingent upon various influencing factors. This study seeks to determine the key factors that drive the acceptance of online learning platforms, utilizing the Theory of Planned Behavior (TPB) as a theoretical framework. The research specifically examines three independent variables: attitudes, subjective norms, and perceived behavioral control. As explanatory research with a quantitative orientation, data were collected from active students who met predetermined criteria and were provided access to an online survey. The research sample was selected through purposive sampling. Multiple linear regression analysis was employed, facilitated by computational tools. The findings from hypothesis testing reveal that two hypotheses—subjective norms affecting intention and intention affecting behavior—have a positive and significant impact. This indicates that individuals' perceptions of their social surroundings strongly influence their intention to engage with online learning platforms. However, the other three hypotheses demonstrate a positive yet statistically insignificant effect, suggesting that behavioral control and attitudes do not play a critical role in the actual use of these platforms. Overall, the four variables explain only 43.7% of the variance in behavioral outcomes, implying that the remaining 56.3% is likely influenced by factors outside the purview of this study.

Keywords: E-Learning; Theory of Planned Behavior; Multiple Linear Regression

Abstrak

E-learning diakui sebagai salah satu bentuk pendidikan yang diselenggarakan melalui penerapan teknologi informasi dan komunikasi. Keberhasilan penerapan e-learning dipengaruhi oleh berbagai faktor. Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor yang menentukan penerimaan platform pembelajaran daring berdasarkan perspektif Theory of Planned Behavior (TPB). Penelitian ini memfokuskan pada tiga variabel independen, yaitu sikap, norma subjektif, dan kontrol perilaku yang dirasakan. Dengan pendekatan eksplanatori dan fokus pada data kuantitatif, data penelitian diperoleh dari mahasiswa aktif yang memenuhi kriteria tertentu, yang kemudian diberi akses untuk mengisi kuesioner daring. Sampel penelitian dipilih melalui metode purposive sampling. Penelitian ini menggunakan analisis regresi linier berganda yang dilakukan secara komputasi. Hasil pengujian hipotesis menunjukkan bahwa dua hipotesis, yaitu pengaruh norma subjektif terhadap niat dan pengaruh niat terhadap perilaku, memiliki dampak positif dan signifikan. Ini menunjukkan bahwa persepsi sosial seseorang dapat berperan penting dalam membentuk niat untuk menggunakan platform pembelajaran daring. Namun, tiga hipotesis lainnya menunjukkan pengaruh positif yang tidak signifikan, yang mengindikasikan bahwa kontrol sikap dan perilaku tidak secara signifikan memengaruhi penggunaan platform tersebut. Secara keseluruhan, keempat variabel tersebut hanya menjelaskan 43,7% dari perilaku pengguna, sementara 56,3% sisanya kemungkinan dipengaruhi oleh faktor lain yang tidak tercakup dalam penelitian ini.

Kata kunci: E-Learning; Theory of Planned Behavior; Multiple Linear Regression

1. Introduction

Information technology has become an essential part of daily life, facilitating various activities, including E-learning. E-learning, a form of information technology designed for remote education, plays a crucial role in streamlining the process for students to acquire skills through online platforms [1], [2], [3]. E-learning technology is essential when it provides user-friendly features and ensures seamless remote access. As a mode

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of education, E-learning encompasses a broad spectrum of activities that harness information and communication technology (ICT) to enrich and optimize the teaching and learning process. The adoption of E-learning, however, largely hinges on the user's viewpoint. Typically, technology is embraced when it becomes indispensable, when there are adequate support services, financial resources, and backing from policy makers.

E-learning, short for Electronic Learning, represents a contemporary approach to education, utilizing electronic media, particularly the Internet, as its foundation. The E-learning platform developed by STIKI Malang is known as e-belajar application. Currently, E-learning is not intended to replace traditional classroom settings, where students and lecturers engage in face-to-face learning. Instead, it serves as a supplementary tool that enhances the learning process and facilitates interaction between lecturers and students, offering flexibility through online access. The effectiveness of such an information system is significantly influenced by behavioral factors, which play a crucial role in determining its success or failure [4], [5], [6], [7]. A system or technology frequently fails due to a lack of user acceptance. To address this, it is crucial to either modify the rejection behavior or ensure that the system is designed in a way that encourages acceptance. Consequently, identifying the underlying factors that lead to either rejection or acceptance of the system is essential.

The Theory of Planned Behavior (TPB) provides a framework for assessing the degree of user acceptance of technology. It extends the foundations established by the Theory of Reasoned Action (TRA), which posits that an individual's response and perception towards something are key determinants of their attitude and behavior [8], [9]. The Theory of Reasoned Action (TRA) posits that an individual's intention to perform a specific behavior is shaped by two primary factors: their attitude towards the behavior and the subjective norms influencing it. Ajzen later expanded upon TRA by introducing the concept of perceived behavioral control, which was absent from the original model. This addition, integrated into the Theory of Planned Behavior (TPB), addresses the influence of personal limitations and resource constraints on an individual's capability to carry out the intended behavior [10]. As can be seen in figure 1, The Theory of Planned Behavior (TPB) posits that an individual's actions are guided by their intention to perform the behavior. This intention is influenced by three key elements: the individual's attitude towards the behavior, the pressure from subjective norms, and their perceived control over executing the behavior. [11], [12].

Attitude refers to an individual's feelings about the outcomes of engaging in certain behaviors. In contrast, attitude toward behavior specifically pertains to a person's perception of performing a particular action [13], [14]. Subjective norms pertain to an individual's perception of societal expectations, which shapes their inclination to engage in particular behaviors [15]. Subjective norms are formed by deeply held beliefs about what others deem acceptable, coupled with the motivation to conform to these expectations, known as normative beliefs. As outlined by Ajzen, perceived behavioral control represents an individual's confidence in their capacity to perform a given behavior [16]. Perceptions of behavioral control, often referred to as control beliefs, are influenced by an individual's understanding of the factors that could either enable or hinder the execution of a behavior, along with their evaluation of the relative strength of these factors.

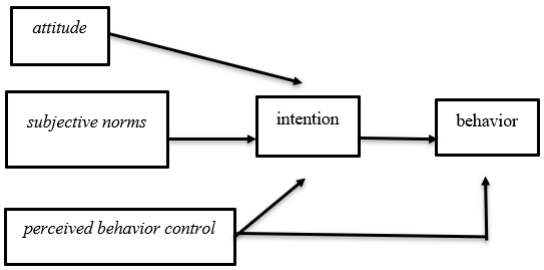

Figure 1. Framework of TPB

This research is grounded in a review of several previous studies, the foremost being the Model of Acceptance and Utilization of Technology: E-Learning in Higher Education. The study seeks to predict and elucidate the factors that require enhancement in e-learning adoption. The findings underscore the significance of addressing users' attitudes toward the technology and their perceptions of its ease of use when deploying e-learning systems [17]. The subsequent study, titled *Assessing Student Adoption of E-Learning: An Integration of TAM and TPB Framework*, aims to pinpoint the critical factors influencing students' acceptance of e-learning platforms. By introducing an extended model that links the C-TAM-TPB framework with three external variables, this research has substantially enriched the understanding of learners' intentions in using e-learning systems. Moreover, the findings offer key insights for more effectively designing and optimizing e-learning systems to enhance student engagement within educational environments. [18].

The next study, titled Acceptance Study of NUADU as an Online Education Platform, utilizes the Technology Acceptance Model (TAM) to assess the acceptance of the NUADU online learning platform among users in private schools in Balikpapan. The findings from hypothesis testing reveal a strong level of acceptance for NUADU as a distance learning tool. Additionally, seven recommendations were developed from the

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descriptive analysis to improve the quality of NUADU as an online learning platform [19]. The Technology Acceptance Model (TAM) is another framework employed to assess students' adoption of e-learning. In the study *Exploring Students' Acceptance of E-Learning Through the Development of a Comprehensive Technology Acceptance Model*, researchers applied the TAM model to pinpoint the factors that shape students' acceptance of e-learning. The findings indicate that three critical factors—system quality, computer self-efficacy, and enjoyment of computer use—substantially affect the perceived ease of using e-learning platforms. Additionally, the perceived usefulness and ease of use are positively impacted by information quality, accessibility, and the perceived enjoyment of these systems [20]. The selection of e-learning platforms plays a crucial role in determining user satisfaction. As highlighted in the study *Students' Happiness and Continued Intention Toward E-Learning: A Theory-Based Study*, the successful adoption of an online learning system that is both intuitive and effective is key to improving students' engagement and overall satisfaction with e-learning experiences. [21]. This study employs the Theory of Planned Behavior (TPB) framework to identify the factors influencing the acceptability of online learning platforms, as informed by a comprehensive literature review. Conducted using a quantitative methodology, the findings of this research offer valuable insights that could serve as a foundation for future studies, thereby enhancing the role of online learning platforms in supporting the teaching and learning process.

2. Research Method

This study employs a quantitative method with a focus on explanatory research to identify the factors influencing the acceptance of the e-learning platform. According to Figure 2, The research process begins with data collection through an online questionnaire distributed to a sample of active students at STIKI Malang, selected using purposive sampling techniques. The sample consists of students who meet specific criteria, such as active participation in courses and involvement with the e-learning platform. The minimum number of respondents is determined using the Taro Yamane formula, with a margin of error set at 10%. Once the data is collected, the study applies multiple linear regression analysis to evaluate the relationships between variables such as attitudes, subjective norms, behavioral control, intention, and actual behavior. All statistical tests are conducted using computational tools to ensure the accuracy and validity of the results.

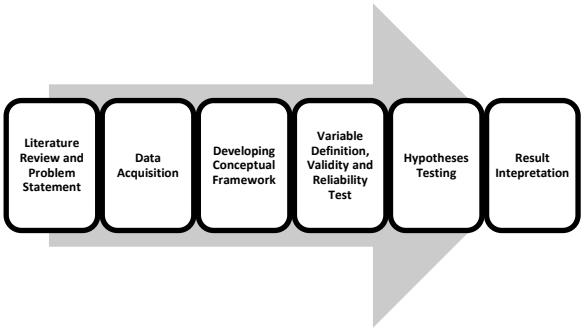

Figure 2. Research Flow

2.1. Data Acquisition

All of the study's participants were STIKI Malang students who were enrolled full-time. The number of investigated samples was calculated using the Taro Yamane formula. Consequently, using the Taro Yamane formula as shown in Equation 1.

$$n = \frac{1447}{1447.0{,}1^2+1} = \frac{1447}{15{,}47} = 93{,}5 \quad (1)$$

The minimum sample size for this study was determined to be 100 respondents, based on calculated parameters. A 10% margin of error was applied. A purposive sampling method, a non-random selection approach, was employed in conjunction with non-probability sampling techniques to ensure a representative sample, guided by the researcher's criteria. The criteria included active students at STIKI Malang and visitors to the e-learning platform. Questionnaires were distributed to qualifying students by STIKI Malang, serving as the main data collection instrument for this research.

2.2. Conceptual Frameworks

The research framework is a concept in interconnected research. Where the depiction of one variable with another depiction can be connected in detail and also systematically. In addition, the research framework needs to be assembled and carried out so that research can be more easily understood. Referring to the TPB model, Figure 3 is a model framework that will be used in this study.

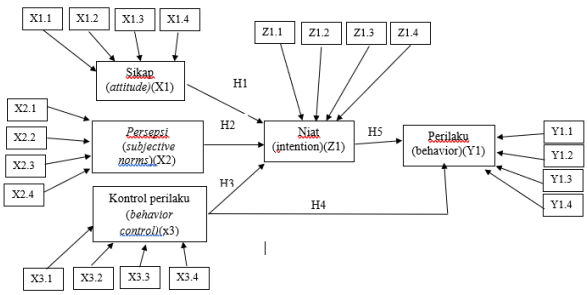

Figure 3. Conceptual Frameworks

The objective of the Operational Definition of Variables is to identify the factors that impact STIKI Malang

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users' acceptance and utilization of the e-learning platform. This study uses specific measurement indicators for each construct within the Theory of Planned Behavior (TPB). Attitude reflects how individuals perceive the decision-making process. Perceived behavioral control represents the belief that one can make decisions based solely on personal preferences, while subjective norms refer to the influence of others' opinions on decision-making. Behavior is defined as an action driven by personal interests, whereas interest denotes a person's need or desire for a particular outcome. The definitions of operation for each variable derived from the TPB model are explained in Table 1.

Table 1. Variable Definition

Var.	Indicator	Items	Source
Attitude X1	*Belief strength*	I think using e-learning is a good idea (X1.1)	[11]
		It would be very beneficial for me to use e-learning. (X1.2)	
	Outcome evaluation	I don't think it is necessary to use e-learning for lectures (X1.3)	
		I think using e-belajar is not a good idea and is difficult to learn (X1.4)	
Subjective Norm X2	*Normative beliefs*)	Most of the people I know suggest I use e-learning regularly (X2.1)	[13]
		Most people who are important to me suggest that I don't need to use e-learning frequently (X2.2)	
	Motivation to comply	I am confident that I can fulfill the expectations of those closest to me to use e-learning more often (X2.3)	
		I think it is too difficult if I have to use e-learning regularly (X2.4)	
Behavior Control X3	*Control belief strength*	I can use e-learning easily (X3.1)	[11]
		I use e-learning based on my own desire (X3.2)	
	Control belief power	If I am sick, tired or something unexpected happens and puts a strain on my time, it will make me more irregular in using e-learning (X3.3)	
		I do not have sufficient skills and knowledge in and resources needed to use e-learning (X3.4)	
Intention Z	*Interest*	I want to use e-learning during my studies (Z1.1)	[1]
		I want to get learning materials through e-learning (Z1.2)	
	Situation	I want to use e-learning more often (Z1.3)	
		I want to get learning materials through e-learning (Z1.4)	
Behavior Y	*Actual usage*	I often use e-learning (Y1.1)	[1], [11], [22]
		I use and try in my assignments (Y1.2)	
		I am more comfortable using e-learning (Y1.3)	
		Using e-learning is the best way for me to learn (Y1.4)	

3. Result and Discussions

3.1. Validity and Reliability Test

The validity test indicates the difference in the level of consistency within the data that the researcher gathered and the data that happens on the item. [23], [24]. Using the SPSS software and the Pearson variable correlation algorithm, the validity test was conducted. The purpose of the validity test is to evaluate the questionnaire's degree of validity for data collection. In the validity test, questions are considered invalid if, at a significance level of 5%, the R-count is less than the R-table.

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Conversely, if R-count > R-table at a threshold for significance of 5%, the questionnaire questions are considered legitimate

It is known that the significance level is 0.05 and the number of samples is 100, so from the calculation of the R value, R-table is obtained at 0.195. Table 2 is the validity test value that has been calculated from 100 respondents who meet the sampling criteria. Table 3 shows the validity test results of the research questionnaire.

Table 2. Validity Test Result

Variable	Indicator	R-Count	Result
Attitude	(X1.1)	0,396	Valid
X1	(X1.2)	0,474	Valid
	(X1.3)	-0,174	Not Valid
	(X1.4)	-0,170	Not Valid
Subjective	(X2.1)	0,508	Valid
Norm	(X2.2)	0,138	Not
X2			Valid
	(X2.3)	0,423	Valid
	(X2.4)	-0,122	Not Valid
Behavior	(X3.1)	0,336	Valid
Control	(X3.2)	0,489	Valid
X3	(X3.3)	0,302	Valid
	(X3.4)	-0,052	Tidak Valid
Intention Z	(Z1.1)	0,651	Valid
	(Z1.2)	0,663	Valid
	(Z1.3)	0,720	Valid
	(Z1.4)	0,740	Valid
Behavior Y	(Y1.1)	0,671	Valid
	(Y1.2)	0,550	Valid
	(Y1.3)	0,716	Valid
	(Y1.4)	0,626	Valid

The aim of the reliability test is to evaluate the consistency of the study's questionnaire, ensuring that it yields stable and dependable results upon repeated administration. A questionnaire is deemed unreliable if its Cronbach's alpha value falls below 0.60, while a value exceeding 0.60 indicates that the instrument is reliable. The reliability test was conducted on a sample of 100 respondents who met the selection criteria and completed the questionnaire. Based on the results presented in Table 4, the research questionnaire can be regarded as reliable.

Table 3. Reliability Test Result

Reliability Statistics	
Cronbach's Alpha	N of Items
0.858	15

3.2. Assumption Classic Test

The purpose of the Classical Assumption Test is to guarantee that the regression equation is consistent, does not exhibit crazy fluctuations, and has an accurate estimate. When a model in research satisfies conventional presumptions or circumvents issues with multicollinearity, heteroscedasticity, normalcy, and linearity tests, it is said to as BLUE (Best Linear Unbiased Estimator) outstanding.

Table 4. Assumption Classic Test Result

Var.	Normality Test	Multicollinearity Test (Y/N)	Heteroskedasticity Test
X1	Normal	N	N
X2	Normal	N	N
X3	Normal	N	N
Z	Normal	N	N
Y	Normal	N	N

The research experiments come next. Every hypothesis will be examined and explicated in light of the outcomes of many linear regression analysis examinations. Five different hypotheses in all need to be evaluated.

The Impact of Attitude Variables on Intention (H1): The inferential analysis reveals that the attitude variable (X1) does not significantly influence the intention to use (Z), as indicated by a significance value of 0.317, which exceeds the alpha threshold of 0.05. Furthermore, the t-statistic of 1.005 is below the critical t-table value of 1.984, suggesting that an individual's attitude toward a system does not necessarily affect their acceptance of it. In this study, the measurement of intention is based on indicators related to user confidence, such as ideas for system usage (X1.1) and perceived benefits of the system (X1.2). Additional indicators include assessments of the outcomes of system usage (X1.3), system utilization during lectures (X1.4), and challenges encountered while using the system. The descriptive analysis findings show that participants generally agree, implying a belief that the e-learning platform offers advantages in the context of lectures.

The Impact of Perception on Intention (H2): The findings from the inferential analysis reveal that the Perception variable (X2) has a significant positive effect on the intention to use (Z), with a significance value of 0.018, which is below the alpha level of 0.05. Additionally, the t-statistic of 2.395 exceeds the critical t-value of 1.984, indicating that an individual's perceptions significantly influence others' willingness to engage with an e-learning platform. The study assesses intention by evaluating confidence indicators influenced by others, such as (X2.1) frequent recommendations to use the website and (X2.2) suggestions from important individuals to limit e-learning usage. Other indicators include motivation to meet others' expectations (X2.3) and the challenge of consistent website use (X2.4). The descriptive analysis suggests that respondents generally agree, indicating that environmental factors play a role in their engagement with the e-learning platform.

The Impact of Behavioral Control on Intention (H3): The inferential analysis results show that the behavioral control variable (X3) does not significantly affect user

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intention (Z), as indicated by a p-value of 0.091, which exceeds the significance level of $\alpha = 0.05$, and a t-statistic of 1.705, which falls short of the critical t-value of 1.984. This suggests that despite the presence of factors that facilitate performance, behavioral control does not influence the intention of e-learning users. The study evaluates intention by examining beliefs related to factors that simplify e-learning use (X3), such as convincing oneself of its ease of use (X3.1) and trusting in its voluntary use (X3.2). Indicators of personal confidence in utilizing e-learning include feeling assured in using it under any circumstances and recognizing limitations in knowledge and skills needed to use the required resources. The descriptive analysis results suggest that respondents tend to strongly agree, indicating they have both the necessary tools and interest in using the e-learning platform.

The impact of Behavioral Control on Behavior (H4): The results of the inferential analysis reveal that the behavior control variable (X3) does not have a significant effect on behavior (Y), as evidenced by a significance value of 0.108, which exceeds the α threshold of 0.05, and a t-statistic of 1.705, which is lower than the critical t-value of 1.984. This suggests that, despite the presence of factors that support performance, behavioral control does not influence the behavior of e-learning users. The behavioral control coefficient is calculated at 0.108, representing 10.8% of the total effect. In this study, intention is measured through beliefs associated with factors that ease the use of e-learning, including self-assurance in using e-learning with ease (X3.1) and trust in its voluntary use (X3.2). Additional indicators of personal belief in e-learning use include confidence in all situations (X3.3) and the perceived lack of necessary skills and knowledge for using e-learning resources (X3.4). Descriptive analysis results suggest that participants tend to strongly agree, indicating that they possess both the necessary resources and motivation to engage with the e-learning platform.

The Influence of Intention on Behavior (H5): The inferential analysis results demonstrate that the intention variable (Z) has a significant positive influence on behavior (Y), as indicated by a significance value of 0.000, which is well below the α threshold of 0.05, and a t-statistic of 8.183, surpassing the critical t-value of 1.985. This suggests that intention or desire significantly impacts the frequency with which behavioral variables are employed in accessing the e-learning platform. The study assesses the intention construct through the Interest in Using E-Learning (Z) indicator, which includes statements such as (Z1.1) "I desire to utilize e-learning in college" and (Z1.2) "I aim to access learning materials through e-learning." Additional indicators of e-learning usage intention include (Z1.3) a desire to increase e-learning usage and (Z1.4) a preference for accessing learning materials online. The descriptive analysis results indicate that most respondents tend to strongly agree, reflecting a high level of interest in engaging with e-learning.

4. Conclusions

This study seeks to identify the factors that affect the acceptance of online learning platforms through the lens of the Theory of Planned Behavior (TPB). The analysis and hypothesis testing indicate that attitude does not significantly influence the intention to use, suggesting that an individual's willingness to adopt the system is not determined by their attitude. However, perception plays a pivotal role in shaping the willingness to engage with the e-learning platform. Behavioral control neither affects the intention to use nor actual behavior, implying it does not influence users' actions on the platform. In contrast, interest strongly impacts behavior, highlighting the crucial role of intention in the effective use of e-learning websites.

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