Exploring the Types of a Material Presentation by Teachers in Mathematics Learning During the COVID-19 Pandemic

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W Murtafiah[1*], S Suwarno[2] and N D S Lestari[3]

[1] Mathematics Education Department, Universitas PGRI Madiun, Indonesia
[2] Mathematics Education Department, Institut Agama Islam Negeri Jember, Indonesia
[3] Mathematics Education Department, Universitas Jember, Indonesia

*Corresponding author's e-mail: wasila.mathedu@unipma.ac.id

Abstract. This study aims to explore the types of presentation of material by teachers in learning mathematics during the Covid-19 pandemic. This research is exploratory qualitative because it is used to examine the kinds of mathematics teachers' learning materials presentation. The data collection used structured interviews through questionnaires distributed by Google forms. Data analysis was performed by reducing, presenting, and drawing conclusions about the types of material presentations by mathematics teachers during the Covid-19 pandemic. The results showed that there were several types of mathematics teachers in presenting material during the Covid-19 epidemic, The results showed that there were several types of mathematics teachers in explaining material during the Covid-19 pandemic, namely: 1) there were three dominant data presentation techniques performed by the teacher, namely uploading material, uploading videos, and asking students to open books/student worksheet, 2) platforms that are effective for presenting material are WhatsApp, Google Classroom, Zoom, and YouTube, 3) learning settings are dominated by independent asynchronous, and 4) effective presentation of material according to the teacher, uploading material with video, multi strategies (using a combination of several platforms), and asking students to open books/student worksheet.

1. Introduction

The Covid-19 pandemic has hit the world (213 countries) starting in early 2020 [1], including Indonesia from mid-March 2020. The existence of this pandemic causes all human activities to be limited to reduce the spread of Covid-19. All fields, including social, cultural, economic, and educational, feel the effects of this situation. In the field of education, the Covid-19 pandemic has an extraordinary influence on schools, teachers, and students [2]. The Covid-19 pandemic is very influential in the administration of education in Indonesia from the elementary to the high level of education.

The Indonesian Minister of Education said that learning activities are carried out from home or in a rotating system [3][4]. The learning process done from home (study from home) is undoubtedly a distance learning because teachers and students are not in the same place. The phenomenon is very influential on the readiness of the teachers in designing distance learning. Before the Covid-19 pandemic, face-to-face learning still dominated the learning process, so many teachers were unfamiliar with online/distance learning tools.

One of the activities carried out by the teacher during learning is to present the material. Presenting the material is the main part that must be done by the teacher to achieve the learning objectives. The

teacher can present learning material in several ways, depending on the model, approach, strategy, method, or learning model. If the teacher can present the material well, students can understand the material well [5]. The teacher can carry out the presentation of material with several techniques and tools used [6]. The production of material depends on the conditions faced by the teacher. This statement is in line with Murtafiah et al. [7] The facilities and material characteristics, and students influence the teacher's decision to design learning tools. Presenting material in the learning mathematics process must consider the visualization of students' material, symbols, and mathematical thinking [8].

The researches on the presentation of material in learning have been carried out by several researchers [6][8][9][10]. Previous research has revealed the influence of various ways of presenting teaching material on students' mathematical problem-solving abilities [8]. Other studies [6] discussed giving material through graphic organizers in science classes in secondary education. Some researchers reveal the presentation of mathematical material on the board [9]. Besides, researchers have previously developed the presentation of material based on mathematical thinking in the geometry class [10].

Some of these studies show that no research has revealed the types of material presentations by mathematics teachers during the Covid-19 pandemic. A study that reveals the kinds of production of material by teachers is essential because researchers want to see the extent of teachers' readiness in presenting material in learning during the Covid-19 pandemic. Thus this study aims to explore the types of a material presentation by mathematics teachers during the Covid-19 pandemic. This study is important to be held to improve the quality of mathematics learning from home due to the Covid-19 pandemic.

2. Methods

This research is exploratory qualitative, exploring the types of material presented by the teacher in mathematics learning during the Covid-19 pandemic. This study uses the subject of mathematics teachers in Indonesia who teach mathematics at elementary and secondary levels. Data collection was carried out through structured interviews through questionnaires distributed using Google Forms. Interview guidelines used in this study are based on presentation techniques, platforms used, and learning settings used by teachers in presenting the material. Table 1 below shows the instrument.

Table 1. Presentation of material by mathematics teachers during the Covid-19 pandemic period.

Presentation technique	Platform used	Learning settings [11]
– Upload photos / images	– Whatsapp	– Sync instantly
– Upload material	– Google classroom	– Virtual sync
– Upload sound	– Youtube	– Asynchronous standalone
– Upload a video	– Zoom	
– Etc.	– Ect.	– Asynchronous collaboration

Data analysis was carried out through several stages [12] namely: 1) Reducing interview data about the way the teacher presents the material in mathematics learning during the Covid-19 pandemic, 2) Presenting data relating to the technique of presenting mathematical material, the platform used, and the learning settings during the Covid-19 pandemic, and 3) Verify data of the types of presentation of the material by the teacher in learning mathematics during the Covid-19 pandemic.

This data analysis was performed using the help of the NVivo 12 plus software. The results of the analysis of the data obtained can describe the types of material presented by the teacher in mathematics learning in the Covid-19 pandemic.

3. Result and discussion

The structured interview was carried out through Google Form during May 2020, which was fulfilled by 35 mathematics teachers at elementary and secondary levels. The types of the mathematics teachers' presentation of the material are described based on the presentation techniques of materials and their

reasons, the learning platforms and settings used, and the types of material presentation that are effective according to the teachers' opinion.

3.1. Material presentation techniques

The data presentation technique is a method used by teachers to present mathematics learning material during the Covid-19 pandemic. Data presentation techniques performed by the teacher include: uploading material, uploading sounds, uploading videos, uploading photos, asking students to open books/worksheets, and asking students to browse. The results of data analysis about the presentation of the material by the mathematics teacher show that there are three dominant data presentation techniques performed by the teacher, namely 1) uploading material, 2) uploading video, and 3) asking students to open books/students' worksheet. Figure 1 below shows the results.

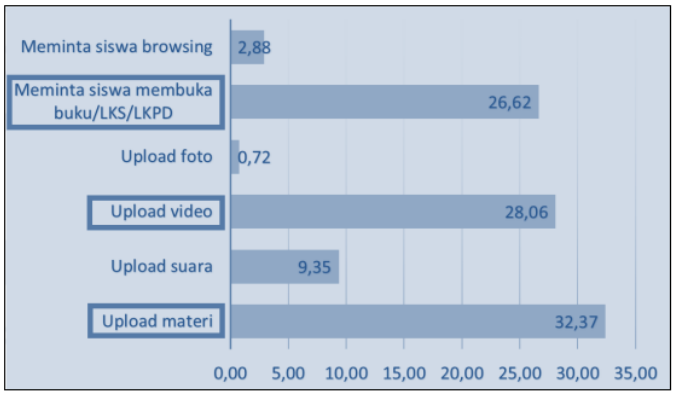


Figure 1. Techniques for presenting material.

Teachers present data by uploading material because it facilitates the delivery of material, fosters learning independence, focuses on the material, introduction to concepts. There is some evidence in the statements of some teachers, such as T11, which states, "the material that I uploaded is the result of my summary because my students are vocational students, I realize that my students' abilities are mostly middle and lower." Another teacher (T6) said, "By presenting the material, students will learn what I share, then I give feedback in the form of questions." T9 states another reason about uploading the material "when this pandemic began, and there was a confusion condition. Many of our students came from out of town, or even outside the province. When the school commands the parents to pick up their children to study from home, many students left their books in the school dormitory/ boarding school. Unfortunately, they only brought a few of their textbooks, so we choose to provide material by uploading it". Presenting structured teaching materials can maximize student learning outcomes. This activity can be carried out by starting the lesson by giving an overview or reviewing the objectives, outlining the content to be discussed, signaling the transition between parts of the course [13].

For presenting material by uploading videos, teachers have the reason that uploading videos make it easy for the teacher to deliver the content, reinforce concepts, use audiovisuals, be more interesting, and facilitate visual type students. The reason given by the teacher can be seen from the statement of several teachers, as stated by T4, namely "uploading videos to clarify and make it easier for students to understand the material, because if only presenting in the form of narration, it has limitations. For example, if some content usually must be delivered through long sentences, but by using a shorter video and activating the sense of sight, hearing, and maybe it must be practiced, it will be even easier to achieve the learning objectives. In the uploading process, we can also load narration and also photos". Otherwise, T19 also states that "children tend to prefer videos than reading material." Another mathematics teacher (T27) said, "without audiovisual, mathematics classes are less optimal." Those

comments are in line with the statement that video can be socially accepted and widely used and supported by multimedia mobile devices and portable media players. Therefore, it can be a strong link between instructors and students [14][15]. Various information and communication tools are available to facilitate mathematics learning in the digital era, and students can view instructional videos [16].

The teacher asks students to open books/students worksheets based on the reason that the books /students worksheets already have appropriate material, to enhance learning activities, as study guides, and practice exercises. There is evidence in the statement of the teacher (T7) "utilizing the media that has been prepared by the school, and alleviating the burden of the teacher in making worksheets". T31 also conveyed another reason, "all students have books/student worksheets that have been routinely studied." In line with T14, "in addition to expanding learning material by opening books, it is also to hone skills in working on the worksheet." Besides that, T23 also said, "reading books is very important. A student worksheet is used to systemize students' activities so that learning objectives can be more easily measured achievement". This is in line with the statement that the material and problems contained in student books and worksheets are developed according to the characteristics and environment of students so that students can use previous experience to solve mathematical problems that make the learning process more meaningful [17].

3.2. Learning platforms and settings used

During the Covid-19 pandemic, teachers used several platforms to present different learning material and settings to mathematics learning before Covid-19. Figure 2 below shows the platform used by the teacher to present the material. Based on the results of the analysis in Figure 2, it is known that effective platforms used to present material according to the teachers who participated in this study were WhatsApp, Google Classroom, Zoom, and YouTube.

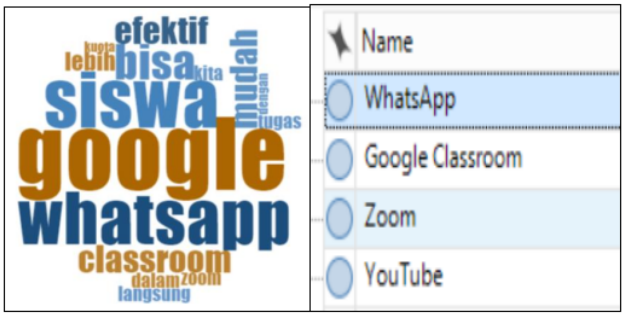
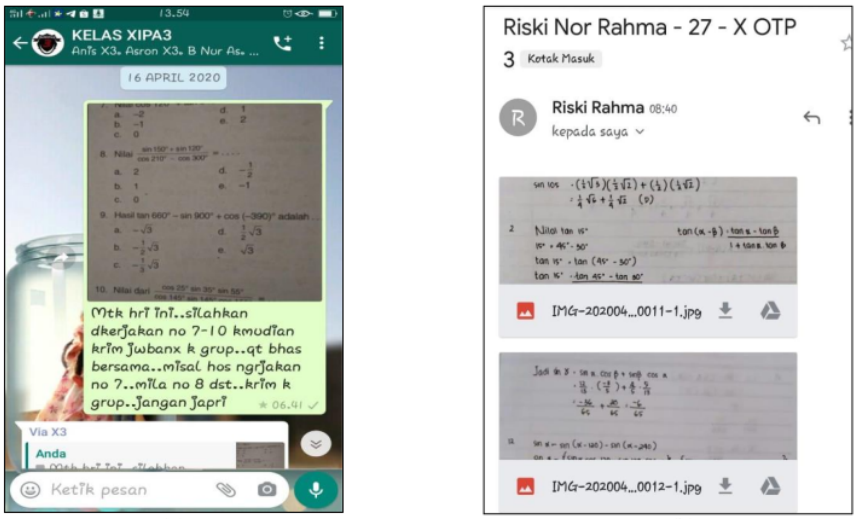


Figure 2. The platform is used by most teachers.

These facts are indicated by several reasons conveyed by teachers regarding the use of these platforms. G12 states that "WhatsApp is easy to use and affordable for the network." G8 says that "many students have WhatsApp applications and are easy to use." The same response was expressed by G17 that "all students have the application and it is easy to use." Presentation of material using WhatsApp can be set up as virtual face-to-face at the same time or at different times so that this includes synchronous virtual and asynchronous independent or collaboration [11]. The use of WhatsApp can be arranged at the same time so that the learning settings can be carried out with virtual synchronization so that students actively respond when learning activities. Those facts are in line with Peterson [18] that synchronous learning settings positively affect the students. The use of WhatsApp in mathematics learning can be seen in figure 3.

For the use of the Google Classroom platform, one of the teachers (T29) stated that "by using Google Classroom, students can immediately get notifications about assignments, assignment info, and completeness of student assignments." The use of Google Classroom is more suitable as independent

synchronous learning settings [11][19]. However, asynchronous learning settings are not appropriate when applied to cooperative learning [20]. The use of Google Classroom can be seen in figure 3.



(a) (b)

Figure 3. Presenting material by WhatsApp (a) and Google Classroom (b).

The use of Zoom for the presentation of the material is selected because it can directly control student activities when studying. Those facts are in line with T16's statement that "by using the Zoom, I can explain the material directly and see the students directly even though online." The learning settings using this Zoom are virtual synchronous because the teacher and students meet online at the same time in different places [11]. Learning with this virtual synchronous setting has advantages; the teacher can provide feedback to students directly and monitor student activities while learning takes place [21]. The use of zoom can be used to explain the material directly as in figure 4, where the teacher presents material about integrals.

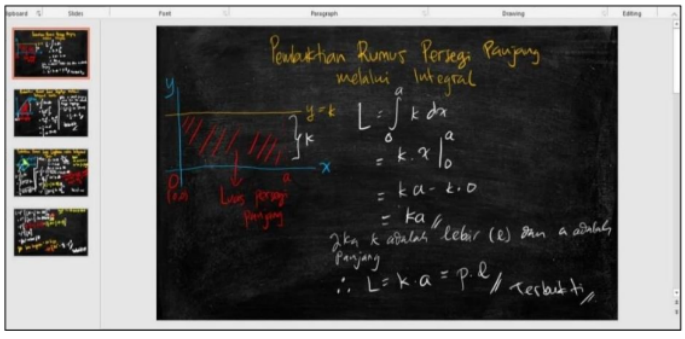


Figure 4. Presenting material by using Zoom.

Next, present the material using YouTube. According to a teacher (T25), "the material is easily conveyed and understood, YouTube can explain the material with a video that we make ourselves". Thus the learning settings for using YouTube for the presentation of material are asynchronous independently because it can be done by students individually at different times and places [11]. The

use of videos via YouTube can increase student involvement in receiving learning materials asynchronously independently [22]. The use of YouTube in mathematics learning can be seen in figure 5, which shows that the teacher explains material about the area of the triangle.

Figure 5. Presenting material by using YouTube**.**

The learning settings undertaken by the teacher in learning mathematics during the pandemic Covid-19 are dominated by independent asynchronous because students are given material either through WhatsApp, Google Classroom, and students open YouTube at any time and from each student's home.

3.3. Types of effective presentation of material according to the teacher

There are several types of material presentations during the Covid-19 pandemic conducted by the teacher. The teachers said that there are types of effective presentations that they think can be seen in figure 6.

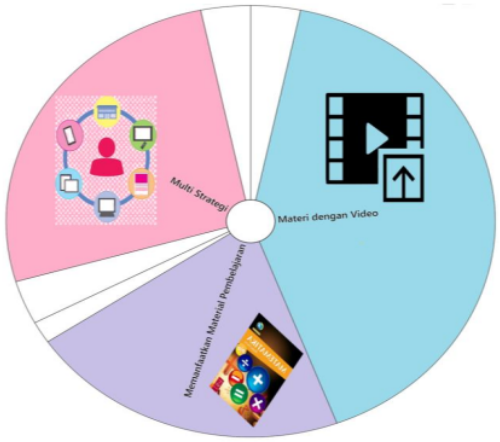


Figure 6. Presentation of effective material according to the teacher.

The analysis results in figure 6 show that there are three types of effective presentations according to the teacher, namely: 1) uploading material with video, 2) multi-strategy (using a combination of multiple platforms), and 3) asking students to open books/students worksheet. Uploading material with

video, because based on student information, students prefer videos because they are more familiar with the material presented, but also feel that meeting the teacher must not attend in person. Presenting material by uploading a video and submitting a written image display also provides an oral explanation. Upload material and upload videos because it can further make students motivated to learn. This is in line with previous studies' results that the use of videos for learning activities is a feasible thing to do to present or deliver material to students [23].

Multi-strategy and combination of several platforms being another choice for the teacher in presenting mathematics topics because they believe that each topic in mathematics has a special characteristics such that it need a different way to present. This was conveyed by T5 that the presentation of data can be done with a combination of various media, which are arranged in a structured and planned manner The learning material presented by YouTube while the assignment given by Google Classroom. The teacher's decision shows that they use a platform based on their strengths. Platforms/applications can influence students' mathematics learning, including expressing, hiding, and developing mathematical understanding. It implies to the teachers when they want to apply platforms/applications, and teachers must consider mathematical concepts, technology, application characteristics, and students [24].

Asking students to open books/students worksheets is more effective if all students have books/students worksheets and routine/accustomed to learning so that students more easily understand the material. Books/students worksheets contain material and practice questions that can guide student learning independently [25]. Textbooks are one of the teaching materials used to help the learning process achieve goals [10].

4. Conclusion

The results showed that mathematics teachers used several types in presenting material during the Covid-19 pandemic. The types of presentation of the material include: 1) there are three dominant data presentation techniques performed by the teacher, namely uploading material, uploading videos, and asking students to open books/student worksheets, 2) effective platform that used to present material according to the teachers who participated in this study were WhatsApp, Google Classroom, Zoom, and YouTube, 3) setting learning carried out by teachers is dominated by independent asynchronous, because students are given material either through WhatsApp, Google Classroom and YouTube that can be opened by students at any time and from each student's home, 4) the presentation of useful material according to the teacher, upload material with video, multi-strategy (using a combination of several platforms), and asking students to open books /students worksheet.

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