An Analysis of the Intensity of Online Learning Media as Tools for Mathematics Teachers

Niken Rahmawati[1], Padrul Jana[2]*, Abdul Aziz Saefudin[3], Kristina Warniasih[4], MM Endang Susetyawati[5].

[1,2,3,4,5]*Pendidikan Matematika, Universitas PGRI Yogyakarta, Indonesia.*
**Email: padrul.jana@upy.ac.id*

ABSTRACT
During the current pandemic, online learning is one solution to break the chain of spreading the virus. The use of online learning media is needed to support the implementation of online learning. The purpose of this study was to determine the intensity of online learning media used by mathematics teachers in online learning, as well as the reasons for choosing the media. The method used was descriptive qualitative. Subjects in this study were 21 mathematics teachers teaching in the Special Region of Yogyakarta. The sampling used the purposive sampling technique. The instruments used in this research were questionnaires and interview instruments. The results of the study indicated that the intensity of online learning media used for online learning was google classroom. This was reinforced based on several reasons when the teacher stated that google classroom provided convenience in implementing online learning. Delivery of materials and assignments that were easy to do, simple in appearance, and features that supported the implementation of online learning. Several other media such as WhatsApp, Zoom, Google Form, Kahoot, and Quizizz were also used in online learning. But, the intensity of its use was not as much as Google Classroom.

Keywords: *Intensity, Online learning, Online learning media*

1. INTRODUCTION

During a pandemic, as is happening nowadays, a face-to-face learning process is not possible to be carried out. Therefore, the Government issued a policy that the learning process can be conducted *online* (online learning). It aims to cut off the spread of the Covid-19 virus so that there are not more people infected with the virus. Online learning was a learning process that relied on an internet connection to hold a learning process [1]–[3]. Meanwhile, Ahmad (2016) argued that online learning was an activity or learning process that was partly or wholly carried out by utilizing the internet to deliver learning materials and a means of interaction. Online learning was a kind of learning activity that involved the use of the internet to foster, convey, and facilitate a learning process that was carried out anytime and anywhere [5].

Based on some of the opinions above, it can be concluded that online learning is a distance learning process that utilizes an internet connection to deliver learning materials and a means of interaction where teachers and students are not in the same place and room. A tool or media is required to support the implementation of an online learning situation.

Online learning media was a form of distance learning media using internet facilities to communicate online, allowing teaching materials to be delivered to students using internet media [6]. Meanwhile, Darusman (2019) argued that online learning media were all media formats that could only be accessed via internet-based computer or mobile hardware, including text, photos, videos, and sound. Online learning media could make students easier to learn anywhere and the teachers easier to provide material or teach anywhere, such as giving quizzes or practical questions to students online [8]. Therefore, it could be concluded that online learning media was internet-based distance learning media containing text, photos, videos, and sound. The media made students easier to learn and teachers easier to teach anywhere.

Online learning media had many kinds, including *Google Classroom, Edmodo, Google Form, WhatsApp, Quizizz,* and so on [9]–[11]. Of the various kinds of media, a teacher should determine the suitable media to

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implement online learning; therefore, the learning process hopefully could run well and run as expected later. In addition, in selecting online learning media, it was necessary to pay attention to the indicators of online learning media. In this research, the indicators of online learning media used opinions from [12] included ease of use, display, and interest [13], [14]. Researchers chose these indicators because these three indicators represented the research carried out related to online learning media.

2. METHODS AND MATERIALS

This research method used a descriptive qualitative method. [15] said that a descriptive qualitative research method described, explained, and answered problems about current phenomena and events, both the actual phenomena and relationship analysis between variables in a particular phenomenon. The population in this research included mathematics teachers who taught at the Junior High School/equivalent, and Senior High School/equivalent levels in five districts of the Special Region of Yogyakarta. Meanwhile, the sample of this research consisted of 21 mathematics teachers with details of 5 teachers from Bantul Regency, and 4 teachers from each of Sleman, City, Gunung Kidul, and Kulonprogo Regencies. The sampling technique in this research was purposive sampling, in which the sample taken was adjusted to the needs of the research.

In this research, the researcher described the research results in a narrative way of the mathematics teacher's perceptions regarding the use of online learning media utilized during online learning. To obtain data, researchers used data collection techniques through filling out questionnaires and interviews. Meanwhile, the data analysis in this research used the analysis model of Miles and Huberman. Miles and Huberman argued that activities in qualitative data analysis were carried out interactively and continued to completion so that the data was saturated. Furthermore, [16] stated that there were three main components in the data analysis process. The three components started from data collection with the stages included (1) Data reduction, namely a process of selecting data according to the researcher's needs. (2) Data presentation, namely a process of describing data in the form of a short description so that the research results were easier to understand. (3) Concluding, namely a process of providing conclusions so that the data obtained could be accounted for.

2.1. Scope of Research

The population in this research included mathematics teachers who taught at the Junior High School/ equivalent, and Senior High School/equivalent levels in five districts of the Special Region of Yogyakarta. Meanwhile, the sample of this research consisted of 21 mathematics teachers with details of 5 teachers from Bantul Regency, and 4 teachers from each of Sleman, City, Gunung Kidul, and Kulonprogo Regencies. The sampling technique in this research was purposive sampling, in which the sample taken was adjusted to the needs of the research.

3. RESULTS AND DISCUSSIONS

3.1. Results

Data on the intensity of using *online learning* media in online learning were obtained based on the responses of 21 mathematics teachers by filling out questionnaires. Based on these responses, it was found that the intensity of using online learning media was most widely used for the implementation of the online learning of *Google Classroom* with 13 mathematics teachers.

Figure 1 The intensity of Online Learning Media

From the picture above, it could be seen that other *online* learning media such as *WhatsApp, Zoom, Google Forms, Quizizz,* and *Kahoot* were also used for the implementation of online learning, but the intensity of their use was not as much as the *Google Classroom.*

In addition, in this study, the researcher also mapped the results of the analysis based on two categories, namely gender and length of teaching. The gender category was divided into two, namely male and female sex. The results of the data obtained from filling out the questionnaire showed that the male and female mathematics teachers used *Google Classroom* intensely as online learning media. For the category of the length of teaching, there were four categories, namely the category of the length of the teaching of 0 - 5 years, 6 - 11 years, 12 - 17 years, and 18 - 23 years. The results of the data obtained showed that in the category of the length of teaching of 0 - 5 years and 18 - 23 years, the intensity of using *online* learning media was *Google Classroom*, while for the category of the length of the teaching of 6 - 11 years and 12 - 17 years, the intensity of using *online* learning media was *WhatsApp*.

After knowing the intensity of *online* learning media in each category, then an analysis of mathematics teachers perceptions was carried out based on indicators of *online* learning media which included ease of use, appearance, and interest. The results of the analysis of

male mathematics teachers 'perceptions regarding *Google Classroom* for online learning could be seen in Figure 2.

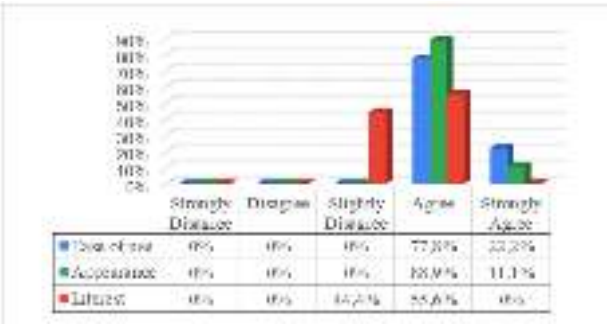

Figure 2 The perception of Male Teachers about Google Classroom

In the picture above, it could be seen that the majority of male teachers' perceptions agreed on all indicators. For indicators of ease of use, respondents agreed that *Google Classroom* had language that was easy to understand and menus that were easy to operate for both teachers and students. On the display indicator, the respondent agreed that the display on the *Google Classroom* was quite simple and not confusing so that students could follow the lesson well. As for the interest indicator, respondents agreed that *Google Classroom* was interesting to use in online learning because students could easily access the material and questions.

The next analysis was the perception of female mathematics teachers about *Google Classroom* for the implementation of online learning.

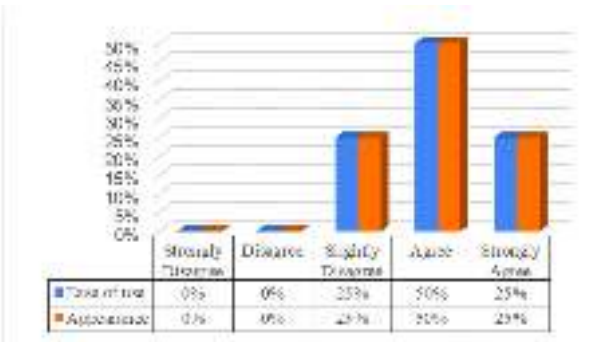

Figure 3 The perception of Famale about Google Classroom

In the picture above, it could be seen that the majority of female mathematics teachers' perceptions agreed on the indicators of ease of use and appearance. For indicators of ease of use, respondents agreed because this media made it easier for teachers to monitor students who had or had not submitted assignments and those who were late in collecting assignments. As for display indicators, respondents agreed that the display on *Google Classroom* was simple and some features supported the implementation of online learning.

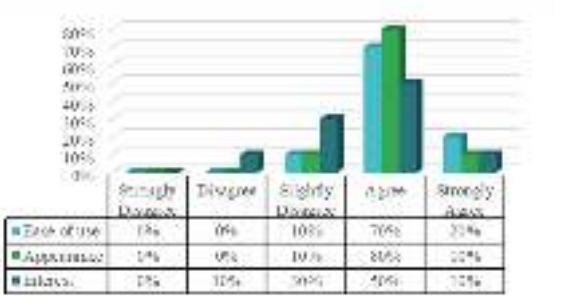

Figure 4 The perception of mathematics Teachers about Google Classroom with a length of teaching of 0-5 years for the Online Learning

From the picture above, it could be concluded that the majority of teachers who used *Google Classroom* tended to agree on all indicators in *online* learning media. On the ease of use indicator, respondents agreed that learning media was very helpful in implementing online learning because this media was very easy to use by both teachers and students. For display indicators, respondents agreed that the display provided on this media was quite simple so that it did not make it difficult for students to take part in online learning. As for the indicators of interest, respondents agreed that this media was quite attractive in terms of appearance, apart from that it made respondents interested in using this media because there were features that facilitated and supported the implementation of online learning.

The next analysis was the perception of mathematics teachers with a length of the teaching of 6-11 years. There were 2 mathematics teachers in the 6-11 years old category of teaching, where the two teachers used *WhatsApp* for the implementation of online learning.

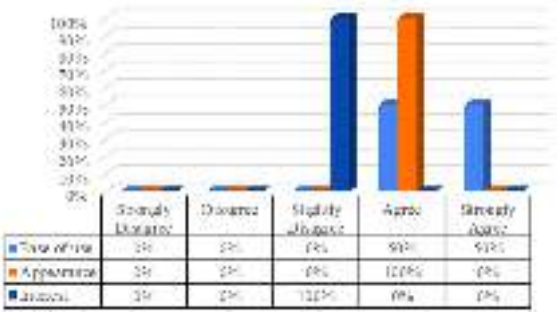

Figure 5 The perception of Mathematics Teachers about WhatsApp with a length of teaching of 6-11 years for the Online Learning

From the picture above, it could be concluded that mathematics teachers with a length of the teaching of 6-11 years argued that they agreed on the display indicators only. Respondents agreed that the display on *WhatsApp* was very simple, so students could easily use it. In addition, respondents also thought they did not agree with the indicators of interest because all students had to send answers to assignments in the form of photos so that the teacher had to check the answers one by one. As for the

ease of use indicator, respondents who strongly agreed and agreed have the same percentage. Respondents strongly agreed that the menu available on *WhatsApp* was easy for most students to operate so that learning could run well. Respondents agreed that by using *WhatsApp* the teacher could convey material and assignments easily.

Furthermore, the analysis of the perceptions of mathematics teachers with the category of the teaching length of 12-17 years with a total of 3 people in this category, two of which used *WhatsApp* for the implementation of online learning.

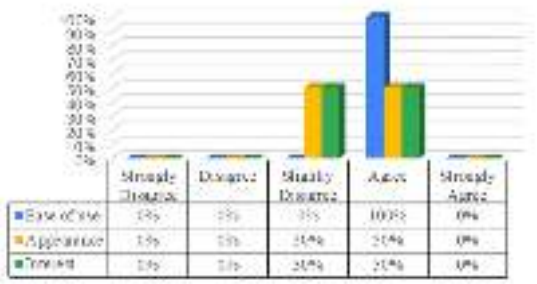

Figure 6 The perception of Mathematics Teachers about WhatsApp with a length of the teaching of 12-17 years for the Online Learning

From the picture above, it could be concluded that mathematics teachers with a length of the teaching of 12-17 years had the most opinion that they agreed only on the ease of use indicator. Respondents agreed that *WhatsApp* provided convenience in the online learning process because by using this media, the teacher could create groups containing students in one class so that the provision of materials and assignments was easy to do, and could facilitate communication between teachers and students in the implementation of online learning.

Furthermore, the last one was the analysis of the perceptions of mathematics teachers with the category of 18-23 years of the teaching time with a total of 3 people in this category, two of which used the *online learning* media of *Google Classroom*.

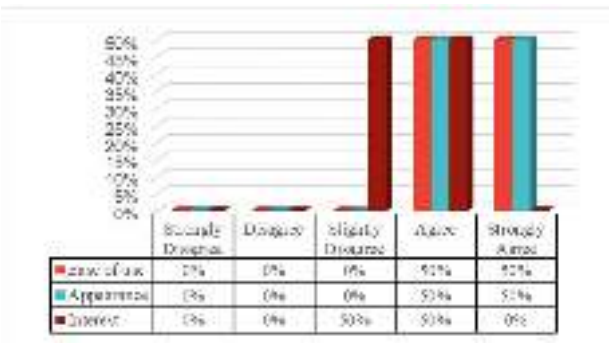

Figure 7 The perception of Mathematics Teachers about Google Classroom with a legth of the teaching of 17-23 years for the Online Learning

Based on the picture above, it could be concluded that there were respondents who agreed on all indicators but there were also those who disagreed on the indicators of interest, and there were also respondents who strongly agreed on the indicators of ease of use and appearance. For respondents who agreed and strongly agreed on the ease of use and display indicators had almost the same perception, namely for the ease of use indicator, respondents argued that this media had a menu that was easy to operate, and for display indicators, respondents thought that the appearance of this media was simple, attractive, and suitable for online learning. As for the indicator of interest, respondents were interested in using this media because it helped teachers in implementing online learning because there were features that supported the online learning process. In the online learning, media of Google Classroom, there were material features that made it easier for teachers to provide material that students could learn in the form of modules or videos. In addition, in this media, there was a feature assignment that the teacher could use to give assignments, where this assignment could be directly typed into the form. Google Classroom also provided a feature of the quiz assignment that could be used by the teacher to make quiz questions.

3.2. Discussions

This research added to the empirical evidence that *Google Classroom* was the most demanding online learning media by students during the online learning implementation in schools. This fact was in line with the results of previous research [17]–[20]. This research found that the most widely used online learning media by mathematics teachers for the online learning implementation were *Google Classroom* and *WhatsApp*. Research conducted by [21] reported that *Google Classroom* and *WhatsApp* were popular online learning media to implement online learning. These two online learning media had the convenience of delivering subject matter and assignments [22] [23]. In addition, these two online learning media did not consume many internet quotas, and students can easily download the uploaded material; furthermore, these media facilitated students and teachers to hold discussions.

3.3. Conslusions

Based on the results of the data analysis and discussion above, it can be concluded that: (1) The *online* learning media used in the implementation of online learning include *Google Classroom, WhatsApp, Google Form, Zoom, Quizizz*, and *Kahoot*. Online learning media widely used by mathematics teachers in the implementation of online learning is *Google Classroom*. (2) The results of the analysis of the intensity of the use of online learning media for the implementation of online

learning based on gender reported that the male and female mathematics teachers used online learning media more intensely using *Google Classroom*. Meanwhile, based on the length of teaching, it was found that in the length of the teaching between 0-5 years and 18-23 years, the intensity of the use of online learning media was mostly in *Google Classroom*. Furthermore, most people used *WhatsApp* for the length of the teaching of 6-11 years and 12-17 years. (3) Perceptions about *Google Classroom* on all indicators were almost the same. On the indicator of ease of use, the teacher said that *Google Classroom* provided several features that made it easier for the online learning process to be more efficient in time. The menus available on *Google Classroom* were easy to operate and deliver. Materials and tasks were easy to do through this medium. On display indicator, the teacher believed that *Google Classroom* provided a simple interface so that teachers and students who had never used it could quickly learn it. Based on the indicator of interest, teachers were interested in using the media because *Google Classroom* provided several features that made it easier for the online learning process, such as material features that help teachers to more accessible provide material that students could learn in the form of modules or videos that teachers could use to assign assignments, where these assignments could be directly typed into the form.

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