



The Influence of Online Learning Quality Model and Student Satisfaction Level on Learning Outcomes During the Covid19 Pandemic

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Abstract. The COVID-19 pandemic has so much impact, one of which happens in the field of education. The face-to-face prohibition in learning process which is intended to prevent the transmission of COVID-19 forces a breakthrough in educational technology. There are many consequences following up the Circular Letter of the Minister of Education and Culture No. 36962/MPK.A/HK/2020 concerning Online Learning and Working from Home in the Context of Prevention and Spread of Corona Virus Disease (COVID 19). The Faculty of Engineering, Universitas Negeri Semarang is one of the campuses that conducts online learning since the prohibition of face-to-face learning. The implementation of new learning method certainly has obstacles or challenges, both in terms of facilities or human resources. The objectives of this research are: 1) to measure the level student satisfaction towards online learning in terms of tangible, reliability, responsiveness, assurance and empathy aspects. This study uses primary data which is the analysis result of questionnaire. The questionnaires were distributed online by google form. The analytical technique used in this research was Partial Least Square (PLS) with the following procedures: 1) Design of a structural model (Inner Model); 2) Design of a Measurement Model (Outer Model); 3) Goodness of Fit Outer Formative Model; 4) Goodness of Fit Inner. It is then further analysed by using descriptive analysis and causal relationships. The conclusions of this study are: 1) There is a significant influence between the Learning quality variable (X1) on Student Satisfaction (X2), 2) The second hypothesis testing found out that the Learning quality variable (X1) has a significant influence on Student Learning Outcomes (Y), 3) The third hypothesis found out that Student Satisfaction (X2) had a significant influence on student learning outcomes (Y), 4) Next, the indirect effect test was used from several direct influence test results and was obtained from the result of multiplication of two or more coefficients of direct influence that shape it. Based on the theoretical model developed in this study, it shows that indirectly, the Learning quality variable through the Student Satisfaction, had an effect on student learning outcomes of 0.312.

Keywords: Covid-19 · Learning outcomes · Student satisfaction · Online learning

1 Introduction

The Covid-19 pandemic that has been hitting the world since 2020 has forced Indonesia to release a number of policies to cut the spread of the Covid-19 virus and reduce the fatalities. On the other hand, the policy affects the education sector. The physical distancing policy causing the elimination of face-to-face learning activities at all levels. However, this does not mean that learning activities have stopped. Following up on the Circular of the Minister of Education and Culture No. 36962/MPK.A/HK/2020, regarding online.

Learning and working from home in the context of preventing and spreading Corona Virus Disease (COVID 19), all educational institutions prepare facilities and infrastructure as well as the readiness of Human Resources to face these changes. This of course means a change in the learning process, where there will be a migration from normal face-to-face meetings to an online learning system with a work from Home (WFH) model.

Various learning methods are also applicable in online learning. Such teaching learning process can improve learning achievement [1]. In online learning, students will process the information presented by the lecturer online. Online learning is an open and dispersed learning system using pedagogical tools (educational aids), which is made possible through the internet and network-based technology to facilitate the formation of learning processes and knowledge through meaningful action and interaction [2]. Online learning is one form of e-learning. E-learning is a general term used to describe computer-based learning that facilitates anyone, anywhere, and anytime to have more fun, easier, and cheaper learning process by using the Internet [3]. E-learning requires students to learn independently, to take control of content, manage learning sequences. Learning independence in e-learning is in “good” category, where the indicator of learning independence is 70% showing that students already have independence in learning using e-learning method [4]. In e-learning, students are required to be active during the learning process. Students’ active behavior during the learning process can improve their learning outcomes [5]. The selection of learning media that matches the needs of students plays a role in the success of learning. Interactive media using Macromedia Flash is 85.8% more effective than the one using textbooks [6]. Following the instructions of the Ministry of Education and Culture, classes in the Faculty of Engineering of UNNES is conducted online during the COVID-19 pandemic to prevent the spread and transmission of the Covid-19 virus. However, the implementation of online learning must still pay attention to the learning quality so they can meet the expected outcomes. Based on this description, researchers are interested in conducting study related to the influence of the quality of online learning and the level of student satisfaction on learning outcomes during the covid-19 pandemic.

Many factors can affect online learning satisfaction, including technology, ease of accessing and studying material, quality of information, and learning design. Quality, disconfirmation of quality, value and disconfirmation of value have a positive effect on satisfaction. In addition, disconfirmation of usefulness, innovation and optimism, as well as technological readiness and performance are also closely related [7]. Technology literacy is important in online learning. In remote learning, technology is the key to the sustainability of it which can be a liaison between teachers and learners who are separated

by distance. However, technology will be useless if it is not accompanied by technology literate users [8].

The results of this study can provide input regarding the current implementation of online learning. Therefore, the purpose of this study is to determine the influence of online learning activities and the level of student satisfaction with learning outcomes during the covid19 pandemic.

1.1 Learning Quality

The learning quality is a must have item in carrying out learning activities. The learning quality is a result of learning components that properly carry out the duties thus the learning objectives can be achieved.

In the context of the learning quality, which is a service provided to students during learning activities, it can be measured through the level of student satisfaction.

The quality of online learning or e-learning can be determined from several categories, as presented by Harvey and Green, namely; (a) idiosyncrasies, (b) perfection or consistency, (c) fit for purpose, and (e) transformation [13]. The learning quality can also be measured from (a) the suitability of learning, (b) the attractiveness of e-learning, (c) effectiveness, (d) efficiency, (e) learning productivity [14].

- a) The suitability of learning means that the learning activities are in accordance with the learning plan material and the needs of the student environment
- b) Attractiveness, it means the ongoing learning activities allow students to take part in the online learning process, which can be seen from the display of the e-learning itself
- c) Effectiveness means the achievement of learning objectives by students during online learning. In addition, the materials and assignments given are able to help students master the achievement of learning objectives
- d) Efficiency is a measurement of learning activities completion in accordance with the time provided. The efficiency of the quality of online learning is determined from the time provided to study the material and complete the tasks given by the lecturer through e-learning.
- e) Online learning productivity means that students have the opportunity to be actively involved in learning activities. Productivity is also determined from the ability of students to complete the assigned tasks

Observation on the quality of online learning from the perspective of students is expected to provide an assessment of the learning quality itself. In this study, it will be observed whether the e-learning that is implemented has a significant influence on student learning outcomes.

1.2 Student Satisfaction Level

The level of student satisfaction is an important part of learning activities. This is one of the points that determines the quality of e-learning. According to Soopiatin, student satisfaction means student's positive attitude towards the services of universities because

of the compatibility between the expectations of the service compared to the reality they receive [15]. The level of student satisfaction in e-learning can also illustrate that students can follow the online learning process. One method that can be used to measure student satisfaction in online learning is the End-User Computing Satisfaction (EUCS) model. The factors that affect satisfaction in EUCS method are (a) content, (b) accuracy, (c) format, (d) ease of use, (e) timeliness [16].

- a) Content contains the system functions as well as the information generated by the system itself.
- b) Accuracy means the material displayed in e-learning is accurate. Student satisfaction can be seen from the accuracy of e-learning in terms of the suitability of the material and tasks presented in e-learning with the lesson plan.
- c) Form refers to the availability of space to access materials, to collect assignments, to view assignment scores, and to communicate with each other.
- d) Easy of use is the ease of using e-learning, for example, ease of access, ease of downloading materials, ease of uploading assignments, and ease of knowing task status.
- e) Timeliness refers to the time students takes to study the material and to collect assignments provided in e-learning. The time provided is adjusted to the material, depth and breadth

In this study, the item explored was the student satisfaction in learning activities that can be seen from the lecture material provided, the learning media used, existing learning facilities, interactions that occur, and the tasks given by the lecturer which were observed on the effect of the satisfaction level of students who used e-learning on student learning outcomes during the Covid 19 pandemic. The level of student satisfaction is measured using the likert scale. The instrument used to measure the level of satisfaction was a questionnaire using google form.

2 Method

The research looks at the effect of online learning quality (X1) on learning outcomes (Y) and the effect of student satisfaction levels (X2) on learning outcomes, as well as the influence of online learning quality (X1) and student satisfaction levels (X2) on learning outcomes (Y) in 227 students of Faculty of Engineering, UNNES (Fig. 1).

This study uses a quantitative method with a survey design. The data was collected using a research instrument in the form of questionnaire which is valid and reliable.

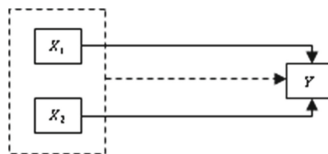


Fig. 1. Research Paradigm

Table 1. Variable Matrix and Research Instrument Indicator

| No | Variable | Indicator |
|----|-----------------------|-----------------------|
| 1 | Learning quality | <i>Tangible</i> |
| | | <i>Reliability</i> |
| | | <i>Responsiveness</i> |
| | | <i>Assurance</i> |
| | | <i>Emphaty</i> |
| 2 | Students Satisfaction | Learning material |
| | | Learning media |
| | | Learning facility |
| | | Interaction |
| | | Assignment |
| 3 | Learning Achievement | Achievement Index |

The data was processed/analyzed using descriptive and inferential statistics with path analysis techniques. The research data from the questionnaire uses a Likert scale with statements range from strongly disagree to strongly agree.

The data was collected by filling out questionnaires which were distributed online using Google Forms. Research variables and indicators are presented in Table 1.

Based on the results of validity testing, it was found that the instruments used to measure the variables of Learning Quality in Online Learning (X1), Student Satisfaction (X2), and learning outcomes (Y) were declared valid where the results of the r value for each indicator ranged from 0.89–0.95 ($r > 0.3$). The testing of the instrument reliability that measures the three variables, which are Learning Quality (X1), Student Satisfaction (X2) and Learning Outcomes (Y) considers the reliable composite value and alpha cronback. The result shows that the instrument is reliable because the apha cronback coefficient index value > 0.6 . In the instrument testing, the learning quality variable is 0.920, while the student satisfaction variable is 0.915 and the learning outcome variable is 0.991.

3 Result and Discussion

3.1 Result of the Research

3.1.1 Description of Research Variables

To determine how the concentration and distribution of respondents' perceptions of these indicators, an assessment of respondents' perceptions was carried out for the Learning Quality variable (X1), Student Satisfaction Variable (X2) and Learning Outcome Variable (Y) (Table 2).

From the perception assessment of Learning Quality variable (X1), an average score of 4,077 was obtained which means it belongs to good category. The Student Satisfaction

Table 2. Respondent’s Perception Goodness Category

| No | Average value | Category |
|----|---------------|-----------|
| 1 | 1.00–1.80 | Not Good |
| 2 | 1.81–2.60 | Less Good |
| 3 | 2.61–3.40 | Average |
| 4 | 3.41–4.20 | Good |
| 5 | 4.21–5.00 | Very Good |

Table 3. Design of Linearity Assumption Test Results

| Relationship among Variables | Assessment Result | | Conclusion |
|--|-------------------|-------------|------------|
| | <i>F</i> | <i>Sig.</i> | |
| Learning Quality (X1) to Student Satisfaction (X2) | 3.847 | 0.000 | Linear |
| Learning Quality (X1) to Learning Outcomes (Y) | 2.402 | 0.000 | Linear |
| Student Satisfaction (X2) to Learning Outcomes (Y) | 4.566 | 0.000 | Linear |

variable (X2) is in good category with a mean score of 3,644. Likewise, the Learning Outcome variable (Y) is in good category with an average of 3.46.

3.1.2 The Analysis of Influence Relationships Among Variables

3.1.2.1 Assumption of Linearity

The linearity assumption test was carried out using the Curve Fit method, calculated with the help of SPSS software (Table 3).

The result of the linearity test analysis shows that all independent variables have a linear relationship with the dependent variable. This is indicated by the value of *F* Count > *F* table (*Sig.* < .05).

3.1.2.2 Normality Assumption

As explained above, the assumption of multivariate normality was tested with the help of AMOS software. If the critical ratio (c.r.) value of multivariate data is less than ± 2.58, the significance is 10%. The data is said to be normally distributed if the critical value of the skewness value of the kurtosis value is below the absolute value of 2.58 and can be rounded up to 3. In general, the value of c.r. skew and c.r. kurtosis is in the range of –3 to 3 so it can be stated that this data has met the assumption of normality. Based on the results of normality testing using AMOS software, it was found that the value of

Table 4. Design of Goodness of Fit Test Results of Structural Model

| <i>Indices Goodness of Fit</i> | | <i>Cut off</i> | <i>Result Value</i> | <i>Conclusion</i> |
|--------------------------------|---|----------------|---------------------|-------------------|
| <i>Absolute fit indices</i> | <i>Chi-Square χ^2 (P)</i> | $P > 0.05$ | 0.000 | Not Fit |
| | <i>RMSEA</i> | ≤ 0.08 | 0.07 | Fit |
| | <i>GFI</i> | > 0.90 | 0.58 | Not Fit |
| | <i>RMR</i> | < 0.08 | 0.03 | Fit |
| | <i>SRMR</i> | ≤ 0.05 | 0.07 | Marginal Fit |
| <i>Incremental Fit Indices</i> | <i>AGFI</i> | ≥ 0.90 | 0.55 | Not Fit |
| | <i>NFI</i> | ≥ 0.90 | 0.93 | Fit |
| | <i>NNFI (TLI)</i> | ≥ 0.90 | 0.95 | Fit |
| | <i>CFI</i> | ≥ 0.90 | 0.96 | Fit |
| | <i>IFI</i> | ≥ 0.90 | 0.96 | Fit |
| | <i>RFI</i> | ≥ 0.90 | 0.93 | Fit |
| <i>Parsimony fit indices</i> | <i>PGFI</i> | > 0.50 | 0.54 | Fit |
| | <i>PNFI</i> | > 0.50 | 0.89 | Fit |

c.r. skew and c.r. kurtosis does not exceed the value of -3 to 3 , so it can be concluded that the research data has met the assumption of normality.

3.1.2.3 Outlier Test

Examination of multivariate outliers from existing data was carried out using the Mahalanobis criteria with $p < 0.001$ criteria. Mahalanobis distance was evaluated using degrees of freedom as much as the number of parameters used, which was 83 with a critical value = 115.88. Based on the results of the outlier test, it was found that the entire value of the mahalanobis d-squared is in the range of 55.95 to 110,092, in the sense that the mahalanobis d-squared value shows a value that is less than the chi-squared value of 115.88. Therefore, it can be concluded that there are no multivariate outliers in this research data.

3.1.2.4 Structural Equation Model (SEM) Analysis

At this stage, A test on the suitability of the model is carried out through a study of various goodness of fit criteria. The following are some designs of conformity index and cut-off values and model test results.

In Table 4, although there are several model indices that are not yet fit, the overall GOF index value can be said to be fit because it has fulfilled 9 GOF criteria and in each indices, either absolute, incremental or parsimony, there is at least one GOF that is fit or fulfilled.

Furthermore, interpretation is carried out for further discussion. The results of the complete analysis can be found in the results of the SEM analysis (Table 5).

Table 5. The Design of the Results of the Direct Effect Hypothesis Testing

| Hypothesis Number | Relationship among Variables | <i>Standardize</i> | <i>CR</i> | <i>t Value</i> | Conclusion |
|-------------------|--|--------------------|-----------|----------------|----------------|
| 1 | Learning Quality (X1) to Student Satisfaction (X2) | 1.04 | 0.92 | 9.02 | Ha is accepted |
| 2 | Learning Quality (X1) to Learning Outcomes (Y) | 0.68 | 0.95 | 10.02 | Ha is accepted |
| 3 | Student Satisfaction (X2) to Learning Outcomes (Y) | 0.30 | 0.95 | 4.48 | Ha is accepted |

In the first hypothesis testing, it was found there was a significant influence between the variables of Learning Quality (X1) on Student Satisfaction (X2). Next, the second hypothesis testing found that the variable Learning quality (X1) had a significant effect on Student Learning Outcomes (Y). Likewise, the third hypothesis testing found that Student Satisfaction (X2) had a significant effect on student learning outcomes (Y).

Based on the theoretical model developed in this study, the results show that the variable Learning quality, through Student Satisfaction, had an indirect influence on student learning outcomes which is of 0.312 (Fig. 2).

3.2 Discussion

The learning quality is one achievement of the education quality. The learning quality is oriented on how to build a learning system that makes students learn well where learning activities are interesting and interactive. Online learning is adjusting to the development of e-learning-based technology. E-learning can facilitate students to learn anytime and anywhere without being limited by distance, space and time. The material accessed by students is not only in the form of verbal but also visual, audio, and motion. According to Milman, the use of digital technology can allow students and lecturers to carry out the learning process even though they are in different places [17].

Online learning is a learning that uses the internet network with accessibility, connectivity, flexibility, and the ability to bring up various types of learning interactions. In addition to these advantages, of course, there are disadvantages, which one of them is when the internet network is not accessible in certain areas or when the internet connection is weak. This bad obstacle makes the online learning hard for students.

In online learning, students can use laptops or smartphones where they can access learning activities, get materials, upload assignments, and others. The study results show that the learning quality affects student satisfaction. The learning quality, which in this case is carried out by lecturers as academic services, covers components such as being tangible, reliability, responsiveness, assurance and empathy that affect student satisfaction. In online learning activities, things that the lecturers do such as using media,

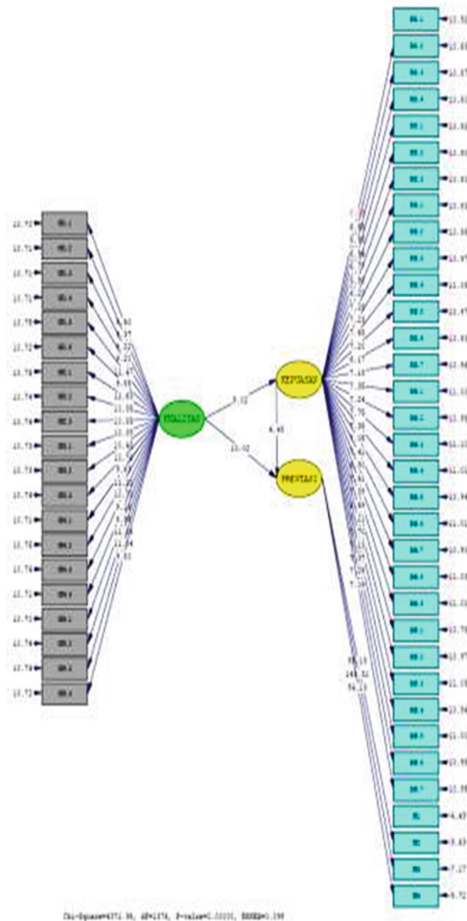


Fig. 2. t-value Test

materials, being able and quick to respond to student needs, having the ability to carry out online learning processes, and having a sense of empathy for students influence the student acceptance attitudes in learning activities and their understanding on the material presented, which ultimately gives them satisfaction.

In learning activities, lecturers must be able to play their role according to student needs, especially in online learning. Lecturers provide materials according to lesson plans, which is accessible, responsible and fair for all students, unlike robots that only provide material but are not able to comfort students when they face difficulties. This will spike their enthusiasm to study hard and, in the end, the learning quality provided by lecturers in online learning influences student learning outcomes.

The level of student satisfaction during online learning process is an important input for the next learning process, especially if the Covid 19 pandemic is still happening. Although, it is also possible for a hybrid learning which means face-to-face and online

learning. According to the factors used to measure the level of student satisfaction, namely lecture materials, learning media, learning facilities, interaction in learning activities, and assignments, the analysis results show that the level of student satisfaction has a positive and significant influence on learning outcomes. The services provided by lecturers in online learning activities also affect learning outcomes. Students feel happy and comfortable in learning activities so that they will feel ease in learning and ultimately affect learning outcomes.

4 Conclusion

The conclusions are as follows:

1. There is a significant influence between the variables of Learning Quality (X1) on Student Satisfaction (X2)
2. The second hypothesis testing shows that the variable Learning Quality (X1) has a significant influence on Student Learning Outcomes (Y)
3. The third hypothesis testing shows that Student Satisfaction (X2) had a significant effect on student Learning Outcomes (Y).
4. Furthermore, the indirect effect test is used from several results of direct influence test and is a multiplication result of two or more direct influence coefficients that form it. Based on the theoretical model developed in this study, it was found that the Learning Quality variable, through Student Satisfaction, indirectly influence the student learning outcomes which is of 0.312.

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