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Analysis of the Effect of Information Quality, System Quality, and Support Service Quality on User Satisfaction Levels and Its Implications for Blended E-Learning Continuance Intention to Use in the New Normal Era

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A B S T R A C T

Technology encourages e-learning to improve student learning and performance. The Covid-19 pandemic accelerated e-learning in Indonesian higher education. The learning method has transitioned from complete online learning to blended e-learning in new normal era. This research was conducted to determine the factors that influence students' intention to continue using blended e-learning using the IS Success Model. This research was conducted using a quantitative approach. Sampling was carried out by convenience sampling of 232 active students using blended e-learning in Indonesia. Data analysis was carried out with PLS-SEM. The hypothesis test shows that information, system, and support service quality affect blended e-learning student satisfaction. This research demonstrates that user happiness affects the intention to continue using blended e-learning

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INTRODUCTION

The advancement of information technology has prompted changes in a variety of facets of modern life, including the fields of education, business, and health, to name just a few of these facets (Al-Fraihat et al., 2020). In the realm of education, the proliferation of information technology in the form of the utilization of the internet, mobile devices (such as smartphones and tablets), and laptops has also led to an increase in the utilization of e-learning in the process of education (AlMulhem, 2020). E-learning is a web-based learning ecosystem that integrates a variety of stakeholders with different types of technology and various learning procedures (Cidral et al., 2018). E Learning is made easier and more effective through the utilization of various forms of information technology, which is the foundation of e-learning. E-learning makes the learning process easier by providing a variety of learning formats as well as a number of different ways to expand one's knowledge and learning poses (Kumar Basak et al., 2018).

E-learning, which makes use of information technology, offers a number of benefits, including the flexibility of the learning process, which includes the freedom to choose learning topics, the freedom of learning time, the freedom to express thoughts and ask questions without limitations of study hours, can be accessed anywhere, and improves the process of learning collaboration in groups. In addition, e-learning helps improve the process of learning collaboration in groups (Liaw, 2008). Because students and professors will have quick and simple access to the vast majority of information that is currently available on the internet network, the implementation of an e-learning system at a university will result in an increase in the effectiveness of the dissemination of knowledge. In addition, the use of e-learning will completely eliminate the problem of insufficient classrooms for lectures, which will result in significant cost savings. This is because students will be able to easily attend lectures online without having their comfort disrupted (Adeoye et al., 2020).

In Indonesia, the use of e-learning for learning has increased because, during the Covid-19 emergency, the Directorate General of Higher Education (Ditjen Dikti) also appealed to universities with autonomy to provide flexibility in the implementation of information technology-based distance learning (Hikmah & Chudzaifah, 2020; Wijaya et al., 2020). Entering the new normal period, the adaptation of the use of e-learning in universities in Indonesia has also begun to transition from full online learning to a form of blended e-learning (Hikmah & Chudzaifah, 2020).

Blended e-learning is a method of using educational technology that combines synchronous and asynchronous online learning. Blended e-learning is also known as hybrid online learning. Blended e-learning, as opposed to traditional asynchronous e-learning, combines synchronous and asynchronous forms of online education in order to provide students with access to both forms of online communication (Chen, 2014; Ghazal et al., 2018). Students are able to take advantage of the e-learning system in blended learning, which allows them to take teaching materials, obtain information related to the class, and transfer knowledge in relation to the course work and other topics (Lin & Wang, 2012).

Several research have come to the conclusion that students who participate in blended learning can achieve learning outcomes that are on par with or even higher than those of students who participate in traditional classroom settings or who study solely online. However, success rates vary between fields of study (Hikmah & Chudzaifah, 2020).

The implementation of blended e-learning, despite the many benefits it offers, still faces many challenges, such as barriers to social interaction, administrative problems, academic and technical skills, time, motivation, technical difficulties, and limited access to resources, among other challenges (Ghazal et al., 2018). In addition, although blended e-learning can be a potentially fruitful alternative, lower levels of learning satisfaction may still be a barrier to the effective deployment of blended e-learning systems (Poelmans & Wessa, 2015). Research has not yet shed light on the extent to which e-learning is related to the levels of satisfaction and loyalty experienced by students. This circumstance is supported by the dearth of research work that is being conducted in developing nations (Dangaiso et al., 2022), such as Indonesia.

Many D&M information system success models are utilized in research that is concerned with the assessment of the utilization of e-learning systems (Delone & Mclean, 2003; Delone & McLean, 1992), , It includes a study on the effectiveness of blended e-learning (Chen, 2014; Ghazal et al., 2018; Hermita et al., 2019; Poelmans & Wessa, 2015). An IS can be evaluated in terms of information quality, system quality, and service quality, according to the updated DeLone and McLean IS success model (Delone & Mclean, 2003). A substantial amount of research in e-learning has advanced our understanding of important e-learning success factors such as system quality, information quality, service quality, and satisfaction (Al-Fraihat et al., 2020; Chen, 2014) as a factor influencing the intention to continue using the e-learning system (Chen, 2014).

Even during the Covid-19 pandemic, students in Indonesia began to become accustomed to online learning. Will universities optimize the use of e-learning in the form of blended learning? Given the numerous advantages of blended learning in the student learning process, it is critical to understand the factors that influence satisfaction and intent to continue using blended e-learning in the new normal period.

Thus, the main objective of this study is to investigate the main factors that influence student satisfaction and intention to continue to use blended e-learning based on a conceptual framework adapted from the Information System (IS) success model by looking at the influence of system quality, information quality, service quality, and satisfaction with the intention to continue using blended e-learning in the new normal period.

LITERATURE REVIEW

Information Quality and User Satisfaction

The information quality serves as an indicator of the quality of the course content that is made available via the LMS (Ghazal et al., 2018). Accuracy, timeliness, completeness, relevance, and consistency are the criteria that are utilized in the assessment of a system's information quality within the context of the IS success model. The degree to which a system enhances the capacity of its

users to make better decisions, as well as the efficiency and caliber of the work they produce, will serve as a measure of the system's information's quality for those users (Delone & Mclean, 2003).

According to the findings of research carried out by Cidral et al. (2018) , the quality of the information has a positive influence on the level of satisfaction experienced by users of e-learning platforms in Brazil. Something similar was discovered in the research that was carried out by Poelmans & Wessa (2015) which shows that the quality of the information provided is the most significant factor in blended e-learning participants' levels of satisfaction. If the information is of higher quality, it will be easier to finish the task, which will lead to increased satisfaction with the way the system supports work. As a result, the hypothesis for this investigation is as follows,

H1: Information quality positively affect user satisfaction.

System Quality and User Satisfaction

The level of system quality is an essential component in determining the level of contentment and acceptance that students have with any technology, including e-learning (Ghazal et al., 2018). The ease of use, functionality, reliability, flexibility, portability, data quality, integration, and importance of the system were the factors that were considered when determining the quality of the system. The quality of the working environment and overall job performance were the individual impacts that were measured (Delone & Mclean, 2003).

The findings from earlier studies have demonstrated that an e-learning system with a high system quality can significantly increase the level of satisfaction experienced by users while they are utilizing the system (Al-Fraihat et al., 2020; Cidral et al., 2018; Dangaiso et al., 2022; Hermita et al., 2019; Salam & Farooq, 2020; Suzianti & Paramadini, 2021). When the quality of the e-learning system is up to the users' standards, users are accepted into the system(Ghazal et al., 2018). In most cases, students would rather have access to pertinent information that is of high quality, not difficult to comprehend, and meets their requirements during the learning process (Hermita et al., 2019). As a result, the hypothesis for this investigation is as follows,

H2: System Quality positively affect user satisfaction

Support Service Quality and User Satisfaction

Learners' satisfaction with and behavioral intention toward an e-learning system can be predicted by the quality of the support service that is provided. Learners will likely have a high level of acceptance and satisfaction with e-learning if they are able to obtain adequate and superior support services from the help desk or services administrators of the e-learning system. It is likely that such a high quality of support services will lead to a high level of acceptance of e-learning among learners(Chen, 2014). According to the findings of research that was conducted by Salam & Farooq (2020) , the level of user satisfaction with an e-learning information system is positively influenced by the quality of the system that is used behind the scenes. A student's level of satisfaction with

education management information systems (EMIS) can be increased if the student has access to online help and high-quality service in the event that the student experiences any issues while using the EMIS. Studies carried out by Al-Fraihat et al. (2020), AlMulhem (2020), dan Dangaiso et al. (2022). As a result, the hypothesis for this study is as follows,

H3: Support service quality positively affect user satisfaction

User Satisfaction and Continuous Intention

The satisfaction of students is an indicator of both happiness and agreement with the use of the system (Ghazal et al., 2018). Learner satisfaction is one indicator of a product's overall level of success (Cidral et al., 2018). According to the findings of a study that was carried out by Lee (2010), a user's level of satisfaction is the single most important factor in determining their future plans regarding e-learning. In addition, the findings of the study that Chen (2014) carried out regarding the implementation of blended e-learning among nurses demonstrate that the degree of satisfaction that is experienced by users is a factor in determining whether or not they will continue to make use of e-learning. The study was carried out among nurses. Students will continue to utilize e-learning so long as they are content with it and will remain devoted to a MOOC (Massive Online Open Course) if it satisfies their requirements (Salam & Farooq, 2020; Wan et al., 2020). In order for students to have a greater desire to keep utilizing MOOCs once they have reached a level of satisfaction and confidence that utilizing MOOCs might boost their overall academic performance (Daneji et al., 2019). Thus, the hypothesis in this study is,

H4: User Satisfaction positively affect continuous intention

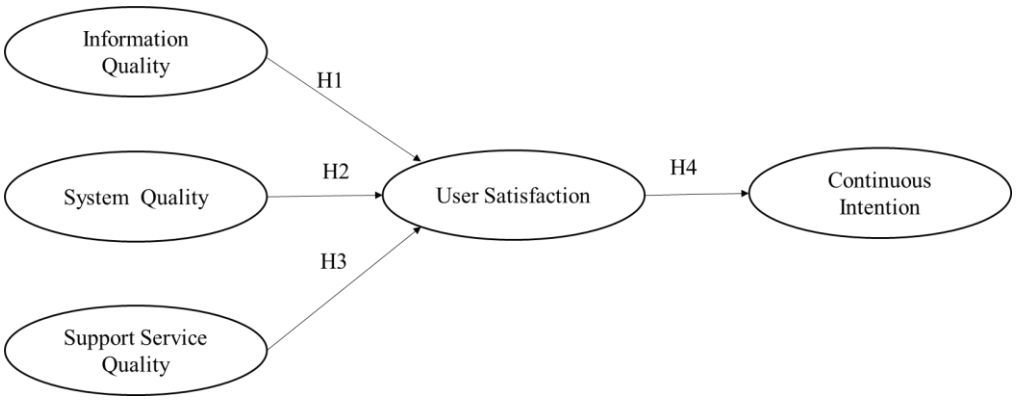

Figure 1. Conceptual Framework

METHODOLOGY

To test theoretical models and research hypotheses, quantitative methods are used in this study. Furthermore, in the new normal era, this study used non-probability sampling with convenience sampling techniques on 232 active student respondents who used blended e-learning in their learning process.

Measurements from previous studies were used in this study. The information quality variables are measured using research conducted by (Ya-Ching Lee (2006) and Lee et al. (2009). The measurement of System Quality Variables are taken from research conducted by Pituch & Lee (2006), and Cho et al. (2009). The support service Quality variables were measured using research from Cho et al. (2009), Lee (2010), and Ozkan & Koseler (2009). User satisfaction variables adapted from Bhattacherjee (2001a), and Bhattacherjee (2001b). Finally, for the measurement of continuous intention variables, Bhattacherjee (2001a), Bhattacherjee (2001b), and Lin & Wang (2012) were used. All of the questions in the study were measured using a Likert scale with a seven-point of scale, ranging from 7 (strongly agree upon once) to 1 (strongly disagree).

Data is collected using Google forms, which are distributed with the assistance of teaching lecturers who use the blended e-learning method in the learning process. In this study, data was analyzed using the composite-based Structural Equation Modeling (SEM) method, also known as Partial Least Squares SEM (PLS-SEM). Meanwhile, SmartPLS software version 3.0 was used to analyze research data.

RESEARCH RESULT

Descriptive Analysis Result

Here is an analysis of descriptive data in this study. Based on table 1, respondents in this study were students who were mostly female, aged 20-22 years, domiciled in Jabodetabek, majored in Management / business, did not have their own business, and did not have parents who worked as entrepreneurs.

Table 1. Results of Descriptive Analysis

Items	Answer Category	Number	Percentage (%)
Gender	Male	136	58.62%
	Female	96	41.38%
Age	18-20 years old	101	43.53%
	21-23 years old	130	56.03%
	>23 years old	1	0.43%
Study Program	Business Studies	156	67.24%

Non-Business Studies	76	32.76%

Results of Measurement Analysis (Outer) Model

The PLS-SEM analysis is carried out with two stages occurring simultaneously. Analyzing the measurement analysis model is the first thing that needs to be done in order to get started with the PLS-SEM analysis (Outer model). In order to determine the research construct's reliability and validity, an outer model is used in the analysis. Reflective structural models are evaluated using individual indicators of reliability, an internal level of consistency of reliability, and their validity, as stated in Hair et al. (2016).

Cronbach's Alpha (α) value and Composite Reliability (CR) values that were greater than 0.70 were used in this investigation to assess the reliability and consistency of the internal measurements of reliability and consistency (Hair et al., 2011; Urbach & Ahlemann, 2010). According to table 2, the values of Cronbach's Alpha and CR for all of the research constructs are higher than 0.7. As a result, we are able to draw the conclusion that the entirety of the research possesses a high level of reliability.

If a Measurement Model (Outer) has an outer loading indicator value that is greater than 0.7 (Hair et al., 2010), and if it has an average variance extracted (AVE) value that is greater than 0.5, then it is said to have good convergent validity (Fornell & Larcker, 1981). According to table 4, each of the research items has an outer loading value that is less than 0.7, and the average variance extracted from each construct is less than 0.5. (Table 2). Therefore, it is possible to assert that the study possesses a high level of convergent validity value.

In addition, the value of a study's cross-loadings and the matrix value of the Fornell-Larcker criterion correlation are two indicators of the study's ability to discriminate between groups of people. According to table 4, it can be seen that all of the values of the outer-loading indicators on the research construct are higher than the value of the correlation between the research construct and other constructions (Hair et al., 2014, 2016). The validity of the discriminant can also be seen from the correlation matrix for the Fornell-Larcker method. This is in addition to the value of cross-loadings, which is discussed previously. In this case, the AVE value that describes the same construct needs to be higher than its correlation with the other constructs (Fornell & Larcker, 1981). . To put it another way, the value on the diagonal must be greater in the same construct compared to the value on the diagonal in other constructions. It is clear from looking at table 3 that the values along the diagonals are significantly higher than the other values within a column. As a result, the validity of the discriminant utilized in this research is satisfactory. The following is an analysis of the measurement model used in this research, and the results are as follows:

Table 2. Construct Reliability and Validity

Variable	Item	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Information System	3	0.845	0.906	0.764
System Quality	4	0.807	0.873	0.635
Support Service Quality	3	0.906	0.941	0.842
Satisfaction	4	0.914	0.940	0.796
Continuous Intention	3	0.916	0.947	0.856

Table 3. Fornell-Lacker Criterion (Discriminat Validity)

	Continuous Intention	SSQ	Satisfaction	Sys_Qual	Sys_inf
Continuous Intention	***0.925***				
SSQ	0.657	***0.918***			
Satisfaction	0.781	0.748	***0.892***		
Sys_Qual	0.669	0.835	0.746	***0.797***	
Sys_inf	0.639	0.728	0.760	0.777	***0.874***

Table 4. Outer Loadings and Cross Loadings

	Continuous Intention	Satisfaction	SSQ	Sys_Qual	Sys_inf
CI1	**0.926**	0.738	0.614	0.580	0.612
CI2	**0.924**	0.722	0.640	0.672	0.605
CI3	**0.925**	0.704	0.568	0.606	0.555
Satisf1	0.691	**0.873**	0.695	0.706	0.739
Satisf2	0.679	**0.907**	0.700	0.628	0.668
Satisf3	0.657	**0.861**	0.618	0.665	0.616
Satisf4	0.753	**0.925**	0.653	0.662	0.682
SSQ1	0.567	0.671	**0.924**	0.724	0.675
SSQ2	0.669	0.678	**0.898**	0.842	0.650
SSQ3	0.573	0.709	**0.931**	0.733	0.679
Sys_Qual1	0.587	0.649	0.602	**0.802**	0.673

Sys_Qual2	0.516	0.579	0.653	**0.790**	0.633
Sys_Qual3	0.412	0.451	0.644	**0.708**	0.517
Sys_Qual4	0.592	0.666	0.767	**0.877**	0.639
Sys_Inf1	0.561	0.698	0.629	0.686	**0.913**
Sys_Inf2	0.559	0.718	0.712	0.726	**0.900**
Sys_Inf3	0.564	0.563	0.557	0.620	**0.804**

Structural Analysis (Inner) Model.

After it has been determined that the Measurement (Outer) model is valid and reliable, the next step is to carry out a model for the structural analyst (Inner). According to (Hair et al., 2010) , the first thing that needs to be done in order to carry out a structural model test analysis is to assess the collinearity issue. The value of variance inflation factors, also known as VIFs, can be used to identify symptoms of collinearity. If the VIF value is less than 5, this suggests that there may be a correlation issue. All of the retrieved VIF values fall within the acceptable range of thresholds, which is VIF less than 5 (Hair et al., 2014, 2016). The VIF value in this study is in the range of values from 1,666 to 3,819. Thus it can be concluded that this study has no symptoms of collinearity.

In addition, in PLS-SEM, structural models (inner) are based on the predictive capabilities of research models, as seen from the value of the determinant coefficient (R^2), the level of path coefficient significance (Value), and the T Statistical value, in contrast to CB-SEM, which uses measurements of Goodness of Fit (Hair et al., 2014, 2016; Ringle et al., 2018).

According to table 5, the adjustment of this study's R^2 Value for the User Satisfaction variable was 65.9%, and the adjustment for the intention variable to continue using blended e-learning was 60.7%. Both of these figures can be found below. The User Satisfaction variable and the intention to continue using blended e-learning both have high R^2 numbers (Hair et al., 2014, 2016; Henseler et al., 2009).

According to Hair et al. (2014) , a structural model has good predictive power if it has a Q^2 and the value of that variable is greater than 0. This study has a Q^2 value of 0.510, which indicates that information quality, service quality, and support service quality have high predictive relevance for user satisfaction. This is based on table 5, which displays these values. In addition to this, the findings of this research demonstrated a Q^2 value of 0.516, which indicates that the user satisfaction variable possesses a high predictive relevance to the continuous intention to use blended e-learning.

According to the recommendations made by Hair et al. (2016), the bootstrapping algorithm was used to conduct the path coefficient test 5000 times in this investigation. Hypothesis testing in the study was carried out by looking at the values of Statistics β and T. Values β indicate the expected variation in dependent construction for unit variation in independent construction. The higher the β value, the greater the substantial effect on the endogenous latent construction. However, the significance level of the β value must be verified through a T-statistical test (Chin, 1998).

Further, refer to Hair et al. (2014), the study also analyzed the impact size (F2) to establish substantive significance. Statistical significance, such as a P value, can only indicate the existence of an impact but not its magnitude. As a result, both statistical significance (P value) and substantive significance (f2 value) assessments are required for appropriate reporting and data interpretation (Sullivan & Feinn, 2012). Meanwhile, in this study, the magnitude of the effect size of f2 refers to (Cohen, 1988) , which states that values of 0.02, 0.15, and 0.35 reflect small, medium, and large impact measurements, respectively.

According to table 5, each and every one of the study's hypotheses can be accepted. It was discovered that Hypothesis 1, Hypothesis 2, and Hypothesis 3 about the level of user satisfaction attained by blended e-learning are all accepted. This demonstrates that there is a positive relationship between the amount of information quality and the level of user satisfaction in blended e-learning (=0.392, T=3.750, P=0.000, with a moderate effect size where, f2=0.173), as shown by the data. Additionally, system quality also positively affects the level of user satisfaction with blended e-learning (=0.182, T=1.722, P=0.043, with a small effect size; where, f2=0.024), and support service quality also affects the level of user satisfaction with blended e-learning (=0.311, T=2.257, P=0.012, with a small effect size; where, f2=0.083). Finally, the results of the research hypothesis test also show that the level of satisfaction of blended e-learning users also has a positive effect on the desire to continue using e-learning among students (β=0.781, T=20.152, P=0.000, with a large effect size where f2=1.559). In other words, hypothesis 4 in the study is accepted.

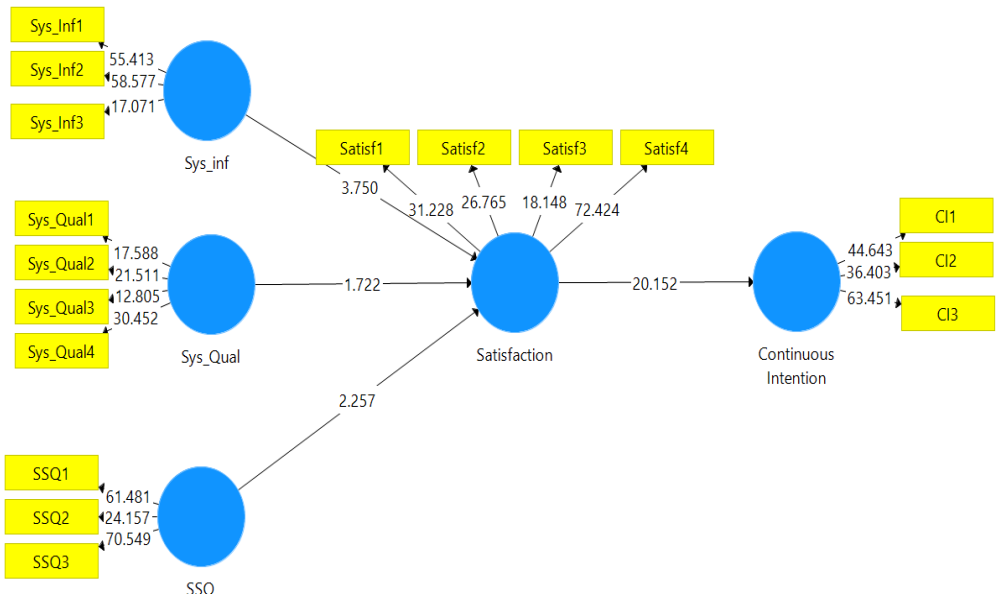

Figure 2. Results of Path Analysis Research

Table 5. Outer Loadings and Cross Loadings

Path Hypothesis	Standardized Beta (β)	T Statistic	P Value	Decision	R^2	f^2	Q^2
Information Quality → Satisfaction	0.392	3.750	0.000	Supported	0.659	0.173	0.510
System Quality → Satisfaction	0.182	1.722	0.043	Supported		0.024	
Support service Quality → Satisfaction	0.311	2.257	0.012	Supported		0.083	
User Satisfaction → Continuous Intention	0.781	20.152	0.000	Supported	0.607	1.559	0.516

DISCUSSION

In this study, the IS success model framework is utilized to conduct an investigation into the factors that influence the continuing intention to use blended e-learning during the transition to the new normal in Indonesia. The findings of the study's test of hypotheses revealed that each of the four hypotheses examined in this study was supported by the data. To put it another way, the quality of the information, the quality of the system, and the quality of the support service all have a positive influence on the level of user satisfaction experienced through blended e-learning. In addition, the findings of this study provide more evidence that a positive effect exist between the levels of user satisfaction and the intention to continue making use of the blended e-learning system.

The results of this study confirm the findings of previous studies that state that information quality has a positive effect on the level of satisfaction of e-learning users (Cidral et al., 2018; Ghazal et al., 2018; Poelmans & Wessa, 2015). In this study, the quality of information was the biggest factor influencing the level of user satisfaction blended e-learning when compared to system quality and support service quality. In the blended learning process, students will use the e-learning system to access learning content. Therefore, the easier it is for students to get and access content related to learning information in e-learning, the higher the level of satisfaction.

Furthermore, the results of this study confirm the findings of previous studies that state that system quality has a positive effect on the level of satisfaction of e-learning users in various countries, such as Zimbabwe (Dangaiso et al., 2022), Yemen (Ghazal et al., 2018), and Brazil (Cidral et al., 2018). In the

blended learning process, students will access the e-learning system when they want to get and re-read learning content that has been uploaded digitally by the lecturer. Therefore, good system quality, easy to use, reliable, not easy to error, has many features that make it easier for students to do assignments and collaborate will be factors that affect the level of user satisfaction.

The findings of this study, which confirm the findings of earlier research, indicate that the level of satisfaction experienced by users of e-learning platforms is positively influenced by the quality of support services received by those platforms (Al-Fraihat et al., 2020; AlMulhem, 2020; Dangaiso et al., 2022; Salam & Farooq, 2020). Therefore, it is very important to have technical personnel available when needed, to have control over the technology, to support students by providing guidance and training on how to use the system, and to be able to provide solutions to technical problems that students face with the e-learning system, and who, as a result, can meet the needs of the students, generate positive feelings in the students, and affect the students' overall satisfaction with the system (Al-Fraihat et al., 2020). Students will have a higher level of satisfaction with the blended e-learning system if it is simpler for them to receive assistance when they are unable to access the online learning platform due to technical difficulties.

In conclusion, the findings of this research show that the level of e-learning users' happiness has a favorable influence on their intention to continue utilizing blended forms of e-learning in the future (Chen, 2014; Daneji et al., 2019). The findings of this study further demonstrate that the level of satisfaction experienced by system users is the component that has the most impact on whether or not they intend to keep utilizing the system (Bhattacherjee, 2001a). In other words, the degree to which students are content with the e-learning platform that is integrated into blended learning determines the likelihood that they will continue to make use of the platform in the years to come.

CONCLUSIONS AND RECOMMENDATIONS

This research was conducted to see the factors that influence the intention to continue using blended e-learning in Indonesia during the new normal period using a theoretical model framework IS success models developed by various scholars to investigate the important factors for satisfaction and acceptance of LMS usage in a blended learning environment (Chen, 2014). The results of this study show that information quality, system quality and support service quality have a positive effect on the level of user satisfaction blended e-learning. The results of this study also confirm that the level of system user satisfaction is something that greatly influences the intention to continue using e-learning in the blended learning process in Indonesia.

This study offers insights for universities to foster e-learning applications and improve student acceptance and satisfaction to continue their blended learning education. To increase student’s satisfaction then, university have to provide good information quality, system quality, and service support quality in order to create and maintenance immerse learning experience in blended learning.

According to the findings of this study, the quality of the information has a considerable impact on how it is used as well as the level of satisfaction that it provides. The content should be easily retrievable, helpful, easily comprehensible, entertaining, and trustworthy. Investing time and money into the material covered in classes is one approach for educational institutions to boost their students' chances of success overall. The results of this study taught us that an improvement in learner satisfaction can be achieved through the use of e-learning systems that offer a variety of methods for assessing learners' progress and encourage learners to connect with one another.

In addition, universities are obligated to maintain a high-quality and dependable system in order to guarantee that their e-learning platforms are user-friendly, simple to access, simple to use, that they offer interactive learning evaluations, and that they permit students to work together on their assignments while they are located remotely. Since the study also confirms that the quality of support services has an effect on the degree to which students are satisfied with their use of e-learning systems, universities need to ensure that they have live support and call centers that are easy for students to get in touch with and that offer real-time solutions whenever students have issues with accessing blended e-learning systems.

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