

Examining E-Learning Adoption Through the Lens of the Information Systems Success Model: An Empirical Study on Higher Education Institutions in Indonesia

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ABSTRACT

Due to the outbreak of COVID-19, learning institutions in Indonesia have been forced to switch to e-learning. E-learning is a new way of education that everyone had to adopt. To ensure the continuity of teaching and learning activities, higher education institutions (HEIs) need to explore ways to increase the quality of e-learning systems. The paper aims to understand the quality factors that influence e-learning adoption in Indonesia. The proposed framework is validated with 753 students from four universities located in different regions of Indonesia. Data were analysed using Statistical Package for the Social Sciences (SPSS) software. The findings show that a relationship does exist between information quality and e-learning adoption. However, system and service quality did not indicate any significant influence on e-learning adoption.

Keywords: Information Quality, System Quality, Service Quality, E-Learning Adoption

1. Introduction

COVID-19 has caused educational disruptions around the world. In March 2020, all educational institutions, including schools, colleges, and universities, were obliged to suspend operations as COVID-19 cases began to rise. As a result of the crisis, there has been a significant trend toward online or remote learning. In Indonesia, approximately 68 million students were affected due to school closures in response to the pandemic (The Jakarta Post, April 7, 2020). Despite the growing importance of e-learning systems, the implementation of E-learning In Indonesia is relatively new and has not been widely adopted (Abidah et al., 2020). The sudden transition to remote learning has presented many challenges to students and educators. Susilana, Hutagalung and Sutisna (2020) conducted a study among Indonesian university students and found that the majority of respondents (71.6 percent) considered online learning was more challenging than traditional face-to-face learning during the COVID-19 pandemic. Poor internet connections and other technical issues can make learning from home less conducive for most students.

E-learning represents the delivery of educational material and learning through digital resources. The flexibility and convenience of online learning make it an attractive learning platform. Scholars have mutually agreed that the successful implementation of e-learning depends on students' willingness to use the systems (Almaiah & Alismaiel 2019; Shawai & Almaiah 2018). Therefore, this research seeks to investigate factors that could facilitate e-learning usage, especially in extreme conditions such as COVID-19.

Since students are the main customers, universities need to give a greater focus to enhance the quality of e-learning services (Martinez-Arguelles & Batalla-Busquets, 2016). The platform includes Google Class-room, Zoom, Webex, and Microsoft (Dash et al., 2021). These technologies provide the HEIs community and the general population opportunities to improve teaching and learning (Maatuk et al., 2021). To understand students' views regarding online learning systems, the effect of quality factors on e-learning usage should be considered. The current study used DeLone and McLean Information Systems (IS) Success Model as a

framework to explore whether E-learning quality dimensions (information quality, system quality, and service quality) play important role in determining E-learning usage in the context of higher education institutions in Indonesia. In addition, it would also be interesting to identify which quality dimension best predicts online learning adoption.

2. Literature Review

Information Quality

Information quality is related to system use (McKnight et al., 2017). Information quality has attributes such as information obtained from a system, accuracy of the information, relevance of information, timeliness, and completeness of the information. E-learning and online education are arguable topics for the investigators. Many scholars trust that online teaching and distance learning are beneficial as they are time-saving and less costly, student-paced understanding, it is accessible by everyone and many more (Bataneh et al., 2021; Chen, 2010; Smart & Cappel, 2006; Traxler, 2018; Wu et al., 2011). The usage of e-learning system offers several benefits for students, instructors, and universities such as increase the quality of teaching and learning, as well as an improvement in the interactions among students and instructors (Almaiah & Alyoussef, 2019). This study views the benefits derived from e-learning system. It investigates how e-learning systems help educational institutions facilitate student enrolment, enhance reputation of their educational system, respond quickly to change, and lower costs. However, there are consistent measures of information quality for E-learning success as follows: Relevance, Usefulness, Under-standability, Accuracy, Reliability, Currency, Completeness, Timeliness. In his research (Traxler, 2018), online teaching could spread admission to progressive organizations and lift the learner populace's diversity.

H1: Information quality has a significant and positive effect on e-learning adoption.

System Quality

System quality is a measurement of the information system process that focuses on the results of the interaction between users and the system. Talidong & Toquero (2021) indicated that distance education is the use of different tools, techniques, and means of learning that differ in their form, style, and tools from face-to-face education, with different in performance and technology. The need for distance education appeared due to the need to cope with current situations. Distance education was the way to do so. The quality of the system has attributes such as equipment availability, equipment reliability, ease of use, and response time are the determining factors why an information system is used or not used (Aldholay et al., 2018; Dreheeb et al., 2016). E-learning involves the usage of modern technology to impart learning; thus, the present study needs to investigate how the end-user accepts much E-learning portal success.

Ozudogr (2021) conducted a study aimed at investigating the problems faced by pre-service teachers in the distance education process, which has been implemented during the COVID-19 pandemic. The researcher used interviews to collect data (Alnasraween, et al., 2022), The study sample consisted of 241 pre-service teachers and technical The study results showed that the pre-service teachers mainly faced problems such as the lack of time spared for live courses regarding "implementation", failure to establish communication with friends regarding "student", absence of internet regarding "impossibility", sound problems regarding "technical" and lack of communication regarding "instructor".

H2: System quality has a significant and positive effect on e-learning adoption.

Service Quality

Aldholay et al. conducted research on online learning to transformational leadership, and compatibility -which affect user satisfaction and actual usage that in turn affect performance impact. Initially, ten dimensions were used to measure service quality, which later transformed into five named; tangibles, reliability, responsibility, assurance, and empathy. This updated model of D&M Model found very useful for evaluating the success of different types of technologies related application.

A high quality IS is a system that reaches the needs and expectations of users. To qualify as a good IS, it needs a well-designed system, providing and developing various assistance and information. A provider that delivers and maintains the IS is a crucial role to success in satisfying users.

The system administrator also can improve its service through periodic interaction and from user feedback. The service quality can be measured by interactivity, functionality, and responsiveness to fulfill user expectations and satisfaction (D. Abrego-Almazán et al., 2019). In the e-learning system, five main factors represent service quality: administrative and support, instructor quality, accuracy, course materials, and security (L. Pham, et al., 2018). Good service quality certainly will bring a positive impact on user satisfaction and performance. Therefore, service quality becomes one of the main aspects to be considered as a success of IS. To reach a good service of IS in education, universities have to improve e-learning quality. The improvement can be performed through evaluation based on students' experiences and perceptions.

H3: Service quality has a significant and positive effect on e-learning adoption.

Figure 1 below depicts the research framework of the study.

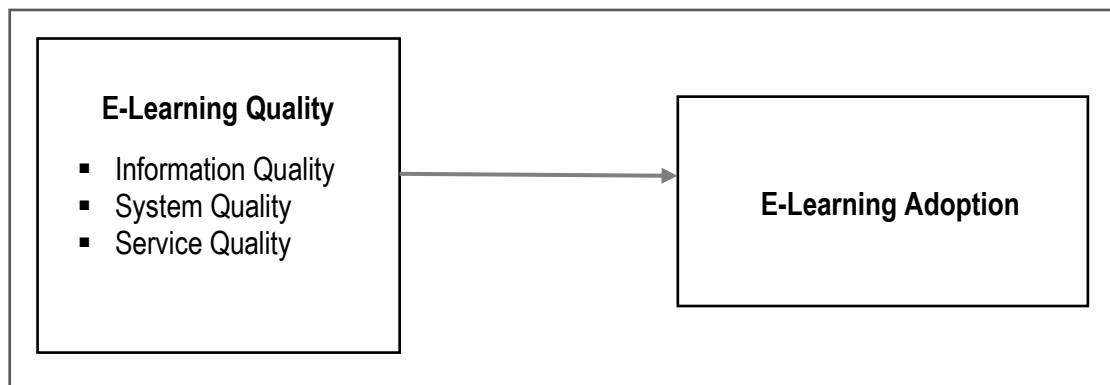


Figure 1. Research Framework

3. Research Methodology

Sample and Data Collection

The population for this study consisted of students who are pursuing tertiary education in Indonesia. This study was conducted in four universities, namely Universitas Medan Area (Medan), Universitas Indonesia (Jakarta), Universitas Airlangga (Surabaya), and Universitas Hasanuddin (Makasar).

Due to the COVID-19 outbreak in Indonesia, all teaching and learning activities were carried out online. The Google Form platform is used to disseminate online surveys since researchers are unable to meet with respondents in person. Data were gathered between 28 March and 18 July 2021.

As the targeted population for this study was university students who were users of E-learning, question 7 was formulated to ask respondents whether they are currently using online learning. Respondents who ticked “No” were excluded from the study sample. After the screening process, 753 were usable for this study. The majority of respondents (72.8 percent) were between the ages of 18 and 22. 81.5 percent of participants enrolled in a bachelor's degree programme, while the remaining 18.5 enrolled in a master's degree programme. In terms of the field of study, students from the business administration area formed the largest groups with 38.8 percent. Table 1 shows the demographic characteristics of the sample.

Table 1: Respondent's Demographic Profile

Demographic Information		Frequency	Percentage (%)
Gender	Male	294	39.0
	Female	459	61.0
Age	18-22 years	548	72.8
	23-27 years	83	11.0
	28-32 years	52	6.9
	33-37 years	35	4.6
	Above 38 tahun	35	4.6
Location	Medan	116	15.4
	Jakarta	458	60.8
	Surabaya	105	13.9
	Makassar	74	9.8
Programme	Bachelor's Degree	614	81.5
	Master's Degree	139	18.5
Education level	First Year	227	30.1
	Second Year	244	32.4
	Third Year	141	18.7
	Fourth Year	141	18.7
Field of study	Business Administration	292	38.8
	Accountancy	99	13.1
	Economics	70	9.3
	Politics	21	2.8
	Psychology	17	2.3
	Information Technology	42	5.6
	Education	70	9.3
	Agriculture	18	2.4
	Medical	115	15.3
Language	9	1.2	
Was your lecturer or	Yes	686	91.1
	No	67	8.9

instructor support sufficient to facilitate E-learning for your course/s?			
Does your university provide adequate training on E-learning?	Yes	639	84.9
	No	114	15.1
From your experience of using E-learning, what are the major problems that you faced?	Slow internet connectivity	401	53.3
	Less effective learning method	68	9.0
	Hard to do discussions with lecturers	53	7.0
	Server problem	52	6.9
	Error problem in E-learning system	47	6.2
	Access problem	44	5.8
	Not familiar with online learning tools	38	5.0
	No problem	27	3.6
	No interest in using E-learning	23	3.1

Measures

The items used in this survey were obtained from previous studies. The scales of E-learning quality and e-learning adoption were measured by the items derived from Mohammadi (2015). The quality scale consists of 15 items that measure the following subscales: Information Quality (6 items), System Quality (5 items), and Service Quality (4 items). Participants responded to the questions on a seven-point Likert scale (1 = Strongly disagree, 7 = Strongly agree).

4. Data Analysis and Results

Before testing the hypotheses, the normality and reliability of the construct were verified.

Test of Normality

Kurtosis and skewness measurements are used to describe the spread and height of normal distribution (Kline, 2016). Kurtosis must be between -7 and +7 to be considered acceptable, while skewness is appropriate from a range of -2 to 2 (Hair et al., 2010).

Table 2: Normality Test Results

Variables	Skewness Statistics	(S.E-skew) ²	Kurtosis Statistics	(S.E- kurt) ²
IFQ	-0.905	0.089	0.585	0.178
SYQ	-0.673	0.089	-0.009	0.178
SVQ	-1.002	0.089	0.786	0.178
EA	-0.780	0.089	0.124	0.178

Note: IFQ = Information Quality, SYQ = System Quality, SVQ = Service Quality, EA = E-Learning Adoption

As presented in Table 2, skewness and kurtosis values were within the acceptable range, indicating that the data had a normal distribution.

Reliability Test

Cronbach's alpha is a measure used to assess the internal consistency of measurements. The reliability test results are shown in Table 3.

Table 3: Reliability Test Results

Construct (s)	Cronbach's Alpha Statistics	N of Items
E-Learning Quality		
Information Quality	0.969	6
System Quality	0.949	5
Service Quality	0.952	4
E-Learning Adoption	0.951	3

As shown in Table 3, Cronbach's alpha values for all the constructs exceeded the threshold value of 0.70 recommended by Sekaran and Bougie (2016). Thus, it can be concluded that all constructs in the model satisfied the requirements for reliability.

Hypothesis Testing

Table 4: Hypothesis Testing Results

Hypothesis	Relationship	β	S.E.	T	Sig.	Results
H1	IFQ → EA	0.122	0.069	1.762	**	Supported
H2	SYQ → EA	0.092	0.069	1.186	#	Not Supported
H3	SVQ → EA	-0.035	0.069	0.487	#	Not Supported

(**) Significant at $p < 0.05$, at one-tailed T statistics value of 1.65

IFQ = Information Quality, SYQ = System Quality, SVQ = Service Quality, EA = E-Learning Adoption

From all the quality dimensions, only information quality had a significant influence on e-learning adoption, with a T value of 1.762. System quality and service quality did not exhibit any significant influence on e-learning adoption. Thus, H1 was supported. While H2 and H3 are not supported.

5. Discussion

The first objective of this study was to investigate whether information quality would be positively related to e-learning adoption. The results demonstrated that information quality exhibited a positive significant relationship with e-learning adoption. Universities must provide services as promised to the students, always treat the student as a customer to serve, and put the interests of students first. Meeting the students' needs and requirements relating to information search, registration and preparation of online courses should be conducted in a quick, accurate and timely manner. Universities must maintain an online office which is in charge of students' inquiries and this office's working hours must be favourable for the students. Universities must develop a student relationship management system with integrated programming algorithms that can automatically answer students' most common questions about e-learning issue

6. Conclusion

The IS Success Model was used as the framework for this study to evaluate the impact of quality factors on the adoption of E-learning among Indonesian university students. The results demonstrated the critical importance of information quality in predicting e-learning adoption.

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