Analysis of ECSF (E-Learning Critical Success Factor) at Universitas Negeri Surabaya

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Abstract. The use of e-learning has become common in educational institutions. This is further supported by the obligation to implement online education during the COVID-19 pandemic. E-learning is a system that is anticipated to not only replace traditional learning techniques and resources but also to introduce fresh, cutting-edge approaches to the way we currently learn. The goal of this study was to identify the characteristics that contributed to the application of vinesa's success and had an effect on the growth of vines users. Within the Surabaya State University. Applying the DeLone McLean IS Model technique, measurements were done with an emphasis on the system quality factors, information quality, and service quality in information systems. The results showed that the quality of the system and the quality of information significantly affected sustainable use. While the quality of service does not have a significant effect on sustainable use.

Keywords: ECSF · e-learning · Vinesa

1 Introduction

Instead of only replacing traditional learning methods, the e-learning system is anticipated to be able to contribute new creative approaches and strategies to the learning process. E-learning is a teaching method that can help students study independently, boost their excitement for learning, and overcome their passive learning styles [1]. Various platforms can be used to support online learning. Either managed independently by the institution using a Learning Management System (LMS) or provided free of charge by a third party. Online learning can be supported by a variety of platforms. Either free of charge from a third party or independently administered by the school using a learning management system (LMS). Mobile technology, social (community) networks, ubiquitous learning, and individualized knowledge management all influence the nature of online learning services [2]. According to the results of an Indonesian association study conducted in 2020, Google Classroom holds the highest position among distant learning platforms with 26.1 percent, followed by Ruang Guru with 17.1 percent and Learning Houses with 15.2 percent [3]. The user- favourite of the three systems is the one for remote learning. While Zoom (57.2%) is the most popular video call platform in the distance learning platform, it is followed by Google Meet (18.5%), Cisco Webex (8.3%), U Meet Me (5.0%), and Microsoft Teams (2 0.0 percent). In order to meet the
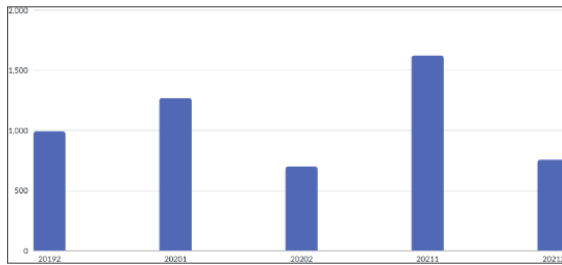
Fig. 1. Number of courses at VINESA.

requirements of the remote learning platform, State University of Surabaya (UNESA) offers a virtual learning platform called UNESA (Vinesa).

A learning management system (LMS) used for teaching and learning is called Vinesa, and it is built on the Moodle platform. As illustrated in Fig. 1, UNESA offered 5327 courses beginning with the 2019–202–2021 academic year during the COVID–19 epidemic. This number is still far from the number of courses issued in the 20192–2021 academic year, namely 20191 as many as 3020, 20192 as many as 2672, 20201 as many as 3016, 20202 as many as 2614, 20211 as many as 3388, 20212 as many as 2479. So the total courses issued are 17189.

The effectiveness of establishing an e-learning distance learning platform depends on the system's, the information's, and the service's overall quality. In order to increase the usage of Vinesa at the State University of Surabaya, it was the goal of this study to identify the success elements of the Vinesa application. Measurements were carried out using the DeLone McLean IS Model approach, focusing on the system quality factors, information quality, and service quality in information systems. The development of the most important elements in the successful use of the distant learning platform employing Vinesa serves as proof that the research objectives were met.

Figure 1 show that the number of courses at VINESA. Based on research conducted by [4], the e-learning success factor is affected by the availability, reliability, response time, and functionality of the design of e-learning. The quality of the information has the biggest impact on students' intention to utilize, with system quality coming in second [4]. Furthermore, research conducted by [5], according to the findings, both the system's and the information's quality have an impact on how well e-learning systems are used. User satisfaction is impacted by information quality, while success is impacted by system use and user pleasure with the e-learning system [6–8]. In addition, the constituent indicators, such as time savings, cost savings, increased learning, ability empowerment, academic success, and perceived success of the whole system also affect the success [9, 10].

2   Methods

Figure 2 illustrates how the DeLone and McLean models were employed in this investigation. This model is used to measure the success of implementing information systems.
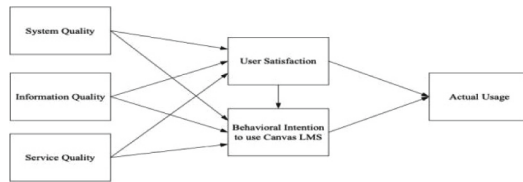
Fig. 2. DeLone McLean IS Model.

The DeLone and McLean IS models are employed in this study's variables, and numerous indicators have been developed that are tailored to the circumstances in Vinesa.

Table 1 provides comprehensive descriptions of variables and indicators. The research was conducted at UNESA on 93 students who took classes using Vinesa. Respondents were given a list of questions online using a google form. Respondents provided their responses for each topic by selecting an evaluation of Vinesa's system

Table 1. Variable indicator

Variable	Mnemonik	Indicator
System Quality	SQ1	Availability
	SQ2	Reliability
	SQ3	Response
	SQ4	Convenience
Information Quality	IQ1	Easy to understand
	IQ2	Relevant
	IQ3	Security
Service Quality	ServQ1	Guarantee
	ServQ2	Responsive
	ServQ3	Skilled
	ServQ4	Empathy
User Satisfaction	US1	Function
	US2	Learning Process
	US3	Satisfaction
	US4	Feature
Behavioral Intention	BI1	Intention to Use
	BI2	Willingness to Persuade
	BI3	Desire for Increased Usage
	BI4	Overall Satisfaction
Actual Usage	AU1	Usage Increase
	AU2	Function Enhancement

Table 2. Likert scale

Assessment Criteria	Score
Strongly Disagree	1
Disagree	2
Agree	3
Strongly Agree	4

quality, information quality, and service quality. Respondents poured their perceptions and the Linkert scale into Table 2.

Partial Least Square (PLS) was used to perform statistical analysis. Validity and reliability tests were conducted to analyze the model. Then a structural model test was conducted to determine the significance and research hypotheses. The following are the theories posed in this study:

H1: User satisfaction will be positively impacted by the system's quality

H2: The effectiveness of the system will positively affect behavioral intent to use

H3: User happiness will increase as information quality increases

H4: Information quality will have a favorable impact on behavioral intentions to use

H5: User satisfaction will rise as a result of improved service quality

H6: The level of service will have a favorable impact on usage behavior intention

H7: User satisfaction will have a favorable impact on usage behavior intentions

H8: Actual utilization will be positively impacted by user happiness

H9: Intention to use behavior Vine will have a favorable impact on real use

3   Results and discussion

3.1   Outer Model Testing

The validity and dependability of the link between latent variables and indicators are assessed using the outer model test (loading factor). When the loading factor exceeds 0.70, it is deemed legitimate. Figure 3 displays test outcomes for the outer model.

3.1.1   Convergent Validity

The indicator's validity when used with the variable is assessed using the convergent validity value. If the loading factor value is more than 0.7, the indicator is considered to be genuine. The results of the convergent validity test are shown in Table 3.
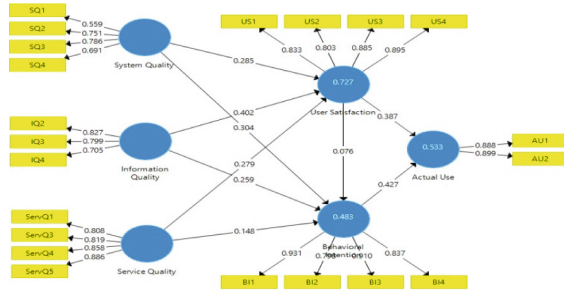
Fig. 3. Outer model test result.

Table 3. Convergent validity test result

Aspect	AU	BI	IQ	ServQ	SQ	US
AU1	0.888					
AU2	0.899					
BI1		0.931				
BI2		0.798				
BI3		0.91				
BI4		0.837				
IQ2			0.827			
IQ3			0.799			
IQ4			0.705			
SQ1					0.559	
SQ2					0.751	
SQ3					0.786	
SQ4					0.691	
ServQ1				0.808		
ServQ3				0.819		
ServQ4				0.858		
ServQ5				0.886		
US1						0.833
US2						0.803
US3						0.855
US4						0.895

Table 4. Composite reliability test result

Variable	Composite Reliability
Actual Usage	0.888
Behavioral Intention	0.926
Information Quality	0.821
Service Quality	0.908
System Quality	0.793
User Satisfaction	0.915

Table 5. AVE test result

Variable	Average Variance Extracted (AVE)
Actual Usage	0.799
Behavioral Intention	0.758
Information Quality	0.606
Service Quality	0.711
System Quality	0.493
User Satisfaction	0.731

3.1.2   Composite Reliability

Measuring the questionnaire, an indicator variable, is done by calculating composite reliability.

The composite reliability result test in Table 4 shows that the value of each variable is > 0.7. It can be concluded that the stability and consistency of an instrument used are quite high.

3.1.3   Average Variance Extracted (AVE)

The AVE test results in Table 5 show that the variable has a fairly good construct value because it has a value > 0.5.

3.2   Inner Model Testing

The test was run to see how latent variables related to one another. Figure 4 shows the outcomes of the inner model test.
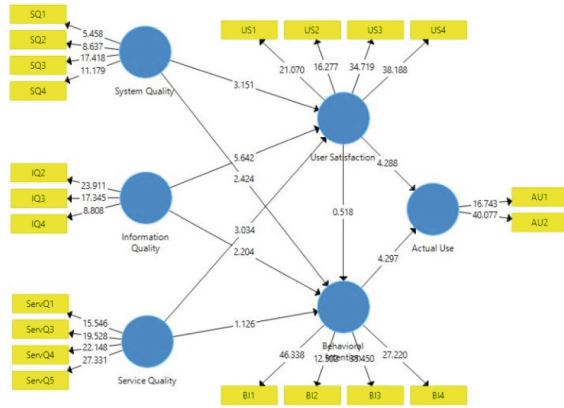
Fig. 4. Inner model test result.

Table 6. R Square test result

Variable	R-square
Actual Use	0.533
Behavioral Intention	0.483
User Satisfaction	0.727

3.2.1 Path Coefficient Testing

The test is carried out to find out if the path value> 0.1 influences the research model. The results state that all variables have a path value > 0.1, which that concludes all variables have a significant effect.

3.2.2 R Square Test

The R Square test is used to see the dependent variable with the assumption that the variable is strong if the measurement value is 0.670, moderate if the measurement value is 0.333, and weak if the measurement value is below 0.190.

The user pleasure variable has a strong measurement value, according to the test findings in Table 6, whereas the actual usage and behavioral intention variables have a moderate measurement value.

3.2.3 T-Statis Test

T-Static test was carried out using the boost trapping method and using a two-tailed test.

The test results on Table 7 show that all variables are acceptable, except US to BI because the T- Static value is > 1.96.

Table 7. T – Statis test result

Variable	T-Statis	P-Value
BI -- > AU	4.242	0.000
IQ -- > BI	2.377	0.018
IQ -- > US	5.509	0.000
ServQ -- > BI	1.152	0.250
ServQ -- > US	3.217	0.000
SQ -- > BI	2.385	0.017
SQ -- > US	3.347	0.001
US -- > AU	4.04	0.000
US -- > BI	0.527	0.599

Table 8. Fit model test result

Fit Summary	Estimated Model
SRMR	0.077
NFI	0.703

3.2.4 Fit Model

The test results in Table 8 state that the SRMR value is < 0.08 which is 0.077, so the model is concluded to be suitable and appropriate. While the NFI value is close to 0.9, which is 0.703, so the model is concluded to be suitable and appropriate.

3.3 Hypothesis Test

Hypothesis testing can be done by looking at the results of calculations in 3 stages, namely Path Coefficient, T-Static, and P-Value. The presentation of the measurement results can be seen in Table 9.

The findings of the hypothesis analysis can be described by the processing results in Table 9:

a. H1: System quality (SQ) will have a positive influence on user satisfaction (US)

Path Coefficient is equal to 0.285, a T-Static is equal to 3.347, and a P-Value is equal to 0.001. This number is greater than 0.1 for the Path Coefficient, 1.96 for the T-Static, and less than 0.07 for the P-Value. It demonstrates that the SQ has a significant impact on the US.

b. H2: System quality (SQ) will have a positive influence on behavioral intention to use (BI)

Table 9. Hypothesis test result

Variable	Path Coefficient	T-Statis	P-Value
SQ -- > BI	0.304	2.385	0.017
SQ -- > US	0.285	3.347	0.001
IQ -- > BI	0.259	2.377	0.018
IQ -- > US	0.402	5.509	0.000
ServQ -- > BI	0.148	1.152	0.250
ServQ -- > US	0.279	3.217	0.000
US -- > BI	0.076	0.527	0.599
US -- > AU	0.387	4.04	0.000
BI -- > AU	0.427	4.242	0.000

The Path Coefficient has a value of 0.304, a T-Static value of 2.385, and a P-Value of 0.017. This value\shows that the SQ relationship has a significant effect on BI.

c.   H3: Information quality (IQ) will have a positive effect on user satisfaction (US)

The a T-Static value is 5.509, the aP-Value value is 0, and the Path Coefficient is 0.402. This result demonstrates that the link between IQ and US has a major impact.

d.   H4: Information quality (IQ) will have a positive influence on behavioral intention to use (BI)

The Path Coefficient's values are 0.259, 2.377 for T-Static, and 0.018 for P-Value. This demonstrates that there is a strong correlation between IQ and BI.

e.   H5: Service quality (ServQ) will have a positive effect on user satisfaction (US)

The Path Coefficient is equal to 0.279, a T-Static is equal to 3.217, and a P-Value is equal to 0. This figure demonstrates that the ServQ connection has a big impact on the US.

f.   H6: Quality of service (ServQ) will have a positive influence on behavioral intention to use (BI)

The P-Value is 0.250, the T-Static is 1.152, and the Path Coefficient is 0.148. This result demonstrates that the ServQ connection has no discernible impact on BI.

g.   H7: User satisfaction (US) will have a positive influence on behavioral intention to use (BI)

The a T-Static value is 0.527, the aP-Value value is 0.599, and the Path Coefficient is 0.076. This figure demonstrates that the US-BI relationship has no appreciable impact.

h. H8: User satisfaction (US) will have a positive influence on actual use (AU)

The a T-Static value is 4.04, the aP-Value value is 0, and the Path Coefficient is 0.387. This figure demonstrates that the US-AU connection has a big impact.

i. H9: Behavioral intention (BI) to use Vinesa will have a positive influence on actual use (AU)

The T-Static value is 4.242, the aP-Value is 0, and the Path Coefficient is 0.427. This number demonstrates that the BI connection significantly influences AU.

4   Conclusion and suggestion

The three essential components for success are system quality, information quality, and service quality for using Vinesa as a distance learning medium at UNESA, according to the analysis and assessment findings. Although the results of the analysis of service quality do not affect the user's desire to use Vinesa. This is based on the quality of the system and the good quality of information that Vinesa has provided to users. It is proven by the significant influence between system quality and information quality variables on user satisfaction and the desire to use it to become a habit or continuous use. Further research can combine the two measurement methods, not only measuring the quality of the information system, but also the surrounding environment outside the information system. In addition, research can also be carried out on lecturer users, not only students.

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