The Effect of Learning Quality And Learning Satisfaction on Learning Outcomes in Online Learning

Nailis Sa’adah¹*, & Taufik Hidayat²

¹,²Faculty of Engineering, Universitas Serambi Mekkah, Aceh, Indonesia
*Corresponding Author: nailis.saadah@serambimekkah.ac.id

Abstract
The Covid-19 pandemic has started to hit Indonesia since 2020. The government has implemented online learning for all levels of education to suppress the spread of the virus. There are many differences that students feel when participating in online learning. This study aims to determine the effect of the quality of learning and the learning process on learning outcomes during the implementation of online learning at the Department of Computer Engineering, University of Serambi Mecca. The survey was conducted using a descriptive method. The survey was carried out by distributing questionnaires to be filled in by students of the Computer Engineering Department who had attended online lecture activities. Survey data analysis was carried out using the Linear Regression Method. Based on the results of the analysis, it was obtained a Sig value > 0.05 where partially the variable quality of learning and learning satisfaction did not have a significant effect on the variable Learning Outcomes. The RSquare value is 0.021 or 2.1%. This means that this model can only explain 2.1% of the effect of the variable and the rest is influenced by other variables not examined in this study.

Keywords: Online Learning, Linear Regression Method, Survey.

1. Introduction
In 2020, the Government officially announced that the Covid-19 virus outbreak had entered Indonesia and was declared a non-natural disaster (BNPB, 2020). Online learning is an alternative that can be applied in the era of technology and communication that is overgrowing now (Pusvyta, 2015). The COVID-19 pandemic highlights the need to use online models and applications to achieve the learning goals (Schneider & Council, 2020). Learning through network systems, such as e-learning prepared by universities through campus websites or using online applications, is a learning model that may be used for learning during the COVID-19 pandemic (Sintema, 2020).

The government has made various efforts to suppress the spread of this virus. In the education sector, the government enforces online learning in all educational institutions. This is of course different from the offline learning system as it has been going on so far. Students as parties who have undergone online lectures during the Covid-19 pandemic certainly feel some of these differences, such as in terms of learning satisfaction, learning processes and learning outcomes. The purpose of this study was to determine the effect of learning quality and learning satisfaction on learning outcomes during the online learning process carried out during the COVID-19 pandemic.

The level of student satisfaction is one of the benchmarks for the quality of e-learning. The level of student satisfaction using e-learning can show that students enjoy the online learning process. Previously, Tri and Chrisna (2020) had conducted research which aimed to determine the effect of the quality of online learning on learning outcomes and the results were similar and the results showed that the coefficient of determination of the quality of online learning and the level of student satisfaction on learning outcomes was 0.155. This shows that the variables of online learning quality and satisfaction level have a contributing influence on learning outcomes. Quality learning will have a high level of satisfaction for its users. One of the methods used to measure the effectiveness of learning
is end-user computing satisfaction (EUCS). EUCS is an assessment of all information systems or applications that are run by customers of a system/application related to the proficiency in using the application. Proficiency in using the application is calculated to obtain information on whether the application being run is efficient and suitable as expected (Aggelidis & Chatzoglou, 2012).

The EUCS variable consists of:

a) Content (CON) CON in this study is applied as an assessment of customer satisfaction which is studied from the perspective of the content of an application. This criterion assesses whether the application creates information that matches customer needs (Fitriansyah & Harris, 2018).

b) Accuracy is the accuracy between the data displayed in e-learning with the syllabus of vocational learning media. Accuracy includes the accuracy of the data generated by the information system, the integrity and integrity of the resulting data, limited user access rights and others (Asti, 2018).

c) Form is a form of e-learning vocational learning media, such as e-learning user satisfaction from the form side seen from the availability of space to access materials, collect assignments, space to see task grades, and space to communicate with each other (Asti, 2018).

d) Easy of use is the ease of using e-learning vocational learning media. Ease of use measures satisfaction or user friendliness in using e-learning such as ease of access, ease of downloading material attachments, ease of uploading assignments, ease of knowing task status, and ease of obtaining e-learning operating guidelines (I. Purwandani, 2018).

e) Timeliness or timeliness is a measurement of the level of student satisfaction in terms of the timeliness of online learning. The timeliness of e-learning in providing data and information during online learning is measured based on the student's perspective. Timeliness in this study refers to the time required by students in studying the material and collecting assignments provided in the e-learning of vocational learning media. Measurement of time is adjusted to the lecture syllabus (Purwandani, 2018).

The regression method is a statistical method that makes predictions using the development of mathematical relationships between variables, namely the dependent variable \( Y \) and the independent variable \( X \) (Khotimah & Nindyasari, 2017). Multiple linear regression method is an analytical technique that explains the relationship between two or more variables, especially variables that contain cause and effect, which is called analysis. This model assumes a straight line relationship to the dependent with each predictor (Janie, 2012). The dependent variable is the effect variable or the influenced variable, while the independent variable is the cause variable or the influencing variable (Kusumawati, et al., 2017). Regression analysis is a statistical method that observes the relationship between the dependent variable \( Y \) and a series of independent variables \( X_1, ..., X_p \). The purpose of this method is to predict the value of \( Y \) for a given value of \( X \).

The simple linear regression model is the simplest regression model that has only one independent variable \( X \). Regression analysis has several uses, one of which is to predict the dependent variable \( Y \) (Smadi & Nour, 2012).

This correlation and multiple regression analysis is an analysis of the relationship between one dependent variable and two or more independent variables. If there is more than one independent variable to estimate the value of \( Y \), the first-order equation of the equation is called a regression surface, for example \( Y = a + bX + cZ \). \( Y \) is a linear combination of \( X \) and \( Z \). The constants \( b \) and \( c \) are called the regression coefficients. There are times when \( a \), \( b \), and \( c \) are replaced with \( a' \) and \( X_1 \) and \( X_2 \) (Arikunto & Suharsimi, 2013). In regression analysis, both simple regression (with one independent variable) and alternate regression (with more than one independent variable) there are three basic pillars that must be sought, namely:
1. Regression line, which is a line that states the relationship between the variables.
2. Standard error of estimate, which is a price that measures the scatter of each point (data) against the regression line. Or is the standard deviation of the dependent prices (Y) to the regression line
3. The correlation coefficient (r), which is a number that states the close relationship between the variables.

The statistical method that is widely used to analyze data from a designed experiment is the technique of analysis of variance or often called ANOVA. Analysis of variance is a method for examining the relationship between two or more data sets. Analysis of variance is sometimes referred to as the F-test. A feature of analysis of variance is that this model is over-parameterized, meaning that it contains more parameters than needed to represent the desired effects. One type of analysis of variance is one-way analysis of variance or also known as one-way ANOVA (Ndruru, et al., 2014). One-way analysis of variance is the process of analyzing data obtained from experiments with multiple factor levels, usually more than two factor levels. The purpose of this analysis is to identify the important independent variables and how these variables can affect the response.

2. Method

This study uses a survey method with a correlational approach, which is looking for a significant correlation coefficient value of the relationship between variables and the resulting contribution. The population in this study was students from the computer engineering department. The sampling technique used proportional random sampling technique. Proportional random sampling technique is a random sampling technique where every individual in the population has the same opportunity to be sampled. Data collection techniques in this study used a questionnaire technique. The stages of the research are shown in the following diagram:

![Flowchart](image-url)

**Figure 1 : Flowchart**
a. Identification of problems
The problem studied is the influence of learning quality and learning satisfaction on learning outcomes in online learning systems during the Covid 19 pandemic.

b. Data collection
Data was collected using a questionnaire which was distributed to students in the Computer Engineering Study Program. Questionnaires were distributed offline within the Serambi Mekkah University Campus Institutions which were then filled in according to the instructions for filling in.

c. The first stage in the implementation of this research is to collect data. The data collected is questionnaire data from 43 respondents. Respondents consist of students from the Department of Computer Engineering. The measurement used to measure the instrument on the respondents' responses is to use a Likert scale with intervals.

d. At this stage, the independent variable and the dependent variable will be determined. The independent variables consist of learning quality variables and learning satisfaction, while the dependent variable consists of learning outcomes variables.

e. Multiple linear regression analysis
Multiple linear regression analysis as a preference analysis is used to determine the effect of the quality of learning and the learning satisfaction on the learning outcomes of students who experience online learning. Formula used is

$$Y = a + bX + cZ$$

which is then translated into the following formula (Arikunto, 2013):

$$Y = b_0 + b_1X_1 + b_2X_2$$

Which

- $Y$ = Decision
- $X_1$ = Learning quality
- $X_2$ = Learning satisfaction
- $b_0$ = Constant
- $b_1$ = Regression coefficient
- $b_2$ = Regression coefficient

$$a = \frac{\bar{y} - (b_1\bar{x}_1 + b_2\bar{x}_2)}{n}$$  \hspace{1cm} (2)

$$b_1 = \frac{[(\sum x_1^2 \times \sum x_2 y) - (\sum x_1 y \times \sum x_2)]}{(\sum x_1^2 \times \sum x_2) - (\sum x_1 \times \sum x_2)^2}$$ \hspace{1cm} (3)

$$b_2 = \frac{[(\sum x_2^2 \times \sum x_1 y) - (\sum x_1 y \times \sum x_2)]}{(\sum x_1^2 \times \sum x_2^2) - (\sum x_1 \times \sum x_2)^2}$$ \hspace{1cm} (4)

1. Classical Assumption Test
This test consists of normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test. The requirement to get a good regression model is that the data distribution is normal or close to normal. If the data is not normally distributed, it is necessary to transform the data first. Furthermore, a good regression model is a regression model that does not occur multicollinearity, heteroscedasticity, and autocorrelation.
2. Hypothesis Testing

The hypothesis test used is the Partial Test (t test). The t test was conducted to find out whether in the regression model the independent variables partially have a significant effect on the dependent variable (Sulistyono & Sulistiyowati, W, 2017). Testing this hypothesis is to find out whether the influence of the independent variable (learning satisfaction and learning process) has an effect on the dependent variable /b (learning outcomes) or not. The test was carried out by comparing the t value of the independent variable with the t table value of the dependent variable with an error degree of 5% (α = 0.05). If the value of t count ≥ t table, then the independent variable influences the dependent variable. A hypothesis is a temporary conjecture that will still be verified through research. The hypothesis is formed as a relationship between the two variables used in the study. The purpose of preparing hypotheses in research is not only to provide research direction but also to limit the variables used. The hypothesis in this study, namely:

H0: Learning Satisfaction Factors and Learning Processes have no effect on Learning Outcomes.
H0: Learning Satisfaction Factors and Learning Processes affect Learning Outcomes.

The hypothesis test used is the Partial Test (t test). The t test was carried out to find out whether in the regression model the independent variables partially have a significant effect on the dependent variable (Sulistyono & Sulistiyowati, W, 2017). Testing this hypothesis is to determine whether the influence of the independent variables (learning satisfaction and learning process) affects the dependent variable /b (learning outcomes) or not. The test was carried out by comparing the t value of the independent variable with the t table value of the dependent variable with an error rate of 5% (α = 0.05). If the value of t count ≥ t table, then the independent variable affects the dependent variable.

3. Results and Discussions

Normality Test

Table 1. Normality Test

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnov²</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>df</td>
</tr>
<tr>
<td>Unstandardized Residual</td>
<td>.115</td>
<td>43</td>
</tr>
</tbody>
</table>

a. Lilliefors Significance Correction

Based on the Test of Normality data with a total sample of 43, the Shapiro-Wilk test is recommended as a reference to determine whether it is normal or not. From the data above, the Sig value in the Shapiro Wilk column is 0.235, meaning this value is > 0.05 so it can be concluded that the data is normally distributed.

Reliability Test

Table 2. Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.607</td>
<td>3</td>
</tr>
</tbody>
</table>
Reliability test was carried out using the Reliability Coefficient (Cronbach Alpha). The basis for decision making is Alpha > r table = Consistent, Alpha < r table = Inconsistent. Reliability test decision = All questionnaires are declared consistent/reliability, Alpha > r table = Consistent. Based on the Reliability Statistics data obtained from Cronbach's Alpha value of 0.607 where this number is greater than 0.06, so 0.607 > 0.06 is consistent. It can be concluded that the research data is consistent or reliable.

**Validity Test**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean if Item Deleted</th>
<th>Variance if Item Deleted</th>
<th>Corrected Item Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student satisfaction</td>
<td>6.95</td>
<td>1.664</td>
<td>.394</td>
<td>.544</td>
</tr>
<tr>
<td>Quality of learning</td>
<td>7.28</td>
<td>1.206</td>
<td>.603</td>
<td>.213</td>
</tr>
<tr>
<td>Result of learning</td>
<td>7.12</td>
<td>1.439</td>
<td>.294</td>
<td>.711</td>
</tr>
</tbody>
</table>

Based on Item Total Statistics data in the Corrected Item Total Correlation column, the value of r is obtained which is > from the value of r table with (df = N-2 (41) ) which is 0.3008. The validity provisions of an instrument meet the requirements and are considered valid at least 0.5 as an instrument. So the research instrument can be said to be valid, namely the variable Student Satisfaction and Learning Quality, while Learning Outcomes < from r Table so it is said to be invalid.

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.144&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.021</td>
<td>-.028</td>
<td>.43668</td>
</tr>
</tbody>
</table>

<sup>a</sup> Predictors: (Constant), Mutu_Belajar, Kepuasan_Siswa

Based on the values in the Model Summary table, the R Square value is 0.021 or 2.1%. This means that this model can explain the effect of the variables only 2.1% and the rest is influenced by other variables not examined in this study.

**Regression**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>.161</td>
<td>2</td>
<td>.080</td>
<td>.422</td>
</tr>
<tr>
<td>Residual</td>
<td>7.627</td>
<td>40</td>
<td>.191</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7.788</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Dependent Variable: Abs_Res

<sup>b</sup> Predictors: (Constant), Mutu_Belajar, Kepuasan_Siswa

Based on the value in the ANOVA table, the Sig value obtained > 0.05, it can be concluded that simultaneously the variables of Learning Quality and Learning
Satisfaction have no significant effect on the variable Learning Outcomes.

**Coefficient of Regression Model**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.254</td>
<td>.419</td>
<td>.608</td>
</tr>
<tr>
<td></td>
<td>Student satisfaction</td>
<td>.048</td>
<td>.129</td>
<td>.071</td>
</tr>
<tr>
<td></td>
<td>Quality of learning</td>
<td>.054</td>
<td>.111</td>
<td>.092</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Abs_Res

Based on the value in the coefficient table, the Sig value obtained is > 0.05, thus it can be concluded that partially the learning quality and learning satisfaction variables have no significant effect on the learning outcomes variable.

The regression equation model: \( Y = 2.54 + 0.048 X_1 + 0.054 X_2 \)

The two independent variables Student Satisfaction and Learning Quality choose a relationship that is in the direction of Learning Outcomes, meaning that if these two variables increase, learning outcomes will also increase. The equation shows that if the independent variable is considered constant, then the effect of learning quality and learning satisfaction on learning outcomes is 0.254 or 25.4%. In addition to the multiple linear regression equation above, there is a positive value for the regression coefficient of the independent variable X.

A positive X coefficient value means that if there is a change in the X variable, it will cause a unidirectional change in the Y variable. The X\(_1\) regression coefficient (quality of learning) is 0.048 which means that if X\(_1\) (quality of learning) increases by one unit, it will affect learning outcomes by 0.048 units or 4.8%, assuming that other variables are held constant. And The Regression Coefficient of X\(_2\) (learning satisfaction) is 0.054 which means that if X\(_2\) (learning satisfaction) increases by 1 unit, it will affect the quality of Supermall Super Member ownership decisions by 0.054 units or by 5.4%, assuming that other variables are held constant.

4. **Conclusions**

Based on the research results, the variables of learning quality and learning satisfaction have no significant effect on learning outcomes, with a Sig value of > 0.05. The regression equation model: \( Y = 2.54 + 0.048 X_1 + 0.054 X_2 \)

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**References**


