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Assessing E-learning Systems Using the DeLone & McLean and Technology Acceptance Models

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Abstract: This study investigates the effectiveness of e-learning at Islamic universities in Central Java and Yogyakarta using Technology Acceptance Model (TAM) and the DeLone and McLean. It employs variables from both models, including system quality, net benefits, service quality, user satisfaction, perceived ease of use, and intention to use. Data were collected through questionnaires distributed to 250 students from these universities. The research utilizes a quantitative approach and applies proportional random sampling, analyzed with SmartPLS version 3 software. The findings are as follows: (1) Intention to use positively impacts net benefit, with a t-statistic of 1.982 (greater than 1.96) and a p-value of 0.048 (less than 0.05); (2) Perceived ease of use significantly influences intention to use, with a t-statistic of 15.996 (greater than 1.96) and a p-value of 0.000 (less than 0.05); (3) Service quality has a significant effect on user satisfaction, indicated by a t-statistic of 4.221 (greater than 1.96) and a p-value of 0.000 (less than 0.05); (4) System quality also significantly affects user satisfaction, with a t-statistic and p-value of 11.621 which is more than 1.96 and 0.000 which is less than 0.05; (5) Finally, user satisfaction has a significant influence on net benefits, as indicated by a t-statistic and p-value of 14.630 which is more than 1.96 and 0.000 which is less than 0.05.

Keywords: DeLone and McLean model; E-learning; TAM

Introduction

Changes in people's lives occur due to the rapid development of technology. Apart from humans, organizations, institutions and companies also use technology. Technology is widely used in all fields to facilitate the dissemination of information throughout the world. Everyone in the world can find out all the information with information systems. Information systems are a combination of human resources and information technology, as well as organizational procedures, and provide a collection of information for decision making (Saputri et al., 2019). The method or process of conveying information, ideas and messages using instructions either verbally or non-verbally to each individual or group that aims to understand each other is called communication. Communication is an important aspect of everyday life as social and individual beings. Humans are unlikely not to communicate at some point in their lives either directly or indirectly (Atlis et al., 2024).

Human interaction without space and time limits is a testament to the existence of information networks via the internet. Management of technology and information needs to be improved proccess can run optimally in the learning (Jati et al., 2023). Educational communication provides understanding and explanation of the learning process. The interactions that occur during the learning process and teaching will raise the enthusiasm of each individual. The role of communication in education has a strong influence because it can support the achievement of educational goals (Atlis et al., 2024).

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Education from elementary school to college must continue to become proficient in using technology and adapt quickly. Most education levels will have no difficulty in using various devices (Wulandari et al., 2024). Information technology has greatly influenced the field of education over time. Many of the benefits of using e-learning have shown a positive response to using related systems that will be incorporated and used until a specified time limit. The field of education has gone through a transition from the use of conventional books and physical filing to electronic and virtual information systems in its learning approach. Distance learning in lectures can be assisted by software and applications such as moodle to access and deliver information without having to come to school (Obaid, 2020).

The role of information technology for the education system is very important. E-learning is designed to facilitate learning both for lecturers who conduct assessments or also students who collect and access assignments. The utilization of this technology is efficient in implementing technology (Marzuki et al., 2019). In addition, lack of understanding and resistance to change are obstacles. Due to limited internet quota, loss of signal while studying, and other network problems, communication that is not smooth becomes difficult to understand when using e-learning, especially practicum. audio visual learning and causes learning to be less effective because it is constrained by the application network (Kholipah et al., 2021). This is not only a challenge for learners, but also for teachers who sometimes hesitate to integrate technology in learning activities due to lack of experience, skills and knowledge in using technology (Setiawaty et al., 2024).

E-learning was created to support the learning process made with the help of technology. In addition to its speed and ease of use, information technology is a multimedia tool that uses graphics to enhance the learning experience (Rachman et al., 2017). The quality of service of higher education institutions also uses technology which will continue to develop and change perspectives in obtaining information such as newspapers, audio visuals, and electronic media also utilizing sources via the internet. One solution to facing competition in the world of education today is to increase customer satisfaction through services and services facilitated in higher education (Ilhami et al., 2024).

The application of e-learning is of particular interest to developing countries, especially in the field of education. Educators need to understand the use of curriculum and technology deeply in order to find meaningful ways to integrate technology. The integration of media and technology in the learning process is closely related to the strategies used because it facilitates educators and students in achieving learning goals (Pahrijal et al., 2023). The use of a good e-learning system can lead to good user expectations or intentions as well as these are consumer expectations of a technology service used. That way, consumers will think about using e-learning services or stop using them after using these services (Wijanarko et al., 2024).

One model that studies technology acceptance is TAM (Technology Acceptance Models) which has several constructs to see how a person's attitude towards using technology (Narassima et al., 2017). Research (Setyawan et al., 2022) shows that e-learning can change the role of students to participate more actively in discussing material. Reinforced by research Novianti (2019) which shows that user acceptance of e-learning implementation is successfully implemented in their environment. There are several variables that affect the success of e-learning implementation, namely user satisfaction, performance quality, effort expectancy, behavioral intention, and system quality. Since each variable will have an impact on other factors, it is necessary to measure the variables collectively rather than separately in order to assess the effectiveness of information systems (Seta et al., 2018). In addition to TAM, Delone Mclean is also a tool for testing the success of an information system which in research Putra et al. (2018) has adopted four constructs including information quality, system quality, service quality, and user satisfaction.

This research focuses on public Islamic universities that are diverse in educational area and student population in Central Java and Yogyakarta. In the classroom, technology has been adopted and integrated, but success also faces challenges. It is imperative that we address these issues, especially in Central Java and Yogyakarta. These areas face issues such as limited literacy, inadequate access and equipment, and no change in educational content. This affects not only students' academic performance but also their preparedness for a future that increasingly depends on digital skills (Pahrijal et al., 2023).

This research has similarities with previous research, namely regarding the factors that influence the e-learning system. However, it also has some differences contained in the object where this research has a wider scope, namely Islamic universities in Central Java so that it does not only focus on one institution or university involving Islamic universities in Central Java including UIN Prof. K.H. Saifuddin Zuhri Purwokerto (UIN SAIZU), UIN Sunan Kalijaga Yogyakarta, UIN KH. Abdurrahman Wahid Pekalongan (UIN GUSDUR), IAIN Kudus, UIN Salatiga, UIN Raden Mas Said Surakarta, and UIN Walisongo Semarang. E-learning

has been used by every Islamic university as a teaching tool. The researchers conducted this study by giving questionnaires to students at each of these Islamic universities to obtain information relating to the state of e-learning at these institutions.

As indicated by some of the students interviewed and what they saw, there are many challenges in using the e-learning information system. Difficulty logging into the system, sudden logout, and incomplete data are the most common problems. This research examines the use of e-learning at state islamic university on Indonesia based on these problems. It is expected that this research will provide an overview of the actual situation in the field. Some important factors that will be discussed in this research are factors that affect the success of e-learning using TAM and the DeLone McLean evaluation methods.

Method

The purpose of this study is to assess e-learning effectiveness utilising the Delone Mclean and TAM system evaluation models with a quantitative research approach that investigates the relationship between variables from the collected questionnaire data to explain several variables tested, namely user satisfaction, perceived ease of use, service quality, intention to use, system quality, and net benefits (Jumardi, 2020).

This research was conducted at state Islamic Universities in Central Java and Yogyakarta which include: UIN Sunan Kalijaga Yogyakarta, UIN KH. Abdurrahman Wahid Pekalongan (UIN GUSDUR), IAIN Kudus, UIN Salatiga, UIN Raden Mas Said Surakarta, UIN Prof. K.H. Saifuddin Zuhri Purwokerto (UIN SAIZU), and UIN Walisongo Semarang. With the use of SmartPLS software version 3, this study employs the proportional random sampling technique. According to the research requirements, 250 respondents—students from Islamic universities in Central Java and Yogyakarta were given questionnaires to complete in order to measure the data analysed in this study.

Central Java and Yogyakarta are home to seven state Islamic universities, prompting the researchers to use the Slovin formula for sampling students with a 5% margin of error. The Slovin equation, applied is:

$$n = \frac{N}{1 + N\,(e)^2} \quad (1)$$

Notes:
N = population size
n = sample size
e = percentage (%), tolerance for inaccuracies due to sampling errors

According to this formula, the study collected a total of samples:

$$n = \frac{250}{1 + 250\,(5\%)^2}$$

$$n = \frac{250}{1 + 250\,(0{,}5)^2}$$

$$n = \frac{250}{1 + 250\,(0{,}25)}$$

$$n = \frac{250}{1{,}625} = 153{,}8 = 154$$

Based on the results of these calculations, a value of 153.8 was derived, which was then rounded up to 154 respondents. Subsequently, the sample size for each of the state Islamic universities studied was determined using the following formula:

$$N = \frac{n}{S}\, x\, n \quad (2)$$

Notes:
N = The samples from each State Islamic University
n = The total of students at each State Islamic University
e = The total number of students at each State Islamic University

Table 1. Total Population and Sample Quantity

State Islamic Universities in Central Java and Yogyakarta	Sample Count	Number of Students	Sample Number
UIN Walisongo Semarang	$\frac{154}{250}$ x 154 = 95	154	95
IAIN Kudus	$\frac{3}{250}$ x 154 = 2	3	2
UIN Raden Mas Said Surakarta	$\frac{34}{250}$ x 154 = 21	34	21
UIN KH. Abdurrahman Wahid Pekalongan	$\frac{12}{250}$ x 154 = 7	12	7
UIN Salatiga	$\frac{5}{250}$ x 154 = 3	5	3
UIN Prof. K.H. Saifuddin Zuhri Purwokerto	$\frac{27}{250}$ x 154 = 17	27	17
UIN Sunan Kalijaga Yogyakarta	$\frac{15}{250}$ x 154 = 9	15	9
Total		250	154

Based on Table 1, it can be described through the 7 Islamic universities in Yogyakarta and Central Java have a total population of 250 students who filled out the questionnaire with a sample size of 154 students. The details are UIN Walisongo Semarang consists of 154 students with 95 samples, IAIN Kudus consists of 3 students with 2 samples, UIN Raden Mas Said Surakarta consists of 34 students with 21 samples, UIN KH. Abdurrahman Wahid Pekalongan consists of 12 students with 7 samples, UIN Salatiga consists of 5 students with 3 samples, UIN Prof. K.H. Saifuddin Zuhri Purwokerto consists of 27 students with 17 samples, and UIN Sunan Kalijaga Yogyakarta consists of 15 students with 9 samples. The following is an example of the design of the PLS-SEM version 3 model.

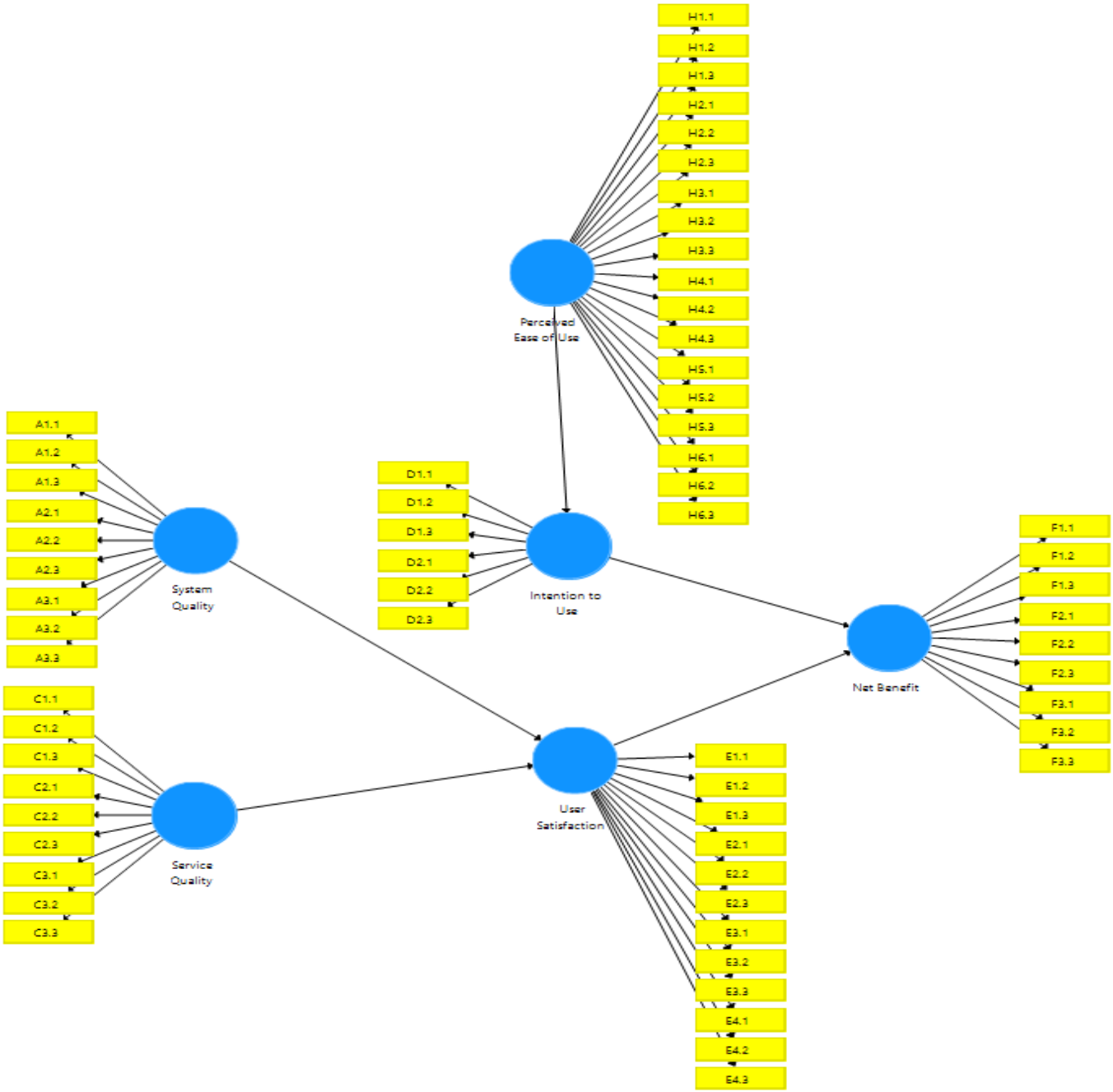

Figure 1. PLS-SEM model design

Figure 1 is a model design using the PLS-SEM application for testing the relationship between constructs from the variables of perceived ease of use, service quality, user satisfaction, system quality, intention to use, and net benefits.

Table 2. Experimental Design

Constructs	Items	Indicators
System Quality	A1.1	The e-learning system reacts to user inputs rapidly
	A1.2	There aren't many errors in the e-learning system
	A1.3	The e-learning system has the capability to address user requirements
	A2.1	The online course is easy to utilize
	A2.2	The e-learning system is simple for users to utilise
	A2.3	Users can easily comprehend the features of e-learning
	A3.1	The e-learning platform can preserve user information
	A3.2	Updates continuously enhance the e-learning system's performance
	A3.3	The e-learning system stores data securely
Service Quality	C1.1	The e-learning system guarantees user data security
	C1.2	The e-learning system guarantees the privacy of user data
	C1.3	E-learning system can improve course learning
	C2.1	The e-learning system is able to understand user needs
	C2.2	The e-learning system is able to overcome e-learning difficulties
	C2.3	Technicians are friendly and show empathy
	C3.1	Technicians respond quickly if there is a fault
	C3.2	Technicians are easy to contact if users input wrong data
	C3.3	The e-learning system solves problems quickly
Intention to Use	D1.1	You can utilise the e-learning system whenever you like
	D1.2	The e-learning system does not experience errors when many people log in
	D1.3	Server does not go down if not opened for too long
	D2.1	The e-learning system is used to upload assignments
	D2.2	The e-learning system is useful for knowing the percentage of task completion
	D2.3	Setting up assignment due dates is made simpler by the e-learning platform
User Satisfaction	E1.1	Information in e-learning is easy to understand
	E1.2	The e-learning content is quite pertinent and easy to understand
	E1.3	Information presented based on the user's needs
	E2.1	Users are satisfied with the information provided
	E2.2	A user friendly e-learning system
	E2.3	The e-learning system improves the user's productivity
	E3.1	The information provided is accurate and relevant
	E3.2	E-learning is effective and available at all times
	E3.3	The e-learning system responds fast to user commands
	E4.1	The e-learning system responds swiftly to user input
	E4.2	The e-learning system is regularly updated to enhance its performance
	E4.3	The e-learning system does not error frequently
Net Benefit	F1.1	Information that can increase user knowledge
	F1.2	The information provided can improve the user's understanding
	F1.3	Users get the information they need
	F2.1	Users can save time in getting information
	F2.2	Accurate and relevant information
	F2.3	The e-learning system responds quickly to user commands
	F3.1	Users are able to maximize performance optimally
	F3.2	Users minimize work error rates
	F3.3	Users are able to complete work on schedule
Perceived Ease of Use	H1.1	E-learning is useful in getting work done
	H1.2	E-learning is useful in scheduling work
	H1.3	E-learning is beneficial in saving time and money
	H2.1	E-learning is easy for users to implement
	H2.2	E-learning makes it easy to access information
	H2.3	E-learning is easily accessible to users
	H3.1	E-learning offers users a high level of autonomy and control
	H3.2	Users may readily obtain e-learning
	H3.3	Monitoring e-learning is straightforward
	H4.1	The acquired information is pertinent, lucid, and accessible to users
	H4.2	The language employed is lucid and comprehensible to consumers
	H4.3	E-learning features are easy for users to remember and understand
	H5.1	You can access the online learning platform at any time

Constructs	Items	Indicators
	H5.2	Setting up the e-learning system is simple
	H5.3	Anytime, the e-learning system can be observed
	H6.1	Improved user skills in e-learning
	H6.2	E-learning system minimizes work error rate
	H6.3	The e-learning system can complete work on target
	H7.1	Users may easily use the e-learning system
	H7.2	There is no difficulty in using the e-learning system
	H7.3	Users may readily access the e-learning system

Results and Discussion

Outer Model Evaluation

The evaluation of the Outer Model is done to show how each indicator block and its underlying variable are correlated. The outer model in the PLS-SEM application in measurement theory is called the outer relationship (Duryadi, 2021). The evaluation of the outer model measurement covers reliability, discriminant validity, and convergent validity assessments.

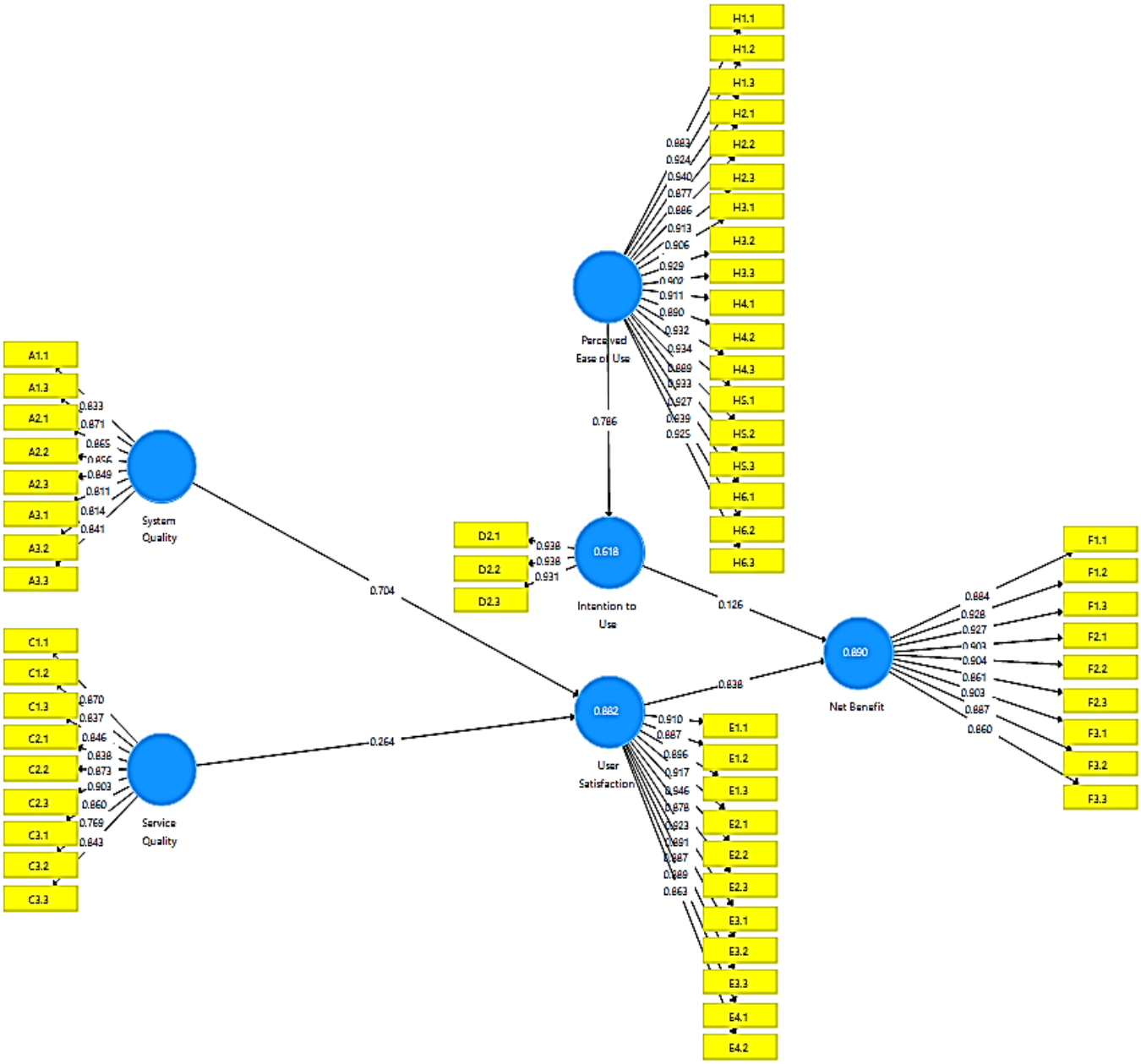

Figure 2. Outer model results

Table 3. Outer Model Results

Constructs	Items	Consistency Reliability		Convergent Validity	
		Cronbach's Alpha α ≥ 0.7	Composite Reliability ≥ 0.7	Outer Loading ≥ 0.7	AVE ≥ 0.5
Intention to Use	D2.1	0.929	0.955	0.938	0.876
	D2.2			0.938	
	D2.3			0.931	
Net Benefit	F1.1	0.969	0.973	0.884	0.802
	F1.2			0.928	
	F1.3			0.927	
	F2.1			0.903	
	F2.2			0.904	
	F2.3			0.861	
	F3.1			0.903	
	F3.2			0.887	
	F3.3			0.860	
Perceived Ease of Use	H1.1	0.988	0.989	0.883	0.835
	H1.2			0.924	
	H1.3			0.940	
	H2.1			0.877	
	H2.2			0.886	
	H2.3			0.913	
	H3.1			0.906	
	H3.2			0.929	
	H3.3			0.900	
	H4.1			0.911	
	H4.2			0.890	
	H4.3			0.932	
	H5.1			0.934	
	H5.2			0.889	
	H5.3			0.933	
	H6.1			0.827	
	H6.2			0.839	
	H6.3			0.925	
Service Quality	C1.1	0.942	0.951	0.870	0.710
	C1.2			0.837	
	C1.3			0.846	
	C2.1			0.838	
	C2.2			0.873	
	C2.3			0.903	
	C3.1			0.860	
	C3.2			0.769	
	C3.3			0.843	
System Quality	A1.1	0.952	0.959	0.833	0.721
	A1.3			0.871	
	A2.1			0.865	
	A2.2			0.886	
	A2.3			0.849	
	A3.1			0.811	
	A3.2			0.814	
	A3.3			0.841	
User Satisfaction	E1.1	0.976	0.979	0.910	0.808
	E1.2			0.887	
	E1.3			0.896	
	E2.1			0.917	
	E2.2			0.946	
	E2.3			0.878	
	E3.1			0.823	
	E3.2			0.891	
	E3.3			0.887	
	E4.1			0.889	

Constructs	Items	Consistency Reliability		Convergent Validity	
		Cronbach's Alpha α ≥ 0.7	Composite Reliability ≥ 0.7	Outer Loading ≥ 0.7	AVE ≥ 0.5
	E4.2			0.863	

The results of convergent validity can be seen in figure 2 and table 3. These results show that the outer loading on all constructs has a value above 0.7 and an AVE value above 0.5, meaning that all items can be said to be suitable and valid for use in this study. Thus, the requirements for convergent validity can be met properly, as well as other constructs (Muhson, 2022).

These results show that all constructs have a Cronbach Alpha and Composite Reliability with value above 0.70, Thus, all structures can be considered to be highly reliable (Hamid et al., 2019). Table 3 also shows the discriminant validity results. These results show that all constructs have an AVE value greater than 0.5, meaning that the requirements for discriminant validity can be met properly.

According to Table 4, since all variables have a VIF value under 10, it indicates that there is no multicollinearity among the variables affecting each other (Sholihin, 2020).

Table 4. Variance Inflation Factor Value (VIF)

Variables	Intention to Use	Net Benefit	User Satisfaction
Service Quality			3.708
System Quality			3.708
User Satisfaction		3.295	
Perceived Ease of Use	1.000		
Intention to Use		3.295	
Net Benefit			

Structural Model Evaluation (Inner Model)

To assess the connections between latent constructs and variables, the inner or structural model is tested. The R-Square value and significance value can be used to see this evaluation of the inner model.

Table 5. Net Benefits, User Satisfaction, and Intention to Use Constructs' R-Square Value

Constructs	R Square	Category
User Satisfaction	0.882	Strong
Intention to Use	0.618	Medium
Net Benefit	0.890	Strong

The R-Square results presented in Table 5 show that user satisfaction is 0.882, which exceeds the 0.67 threshold, indicating that the model is moderate. Likewise, the R-Square result for intention to use has a value of 0.618, which exceeds the 0.33 threshold, indicating a moderate model fit. In addition, the R-Square value for net benefit is 0.890, which is higher than the 0.67 threshold, so it is identified that the model used is moderate.

Table 6. Significance of Path Coefficients

Constructs	T-Statistic (|O/STDEV|)
Perceived Ease of Use -> Intention to Use	15.996
Service Quality -> User Satisfaction	4.221
System Quality -> User Satisfaction	11.621
Intention to Use -> Net Benefit	1.982
User Satisfaction -> Net Benefit	14.630

With a coefficient value of 4.221, Service Quality positively affects User Satisfaction. With a coefficient value of 11.62 in Table 6, it shows that System Quality directly affects User Satisfaction. With a value of 15.996, Perceived Ease of Use significantly affects Intention to Use. Then, with a value of 14.630, User Satisfaction significantly affects Net Benefits, and with a coefficient value of 1.982, Intention to Use significantly affects the "Net Benefits" variable. So it can be said that all variables have a considerable influence on the measured variable, because the value is more than the threshold of 1.96 at the 5% significance level (Musyaffi et al., 2021). In table 6, the variable with the greatest influence is Perceived Ease of Use on Intention to Use, while the variable with the least influence is Service Quality on User Satisfaction.

Hypothesis Testing

The hypothesis is accepted if the P-value is below 0.05 and the T-statistic exceeds 1.96.

Table 7. Hypothesis Test of All Constructs

Constructs	Original Sample (O)	T Statistics (|O/STDEV|)	P Values
System Quality -> User Satisfaction	0.704	11,621	0.000
Perceived Ease of Use -> Intention to Use	0.786	15,996	0.000
Service Quality -> User Satisfaction	0.264	4,221	0.000
User Satisfaction -> Net Benefit	0.838	14,630	0.000
Intention to Use -> Net Benefit	0.126	1,982	0.048

Effect of System Quality on User Satisfaction

According to Table 7, System Quality has a effect on User Satisfaction, with a coefficient of 0.704. The t-statistic for this effect is 11.621, which exceeds 1.96, and the P-Value is 0.000, which is below 0.05. This indicates that improvements in System Quality lead to increased User Satisfaction. Therefore, there is a significant impact of System Quality on User Satisfaction, and hypothesis 4 is supported.

This hypothesis is in line with research aligns with previous studies indicating that System Quality significantly and positively impacts User Satisfaction. This suggests that user satisfaction is likely to increase when the quality of the system enhances ease of use (Nugraheni et al., 2017). Research conducted by Amelia Setiawan and Joy Evan Saimara Tarigan, who found indications that system quality has an impact on user satisfaction, as demonstrated by the fact that it partially influences user happiness. More user comfort and happiness with a system are directly correlated with its quality (Tarigan et al., 2022).

The Effect of Perceived Ease of Use on Intention to Use

According to Table 7, Perceived Ease of Use affects Intention to Use, with a coefficient of 0.786. The t-statistic is 15.996, which is above the 1.96 threshold, and the P-value is 0.000, which is below 0.05. This suggests that as Perceived Ease of Use improves, the Intention to Use also increases. Consequently, the effect of Perceived Ease of Use on Intention to Use is significant, thereby supporting the acceptance of hypothesis 2.

This theory is consistent with the research performed by Riski Nurida Rahmawati and I Made Narsa, which demonstrates that the perception of how easy it is to use something One important factor influencing the intention to utilize something is perceived ease of usage. PU (Perceived Usefullness) directly affects the intention to use the e-learning system, to put it simply. There is a direct correlation between the intention to use technology and perceived ease of use (Rahmawati et al., 2019). Nursiah also determined that the Perceived usability, or just how simple it is to use, affects both the intention to use and the actual usage. This indicates that an augmentation in the perceived simplicity of utilizing a product or service might directly amplify the inclination to use it, whilst a reduction in the perceived simplicity can directly reduce the inclination to utilize it, to varying degrees (Huda et al., 2024).

Effect of Service Quality on User Satisfaction

According to Table 7, it is observed that Service Quality affects User Satisfaction, with a coefficient of 0.264. The t-statistic is 4.221, which is more than 1.96, and the P-Value is less than 0.05, at 0.000. This suggests that User Satisfaction rises in tandem with Service Quality. As a result, hypothesis 3 can be accepted since there is a substantial correlation between user satisfaction and service quality.

This hypothesis is consistent with the study carried out by Nadia Navis Ramadhanti, which concluded that service quality variables significantly affect user satisfaction variables, with an influence level of 15.9% (Ramadhanti, 2022). Additionally, Nugraheni and colleagues also determined that the quality of service significantly impacts user satisfaction. This implies that as the quality of service improves, the level of satisfaction experienced by e-learning users increases (Nugraheni et al., 2017).

Effect of Intention to Use on Net Benefit

Based on table 7, it is known that Intention to Use has a effect on Net Benefit of 0.126 with a t-statistic of 1.982 greater than 1.96 and a P-Value of 0.048 smaller than <0.05. This means that the higher the Intention to Use, the higher the Net Benefit. So, this shows that there is an influence between Intention to Use on Net Benefit or it can be said that hypothesis 1 is accepted.

This hypothesis aligns with the research by Syaiful Hendra and colleagues, which found that Intention to Use significantly impacts Net BenefitThis implies that a higher perceived Intention to Use within the E-Learning Cluster leads to a greater Net Benefit. On the other hand, a lower perceived Intention to Use results in a reduced Net Benefit (Hendra et al., 2015). Moreover, Utomo et al. concluded that the on net advantages, intention to utilise the e-learning system has a major influence. The results indicate that perceived net benefits are considerably affected by the purpose of using the online learning platform, which serves as an antecedent (Utomo et al., 2022).

Effect of User Satisfaction on Net Benefits

Based on Table 7, it is observed that User Satisfaction impacts Net Benefit, with a coefficient of 0.838 and A t-statistic of 14.630 is higher than 1.96, and the P-value is less than 0.05 at 0.000. This indicates that as User Satisfaction increases, the Net Benefit also increases. Therefore, this demonstrates a significant effect of User Satisfaction on Net Benefit, leading to the acceptance of hypothesis 5.

This hypothesis aligns with the research by Suwarto et al., which found a significant impact between Net Benefit and User Satisfaction. This means that improved services lead to higher user satisfaction with the application, resulting in greater benefits from the service (Suwarto et al., 2021). Furthermore, this study aligns with previous research indicating that user satisfaction significantly impacts the net benefit variable, with an effect size of 71% (Ramadhanti, 2022). Additionally,

Fadhillah found that the significance level for User Satisfaction on Benefits is 0.000, which is less than 0.05.

This study Kurniawan et al. (2023) also shows the results that user satisfaction has a significant effect on net benefits. This indicates that User Satisfaction significantly impacts Net Benefits by 73.9%, with the remaining 26.1% being influenced by factors not covered in the study (Fadhillah, 2021). This is in accordance with research that has shown that user satisfaction is influenced by net benefits (Harianur, 2018).

Conclusion

Based on the explanation given, it can be concluded that all hypotheses are confirmed. with the results of perceived ease of use having an impact on intention to use, system quality having an impact on user satisfaction, service quality having an impact on user satisfaction, user satisfaction having an impact on net benefits and intention to use having an impact on net benefits. The hypothesis stating that Intention to Use has the least impact on Net Benefits is the hypothesis stating that Perceived Ease of Use has the most influence on Intention to Use.

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This research contributes to technology-based learning media that can be used by the entire academic community in higher education. The author was involved in the entire creation of this article.

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Conflicts of Interest

The writers affirm that they are impartial or conflicts related to the publication of this article.

References

Atlis, L. D., Lubis, N. S., Hasri, S., & Sohiron, S. (2024). Urgensi Komunikasi Efektif dalam Media Pembelajaran Pendidikan Secara Daring. *Ta Dib Jurnal Pendidikan Islam*, *13*(1), 19–26. https://doi.org/10.29313/tjpi.v13i1.13294

Duryadi. (2021). *TEKNIK Metode Penelitian Empiris Model Path Analysis dan Analisis Menggunakan SmartPLS*. Penerbit Yayasan Prima Agus Teknik.

Fadhillah, M. H. (2021). Meningkatkan Benefits melalui Kepuasan Pengguna berdasarkan Kualitas Sistem Informasi Akademik. *Coopetition: Jurnal Ilmiah Manajemen*, *12*(3), 313–322. https://doi.org/10.32670/coopetition.v12i3.444

Hamid, R. S., & Anwar, S. M. (2019). *Structural Equation Modeling (SEM) Berbasis Varian (Konsep Dasar dan Aplikasi Program Smart PLS 3.2.8. dalam riset bisnis*. PT Inkubator Penulis Indonesia.

Harianur, I. (2018). Pengaruh Kualitas Informasi Terhadap Kinerja Individu: Kepuasan Pengguna Sebagai Variabel Intervening. *Universitas Muhammadiyah Surakarta*, *9*(2), 67–72. Retrieved from http://eprints.ums.ac.id/29301/12/NASKAH_PUBLIKASI.pdf [Diposting pada 11 Mei 2014]

Hendra, S., Sukardi, & Syahrullah. (2015). Pengaruh Penggunaan E-Learning Klasiber terhadap Net Benefit di Universitas Islam Indonesia dengan User Satisfaction sebagai Variabel Intervening. *Seminar Nasional Aplikasi Teknologi Informasi (SNATi)*, 37–42. Retrieved from https://journal.uii.ac.id/Snati/article/view/3563

Huda, M., & Waluyowati, N. P. (2024). Pengaruh Perceived Ease of Use Dan Perceived Usefulness Terhadap Actual Use. *Jurnal Kewirausahaan Dan Inovasi*, *2*(4), 982–993. https://doi.org/10.21776/jki.2023.02.4.04

Ilhami, Putri, A., Putri, A. S. V., Palupi, A. D., Luthfita, A., Rahma, A., Maylina, D. A., Agustina, H., Azizah, N., Utami, R. R., Anisa, S. N. P., Ervina, S., Vionita, V., & Rohati, P. (2024). Analisis Kepuasan Pelanggan Terhadap Kualitas Layanan Di Lembaga Pendidikan Tinggi. *Jurnal Review Pendidikan Dan Pengajaran*, *7*(2), 6214. https://doi.org/10.31004/jrpp.v7i2.28760

Jati, W. P. A., Prihatin, S. D., & Priyanto, I. F. (2023). Kepuasan Pengguna Elearning Portal Spada Di Universitas Sebelas Maret Surakarta. *BIBLIOTIKA: Jurnal Kajian Perpustakaan Dan Informasi*, *7*(1), 17. https://doi.org/10.17977/um008v7i12023p17-27

Jumardi, R. (2020). Evaluasi E-Learning Menggunakan Pendekatan Technology Acceptance Model. *Journal of Technopreneurship and Information System (JTIS)*, *3*(2), 34–41. https://doi.org/10.36085/jtis.v3i2.887

Kholipah, N., Arisanty, D., & Hastuti, K. P. (2021). Efektivitas Penggunaan E-Learning dalam Pembelajaran Daring Selama Masa Pandemi COVID-19. *JPG (Jurnal Pendidikan Geografi)*, *7*(2), 24–33. https://doi.org/10.20527/jpg.v7i2.10206

Kurniawan, E., & Tjhin, V. U. (2023). Measuring geospatial information system success on individual performance impact. *Indonesian Journal of Electrical Engineering and Computer Science*, *30*(2), 1128–1139. https://doi.org/10.11591/ijeecs.v30.i2.pp1128-1139

Marzuki, K., Apriani, & Mardedi, L. Z. A. (2019). Evaluasi Penerapan Teknologi Informasi E-Learning Pada Kampus Swasta Menggunakan Cobit 4.1 (Study Kasus Prodi Ilkom Universitas Bumigora). *Jurnal Bumigora Information Technology (BITe)*, *1*(2), 161–166. https://doi.org/10.30812/bite.v1i2.598

Muhson, A. (2022). *Analisis Statistik Dengan SmartPLS*. Universitas Negeri Yogyakarta. Retrieved from https://susi.utmj.ac.id/wp-content/uploads/Panduan-Penggunaan-SmartPLS.pdf

Musyaffi, A. M., Khairunnisa, H., & Kismayanti, D. (2021). *Konsep Dasar Structural Equation Model – Partial Least Square (SEM-PLS) Menggunakan SmartPLS*. Pascal Books.

Narassima, M. S., Anbuudayasankar, S. P., Vasudevan, S. K., & Abhinavaram, J. (2017). Physicians' and users' perceptions towards wearable health devices. *Indonesian Journal of Electrical Engineering and Computer Science*, *5*(1), 234–242. https://doi.org/10.11591/ijeecs.v5.i1.pp234-242

Novianti, K. D. P. (2019). Analisis Evaluasi E-learning Menggunakan Integrasi Model D&M dan UTAUT. *Techno.Com*, *18*(2), 122–133. https://doi.org/10.33633/tc.v18i2.2217

Nugraheni, D., Saputra, M. C., & Herlambang, A. D. (2017). Analisis Penerimaan dan Kesuksesan Implementasi E-Learning Universitas Brawijaya Pada Aspek Intention To Use , Use , User Satisfaction dan Net Benefits. *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer (J-PTIIK) Universitas Brawijaya*, *2*(5), 1921–1931. Retrieved from https://j-ptiik.ub.ac.id/index.php/j-ptiik/article/view/1426

Obaid, T. (2020). Factors Driving E-Learning Adoption In Palestine: An Integration of Technology Acceptance Model And IS Success Model. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3686490

Pahrijal, R., & Novitasari, S. A. (2023). Urgensi Menghadapi Hambatan Digital dalam Pemanfaatan Teknologi dalam Pembelajaran Siswa di Jawa Tengah. *Jurnal Pendidikan West Science*, *1*(10), 644–653. https://doi.org/10.58812/jpdws.v1i10.729

Putra, S. J., Subiyakto, A., Yunita, I., Gunawan, M. N., & Durachman, Y. (2018). Assessing the user satisfaction perspectives of information system: A library case study in Indonesia. *Indonesian Journal of Electrical Engineering and Computer Science*, *12*(1), 95–101. https://doi.org/10.11591/ijeecs.v12.i1.pp95-101

Rachman, T., & Napitupulu, D. B. (2017). Rasch Model for Validation a User Acceptance Instrument for Evaluating E-learning System. *CommIT (Communication and Information Technology) Journal*, *11*(1), 9. https://doi.org/10.21512/commit.v11i1.2042

Rahmawati, R. N., & Narsa, I. M. (2019). Intention to Use e-Learning: Aplikasi Technology Acceptance Model (TAM). *Owner*, *3*(2), 260. https://doi.org/10.33395/owner.v3i2.151

Ramadhanti, N. N. (2022). *Penerapan Model DeLone dan McLean untuk Menganalisis Kesuksesan Website E-Learning SMA Muhammadiyah 2 Sidoarjo* [Universitas Dinamika]. Retrieved from https://repository.dinamika.ac.id/id/eprint/6808/

Saputri, M. A., & Kunang, S. O. (2019). Model Delone and McLean Untuk Mengukur Kesuksesan Sistem Informasi Online Class Pada Universitas Bina Darma. *Bina Darma Conference on Computer Science*, *2*, 1048–1054. Retrieved from https://conference.binadarma.ac.id/index.php/BDCCS/article/view/640/352

Seta, H. B., Wati, T., Muliawati, A., & Hidayanto, A. N. (2018). E-learning success model: An extention of delone & mclean is' success model. *Indonesian Journal of Electrical Engineering and Informatics*, *6*(3), 281~291. https://doi.org/10.11591/ijeei.v6i3.505

Setiawaty, S., Lukman, I. R., Imanda, R., Sudirman, S., & Rauzatuzzikrina, R. (2024). Integrating Mobile Augmented Reality Applications Through Inquiry Learning To Improve Students' Science Process Skills and Concept Mastery. *Jurnal Pendidikan IPA Indonesia*, *13*(1), 90–102. https://doi.org/10.15294/jpii.v13i1.48891

Setyawan, A. E., & Anyan. (2022). VOX EDUKASI: Jurnal Ilmiah Ilmu Pendidikan Evaluasi Keberhasilan Learning Management System (LMS) STKIP Persada Khatulistiwa Menggunakan Model DeLone Dan McLean. *VOX Edukasi: Jurnal Ilmiah Ilmu Pendidikan*, *13*(2), 336–347. Retrieved from http://jurnal.stkippersada.ac.id/jurnal/index.php/VOX

Sholihin, D. R. M. (2020). *Analisis SEM-PLS dengan WarpPLS 7.0 Untuk Hubungan Nonlinier dalam Penelitian Sosial dan Bisnis* (1st ed.). CV Andi Offset.

Suwarto, S., Japlani, A., & Amelia, A. (2021). Implementasi System Quality, Information Quality, Service Quality Terhadap Pembelajaran

Berbasis Online Di Saat Pandemi Covid-19 (Studi Kasus Pada Mahasiswa Feb Um Metro). *Derivatif Jurnal Manajemen*, *15*(1), 100–107. https://doi.org/10.24127/jm.v15i1.587

Tarigan, J. E. S., & Setiawan, A. (2022). Pengaruh System Quality, Information Quality, Service Quality, Dan Security Control Terhadap User Satisfaction. *Parahyangan Accounting Review*, *1*(1), 27–35. Retrieved from https://journal.unpar.ac.id/index.php/pasreview/article/view/6560/3961

Utomo, A. P., & Andiyan Bagas Alfiandika. (2022). Analisis Keberhasilan E-Learning Universitas Dalam Perspektif Sistem Informasi. *E-Bisnis : Jurnal Ilmiah Ekonomi Dan Bisnis*, *15*(1), 24–38. https://doi.org/10.51903/e-bisnis.v15i1.605

Wijanarko, A., Erlanshari, A., & Juliani, K. (2024). Analisis Faktor-Faktor Yang Mempengaruhi Intensi Pengguna E-Learning Menggunakan Metode Utaut 2. *Indonesian Journal of Computer Science and Engineering (IJCSE)*, *1*, 47–54. Retrieved from https://rumah-jurnal.com/index.php/ijcse/article/view/71/69

Wulandari, D. A., Soeprobowati, T. R., & Nugraheni, D. M. K. (2024). Assessing actual usage and satisfaction factors of Microsoft Teams in online learning. *Indonesian Journal of Electrical Engineering and Computer Science*, *34*(2), 991–1001. https://doi.org/10.11591/ijeecs.v34.i2.pp991-1001