

Analysing influential factors in e-learning technology acceptance for digital learning effectiveness enhancement

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ABSTRACT

This study aims to discover the factors that influence the acceptance of electronic learning media and its effect on the effectiveness of digital instruction. The study involved a learning management system and online tutorials using management system (MS) teams from various faculties at the Universitas Terbuka. These include the Faculty of Economics and Business, the Faculty of Teacher Training and Education, the Faculty of Science and Technology, and the Faculty of Law, Social Sciences, and Political Sciences. The study also conducted in three regional offices in Ambon, Gorontalo and Makassar, which were selected through purposive sampling. Primary data sources include participant questionnaires and interviews. Analytical methods include correlation and multiple regression analysis, with descriptive statistics used to summarize the dataset. Variable selection involves reliability and validity tests and classical assumption tests like multicollinearity. The F-test demonstrates a statistically significant and beneficial influence of utilizing e-learning media and individual ability, training, and intention to use it for digital learning success. The results of t-tests and regression models provide empirical evidence supporting the significant effect of e-learning media and intention to use on the effectiveness of digital learning. However, variables related to training and ability do not show any significant influence.

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1. INTRODUCTION

In recent years, technology-based education has advanced rapidly. The introduction of e-learning technology media offers the opportunity to learn online through digital platforms [1], [2]. On online learning platforms, students derive advantages from the flexibility of asynchronous learning, which allows them to engage in educational activities at their convenience and regardless of their physical location. E-learning can be categorised according to the academic or professional training objectives it serves [3], [4].

Learning through digital learning can be enhanced by education developers and policymakers who take appropriate action to increase the acceptance and use of online learning technologies. An organisation can help its employees improve online learning by developing an environment conducive to learning [5]. Digital learning can help promote knowledge acquisition by blending modern and conventional methods with younger students, who would no longer have to spend more money on traditional classes [6].

Moreover, with the COVID-19 pandemic sweeping the world in 2020, online education through e-learning media technology has grown in unprecedented meaning and relevance. The emergence of the COVID-19 pandemic has provided an opportunity to rethink how education is conducted. It is also an opportunity to use technology in new and innovative ways [7]. Therefore, educators must creatively develop engaging learning media to increase motivation and effectiveness in e-learning [3], [8].

Online education management encompasses various instructional technologies and approaches, including online and in-person classes, competency-based learning, and exploratory methods [9]. Globally, schools and educational institutions force them to use distance learning strategies to protect the well-being and safety of students and teachers. All countries have adopted remote learning systems that use various kinds of media, such as smartphones, televisions, radios, and computers, which is commendable [10], [11].

Learning media is becoming more widely used [12], but not all users can use technology to its full potential. Some users may need help with using e-learning platforms. The learning environments may offer a variety of features and enhance user interactions, but without the students' participation, we cannot fully realise these advantages. Students may seem disinterested for various reasons [13]. Social factors, including community support and public perceptions of the effectiveness of online learning, can also influence the adoption and successful use of e-learning media technologies.

The success of e-learning services depends on the quality of the materials and the online tutorial approach used. This ensures that the learners reach their goals, such as self-directed education and learning outcomes [14]. As stated earlier, Universitas Terbuka is one of the institutions that uses a distance learning system, where the learning process is carried out through information technology. Technological advances generally integrate digital learning tools into the learning environment, facilitating online learning opportunities and increasing learning effectiveness [15]. According to Panigrahi *et al.* [3], Learning effectiveness is conceptualised as the extent to which the intended learning objectives are accomplished.

Technology integration in education is becoming increasingly significant, with the learning management system being a pivotal technology for enhancing virtual learning environments, accessing resources, engaging in collaborative activities, and evaluating progress [16], [17]. The ability to deliver live lectures using uploaded materials has become more practical with the help of learning management systems and software [18]. Learning management systems (LMS) utilization rates, student acceptance, and effectiveness can be affected by various factors. It is essential to understand these factors to demonstrate how beneficial they are in educational settings [19]. These factors encompass individual abilities, training, and the intention to employ the LMS.

Several studies have been conducted to see the ability of individuals as programmers, and also the results of research show related to training strategies used to achieve training effectiveness and the intention to use management system (MS) teams directed by communities created in social media and WhatsApp [20]–[22]. Educational institutions can enhance implementing and utilising LMS by acquiring a deeper understanding of this subject matter. Given the challenges and limited experience in adapting to evolving technology, it is imperative to evaluate the impact and effectiveness of e-Learning on educational activities to increase knowledge in this area [23]. This study aims to analyze the factors that influence e-learning media's acceptance, namely the effect of utilizing e-learning media, individual ability, training, and intention to use on the effectiveness of digital learning.

2. METHOD

This study elucidates the influence of the independent variable on the dependent variable, with a particular focus on examining the interplay between elements that influence the adoption of e-learning technological media and the efficacy of online digital learning. We researched three regional Universitas Terbuka offices: Ambon, Makassar and Gorontalo. The primary source of study data comprises the responses provided by participants on disseminated questionnaires. The study's population consisted of tutors from the University Terbuka who used the learning management system learning media.

This study utilised a purposive sampling technique [24]. The population for this study consisted of 70 tutors who were respondents to the survey conducted and utilised the learning management system. The data for the study was gathered using observation and questionnaire processes. In the context of data collection, questionnaires are distributed to participants using Google Forms. The Likert scale is a commonly employed measurement tool utilised by researchers in the design and implementation of surveys. The data gathered is subsequently analysed using various multiple linear regression analysis approaches. Analyse the outcomes in terms of internal reliability. The Cronbach alpha test with IBM SPSS software was used to analyse the results' internal reliability. It helped to draw suitable conclusions [25].

3. RESULTS AND DISCUSSION

The results of this study are the results of a combination of problem background, data collection and literature testing using data analysis methods carried out on data collection ability, for example, questionnaires collected online as many as 71 copies (95%), the number of questionnaires with data that process is 70 copies (9.3%). The initial experiment conducted in this study involves a data quality assessment, as outlined in the research methods section. Data quality testing encompasses two main types of evaluations: validity tests and reliability tests.

Reliability test is the reliability of various research instruments is shown in Table 1. It shows that the results they produce are reliable. The Cronbach Alpha value of the various instruments used in the study is over 0.60. This indicates that they are reliable and can perform their tasks efficiently.

Table 1. Reliability test results

No	Variable	Cronbach alpha value	Information
1	Utilisation	0.901	Reliable
2	Ability	0.943	Reliable
3	Training	0.932	Reliable
4	Intention	0.928	Reliable
5	Effectiveness	0.901	Reliable

3.1. Classical assumption test

Regression analysis statistical testing can do it. At the same time, consider the absence of breaches of traditional assumption tests. These traditional presumptions consist of: The multicollinearity analysis aims to determine if the regression model's independent variables are related. A good model should not have any correlation between the variables. One must first examine the variance inflation factor (VIF) and tolerance value. The results of multicollinearity analysis show that there is no correlation between the independent variables of the regression model when the tolerance value exceeds 10% and the VIF value falls below 10, as can be seen in Table 2. The Table 2 shows the independent variables' VIF and tolerance values. It can be assumed that there is no multi-collinearity between these variables in the model.

Table 2. Multi-collinearity test results

Model		Effectiveness Collinearity statistics	
		Tolerance	VIF
1	(Constant)		2.657
	Utilisation	0.376	9.351
	Ability	0.107	2.572
	Training	0.389	6.611
	Intention	0.151	2.657

3.2. Multiple linear regression test

Multiple linear regression tests are utilized to determine the independent variable's influence on the dependent variable. The multiple regression equation can then calculate the magnitude of the independent variable's impact on the dependent variable. It can be shown in Table 3.

Table 3. Multiple linear regression test

Model		Unstandardised coefficients	
		B	Std. Error
1	(Constant)	1.181	1.566
	utilisation	.141	.070
	ability	.223	.141
	training	.053	.078
	intention	.312	.115

3.3. Dependent variable: effectiveness

The first equation in the regression model can be obtained from the table: $Y=1.181+0.141 X_1+0.223 X_2+0.053 X_3+0.312 X_4$. The first equation in the regression model indicates that the constant is 1.181. a sign that indicates that the independent variable can be considered stable is affixed to this flowchart: Y is 1.181.

The increase in the utilisation rate by one unit can be expected to boost it by 0.141, assuming that the other variable remains stable, according to the regression coefficient of the utilisation variable (X1), which has a positive sign f.

An example is to assume that the ability level of a given unit increases by one while maintaining the other constant. The employee's performance would then increase by 0.223, according to the variable ability regression coefficient (X2), which has a positive sign. With the other variable's status quo, the training level can be raised by one unit. In that case, employee performance will increase by 0.053, according to the regression coefficient of the training variable (X3), which has a positive sign. The objective rate of increase for the employee's performance would be 0.312. This indicates that the increase would be due to the one-unit increase in intention rate (X4).

The R Square measures the independent variable's influence on the dependent variable within a regression model. The study's results can be found in Table 4. The R square value shown in the table equals 79.2%. It indicates that the factors of training, utilisation, intention, and ability all impact the effectiveness factor. On the other hand, about 20% of the variables were also influenced by external factors.

Table 4. Coefficient of determination (R2)

Model	R	R square	Adjusted R square	Std. Error of the estimate
1	.890a	.792	.773	1.21759

a. Predictors: (Constant), utilisation, ability, training, intention
 b. Dependent variable: effectiveness

3.4. Simultaneous testing (F-test)

An independent variable's effect on a dependent variable is determined by the F-test. This test is used to determine the significance of a variable's significance. With the following criteria: i) If P value (Sig)>α, then Ho is accepted. This indicates that independent variables do not exert a notable influence on effectiveness; ii) If P value (Sig)≤α, then Ho is rejected. This indicates that independent factors influence the effectiveness of the variable. Table 5 shows that the significance value is 0.000, more significant than 0.05. Therefore, we can conclude that utilisation, ability, training, and intention simultaneously affect effectiveness.

Table 5. Simultaneous significance test results (statistical F-test)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	356.543	6	59.424	40.083	.000 ^b
	Residual	93.400	63	1.483		
	Total	449.943	69			

a. Dependent variable: Effectiveness
 b. Predictors: (Constant), utilisation, ability, training, intention

3.5. Partial test (t-test)

The partial test method is known as the t-test. It can be used to analyse the effectiveness of learning media. Decision-making is then carried out using the significance of Sig. Based on criteria: i) If P value (Sig)>Ho is accepted. The effectiveness of the learning media does not depend on the independent variable; ii) If P value (Sig)≤Ho is rejected. The learning media's effectiveness is affected by the independent variable. The following are the t-test results of five variables against the effectiveness variable in Table 6.

Table 6. T-test results

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.181	1.566		.755	.453
	Utilization	.141	.070	.187	2.003	.049
	Ability	.223	.141	.278	1.583	.118
	Training	.053	.078	.062	.675	.502
	Intention	.312	.115	.401	2.716	.009

a. Dependent variable effectiveness

The study's results assessing the impact of media utilization on the effectiveness of educational content can be calculated by taking a t-test value of 0.049. A value less than 0.05 indicates that the utilization factor impacts the content's effectiveness. The test results revealed that the ability had no significant effect on the effectiveness. The conformity variable had a significance level of less than 0.05, meaning it did not affect the study's effectiveness. The study's results revealed that the training variable did not affect the effectiveness. The significance level of the test data was 0.009. It indicates that the intention variable has an impact on the effectiveness of the study.

3.6. Discussion

The impact of utilisation on the effectiveness of digital learning is analysed by test results. It reveals that utilising educational resources significantly positively affects online digital learning. This study supports previous research that indicated that using internal controls and information technology can affect the efficiency of accounting information systems [26]. Thus, digital learning technology can increase learning effectiveness through broader access to learning resources, the flexibility of time and place, and various interactive methods that can increase student engagement and understanding. Therefore, the use of digital technology needs to be directed and elaborated correctly to impact the effectiveness of digital learning positively.

The effect of ability on the effectiveness of digital learning: based on the study's results, one can conclude that the relationship between variable ability and the effectiveness of digital learning is not particularly significant. Based on these findings, other studies also show the significance of consistently implementing various teaching strategies in mixed-ability classrooms to advance equity and teaching effectiveness [27]. However, some limitations ultimately need to be considered and simultaneously serve as a guide for future research. Users' acceptance of this technology is vital for them to benefit from these technologies. Despite all this, a digital learning system can be a solution [28].

The effect of training on the effectiveness of digital learning the study's findings demonstrate that training does not significantly and favourably affect the efficacy of digital learning. This is inconsistent with the research findings. This project aims to identify the key factors that can influence the engagement of participants in online training programs. This will help improve the effectiveness of the programs by developing effective communication and engagement strategies [29]. Individuals or organisations can better understand the basic ideas, practical abilities, and approaches most helpful in achieving the desired results through proper training. Learning management systems are software applications that help administer and track e-learning initiatives. These applications can be used in various ways, such as online training courses [30].

The effect of intention on digital learning effectiveness: the digital learning variable intention test results have shown that it can be effective. Inconsistent intentions have a significant impact on the effectiveness of digital learning. The intent test's results did not meet the expectations. The influence of technological media on digital learning's efficacy is complex due to the varying factors that affect its efficiency, such as environmental support, individual motivation, and technological readiness. The intent test was also conducted to determine the people's intention to use a learning platform. It was determined that they were most likely to use it effectively [31].

4. CONCLUSION




The study's results revealed that intention and partial utilisation significantly impact the effectiveness of online learning. On the other hand, training and ability do not affect digital learning's efficiency. This suggests that combining training, ability, and utilisation can make a difference in learning effectiveness. By conducting this study, we aim to gain a profound comprehension of the diverse elements that impact the digital learning phenomenon. This knowledge will allow us to create a more personalised and practical educational experience. Researchers can unlock essential insights that advance digital learning through studies that investigate these aspects and can provide knowledge to identify better approaches to optimise the learning experience for students and tutors.

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