Jurnal Mantik, 6 (1) (2022) 121-130

Published by:Institute of Computer Science (IOCS)

Jurnal Mantik

Journal homepage: www.iocscience.org/ejournal/index.php/mantik/index

Measuring Student Satisfaction in Using Learning Management System at Ed-Tech Company

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A R T I C L E I N F O

Article history:

Received: Mar 02, 2022
Revised: Mar 11, 2022
Accepted: Apr 10, 2022

Keywords:

Ed-tech Company,
E-learning,
Learning Management System,
Online Learning,
IS Success Model

A B S T R A C T

Nowadays, technology and education have a strong relationship. Especially in this pandemic situation which forced people to work and study from home. The education world does not only talk about formal education such as school or college. Many students or employees searching for informal education to develop their skills. Education technology companies offer educational services that are combined with technology to enable the online teaching and learning process. This process supports the current condition which we need to keep learning in the middle of social distancing. This case study aims to evaluate student satisfaction with the learning management system while studying at an education technology company. This research uses IS Success Model to find is there any direct influence from technical system quality, service quality, educational system quality perceived usefulness, and information quality to the user satisfaction toward learning management system. This research took a sample of 70 students at one of the ed-tech companies in Indonesia who already used the learning management system in this company for at least 1 month for their study. The result showed that perceived usefulness and technical system quality are significantly affected user satisfaction.

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1. Introduction

As technology develops, Companies must have the ability to carry out this digital and technological transformation to survive in the future (Ignat, 2017). Recognizing this, companies in every field need to have a concern about technology implementation, including the education field. Wright and Peter stated that the increasing numbers of education platforms and applications showed us the education technology ecosystem is constantly evolving (Wright & Peters, 2017).

Applications of technology for the educational process (Ed-Tech) are technological devices used in the education sector to assist the educational process (Baldominos & Quintana, 2019). It makes many education companies try to implement this technology for their education platform and become ed-tech companies. Education platforms can help ed-tech companies to develop their businesses and reach their goals (Selwyn et al., 2020). An education platform is the form of software used by teachers and students to connect and carry out the teaching and learning process.

Face-to-face meetings are very limited during Covid-19 pandemic. Therefore, Ed-tech companies need to rely on technology that facilitates the teaching and learning process online. During the pandemic, both teachers or lecturers, and students should use technology in learning, one of the technology is Learning Management System (LMS) (Siron, Wibowo, & Narmaditya, 2020).

With LMS, smooth communication between students, tutors, and admin staff is necessary. we cannot avoid technical problems that can occur at any time. This condition is suitable with the statement of Ohliati &

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Abbas (Ohliati & Abbas, 2019) that the quality of service also needs to be considered in the implementation of the LMS because the services provided can affect student satisfaction (Ohliati & Abbas, 2019).

Many factors affect student satisfaction when using LMS. Several studies also confirm that e-learning with LMS has not yet reached its potential and we still can't find a significant advantage between e-learning and face-to-face learning. So that, measuring the effectiveness of e-learning is very important to determine what learning methodologies, techniques, or theories that more effective for e-learning process (Montebello, 2018).

This research is conducted in a new ed-tech company in Indonesia. This company offers in-depth training on digital marketing and data science by bringing in tutors who are proven in this field. The training was carried out for 3 months with the number of students in each batch ranging from 30-50 people. as an ed-tech company, the company always continue improving in every side, including technology side.

TABEL 1.
INFORMATION SYSTEM DEVELOPMENT HISTORY

Date	Information System Development
April 2020	Using 3rd party for the learning system. Namely Google Classroom
April 2021	Started to use independent learning management system for learning process
July 2021	Matured learning management system which has after sales purpose to track student careers and solved their problem to have new job.

The table above showed the system development history of the information system in this company. With the latest development, the companies started to fully manage learning process via learning management system and retain customers through career development features.

Based on direct observations of students in batch 10 who were conducting the learning process in May – July 2021. During the learning process, students were given assignments by tutors on each material, and each student was required to upload the assignment to the LMS so that the tutor could provide an assessment. However, in the process errors often occur where the uploaded file is not read by the system, or the uploaded file is duplicated into several files. This results in students who upload calculated assignments not submitting assignments so that it affects the assessment.

The admin staff who handle the LMS, confirmed that the problem of failing to upload this task file often occurs. When this problem occurs, students must report the problem through the WhatsApp group to the admin staff, so that the admin staff can report the problem to the developer, and finally the developer makes manual repairs so that the student can re-upload his assignment. In this situation, smooth communication between students, tutors, and admin staff is necessary. This admin services should have high attention from ed-tech company's management because the service quality can potentially affect student satisfaction (Ohliati & Abbas, 2019).

Based on this phenomenon, the researchers conducted preliminary research on 30 students who were already using the LMS in this company. Preliminary research conducted by distributing questionnaires related to information quality, technical system quality, service quality, perceived usefulness, and education system quality.

TABEL 2.
PRELIMINARY RESEARCH

Variable	Indicators	Percentage		
		Good	So-so	Bad
Information quality	Availability	63.3%	36.7%	0.0%
Technical System Quality	Navigation	73.3%	26.7%	0.0%
	Facility	43.3%	56.7%	0.0%
Service Quality	Availability	73.3%	20.0%	6.7%
	Reliability	66.7%	26.7%	6.7%
	Responsive	86.7%	6.7%	6.7%
	Assurance	80.0%	20.0%	0.0%
Perceived Usefulness	Improving performance	80.0%	20.0%	0.0%
	Overall usefulness	80.0%	20.0%	0.0%

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Variable	Indicators	Percentage		
		Good	So-so	Bad
	Flexibility	83.3%	16.7%	0.00%
Education System Quality	Communication facilities	46.7%	30.0%	23.3%

The results of the preliminary research related to the LMS showed that there were still students who gave so-so answers as much as 25.45% and bad as many as 3.94%. Especially in terms of the quality of communication where 23.33% of students answered bad and 30.00% answered so-so. The pilot interviews were conducted informally with Learning Manager to know management expectation for LMS. The Learning Manager said that this result still far from their expectations, Management hopes 0% of students who rate poorly and at least 80% of good ratings related to student satisfaction with LMS.

In an ed-tech company, the teaching and learning process during the pandemic is 100% carried out using LMS so that the student satisfaction in using LMS will greatly affect this business going forward. User satisfaction is very important to build students' trust in LMS. if students trust the LMS, they will give a positive attitude and increase loyalty (Dorobat, Corbea, & Muntean, 2019).

2. Method

2.1 Information System

Nowadays, many companies use information systems as the foundation of their business model. According to Berdik, the Information system already become a fundamental role in this era (Berdik, Otoum, Schmidt, Porter, & Jararweh, 2021). This statement matched with Gordon & Otoum statement that Information system refers to hardware, storage, internet utilities, digital application, and other aspects of the technological infrastructure of the organizations, business, schools, government, or other enterprise that uses the notion of big data structure and management (Gordon & Catalini, 2018)(Otoum, Ridhawi, & Mouftah, 2020). Education is one of the potential fields that is greatly influenced by information systems and technology (Education, Amelia, & Retnowardhani, 2021).

2.2 E-Learning

E-Learning can be defined as the use of internet to deliver instructions using digital devices such as laptops, tablets, desktop computers, and smartphones (Authors, 2016). E-Learning is a learning tool through electronic circuits to deliver learning materials and interactions between teachers and students. Nowadays, with various technologies, e-learning is rapidly growing (Education et al., 2021). Especially in the pandemic situation, Amit Joshi and Muddu Vinay stated that the education system already moved to a tech-savvy path because of COVID-19 pandemic. Even though online classes and online assessment can't change conventional teaching, but technology has an important role in education firms and cannot be neglected (Joshi, Vinay, & Bhaskar, 2020).

2.3 Learning Management System

Technology-driven teaching required an educational organization to have an exclusive department responsible to develop technological infrastructure for the learning process (Joshi et al., 2020). One technological infrastructure which can help the learning process is Learning Management System (LMS). LMS can facilitate E-Learning by supporting teaching and learning activities, administration, and communication-related to the learning process (Mehrolia, Alagarsamy, & Indhu Sabari, 2021).

The success of the learning management system needs to be a major concern for educational organizations. Research shows that during a pandemic, students are willing to use LMS to complete their courses if they have a good perception of the benefits of e-learning through the LMS (Raza, Qazi, Khan, & Salam, 2021).

2.4 Information Quality

Information Quality can be defined as the desired output from a system that is made. The desired characteristics of Information Quality are relevance, ease of understanding, conciseness, completeness, timeliness, and usefulness (Bakhit, 2017). This output has several characteristics such as accuracy, timeliness, and completeness metrics. Information quality in LMS is a dimension that provides a summary of course management and content quality (Dorobat et al., 2019).

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2.5 Technical System Quality

System Quality is a technical part of the IS Success Model. DeLone & McLean (1992) defined System Quality as: "desirable characteristics of the information system itself, which produces information". Variables that can be seen from System Quality include ease of use, system flexibility, system reliability, and ease of use, as well as intuition, sophistication, flexibility, response time (DeLone & McLean, 2003).

2.6 Service Quality

Service quality can be defined as the quality of service or support perceived by the user (Ohliati & Abbas, 2019). This service is provided by the IS provider or the IT support team of the organization or company. This support is provided to overcome problems faced by users when using IS. Variables that can measure service quality include response accuracy, reliability, technical competence, and empathy from personal staff. (Alsabawy, Cater-Steel, & Soar, 2016).

2.7 Perceived Usefulness

Perceived usefulness explains the level of confidentiality from a person about a system that can improve the performance of the system (Ohliati & Abbas, 2019). Alsabawy measured perceived usefulness with indicators of increasing productivity, accomplishing quickly, easier study, improving performance, and overall usefulness (Alsabawy et al., 2016).

2.8 Educational System Quality

Different from technical system quality, educational system quality is a system that relies on functionalities that facilitate and develop the teaching and learning process (Mehrolia et al., 2021).

Dorobat et al (2019) used indicators of communication facilities, course community, appropriation of the system with students' learning styles, and evaluation speed on educational system quality. The results of this study indicate that educational system quality has the highest direct impact on student satisfaction (Dorobat et al., 2019).

2.9 User Satisfaction

User satisfaction is the general perception of students about the whole system. User satisfaction is also used to assess student mindset. The components of user satisfaction are used to evaluate the interaction between students and the LMS (Mehrolia et al., 2021).

User satisfaction is very important to build students' trust in LMS. if students trust the LMS, they will give a positive attitude and increase loyalty. Dorobat et.al conclude that user satisfaction and trust are the ultimate metrics for LMS Success (Dorobat et al., 2019).

2.10 Related Works

In a previous study entitled “Moderating effects of academic involvement in web-based learning management system success: A multigroup analysis (Mehrolia et al., 2021)” , the research was conducted to measure the effect of academic involvement on web-based learning management system success. The research model was created by developing the IS Success Model from DeLone and McLean. Quantitative research was conducted with a sample of 477 students who were under-graduate and post-graduate arts, science, and engineering programs in India.

This study confirmed that DeLone and McLean IS Success Model is a useful model for understanding the factors that influence LMS success. The results of this study demonstrated that factors such as information quality, educational system quality, and service quality positively affect student satisfaction with LMS (Mehrolia et al., 2021).

Another previous study entitled “Evaluating E-learning Systems Success: An Empirical Study (Al-Fraihat, Joy, Masa’deh, & Sinclair, 2020)”, investigates the factors that influence the success of e-learning and proposes a model that incorporates the determinants and aspects of e-learning success in developed countries such as the UK.

This study uses the perceived usefulness variable as the dependent variable which has an indirect effect on user satisfaction. Perceived usefulness is influenced by other variables such as technical system quality, information quality, support system quality, learner quality, and instructor quality.

2.11 Methodology

Based on the analysis of previous, a new research model was created to measure student satisfaction in using the LMS. The variables to be used are information quality (IQ), Technical System Quality (TSQ),

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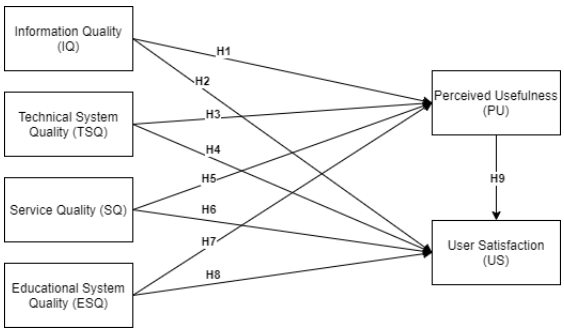
Service Quality (SQ), Educational System Quality (ESQ), Perceived Usefulness (PU), and User Satisfaction (US).



Picture 1. Proposed Research Model

Based on the research framework in figure 1, below are the hypotheses that will be tested:

a. H1: Information Quality (IQ) has a significant effect on Perceived Usefulness (PU).
b. H2: Information Quality (IQ) has a significant effect on User Satisfaction (SU).
c. H3: Technical System Quality (TSQ) has a significant effect on Perceived Usefulness (PU).
d. H4: Technical System Quality (TSQ) has a significant effect on User Satisfaction (SU).
e. H5: Service Quality (SQ) has a significant effect on Perceived Usefulness (PU).
f. H6: Service Quality (SQ) has a significant effect on User Satisfaction (SU).
g. H7: Educational System Quality (ESQ) has a significant effect on Perceived Usefulness (PU).
h. H8: Educational System Quality (ESQ) has a significant effect on User Satisfaction (SU).
i. H9: Perceived Usefulness (PU) has a significant effect on User Satisfaction (SU).

3. Result and Discussion

3.1 Validity Test

The questionnaire from Google form was distributed to students through WhatsApp group. There are 70 students filled the questionnaire. The questionnaires that have been obtained are processed using SmartPLS v.3.3.1 to perform validity testing. The validity test has been completed by comparing the values of the loading factors. Valid indicator is an indicator with loading factor greater than 0.7 and AVE value greater than 0.5. Table 3 below will show the result of validity test..

TABEL 3.
VALIDITY RESULT TABLE

Variable	Indicator Code	Loading Factor	Desc
	TSQ 1	0.704	Valid
Technical	TSQ 2	0.684	Not Valid
System	TSQ 3	0.778	Valid
Quality	TSQ 4	0.791	Valid
	TSQ 5	0.806	Valid
	IQ 1	0.796	Valid
Information	IQ 2	0.865	Valid
Quality	IQ 3	0.705	Valid
	IQ 4	0.732	Valid
	SQ 1	0.907	Valid
Service	SQ 2	0.898	Valid
Quality	SQ 3	0.917	Valid
	SQ 4	0.866	Valid
Perceived	PU 1	0.873	Valid
Usefulness	PU 2	0.847	Valid

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Variable	Indicator Code	Loading Factor	Desc
Educational System Quality	PU 3	0.845	Valid
	PU 4	0.798	Valid
	ESQ 1	0.765	Valid
	ESQ 2	0.792	Valid
	ESQ 3	0.896	Valid
	ESQ 4	0.642	Not Valid
User Satisfaction	US 1	0.762	Valid
	US 2	0.844	Valid
	US 3	0.793	Valid
	US 4	0.869	Valid

There are 2 indicators weren't valid in this study because the indicators have less than 0.7 loading factor namely TSQ 2 and ESQ 4. So that, we remove these indicators from this study. Unless the 2 indicators mentioned above, other indicators have loading factor greater than 0.7, so the indicators were valid for this research.

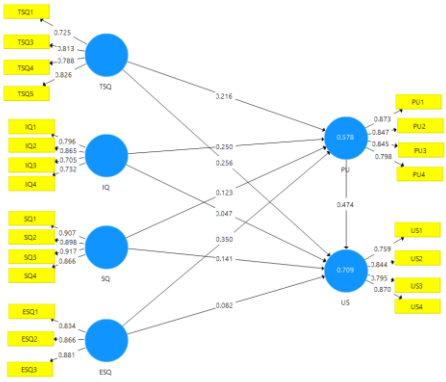

Figure 2. Loading Factor Value After Elimination

Figure 2 shows indicators loading factor after the elimination of TSQ 2 and ESQ 4. From the data above all of indicators' loading factor already greater than 0.7, means that all indicators are valid. Table 4 below will show variable validation based on AVE value. variable will be valid if the variable has AVE value greater than 0.5.

TABEL 4.
VARIABLE VALIDITY TEST

Variable	AVE	Desc
Education System Quality (ESQ)	0.741	Valid
Information Quality (IQ)	0.604	Valid
Perceived Usefulness (PU)	0.708	Valid
Service Quality (SQ)	0.805	Valid
Technical System Quality (TSQ)	0.623	Valid
User Satisfaction (US)	0.669	Valid

Based on table 4 above, all variables have AVE (Average Variance Extracted) greater than 0.5. With this result, all variables are valid for this research.

3.2 Reliability Test

The reliability test were conducted using SmartPLS software. All variables are reliable if the variable has Cronbach's Alpha value greater than 0.7. Based on table 10 below, all variables were feasible to use because all of the variables' Cronbach's Alpha are greater than 0.7.

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TABLE 5
RELIABILITY TEST

Variable	Cronbach's Alpha	Composite Reliability	Result
Education System Quality (ESQ)	0.831	0.896	Reliable
Information Quality (IQ)	0.779	0.858	Reliable
Perceived Usefulness (PU)	0.862	0.906	Reliable
Service Quality (SQ)	0.919	0.943	Reliable
Technical System Quality (TSQ)	0.798	0.868	Reliable
User Satisfaction (US)	0.834	0.890	Reliable

3.3 Hypothesis Test

To test whether the hypothesis is accepted or rejected, the Bootstrapping method has been carried out using SmartPLS to find the significance value of beta coefficients between variables (Original Sample), P-Values, and T-Statistics. There are 3 rules used in this study. The beta coefficient must be in accordance with the hypothesis, T-Statistics must be greater than 1.96, and P-Value must be lower than 0.05 (5%). The table below is the result of the hypothesis testing that has been done:

TABLE 6
HYPOTHESES RESULT

Hypotheses		T-Stat	P-Value	Desc
H1	IQ → PU	2.175	0.030	Accepted
H2	IQ →US	0.387	0.699	Rejected
H3	TSQ → PU	2.059	0.040	Accepted
H4	TSQ → US	2.214	0.027	Accepted
H5	SQ → PU	1.223	0.222	Rejected
H6	SQ → US	1.442	0.150	Rejected
H7	ESQ → PU	3.779	0.000	Accepted
H8	ESQ → US	0.915	0.361	Rejected
H9	PU → US	3.660	0.000	Accepted

a. H1: Information quality has the significant effect on perceived usefulness

These findings further support the idea of previous studies that information quality has a significant effect and positive influence on perceived usefulness (Al-Fraihat et al., 2020) .The result stated with a T- statistical value of 2.175 and a P-value 0.030, the Information Quality Variable was proven to significantly influence perceived usefulness theoretically and empirically. Based on the hypothesis result, LMS Rakamin Academy information quality perceived by the students to have high impact for the usefulness of LMS.

b. H2: Information Quality doesn't have the significant effect on user satisfaction

Contrary to expectations, this study did not find a significant difference between information quality and user satisfaction. This result is different with previous studies that showed information quality variables had a positive influence on user satisfaction (Efiloğlu Kurt, 2019)(Bakhit, 2017)(Mehrolia et al., 2021) but similar with the other previous study (Togar Alam Napitupulu, 2021) that showed information quality doesn't have the significant effect on user satisfaction. This evaluation confirmed that information quality doesn't have significant effect to user satisfaction theoretically and empirically, with a T-statistics value of 0.387 and a P-Value of 0.699. The hypothesis result concluded the initial hypothesis rejected and level of information quality does not much influence user satisfaction.

c. H3: Technical System Quality has the significant effect on perceived usefulness

The result of this study resembled the results of previous studies that indicated that technical system quality directly affected perceived usefulness (Al-Fraihat et al., 2020). The technical system quality has a positive effect on perceived usefulness with a T-Statistics value of 2.059 and P-Value of 0.040. The better technical system quality was greatly contributed to student perceived about LMS usefulness. The evaluation result confirmed that technical system quality theoretically and empirically positively affected perceived usefulness and makes the initial hypothesis accepted.

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d. H4: Technical System Quality has the significant effect on user satisfaction
This finding confirms the association between technical system quality and user satisfaction. These results match those observed in earlier studies that mentioned technical system quality positively influence user satisfaction (Al-Fraihat et al., 2020). The result shows that user satisfaction theoretically and empirically significantly affected by technical system quality with a T-statistical value of 2.214 and a P-Value 0.027. These results accepted the H4. Technical system quality significantly impact students' satisfaction when using LMS in Rakamin Academy.

e. H5: Service Quality doesn't have the significant effect on perceived usefulness
The results of this study were similar to the results of previous studies that showed service quality negatively affected perceived usefulness (Al-Fraihat et al., 2020). This evaluation result confirmed that service quality theoretically and empirically negatively affected perceived usefulness with a T-Statistics value of 1.223 and a P-Value 0.222 which makes the initial hypothesis rejected.

f. H6: Service Quality doesn't have the significant effect on user satisfaction
In contrast with the variable service quality toward perceived usefulness, the service quality hasn't directly affected the user satisfaction. This result is contradictive with previous study that mentioned service quality have the significant effect on user satisfaction (Al-Fraihat et al., 2020)(Mehrolia et al., 2021). But this result support the other previous studies (Ohliati & Abbas, 2019)(Togar Alam Napitupulu, 2021) that mentioned service quality doesn't have significant effect on user satisfaction. The evaluation of user satisfaction when using LMS Rakamin Academy confirmed that service quality theoretically and empirically negatively affected user satisfaction, with a T-Statistics value of 1.442 and a P-Value 0.150 which makes the initial hypothesis rejected.

g. H7: Educational System Quality has the significant effect on Perceived Usefulness
The result of this study have different result with previous study that indicated that educational system quality negatively affected perceived usefulness (Al-Fraihat et al., 2020). The educational system quality has a positive effect on perceived usefulness with a T-Statistics value of 3.779 and P-Value of 0.000. The better educational system quality was greatly contributed to student perceived about LMS usefulness. The evaluation result confirmed that education system quality theoretically and empirically positively affected perceived usefulness, with a T-Statistics value of 3.779 and P-Value of 0.000 which makes the initial hypothesis accepted.

h. H8: Educational System Quality doesn't have the significant effect on User Satisfaction
In contrast with the variable education system quality toward perceived usefulness, the education system quality hasn't directly affected the user satisfaction. This result is contradictive with previous study that mentioned education system quality have the significant effect on user satisfaction (Mehrolia et al., 2021)(Dorobat et al., 2019). The evaluation of user satisfaction when using LMS Rakamin Academy confirmed that education system quality theoretically and empirically negatively affected user satisfaction, with a T-Statistics value of 0.915 and a P-Value 0.361 which makes the initial hypothesis rejected.

i. H9: Perceived Usefulness has the significant effect on User Satisfaction
The results of this hypothesis were similar to the results of previous studies that showed perceived usefulness has directly affected user satisfaction (Al-Fraihat et al., 2020)(Dorobat et al., 2019). The evaluation of user satisfaction of LMS Rakamin Academy confirmed that variable perceived usefulness theoretically and empirically have significant to user satisfaction with a T-statistical value of 3.660 and a P-Value 0.000 which makes the initial hypothesis accepted.

4. Conclusion

This study aims to measure the student satisfaction in using LMS in ed-tech company namely Rakamin Academy. To determine the user satisfaction factors is to use the research model with Information Quality, Technical System Quality, Service Quality, Educational System Quality, Perceived Usefulness, and User Satisfaction.

In the result, we found that there are two variables that affect student satisfaction with the learning management system, namely technical system quality and perceived usefulness because the p-value of the

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two variables is 0.05. perceived usefulness has the biggest influence in increasing user satisfaction, which is 0.474 with a P-Value of 0.000, while technical system quality has an effect of 0.214 with a P-Value of 0.214. These results indicate that the perception of the usefulness of the LMS is the one that has the most influence on student satisfaction in using the LMS.

From the results, it was also found that perceived usefulness was significantly influenced by 3 other variables, namely information quality, technical system quality, and educational system quality. These results indicate that perceived usefulness, which has the highest influence on student satisfaction, is influenced by the quality of information by 0.250 with a P-Value of 0.030, the technical quality of the system is 0.216 with a P-Value of 0.040, and the quality of the education system is 0.350 with a P-Value of 0.000. The education system quality variable has the greatest influence on increasing perceived usefulness.

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