



MATHEMATICS LEARNING ASSESSMENT DURING THE COVID-19 PANDEMIC (A CASE STUDY OF MIDDLE SCHOOL TEACHERS IN WEST SULAWESI PROVINCE)

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Abstract

This qualitative research aimed to describe the efforts and obstacles of teachers in carrying out mathematics learning assessments during the COVID-19 pandemic. The research data were obtained from unstructured interviews with 10 middle school mathematics teachers spread across 4 regencies in West Sulawesi Province. The four regencies were chosen by considering the character of each regency. Data were validated by triangulation of sources. The results showed some of the efforts made by the teacher in conducting assessments, namely (1) for the cognitive domain, the teachers used several types of platforms, asked students to come to school by implementing health protocols, and used essay test form, (2) for the psychomotor domain, the teachers paid attention to students' opinions/ comments during online learning and used performance task, and (3) for the affective domain it was done by observing students' discipline both in collecting assignments and taking part in online learning. The obstacles faced include not all students submitting assignments and exams due to internet network problems and the emergence of teacher doubts about the originality of student work results. For psychomotor and affective assessments, teachers were very constrained because the majority of teachers only use non-video-based applications, while for psychomotor and affective assessments are usually carried out by observation.

Keywords: assessment; COVID-19 pandemic; mathematics learning.

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INTRODUCTION

COVID-19 (Corona Virus Disease-2019) is a disease caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV2) virus, a new corona virus found in humans since an extraordinary event emerged in Wuhan, China, in December 2019 (Ministry of Health (Indonesia), 2020). WHO has designated COVID-19 as a pandemic since March 11, 2020 (Kompas, 2020). Not only does it have an impact on public health problems, pandemics and efforts to



overcome them also have an impact on social, economic and political life. This impact will be felt especially by countries with minimal health facilities. Restrictions such as social distancing have provided interventions in the world of education at all levels, for several months educators and students cannot meet face-to-face at school or campus. Even though it is known that learning time is one of the predictors in the success of the teaching and learning process (Reimers & Schleicher, 2020).

After the determination of the COVID-19 outbreak as a global pandemic, governments in many countries have “locked down”. The UNESCO Institute for Statistics, as of 3 May 2020, reported countrywide school closures in 182 countries, affecting nearly 1.3 billion students worldwide (OECD, 2020b). However, changes in learning patterns and systems in these schools encountered many obstacles. The first obstacle is the digital divide. According to the United Nations International Telecommunications Union, prior to the COVID-19 outbreak only 47% of the population of developing countries used the Internet compared to 86% of the population of developed countries. As pointed out by the Chair of the Culture of Peace and Education at Universidad Técnica Particular de Loja (Ecuador) that at least 60% of the student population has been affected by the pandemic, as many do not have the means or instruments to access it (OECD, 2020). The same thing was expressed by several researchers who examined this distance learning, facility unpreparedness (Arifa, 2020), lack of knowledge (Ahmad et al., 2020) and teachers’ experience (Indrawati, 2020; Syah, 2020) are also obstacles in learning implementation during the COVID-19 pandemic.

The existence of various obstacles does not become a barrier to the implementation of distance learning, including in Indonesia. The form and follow-up of the government is the issuance of Circular Number 4 of 2020 concerning the implementation of emergency education for the spread of Corona Virus Disease 2019 (Covid-19) by the Minister of Education and Culture (Ministry of Education and Culture (Indonesia), 2020). This is because the potential that students have must be improved through the education and learning process, including the mathematical potential of students. Mathematics learning cannot be separated from



mathematical assessments, both of which are concurrent (Kisno et al., 2020). Schools and educators in particular need to prepare several things for the effectiveness of learning, including methods for assessing and evaluating student learning. Regardless of the model and form of learning, including online learning, teachers and schools absolutely take measurements, assessments and evaluations (Fitrah & Ruslan, 2020). Evaluation is the essence of the implementation of education and must be done to see the learning achievements of students (Astuti, 2017) and to improve the quality, performance, or productivity of educational institutions (Siregar, 2018).

However, the form of assessment that has been used so far is not in accordance with the current pandemic conditions, there is no other choice but to generate alternative learning assessments so that the predetermined indicators can still be measured (Damanik et al., 2020). Several assessment models that can be applied in distance learning are online-based assessments, portfolio assessments, and self-assessments (Ahmad, 2020). The importance of assessment in the educational process in any difficult situation makes researchers feel the need to find facts in the field regarding the implementation of mathematics learning assessments during the COVID-19 pandemic, especially for teachers at the middle school in West Sulawesi Province. The objectives of this study were to describe the efforts and obstacles experienced by teachers at the middle school in West Sulawesi Province in carrying out mathematics learning assessment. The researcher feels it is very important because in this very difficult situation, learning assessment must remain the main concern. The data obtained in this study can be information for local governments to maintain the quality of learning even in a pandemic.

METHOD

This research was a case study research using a qualitative approach with descriptive analysis method. This research analyzed the efforts and obstacles faced by middle school mathematics teachers during the COVID-19 pandemic. The research was conducted in West Sulawesi Province. The research subjects were 10 mathematics teachers at the middle school, 2 subjects from Mamasa Regency, 3



subjects from Polewali Mandar Regency, 3 subjects from Majene Regency, and 2 subjects from Mamuju City. The four regencies were chosen by considering the character of each regency

The instrument used was an interview guide with the main questions, namely (1) how did the teacher carry out assessments on mathematics learning during the COVID-19 pandemic? and (2) what were the obstacles faced by teachers in carrying out assessments on mathematics learning during the COVID-19 pandemic? The interview technique used was unstructured interviews. This was done considering that research related to the implementation of assessments of mathematics learning during the COVID-19 pandemic had not been widely carried out so that there were no definite indicators to be found that would be used in compiling structured or semi-structured interview guidelines. Data were validated by triangulation. The triangulation technique used was source triangulation. While the data analysis technique used was descriptive qualitative data analysis. The interview data obtained were presented per subject for each research objective. From the triangulation results, conclusions were drawn up for each research question.

RESULT AND DISCUSSION

Based on the results of interviews conducted in October 2020 regarding the implementation of assessments of mathematics learning during the COVID-19 pandemic by middle school teachers in West Sulawesi Province, the following results were obtained.

Subject 1 (S1) explained that during the COVID-19 pandemic, they continued to carry out assessments in the cognitive, psychomotor and affective domains. For the cognitive domain, the subjects conducted an assessment by giving quizzes through digital platforms such as Quizziz or Kahoot. The psychomotor domain was assessed through the activeness of students in providing opinions or comments on the learning process. While affective was assessed through student discipline both in terms of attendance and collecting assignments. Likewise stated by Subject 2 (S2) regarding the assessment of mathematics learning during the



COVID-19 pandemic. Cognitive assessment was carried out by submitting assignments directly to school but still adhering to health protocols and limiting the number of students who come each day. Psychomotor assessment was carried out by providing problems related to everyday life so that teachers can assess students' creativity in applying subject matter in solving these problems. In order to still be able to provide affective assessments, the teacher shifted the assessment to things such as the way students communicate and respond to the teacher, and the discipline of students following online learning from the beginning to the end of the schedule. Subject 7 (S7) assessed cognitive through student activeness during online learning and student answers during learning evaluation. To be more confident about the results of the cognitive assessment, the teacher called students to school in turn to give answers orally to the teacher so that the teacher was able to distinguish between students who work independently and those who just copying their friends' work. Affective was assessed from students' discipline in collecting assignments. Although all student assignments were correct but past the deadline for collection, the attitude assessment was lacking. In carrying out online assessments, teachers couldn't monitor the math skills of each student individually because teachers and students never use video-based applications.

Another effort was put forward by the subjects to continue assessing mathematics learning. Subject 4 (S4) revealed that the assessment was carried out by looking at the completeness of the assignment that was sent online with a time limit of about three days. Assessment was also carried out by looking at the activeness of students during online learning activities. In addition, the subject also assessed the completeness of the notes, where students recorded the material in the video as evidence that the student actually watched the instructional video that was distributed and sent at least 5 screenshots while the learning video was running. The effort made by Subject 6 (S6) was by giving questions according to indicators in the form of description questions because students were required to find answers by providing a procedure of "why these answers could be found". Psychomotor assessment was carried out by the teacher by using performance task, by means of students writing the way for the answers that have been obtained by students by



writing down the steps. Whereas subject 3 (S3) revealed that the assessment was carried out through the assignments given and the activeness of students answering questions given during the learning process.

The assessment was also carried out by subject 5 (S5) by giving various questions. Furthermore, if there were students who are late in submitting assignments or exams due to network constraints or housing problems, they wouldn't not be sanctioned at all and will be given a follow-up exam provided that the scores obtained will be different from those who collected on time. This was also applied in daily assessments, students who were able to work on questions will get additional points. Subject 8 (S8) strived to continue assessing mathematics learning by conducting face-to-face learning in schools. To get rid of boredom and student saturation, the subject provided innovation and the teaching process was no longer in the classroom, but invited students to leave the classroom by giving problems, then the student looked for solutions and answers to the problems given. For example, Class XII on Statistics material, students were given the task of taking the student's height data in the administration room and then they looked for the average, mode, median, and so on.

In carrying out online assessments during a pandemic, according to subject 9 (S9) the focus of the teacher was only on the cognitive domain. Teachers did not want to bother doing affective and psychomotor assessments. According to the subject, affective and psychomotor assessments can only be done face-to-face, while in learning from home the teacher was unable to make these observations. Likewise, what was conveyed by subject 10 (S10) that especially in learning mathematics, the use of formulas needs to be taught directly or face-to-face to students. Even though the teacher does face-to-face learning, the time used was very limited so that the material couldn't be conveyed optimally.

The obstacles faced by teachers in carrying out mathematics learning assessments during the COVID-19 pandemic which were disclosed in the interviews were described as follows.

According to S1, students' cognitive and psychomotor assessments during distance learning were not effective because the teacher was unable to ascertain the



extent to which students' understanding of the material being taught, especially Mathematics lessons, almost all of the material covered was calculation. At the time of assigning assignments, even daily tests, midterm exams, and end-of-semester exams, the teacher was not sure whether the students were doing it themselves with their understanding, cheating from a friend's assignment, or using a search engine. Likewise with attitude assessment, teachers experienced difficulties because students could no longer be directly monitored, but only assessed from a distance. S2 also expressed that scoring during this pandemic had difficulties for several reasons. For example, for assigning assignments, there were students who collect assignments and others who did not, on the grounds that they were constrained by internet access. The subject experienced a dilemma, whether to give grades to students who did not submit assignments or not, because internet access constraints were not entirely the students' fault. This dilemma was also felt by the subject when carrying out daily tests and semester exams, where the subject had difficulty determining whether the questions given were done alone or get help. Likewise, in assessing the psychomotor of students during discussion, the subject doubted whether the opinions expressed came from the students themselves. For attitude assessment, the subject revealed that after a pandemic, affective assessment was rather difficult to do because previously we used observational techniques which of course required direct encounters.

S7 faced the same obstacle in conducting the assessment. According to the subject, the material taught was not as much material that could be taught in normal times. The learning process was also very limited and not free because communication was only done via a smartphone. Cognitive assessment was carried out by the subject by giving practice tasks to be done anywhere then collected on the next day, for psychomotor and attitude the subject was very difficult to assess because there were students who cannot follow the learning process so it was very difficult to assess. Then those who could be subject to values that were only active, so those that were never active were given only standard values.

S4 noted that the difficulties faced in conducting assessments during the COVID-19 pandemic, one of which was that not all students were able to take



lessons online or offline. Some students had network or internet quota constraints. Even worse, there were some students who do not have smartphones, so the subject was difficult to give an appropriate assessment of their group mates or classmates. The next difficulty that often occurs in learning was that there were still students who often copy their friends' answers or assignments and the subject couldn't monitor the mathematics skills of each student individually. Subjects and students had never used video-based applications, so they were unable to observe directly how the students' proficiency and skills in doing math tasks. The subject was very difficult to give a pure value from the results of student tests because there were still many who did not complete even some students who take remedial scores were still below the standard. This made the subject set the remedial limit three times. If it was enough three times but the student's score had not been completed, then the subject provided a policy by giving other assignments such as making papers or resumes related to material that the student had not mastered. S6 found that students do not accept the concept directly from the teacher so that when they find a problem that was difficult students tend to negotiate it by accepting the situation or surrendering and being silent because of their lack of understanding of online mathematics learning. There were some students who protested about online learning, especially in mathematics learning that really needed repeated explanations for students who did not understand.

A more detailed obstacle was raised by S3. There were several obstacles faced, first, sometimes at the time of the assessment not all students attended due to network constraints, so this caused the subject to take another time for follow-up assessments for students who had not taken the previous assessment. Second, the results of the assessment were not very "real" because the subject couldn't control student behavior during the online assessment. There were several cheating that may be committed by students when online assessments were in progress, namely students opening textbooks or notebooks, looking for answers from the internet, and collaborating through group chat. In conducting online exams, the group chat feature would usually be used by students to work together in solving a problem, including during the final assessment.



What other subjects expressed was also revealed by S5, assessment was difficult because there were students who only had one smartphone in their family which consists of several family members who also had to study online. It was very different from face-to-face learning, in this time of the COVID-19 pandemic, the subject was very difficult to supervise, students could only see answers in books or the internet. The problem of assessing attitudes was also very difficult, many reports during online learning turn out that students only took attendance and after that students did not participate in subjects anymore due to playing games, after the time runs out only students returned to attendance. S8 faced the same problem, assessments were very difficult to do because there were some students who did not have smartphones, if anyone does, there was no internet network access in their area. The next obstacle was that students were indifferent in doing their assignments, some were doing it, some were not.

Some domains of assessment became very difficult to assess, S9 revealed that the focus of the assessment was only on the cognitive domain. For example, psychomotor assessment was very difficult to do because the teacher only used media such as WhatsApp, never uses video-based applications because of students' internet network problems. In assessing and recapitulating student learning outcomes, teachers became doubtful. The assessment would also be biased because the teacher only delivered with very limited media, while learning mathematics required the use of a lot of formulas. S10 revealed the difficulties faced in assessing mathematics learning during the COVID-19 pandemic. According to the subject, in assessing mathematics the subject had great difficulty in measuring the skills and abilities of students online. Because the subject sent the material online, students did not know whether their students studied the material or not. In assessing and recapitulating students' mathematics learning outcomes, subjects often had doubts about the results obtained by students. The answers given by students were more likely to be perfect.

Based on the explanation of the results of the interviews related to the teacher's efforts to carry out the assessment of mathematics learning, it was clear that during the COVID-19 pandemic, mathematics teachers were still trying to carry



out authentic assessments consisting of cognitive, psychomotor, and affective assessments. However, there were some teachers who only focus on cognitive assessment.

The efforts made by mathematics teachers in conducting cognitive assessments include giving quizzes through digital platforms such as Quizziz or Kahoot. Junior (2020) states that Quizziz is an easy-to-use tool because it offers various features to facilitate and manage question creation in an educational context. So there is no need for special skills for students or teachers to access quizzes or exams via Quizziz. Apart from Quizziz, teachers also use Kahoot. Kahoot is a medium that is suitable for use by teachers in online learning (Elita & Asrori, 2019). It is hoped that with this Kahoot, learning will be more interactive and interesting and can help teachers in student assessment. Another effort was to ask students to come to school while adhering to health protocols, this was done so that the teacher was absolutely sure that the students were doing the assigned assignments independently. Another alternative that the teacher did was to make various math problems and in the form of descriptions so that the individual cognitive abilities of students could be measured appropriately. According to Kartono & Yumiati (2007), the description test type is very popular because it is easy to write, and for some people it is the best way to reveal the ability to organize thoughts and express complete knowledge. Test essay questions require both teachers and students or students to practice reasoning. Meanwhile, the assessment does not only look at the final result but also takes into account the answer process.

Psychomotor assessments were carried out by the teacher through student opinions or comments during online learning. The most common thing that teachers did in assessing student psychomotor during the COVID-19 pandemic was to provide performance task. The form of performance could be in the form of giving problems related to everyday life and students applying the material studied to solve them or inviting students to the real world to retrieve data and then manage it. This performance assessment was very appropriate to use to assess student psychomotor, Yudha et al. (2014) stated that performance assessment is an alternative assessment



which focuses on two main activities, namely: observing the process during a skill show and evaluating the product or creation.

The area of assessment from the results of interviews with the subjects was very difficult to do, namely the affective domain. As stated by Ramdhayani et al. (2020), the application of online learning is certainly accompanied by new problems in the learning process and in evaluating students. Online learning problems that are applied in the new order era certainly arise related to the difficulty of teachers in evaluating students, especially in assessing student attitudes during online learning. However, some teachers still made efforts so that affective assessments could still be carried out. The simplest form of affective assessment carried out by the teacher was by looking at students' discipline in collecting assignments, how students communicate and respond to teachers in online learning, student persistence in following learning on schedule, and accepting evidence provided by students that students were really following online learning process.

The efforts made by the teacher so that the assessment of mathematics learning could still be carried out, of course, faced many obstacles. The results of the interviews that were previously stated found so many obstacles faced by mathematics teachers in assessing during the COVID-19 pandemic. The most important obstacle faced by most of the teachers in West Sulawesi Province who were the subject of this study was the inadequate internet network problem. As a result of this poor internet network, the learning process was not optimal, especially learning mathematics which contains a lot of calculations and of course requires a lot of practice questions. In addition to the constraints in the delivery of mathematics subject matter, the assessment process was of course also constrained.

For example, in collecting assignments, due to the lack of smartphones and networks, many students were very late or don't even collect assignments at all. Likewise, when teachers carry out daily tests, midterm exams, or final semester exams, many students couldn't take part. The next obstacle faced by the teachers was that the assignments and examinations that were collected by the students raised doubts. The teacher doubted whether the answers sent were really the answers of students or they copied the work of friends and looked for answers on



the internet. Many students during face-to-face learning got low scores, but when learning online they got nearly perfect scores. This made the teacher a dilemma in giving final grades to students.

The obstacles faced by teachers in conducting psychomotor assessments were not much different from the obstacles in conducting cognitive assessments. When the teacher asked questions and answers in online learning, the teacher became doubtful about the opinions expressed by students, whether their opinions were pure, or the opinions they "copy and paste". Moreover, most of the teachers who were interviewed admitted that they had never used a video-based application. Some teachers decided not to do psychomotor assessments during online learning.

What teachers perceived as the most important obstacle in online learning was affective assessment. If before the pandemic affective assessment was carried out by the teacher by making observations, during this online learning this was almost impossible to do. The teacher did not find a definite standard of how to assess student affective because learning was only carried out using very simple applications, such as WhatsApp. As with psychomotor assessments, some of the teachers interviewed also decided not to do affective assessments.

CONCLUSION

There were several efforts made by teachers to continue assessing mathematics learning during the COVID-19 pandemic. Cognitive assessment was carried out with various efforts, namely used several types of platforms such as Quizziz, Kahoot, or e-learning provided in schools, asked students to come directly to school but by paid attention to health protocols and limiting students to face directly to the teacher, and used the form of essay tests. Psychomotor assessment was carried out by paid attention to the opinions and comments given by students during online learning and using performance tasks. Affective assessment was carried out by looked at the discipline of collecting assignments, the way students communicate and respond to teachers in online learning, students' persistence in following learning on schedule, and received evidence provided by students that students were really following the online learning process.



The obstacles faced by teachers in assessing mathematics learning during the COVID-19 pandemic were that not all students collected assignments and exams due to internet network problems and the emergence of teacher doubts about the originality of student work results. For psychomotor and affective assessments, teachers were very constrained because the majority of teachers only used non-video-based applications, while for psychomotor and affective assessments were usually carried out by observation. Some teachers even completely no longer carried out psychomotor and affective assessments in mathematics learning.

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