

## The Measurement of Usability Using USE Questionnaire on the Google Classroom Application as E-learning Media

(A Case study: SMK Negeri 1 Bandung)

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**Abstract:** *The Pandemic Covid-19 has changed various aspects of human life currently, especially in education. In this Covid-19 pandemic, E-learning users have been increased. Work from home policy from government generates the whole process of learning activities in SMK Negeri 1 Bandung been substituted by an online learning model. E-Learning platform that is widely used is Google Classroom. As a widely used platform, it is necessary to measure the usability of this application. Usability can be measured from the results of the percentage of eligibility obtained based on a questionnaire distributed to users, the questionnaire applied the USE questionnaire method, which contained a series of statements that have been grouped into several aspects of use, i.e., ease of use, ease of learning, satisfaction, and usefulness. The results obtained for each aspect of usability were the ease of use aspect with 80% of eligibility, the ease of learning aspect with 83% of eligibility, satisfaction with 81% of eligibility, and ease of use with 81% of eligibility. Overall the results of usability testing obtained 81% of eligibility. It means that Google Classroom application is very feasible to be used by teachers since this application is easy to use, easy to learn, useful as e-learning media.*

**Keywords:** *E-learning, Google Classroom, Usability*

**Abstrak:** *Pandemic Covid-19 telah mengubah berbagai aspek kehidupan manusia saat ini, khususnya dalam dunia pendidikan. Pada masa pandemi Covid-19 membuat penggunaan media e-learning meningkat pesat, hal tersebut karena adanya kebijakan work from home dari pemerintah sehingga seluruh kegiatan pembelajaran di kelas berganti menjadi pembelajaran secara online, termasuk di SMK Negeri 1 Bandung. E-learning yang banyak digunakan sebagai media pembelajaran adalah google classroom. Platform ini mudah digunakan oleh pengguna smartphone atau laptop. Sebagai platform yang banyak digunakan tentu perlu dilakukan pengukuran kebergunaan dari aplikasi ini. Kebergunaan dapat diukur dari hasil persentase kelayakan diperoleh berdasarkan kuesioner yang disebarakan kepada pengguna, pada penelitian ini kuesioner menggunakan metode use questionnaire berisi serangkaian pernyataan yang telah dikelompokkan dalam beberapa aspek use yaitu ease of use (kemudahan penggunaan), ease of learning (kemudahan belajar), satisfaction (kepuasan), dan usefulness (kegunaan). Hasil yang diperoleh untuk setiap aspek usability yaitu aspek ease of use diperoleh kelayakan 80%, aspek ease of learning diperoleh kelayakan 83%, satisfaction diperoleh kelayakan 81%, dan easy of use diperoleh kelayakan sebesar 81%. Secara keseluruhan hasil usability testing diperoleh kelayakan 81%, berarti aplikasi google classroom sangat layak digunakan oleh guru karena sebagai media e-learning.*

**Kata Kunci:** *E-learning, Google Classroom, Usability*

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## INTRODUCTION

The first positive confirmed patient of Covid-19 in Indonesia occurred on March 2<sup>nd</sup>, 2020. The spread of the virus increases rapidly with a very high patient death ratio (Rokhani, 2020). Covid-19 is a contagious disease that can spread, both directly and indirectly, from one person to another. This condition attacks the respiratory system, such as the nose, throat, and lungs. The complexities of handling this pandemic are the discovery of vaccines and the drugs for healing Covid-19 patients and the lack of personal protective equipment (PPE) for health staff. It triggered the government to implement a strict policy to break the chain of the spread of Covid-19. One way to break the chain of the spread of Covid-19 is by limiting community interactions that are applied in terms of physical distancing (Mustakim, 2020).

Therefore, the government established a WFH (work from home) policy so that some activities, including classroom learning activities, are substituted by online learning models or distance education (Rusdiana, A., Sulhan, M., Arifin, I. Z., Kamludin, U. A., 2020). It makes online learning becomes a popular and hot topic for discussion (Sujito, F., Arifudin, R., & Arini, F.Y., 2019). Hence, the current educational technology leads to learning based on online, mobile, and multimedia.

The use of online media or multimedia-based media is one solution to make students able to understand the subject matter well. It is in line with the results of Ibrahim & Suardiman's research in 2014, which showed that there is a positive influence on the use of e-learning on the motivation and learning achievement of students at SD Negeri Tahunan Yogyakarta (Ibrahim, D. S. & Suardiman, S. P., 2014). Online learning using online media has been implemented at SMK Negeri 1 Bandung since the start of work from home on March 16<sup>th</sup>, 2020, during the Covid-19 pandemic. The online media used are youtube, WhatsApp group, google classroom, and Edmodo. The material is provided in the form of powerpoints, short videos, and reading material.

Online learning is learning that can facilitate learners to learn broadly and more varied. Through the facilities provided by the system, learners can learn anytime and anywhere without being limited by distance, space, and time (Munir, 2012) Teachers and students can also communicate interactively through learning that is facilitated by a computer, internet, or smartphone (Utami, 2019). ). Technology integration and various innovations are characteristic of online learning (Banggur, M. D. V., Situmorang, R. & Rusmono, 2018). Also, the most significant issue is the readiness of educators and students to interact online. Numerous online applications are utilized in the field of education, such as school and campus websites, academic information systems, and others. Besides, online applications are used in learning systems, for example, by creating e-learning applications. The application can be made as you desire with the help of a programmer, or use e-learning services that have been provided by several developers (Asnawi, 2018).

E-learning is an electronic-based information technology application through the internet that is designed for learning purposes (Farida, Lilis D & Sismoro, H., 2020). ). E-learning has two types of models, namely synchronous and asynchronous. Synchronous is when the students and teachers meet at once and do the learning process directly, even in the online process. While asynchronous, students only need to access teaching material already available on the platform that has been provided and can be accessed at any time without the need for face-to-face meetings and appointments with instructors (Setiawan, D., & Mumtahana, H.A., 2018). The infrastructures that support online learning for free through various discussion rooms are Google Classroom, Whatsapp, Smart Class, Zenius, Quipper, and Microsoft (Abidah, A., Hidayaatullah, H. N., Simamora, R. M., Fehabutar, D. & Mutakinati, L., 2020). Whatsapp features include Whatsapp Group that can be used to send text messages, images, videos, and files in various formats to all members (Kusuma, J. W., & Hamidah, 2020).

Face-to-face discussion and knowledge transfer, like meeting through a variety of teleconference video platforms widely and freely available, are Zoom and Google Meet. The platform allows educators and students to meet and interact virtually with instant messaging facilities and presentation activities (Wiranda, T., & Adri, M., 2019). These various services can be utilized as a support for the transfer of knowledge to the discussion of learning content. It is also done by utilizing all local resources nationally, such as television channels for education (Zhou, L., et al., 2020).

Google Classroom also allows educators and teachers to develop creative learning (Herliandry, L. D., dkk., 2020). Google Classroom can assist students and teachers to organize assignments, support collaboration, and help better communication. Google Classroom offers features that can be used by users. On the educator users, features offered include creating classes, inviting participants, making assignments, giving assessments, making quizzes, and collecting student grades. Moreover, there are also features to attach documents, videos, links, and be directly connected to the Google Drive service while the delivery time limit can be set by them (Izenstark & K. L. Leahy, 2015). Google Classroom can be accessed via the website or through a mobile application that has been available since 2015 (Farida, Lilis D & Sismoro, H., 2020).

Since the Covid-19 pandemic, this expertise program has begun using Google Classroom application services as e-learning media. One of the popular e-learning media used today is Google Classroom. Google classrooms are considered as one of the best platforms to improve teacher workflows (Latif, 2016). This application provides a set of advanced features that make it an ideal tool for students. Google Classroom itself can be accessed in multiplatform both using a desktop computer or a mobile device such as a notebook or smartphone and can run on several operating systems such as Android, iOS, Windows, and others (Lee, 2020) This application helps teachers save time, keep classes organized, and improve interaction with students. This application is available for everyone with Google Apps for Education. The free suite of productivity tools includes Gmail, Drive, and Docs (Iftakhar, 2016).

This application helps teachers save time, keep classes organized, and improve interaction with students. This application is available for everyone with Google Apps for Education. The free suite of productivity tools includes Gmail, Drive, and Docs (Mustakim, 2020). However, in the implementation of online learning, evaluation needs to be conducted to obtain clear improvements based on data. Thus, it initiated the writers to recognize the usability description of Google Classroom applications as e-learning media at SMK Negeri 1 Bandung.

## RESEARCH METHODS

This study used a quantitative approach with a case study research design to examine a symptom, event, or object that occurs at a particular research location. It was conducted at SMK Negeri 1 Bandung as one of the public Vocational High Schools (SMK) in Bandung. The research respondents were the teachers. The data collection method was done by distributing questionnaires to the teachers. The measurement of the questionnaire results was completed using a Likert scale divided into scales of one to five, namely Strongly Disagree (SDA), Disagree (DA), Undecided (UD), Agree (A), and Strongly Agree (SA), with the scores of each scale presented in Table 2. The data analysis included data collection, data processing, data presentation, and drawing conclusions.

The population in this study were eighty-one Vocational School teachers in Bandung. The sampling technique in determining the number of respondents in this study was a simple random sampling technique selected from all members of the population. The Slovin formula was implemented as the sample size measurement (Kusuma, W. A., Noviasari, V. & Marthasari, G.I. , 2016).

$$n = \frac{N}{1+N(e)^2} \dots\dots\dots(2)$$

- n = sample size
- N = population size
- e = critical value (accuracy limit) due to sampling error, the error level of 0,1 (10%)

Errors occur because sampling does not match the estimates of a portion of the desired population (Geisen, E. Bergstrom JR., 2017). Errors in surveys can also arise from problems with the choice of words and questions that can affect respondents' responses to survey questions. Based on formula (2), with eighty-one teachers as the population (N), the minimum number of the sample (n) needed was obtained. It was fulfilled by forty-five teachers based on the following calculation of formula (2).

$$\begin{aligned}
 n &= \frac{81}{1 + 81(0,1)^2} \\
 &= \frac{81}{1 + 81(0,01)} \\
 &= \frac{81}{1 + 0,81} \\
 &= \frac{81}{1,81} \\
 &= 44,7
 \end{aligned}$$

The respondents, as a sample of this study, were fifty teachers. It was more than the minimum sample required so that the obtained data can be more valid. Respondents were teachers of SMK Negeri 1 Bandung, who were accustomed to using the Google Classroom application.

The taken data in this study were quantitative as the result of the questionnaire response using the Google Form application. The questionnaire used in the study adopted questions on the USE Questionnaires that contained aspects of Usefulness, Satisfaction, Ease of Learning, and Ease of Use. The questionnaire contained a list of grouped questions according to aspects of application usability measurement, as presented in the following table.

Table 1. The Usability Testing Questionnaire

No.	Question	Assessment				
		SDA	DA	UD	A	SA
<b><i>Ease of Use</i></b>						
1.	Is the Google Classroom application easy to use?					
2.	Is the Google Classroom application easy to understand?					
3.	Can the Google Classroom application quickly and easily avoid errors in use?					
4.	Does the user find any inconsistency while using the Google Classroom application?					
5.	Is the menu display in the Google Classroom application easy to recognize?					
6.	Is the Google Classroom application user friendly?					
<b><i>Ease of Learning</i></b>						
7.	Is the Google Classroom application easy to learn on how it is used?					

8.	Is the Google Classroom application easy to remember on how it is used?
<b>Satisfaction</b>	
9.	Do the Google Classroom application as expected?
10.	Is the Google Classroom application convenient to use?
11.	Is the Google Classroom application fun to use?
<b>Usefulness</b>	
12.	Is the Google Classroom application useful for users?
13.	Does the Google Classroom application have the capabilities and functions as expected?
14.	Does the Google Classroom application suit your needs?
15.	Does the Google Classroom application help you be more effective?
16.	Does the Google Classroom application help you be more productive?
17.	Can the Google Classroom application save time when you use it?

In this study, the steps to be taken are as in Figure 1 below.

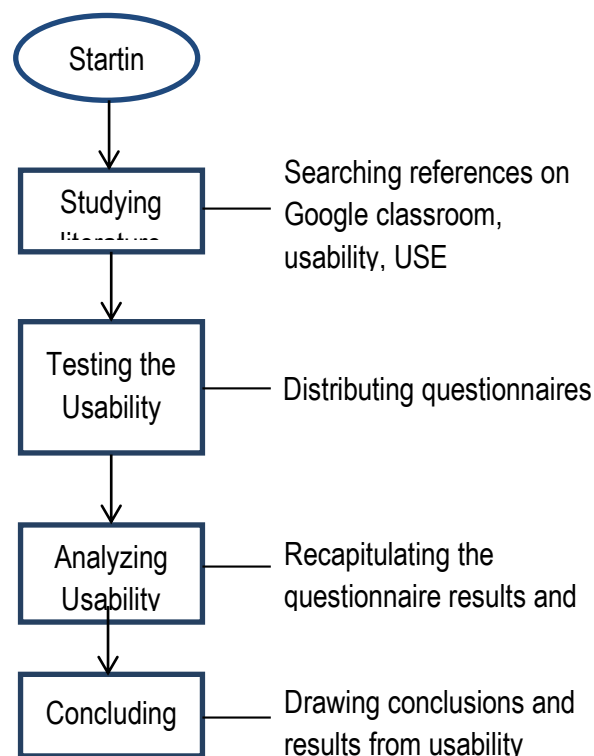


Figure 1. Research Procedure

According to Joseph Dumas and Janice Redish in (Rahadi, 2014), usability refers to how users can learn and use products to obtain their goals and how satisfied they are with the usage.

$$Percentage\ of\ Eligibility\ (\%) = \frac{Observed\ score}{Expected\ score} \times 100\% \dots\dots\dots (1)$$

The expected ideal score (criterion) was determined by assuming that the respondent obtained the highest score on answering each question (Sugiyono, 2013). Meanwhile, the observed score was determined from the results of the respondents' overall answers on the usability aspect multiplied by the score according to the Likert scale. To discover the usability level of the observed application, it can be viewed in Table 2.

Table 2. The Feasibility Categories

Score (%)	Classification
<21	Very poor
21-40	Poor
41-60	Enough
61-80	Feasible
81-100	Very feasible

Source: Kusuma et al. (2016)

To be used as an information, the research data needs to be checked for credibility so that useful and relevant information is obtained (Nugrahani, 2014). The questionnaire used in this study was the USE Questionnaire. It is a tool that can be used in preparing questionnaires. The USE Questionnaire was developed by Arnold Lund and colleagues at Ameritech, U.S WEST Advanced Technologies. The USE stands for Usefulness, Satisfaction, and Ease of use. The Ease of use factor can be divided into two factors, i.e., Ease of Learning and Ease of Use (Asnawi, 2018). The measurement using the USE Questionnaire is expected to be a reference to improve the online learning system, which currently has many shortcomings and obstacles, especially for teachers who hold significant roles in learning.

The Likert scale is used to measure the opinions or perceptions of someone in the research that the researcher has specifically determined. The answers of each instrument item (questionnaire) Likert scale were ranged from very positive to very negative, in the form of words and given a score as in Table 3 (Sugiyono, 2013).

Table 1. Skala Likert

Question	Score
Very Agree/always/very positive	5
Agree/often/positive	4
Undecided/sometimes/neutral	3
Disagree/almost never/negative	2
Strongly disagree/never	1

Source: Sugiyono (2013)

**RESULTS AND DISCUSSION**

After distributing seventeen questions in the questionnaire to fifty respondents, then the recapitulation of the results of the questionnaire was conducted. The assessment was performed using a Likert scale with a scale of one to five, namely SDA (1), DA (2), UD (3), A (4), and SA (5).

Data taken from each respondent were confirmed valid if the respondent filled the assessment on each question item. Table 4 is a recapitulation of responses from respondents. Based on the

questionnaire data using Google Form, the percentage of answers from all respondents for each question item results is presented in Table 4. The total score observed was obtained from calculating the results of the whole respondent's answers on the usability aspect multiplied by each score based on the Likert scale. Meanwhile, the expected score obtained from the highest score of the Likert scale multiplied by the number of respondents, then it multiplied again by the number of questions for each aspect of usability.

Table 4. The Presentation Results of Respondents' Answer Results

No.	Question	Assessment					Observation Score
		SDA	DA	UD	A	SA	
<b>Ease of Use</b>							
1.	Is the Google Classroom application easy to use?	0	0	1	36	13	
2.	Is the Google Classroom application easy to understand?	0	0	4	34	12	
3.	Does the Google Classroom application can quickly and easily avoid errors in its use?	0	1	18	26	5	

Table 2. (Continuation)

No.	Question	Assessment					Observation Score
		SDA	DA	UD	A	SA	
4.	Does the user find any inconsistency while using the Google Classroom application?	1	1	15	26	7	
5.	Is the menu display in the Google Classroom application easy to recognize?	0	1	3	32	14	
6.	Is the Google Classroom application user friendly?	0	0	5	36	9	
		<b>1</b>	<b>3</b>	<b>46</b>	<b>190</b>	<b>60</b>	<b>1205</b>
<b>Ease of Learning</b>							
7.	Is the Google Classroom application easy to learn on how it is used?	0	1	2	31	16	
8.	Is the Google Classroom application easy to remember on how it is used?	0	1	5	31	13	
		<b>0</b>	<b>2</b>	<b>7</b>	<b>62</b>	<b>29</b>	<b>418</b>
<b>Satisfaction</b>							
9.	Do the Google Classroom application as expected?	0	0	7	34	9	
10.	Is the Google Classroom application convenient to use?	0	0	3	36	11	
11.	Is the Google Classroom application fun to use?	0	2	5	33	10	
		<b>0</b>	<b>2</b>	<b>15</b>	<b>103</b>	<b>30</b>	<b>611</b>
<b>Usefulness</b>							
12.	Is the Google Classroom application useful for users?	1	0	3	28	18	
13.	Does the Google Classroom application have the capabilities and functions as expected?	0	0	11	28	11	
14.	Does the Google Classroom application suit your needs?	0	2	9	28	11	
15.	Does the Google Classroom application help you be more effective?	0	0	5	35	10	
16.	Does the Google Classroom application help you be more productive?	0	0	8	29	13	

17. Does the Google Classroom application save time when you use it?	0	0	7	29	14	
	<b>1</b>	<b>2</b>	<b>43</b>	<b>177</b>	<b>77</b>	<b>1227</b>
Total Observation Score	<b>2</b>	<b>9</b>	<b>111</b>	<b>532</b>	<b>196</b>	<b>3461</b>

To obtain a percentage of eligibility in each usability aspect based on the data in Table 4, the calculation was performed using the formula (1). Hence, it was obtained the results for each aspect.

$$\begin{aligned}
 \text{Ease of Use (\%)} &= \frac{(1 \times 1) + (2 \times 3) + (3 \times 46) + (4 \times 190) + (5 \times 60)}{5 \times 50 \times 6} \times 100\% \\
 &= \frac{1205}{1500} \times 100\% \\
 &= 0.80 \times 100\% \\
 &= 80\%
 \end{aligned}$$

The Ease of Use aspect consisted of six questions. It was obtained 80% of eligibility. Based on Table 1, the eligibility category between 61-80 scale means that the Google Classroom application is feasible to be used by the teachers from the aspect of ease of use when users used the Google Classroom application. This application is feasible in the aspect of ease of use because to create a class; teachers can easily use a Google Mail account because it is integrated. This application also uses the Indonesian language. Moreover, the choice of various forms of questions can make it easy for teachers to assess student knowledge and creativity. When composing questions, the teacher can immediately evaluate students' answers, give scores, and provide feedback by the comment. Many other conveniences were provided by this application. However, this aspect is not in the very feasible category because there were still many needs of teachers and students in learning that cannot be supported by this application, such as video conferencing.

$$\begin{aligned}
 \text{Ease of Learning (\%)} &= \frac{(1 \times 0) + (2 \times 2) + (3 \times 7) + (4 \times 62) + (5 \times 29)}{5 \times 50 \times 2} \times 100\% \\
 &= \frac{418}{500} \times 100\% \\
 &= 0.83 \times 100\% \\
 &= 83\%
 \end{aligned}$$

The Ease of Learning aspect consisted of two questions. It was obtained 83% of eligibility. Based on Table 1, the score of the feasibility between 81-100 scale means that the Google Classroom application is very feasible to be used by teachers from the aspect of application ease of learning. It occurred because this application will be easy to use even by beginners. Besides that, this application also provided the menus and tools that exist in other common applications. Thus, the teachers and students were accustomed to using menus and tools in this application. Furthermore, the use of the Indonesian language in this application made users more understanding of how to use this application.

$$\begin{aligned}
 \text{Satisfaction (\%)} &= \frac{(1 \times 0) + (2 \times 2) + (3 \times 15) + (4 \times 103) + (5 \times 30)}{5 \times 50 \times 3} \times 100\% \\
 &= \frac{611}{750} \times 100\% \\
 &= 0.81 \times 100\% \\
 &= 81\%
 \end{aligned}$$



The satisfaction aspect consisted of three questions. It was obtained 81% of eligibility. Based on Table 1, the score of the feasibility category between 81-100 scale means that the Google Classroom application is very feasible to use by teachers from the aspect of user satisfaction. It was because the application user did not find problems when using this application, and this application was in line with user expectations. A very feasible category in this aspect of satisfaction was also because the teachers' need to deliver material, give tests/questions, assess student work, and evaluate learning can be completed using this application.

$$\begin{aligned} \text{Usefulness (\%)} &= \frac{(1 \times 1) + (2 \times 2) + (3 \times 43) + (4 \times 177) + (5 \times 77)}{5 \times 50 \times 6} \times 100\% \\ &= \frac{1227}{1500} \times 100\% \\ &= 0.81 \times 100\% \\ &= 81\% \end{aligned}$$

The Usefulness aspect consisted of six questions. It was obtained 81% of eligibility. Based on Table 1, the score of the feasibility category between 81-100 means that the Google Classroom application is very feasible to be used by teachers in terms of usability because it can help users do their work, and increase teachers' knowledge and skills in using online learning applications, so they also support technology-based learning that is currently being developed in Indonesia. This application is beneficial during a pandemic, which requires not doing face-to-face learning so that learning can continue.

$$\begin{aligned} \text{Usability (\%)} &= \frac{1205 + 418 + 611 + 1227}{1500 + 500 + 750 + 1500} \times 100\% \\ &= \frac{3461}{4250} \times 100\% \\ &= 0,81 \times 100\% \\ &= 81\% \end{aligned}$$

Overall the results of usability testing obtained 81% of eligibility. Based on Table 1, the feasibility category between 81-100 scale means that the overall Google Classroom application is very feasible to be used by teachers as an e-learning media. It was because this application is easy to use, easy to learn, useful for e-learning media, and provides satisfaction.

Google Classroom provides a central location for communicating with students, asking questions, and making assignments (Sudarsana, K., Putra, M., Astawa, N. T., & Yogantara, W. L., 2019). Google Classroom facilitates online learning for students during the Covid-19 pandemic. Moreover, Google Classroom has the potential to save most of the time for students and educators because the process of setting up Google classroom is very fast and convenient to use. Time will not be wasted in distributing physical documents because assignments that have been given to students can be completed timely online. It created a lack of time constraints when face-to-face learning took place can be overcome.

In addition to helping online learning in the Covid-19 pandemic, Google Classroom also supports technology-based learning in the 21st century. Education in Indonesia has now been a computer-based in the final stages of learning evaluation (National Examination). The college entrance examination also now uses the CBT (Computer Based Test) system. Hence, optimizing virtual classes with Google Classroom is very useful for students to be accustomed to computer-based questions.

The use of the Google Classroom application can also improve the ability of data literacy and technology literacy of students. It is because students are directly involved in the learning process that utilizes the internet so that learning becomes more meaningful. Furthermore, educators of 4.0 require an open growth mindset, which is a way of thinking that expands and is open (Kasali, 2018). This way of thinking is needed so that the learning that will be given to students becomes more creative, innovative, and interesting.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the results obtained, the usability percentage level of Google Classroom application usability using the USE questionnaire indicated a feasible category on the ease of use aspect. Meanwhile, the results showed a very feasible category on the ease of learning aspect, satisfaction, and usefulness aspects. Hence, this application is very feasible to be used as e-learning media, but it took time to understand so that this application can be used easily. However, the imperfect score obtained from the usability testing of this application. It was because the facilities provided by this application were not yet meet the needs of online learning, such as the unavailability of video conferencing facilities. Therefore, it is expected that there is an application that can meet all the needs of facilities for online learning, especially during the Covid-19 pandemic, which requires more learning to be done online.

Some of the supporting factors for the learning process of Google Classroom need to be improved starting from the readiness of teachers who can provide e-learning instructions well and facilitate consultation to use Google Classroom so that it can maximize and motivate Google Classroom learning to be more active. Moreover, instructional media using Google classroom can be combined with conventional learning when face-to-face learning has been re-implemented.

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