

# Analysis of the Success Factors of the Blended Learning, Learning System at XYZ University

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**Abstract:** Technology is currently developing very rapidly. Many things can be done now thanks to highly developed technology. Education also develops in line with technology, thanks to the internet now students can learn on their own from wherever and whenever they want. By utilizing the advantages of the internet, we now have a Blended Learning system that combines the advantages of a face-to-face learning system with an online learning system. This paper will discuss the application of the Blended Learning system at one of the best universities in Indonesia. This paper will examine what factors influence the success in implementing the learning system in universities.

**Keywords:** Blended Learning, Information System, E-learning, Information System Success, Education.

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## 1. Introduction

With today's technological advances, many new things are created and used to help with our daily work and activities. With this technology, previously impossible things have become possible, such as talking directly (real-time) with people in other cities or islands. The technology most often used today is the internet, with the internet we can get whatever information we want easily and quickly. With the nature of the internet that makes it easy for users to get information, education is also developing with the internet and the proof is that the e-learning system has emerged.

XYZ University is one of the best private universities in Indonesia. XYZ University was founded in 1981 and since then it has achieved many achievements both domestically and abroad. This has spurred XYZ University to prepare its students to be ready to face the world of work and business in the future. With the increasing popularity of XYZ University making many students want to continue their learning process at XYZ, at the time of writing this journal XYZ had around 42306 students and 1445 active lecturers.

However, a problem arises, namely the number of students is increasing but the number of lecturers is still not increasing as many as students and the limited classrooms are adding to the problem for XYZ University. Fortunately, this can be resolved by implementing the Blended Learning (BL) system, BL is a system that combines the advantages of traditional learning (face to face) and e-learning, this is also a system implemented by XYZ university where they optimize their existing e-learning system (LMS) and add video conferencing features that replace meetings face-to-face in the classroom, this allows students to study on their own with the material provided and if there are those who do not understand, they can ask the lecturer during a video conference which replaces face-to-face meetings in class. Which raises the question of whether the BL system is successful and whether XYZ students accept the application of the system. Even though overseas universities are successful in using a similar system, it is not certain that XYZ University will be successful as well.

Because of this, the researcher wants to examine whether the BL system implemented by Binus University has been successfully implemented and if not what has caused the unsuccessful implementation of the system, and if it is successful, what things can be improved to improve this BL system. Coupled with the case of the COVID 19 outbreak, all of our activities have changed completely. many offices and businesses are forced to carry out WFH (Work from Home) or fire employees so that the company does not suffer losses, as well as schools and colleges, they are forced to start implementing e-learning to replace teaching and learning activities in schools into teaching and learning activities from home each.

## 2. Materials and Method

### 2.1 DeLone & McLean IS Success Model

The IS Success model is a theory that provides knowledge about the success of an information system in identifying, describing, and explaining the relationship between 6 components. The most important dimension of success is always evaluated by information systems. This theory was made by **(Delone and McLean, 1992)** and was later refined by the original authors a decade later in response to feedback received from other scientists working in the area.

According to **(DeLone and McLean, 1992)**, the Information System Success Model was developed in 1992, which is based on processes and causal relationships from six measuring dimensions, namely information quality, system quality, service quality, Use; User satisfaction; and net benefits. In the DeLone and McLean model, the dimensions of success are interrelated.

The significant predictors of user satisfaction are system quality and information quality. System quality and information quality are significant predictors of intended use. User satisfaction is a significant predictor for the intended use and individual impact. Intended use is also a significant predictor of user satisfaction and individual impact affects organizational performance. In **(Delone and McLean, 1992)** model of success is based on the process and causal relationships of the dimensions in the model. The Delone McLean system success model does not measure the six components separately but measures the overall effect between one variable and another. **(Delone and McLean, 2003)**.

### 2.2 Blended Learning

Blended learning (BL), or face-to-face integration of online instruction **(Graham et al. 2013)**, has been thoroughly adopted by colleges which are usually called “New traditional model” or the “new normal” way of teaching. BL provides the best opportunity for learning from transition to e-learning. E-learning is defined as a structural learning method using electronic or computer systems to support the learning process **(Yosep et al. 2015)**. BL involves class (or face-to-face) and online learning. This method is very effective and allows increased discussion of information outside the classroom.

Several studies on BL have been conducted to see the potential of BL to increase learning effectiveness. In general, research has found that BL results in improvements in student success and satisfaction as well as a sense of community among students compared to face-to-face encounters. Students who have experienced the effectiveness of BL emphasize the importance of institutional support for redesigning and creating a new system **(Dziuban et al. 2018)**.

## 3 Conceptual Model

This research model has three e-learning constructs that have an important role in the direct determinant of usage and user satisfaction, Information Quality, System Quality, and Service Quality.

- User Satisfaction

User satisfaction is a measure of the successful interaction between an information system and its users. It is also defined as the degree to which learners believe information systems meet their needs. If a system meets user requirements, their satisfaction with the information system will increase **(Freeze et al. 2010)**. Conversely, if the system does not provide the necessary information, they will become dissatisfied. In a study conducted by **(Freeze et al. 2010)** he found in previous studies that system usage had no significant relationship with user satisfaction and sometimes the relationship was not always positive. For e-learning systems, use and satisfaction with e-learning systems are not necessarily related because of the focus and differences that may be inherent in the environment. In **(Delone and Mclean, 1992)** studied articles that address the subject of user satisfaction in their research. They concluded that user satisfaction is widely used as a measure of IS success. As a measure of educational outcomes, students can demonstrate the success of the e-learning system with the perceived value of their learning outcomes. If students are satisfied with the system and its contribution to their learning, the e-learning system will be considered successful.

- System Usage

System usage is an important measure of system success. The system use construct has also been measured as the construct "possible to use" and "intention to use". In **(Delone and McLean, 2003)** argue that the nature, quality, and suitability of system use are important outcomes, and simple measures of time spent on systems are inadequate. The use of the system is considered a necessary condition in which the system / technology can affect individual performance, in this case learning. Such research highlights the importance of using it to evaluate a system in terms of its success. The use of the system, for this study, is defined as the level and nature of the use of e-learning systems. The use of the system increases when the system is considered profitable and decreases when the system is deemed unprofitable. If students feel that by using this system

their ability to learn and the quality of their learning increases, the implementation of the system is considered successful.

- Information Quality

Information quality traditionally refers to the measure of a system's output, that is, the quality of information the system produces, especially in the form of reports. Desired characteristics include accuracy, precision, currency, reliability, completeness, conciseness, relevance, understanding, meaning, timeliness, comparability, and format (Swaid and Wigand, 2009). The main measures used in the information quality variable for e-learning systems are information accuracy, completeness, relevance, content requirements, and timeliness. These aspects are largely controlled by various entities which include IT departments and learning organizations which are responsible for assembling the contents of these systems. This variable is very important in this case, because this system provides learning information to students. If students see that the information (learning material) obtained is incomplete or relevant, it will affect the satisfaction and use of the system because they think the system is unable to provide the information needed. Researchers theorize that information quality will be highly correlated with user satisfaction and system usage.

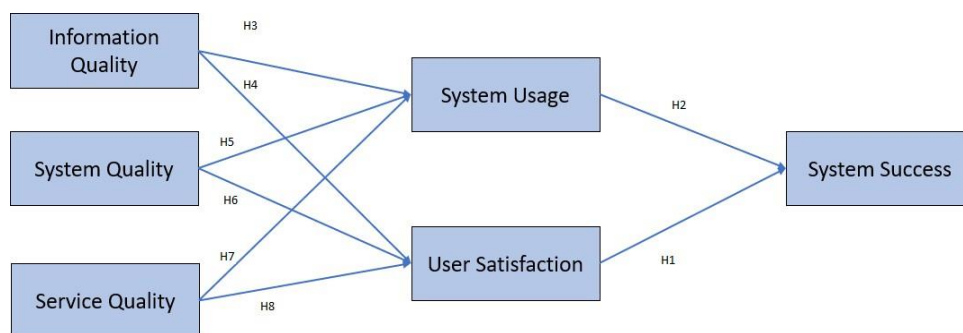
- System Quality

System quality is an individual's perception of system performance. From an e-learning perspective, system quality is measured in terms of the hardware available to the user and the various software applications designed for their intended use and needs. While users are unaware of the network requirements of an e-learning system, e-learning often requires network-to-network communication that requires Internet access. High-quality e-learning systems exhibit the following characteristics: availability, usability, realization of user expectations, ease of learning, and response time (Guimaraes et al. 2009). In keeping with its focus on learning, successful e-learning systems are generally characterized as user-friendly and effective in providing useful feedback to learners. the success of the e-learning system is assessed by learning effectiveness. In a study conducted by (Pei, 2006), quality is one of the main factors for the success of an E-Learning (Pei et al. 2006). In terms of the relationship between system quality and system usage, in (Freeze, 2010) found many studies that stated a direct relationship between system quality and system usage. In (DeLone and McLean, 2003) identified system quality as an important characteristic of users' perceptions of using information technology. This then leads to a direct positive impact on user satisfaction.

- Service Quality

Service quality is very important for satisfaction and use and in the context of service quality (Seta et al. 2018). As with system quality, service quality also affects system usage because people will use a system or application if the services provided meet the criteria they want and expect from a system. In (DeLone and McLean, 2003) identified service quality as an important characteristic of users' perceptions of using information technology. This then leads to a direct positive impact on user satisfaction.

Figure.1 Conceptual Model.



### 3.1 Review Of Related Studies

#### 3.1.1 User Satisfaction Relationship with System Success

In a previous study (Freeze et al. 2010) he looked for factors that influence the System Success variable, in this study he saw student responses about the E-Learning system that was being implemented, showing that the User Satisfaction variable was the determining variable to show success. application of the E-Learning system, this is in line with research (Bano et al. 2017) to see the relationship between the System Success and User Satisfaction variables. The result of this research is System Success achieved through User Satisfaction. Thus, the authors assume and make the following hypotheses:

H1. User Satisfaction has a positive effect on System Success.

### 3.1.2 Relationship between System Usage and System Success Variables

The System Usage variable has a role in determining the success of implementing a system. This is shown in research (Freeze et al. 2010), although the value is not as big as User Satisfaction, this variable is proven to have a role in the successful implementation of a system. In previous studies, many have identified the successful implementation of the system only from users who accept the system or not and whether the system performs its duties as expected. Researchers use the ISS model that has been updated following the study, namely using all available variables to determine System Success, in other studies they use Net Benefit as a measure and only measure success to User Satisfaction to determine whether the system is successful or not and eliminating Service Quality. However, in this study, the researcher used 2 determinants of success used in previous studies, namely User Satisfaction, and System Usage, which have proven to be the main requirements for successful system implementation. The researcher wants to test whether these two variables have been fulfilled in the BL system implemented at Binus University. What researchers do is that all variables are used, and Net Benefit is replaced by another variable, namely System Success. So, the authors hypothesize:

H2. System Usage has a positive effect on System Success.

### 3.1.3 Quality of the System (Information Quality, System Quality, and Service Quality)

Information quality usually refers to the quality of information produced by a system in the form of reports. Desired characteristics include accuracy, precision, currency, reliability, completeness, conciseness, relevance, understanding, meaning, timeliness, comparability, and format (Swaid and Wigand, 2009). This variable is very important in this case because this system provides learning information to students. If students see that the information (learning material) obtained is incomplete or relevant, it will affect the satisfaction and use of the system because they think the system is unable to provide the information needed. Researchers theorize that information quality highly affected with user satisfaction and system use.

System quality is a person's perception of the performance of a system. In the e-learning aspect, the quality of the system will be measured in terms of the hardware available to users and software applications that are designed according to usage needs. According to (Guimaraes et al. 2009), a high-quality e-learning system shows the following characteristics: availability, usability, realization of user expectations, ease of learning, and response time (Guimaraes et al. 2009). The success of the e-learning system is assessed by learning effectiveness. In a study conducted by (Sun et. 2006), quality is one of the main factors for the success of an E-Learning. This is also reinforced by Purtanto's research which proves that system quality affects system use (Putranto et al. 2010).

Service quality is very important for satisfaction and use and in the context of service quality (Seta et al. 2018). As with system quality, service quality also affects system usage because people will use a system or application if the services provided meet the criteria they want and expect from a system. In (DeLone and McLean, 2003) identified service quality as an important characteristic of users' perceptions of using information technology. This then leads to a direct positive impact on user satisfaction. With the explanation above, the author makes the following hypothesis:

- H3. Information quality has a positive effect on system usage.
- H4. Information quality has a positive effect on user satisfaction.
- H5. System quality has a positive effect on System Usage.
- H6. System quality has a positive effect on User Satisfaction.
- H7. Service Quality has a positive effect on System Usage.
- H8. Service Quality has a positive effect on User Satisfaction

## 3.2 Research Method

With the new system implemented by the university, there are still many things that need to be evaluated because this system is a new system, although many large universities use a similar system, it is not certain that what they apply there can be applied in Binus. University. It takes testing and learning from outside universities that have successfully implemented a similar system. There are several obstacles such as slow network to server, lack of socialization about this system and users do not understand the work process of the system.

The evaluation of this BL system will use the IS Success Model (ISS) method. ISS is one of the models used to measure the success rate of the system when the system is implemented. The following are the stages of the research that will be carried out.

- Studying Literature

In the first stage, the authors collect and study literature that discusses the factors that influence the successful implementation of an E-Learning system at universities that have successfully implemented a similar system.

- Identifying Research Problems

The next stage determines the topics to be discussed, the selected topics have been adjusted to the interests and talents of the researcher. Then the researcher identifies the problem that will be investigated further by analyzing the factors that affect the successful implementation of a system.

- Creating Models, Variables and Research Hypotheses

The next stage, the researcher created a research model that was obtained from reading the literature. This model consists of several supporting variables and attributes. The purpose of making a model is to examine the factors that influence the successful implementation of a system. After that, the researcher makes hypotheses related to the model.

- Creating a Questionnaire

After the variables and attributes are determined, the writer then creates a questionnaire based on the existing attributes. The purpose of distributing questionnaires is to obtain data from respondents and then processed and tested to prove the hypothesis that has been proposed in the previous stage.

- Reviewing the Questionnaire

The questionnaire that has been created is then reviewed again. The aim is to ensure that each questionnaire statement made can be understood and understood so that the questionnaire can be filled in as expected.

- Distribute Questionnaire

Before the questionnaire is distributed, the researcher determines the number of population and samples that will be used as respondents. After that, the distribution was carried out to targeted respondents. If the number of respondents has touched the desired number, the distribution of the questionnaire will be stopped and the researcher begins to analyze the data.

- Data Analysis and Processing

At this stage, the authors analyzed the data that had been collected through a questionnaire. Processing data using the Slovin formula then the data is processed to obtain the information needed.

- Conclusion and Suggestions

After the information is obtained in the data analysis and processing stage, the researcher can then draw conclusions and can provide suggestions and input that are expected to assist the university in implementing their system. Stages of this research are conducted by first determining the research model and the problem within it, creating the model and hypothesis, next is formulating a questionnaire, test and validate the result of the questionnaire, analyze the result, and draw the conclusion.

**Table.1.** Variable Measurement.

Variables	Aspect	Indicator	Statement	Source
Information Quality	Precision	Accuracy of information	The system provides exactly the information I need	(Freeze et al. 2010)
	Up to date	Provide up to date information	The system provides up-to-date information	(Freeze et al. 2010)
	Easy to understand	Easy to understand information	The system provides information that is	

			easy to understand	
System Quality	Availability	System availability	The system always available	(Freeze et al. 2010)
	Attractive	Interesting system	The system has an interesting feature for users	
	Fast access	Speed to access the system	The system provides high-speed access to information	
Service Quality	Downloadable	Material can be downloaded	Subject-related document and other information can be downloaded	(Freeze et al. 2010)
	Solving problem	The system helps solve the problem	The system provides a service to help users when a problem arises	(Freeze et al. 2010)
	Help complete the task	The system helps in completing tasks	The system capable to provide the material needed for completing the task	(Seta et al. 2018)
System Usage	Often use	Often used	I often use the system to study	(Freeze et al. 2010)
	Depend	Depending on the system	My learning activities depend on this system	
	Loyal	The desire to continue using the system	I want to use the system for my learning activities	(Freeze et al. 2010)
User Satisfaction	Helpful	Assist learning activities	This system is very helpful in learning activities	(Freeze et al. 2010)
	Supportive	Support learning activities	This e-learning system supports my learning	(Freeze et al. 2010) (Bano et al. 2017)
	Effective and efficient	The system effective and efficient to use	I think this e-learning system is efficient and effective	(Freeze et al. 2010)
System Success	Positive impact	Has a positive impact on	This system has had a positive	(Freeze et al. 2010)

		learning	impact on my learning
	Good performance	Good system performance	Overall, the system performance is good
	Satisfied	Satisfied with the system	I am satisfied with what the system provides

4. Result and Discussion

Evaluation of the Measurement Model (Outer model) was carried out using a co-operative validity test, discriminant validity test, and reliability test. The following is a path diagram of the proposed model and executed in the Smart PLS 3 program.

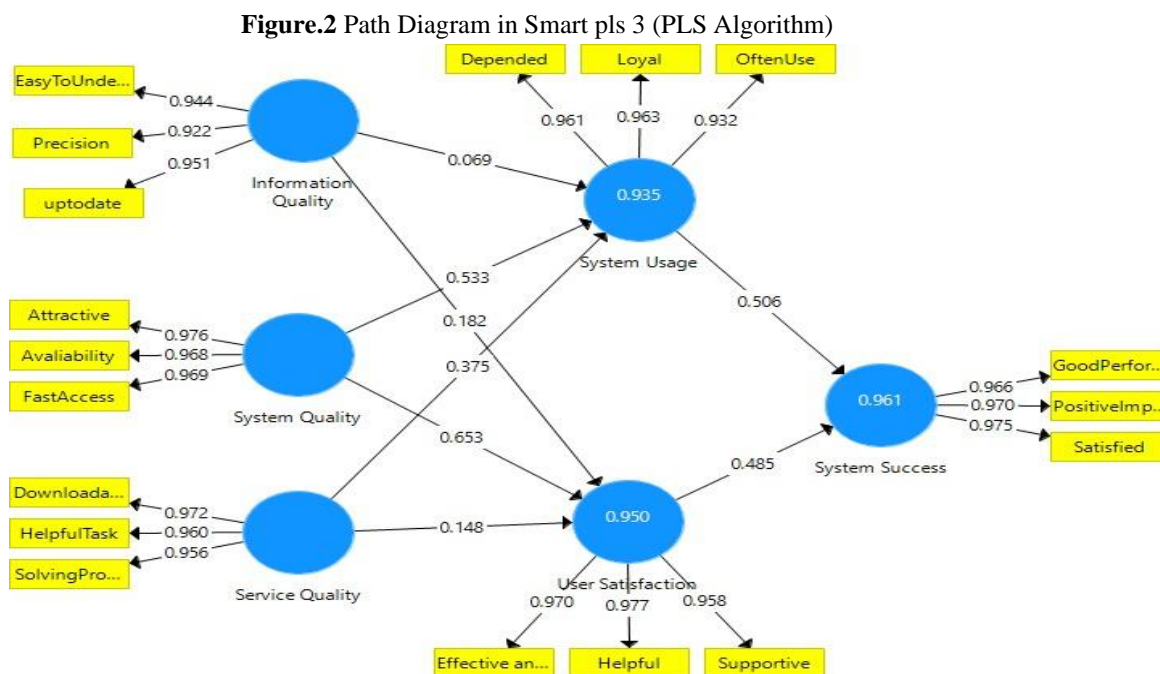


Table.2. Loading Factor.

Variables	Indicator	Loading Factor	Information
Information Quality	Precision	0.922	Valid
	Up to Date	0.951	Valid
	Easy to Understand	0.944	Valid
System Quality	Availability	0.968	Valid

	Attractive	0.976	Valid
	Fast Access	0.969	Valid
Service Quality	Download	0.972	Valid
	Solving Problem	0.956	Valid
	Help Complete the Task	0.960	Valid
System Usage	Often use	0.932	Valid
	Depend	0.961	Valid
	Loyal	0.963	Valid
User Satisfaction	Helpful	0.977	Valid
	Supportive	0.958	Valid
	Effective and efficient	0.970	Valid
System Success	Positive impact	0.970	Valid
	Good performance	0.966	Valid
	Satisfied	0.975	Valid

Based on table 2 above, the validity test of the convergence is carried out by evaluating the value of the loading factor and accepting an indicator with a loading factor  $> 0.7$  (Pan 2011). Based on the loading factor table, all indicators of each variable have a loading factor value  $> 0.7$ . Therefore, the indicators used have met the requirements of the validity of the convergence.

**Table.3.** Average Variance Extracted (AVE)

Variables	AVE	Information
Information Quality	0.882	Valid
System Quality	0.943	Valid
Service Quality	0.927	Valid
System Usage	0.907	Valid
User Satisfaction	0.938	Valid
System Success	0.941	Valid

Based on table 3 above, the validity test of the convergence is indicated by the AVE value  $> 0.5$  (Pan et al. 2011). Based on the AVE table, all variables have an AVE value  $> 0.5$  so that all variables are declared valid.

**Table.4.** Average Variance Extracted (AVE)

Variables	Composite Reliability	Cronbach's Alpha	Information
Information Quality	0.957	0.933	Reliable
System	0.980	0.970	Reliable



Quality			
Service Quality	0.974	0.961	Reliable
System Usage	0.967	0.948	Reliable
User Satisfaction	0.978	0.967	Reliable
System Success	0.980	0.969	Reliable

Based on table 4 above, evaluation of the Structural Model (Inner Model) will be carried out by evaluating the R-squared (R2) value and analyzing the significance value of the path coefficient. The confidence level used was 95%,  $\alpha = 5\%$  and T-table = 1.65. The variable is declared to have a significant effect if T-statistics > 1.65 and p-values <0.05. The following is an image generated from the data collected.

**Table.5.** R Square

Variables	R Square
System Usage	0.935
User Satisfaction	0.950
System Success	0.961

**Table.6.** Path Coefficient

Hypotheses	Original Sample(O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values	Information
Information Quality ◇ System Usage	0.069	0.069	0.083	0.830	0.406	Rejected
Information Quality ◇ User Satisfaction	0.182	0.182	0.090	2.016	0.044	Accepted
Service Quality ◇ System Usage	0.375	0.379	0.117	3.214	0.001	Accepted
Service Quality ◇ User Satisfaction	0.148	0.141	0.119	1.240	0.215	Rejected
System Quality ◇ System Usage	0.533	0.530	0.133	4.010	0.000	Accepted
System Quality ◇ User Satisfaction	0.653	0.659	0.143	4.576	0.000	Accepted
System	0.506	0.507	0.104	4.887	0.000	Accepted

Usage ◇ System Success						
User Satisfaction ◇ System Success	0.485	0.484	0.104	4.662	0.000	Accepted

Based on the table 6 above, Service Quality and System Quality have a significant effect on System Usage because Tstatistics > 1.65 and p-values <0.05. Meanwhile, Information Quality does not affect System Usage because of T-statistics <1.65 and p-values> 0.05. Likewise, Information Quality and System Quality have a significant effect on User Satisfaction because Tstatistics> 1.65 and p-values <0.05. Meanwhile, Service Quality does not affect User Satisfaction because of T-statistics <1.65 and p-values> 0.05. System Usage and User Satisfaction affect System Success.

The R-squared table in table 5 shows that the System Usage value is 0.935, which means that System Usage is influenced by Information Quality, Service Quality, and System Quality by 93.5% and 6.5% by other variables that need further investigation. Meanwhile, the R-squared value of User Satisfaction is 0.950, which means that User Satisfaction is influenced by Information Quality, Service Quality, and System Quality by 95% and 5% by other variables that need to be investigated further. The R-squared value for System Success is 0.961, which means that System Success is influenced by System Usage and User Satisfaction by 96.1% and 3.9% by other variables that need further investigation. Based on the table of output path coefficients, the multiple regression equation in this model is:

$$SU = 0.069 IQ + 0.375 SerQ + 0.533 SQ$$

$$US = 0.182 IQ + 0.148 SerQ + 0.653 SQ$$

$$SS = 0.506 SU + 0.485 US$$

(IQ = Information Quality) (SerQ = Service Quality) (SQ = System Quality) (SU = System Usage) (US = User Satisfaction) (SS = System Success)

But because the Information Quality variable in the System Usage regression equation does not meet the criteria, namely the T-statistic value is 0.830 <1.65 (T-statistic <T-table) and the p-value is 0.406 > 0.05 (p-value > 0.05), as well as in the equation User Satisfaction regression Service Quality variable does not meet the criteria, namely the T-statistic value of 1.240 <1.65 and the p-value of 0.215 > 0.05, then the regression equation in this model becomes:

$$SU = 0.375 SerQ + 0.533 SQ$$

$$US = 0.182 IQ + 0.653 SQ$$

$$SS = 0.506 SU + 0.485 US$$

**Table.7.** Hypothesis Testing Result

Hypothesis	Information
H1 User Satisfaction has a positive impact on System Success	Accepted
H2 System Usage has a positive impact on System Success	Accepted
H3 Information quality has a positive impact on system usage	Rejected
H4 Information quality has a positive impact on user satisfaction	Accepted
H5 System Quality has a positive impact on System Usage	Accepted
H6 System Quality has a positive impact on User Satisfaction	Accepted
H7 Service Quality has a positive impact on System Usage	Accepted
H8 Service Quality has a positive impact on User Satisfaction	Rejected

## 5. Suggestions

Based on the results of the analysis of the research model, the following are some suggestions that have the potential to increase system use, namely:

- In order to increase user satisfaction, it is necessary to know what users have lightened first, asking for feedback from users after using this learning system is the first important thing that must be done to improve the quality of the system.
- The need to make it easier to get the latest information. Currently the information provided is some old information that has not been updated, this makes users have to search the internet to get the information they need and it is not uncommon for them to get wrong or inaccurate information, therefore if the service provider can provide information the right and the latest easily so users will use this system more often.
- The need for improvement of Helpdesk services, there are still complaints that if you use the system to request administrative assistance, the help you get takes very long to receive, so if you need help quickly you must come directly to the university. Perhaps with the increase in the number of administrative employees who can always be contacted during working hours and provide answers to the problems faced will increase student satisfaction in using the system.

## 6. Conclusion

This study uses the ISS model using existing variables to test the System Success variable to determine the success of the new system implemented by the university. There were 8 hypotheses proposed and 6 hypotheses were accepted and 2 were rejected. In measuring this success factor, it can be concluded that:

- Based on the research results, User Satisfaction influences System Success with a T-statistic value of 4.662. H1 accepted.
- System Usage affects System Success with a T-statistic value of 4.887. H2 is accepted.
- The results of the analysis of the model show that System Usage is not significantly influenced by Information Quality because the T-statistic value is 0.830. H3 rejected.
- The results of the analysis of this model show that the quality of information affects user satisfaction, this is indicated by the T-statistical value of Information Quality on User Satisfaction as much as 2016. H4 accepted.
- The use of the system is influenced by the quality of the system; this is based on an analysis of the model with a T-statistic value of 4.010. H5 is accepted.
- User satisfaction is influenced by the quality of the system; this is based on an analysis of the System Quality model to User Satisfaction which results in a T-statistic value of 4.576. H6 accepted.
- The use of the system is influenced by service quality; this is based on an analysis of the module with a T-statistic value of 3.214. H7 accepted.
- The results of the analysis of the model show that User Satisfaction is not significantly affected by Service Quality due to the T-statistic value of 1.240. H8 rejected.

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