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Assesment Process of Mathematics Learning in Primary Schools in The COVID-19 Pandemic

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abstract

Mathematics learning in primary schools is transformed from conventional learning to online learning due to the COVID-19 pandemic. The learning process cannot be separated from the assessment process. This study aims to describe the process of assessing mathematics learning during the COVID-19 pandemic as well as the obstacles of mathematics learning assessment process during the COVID-19 pandemic. This research is a qualitative research using interviews and literature study methods. The results showed that the process of assessing mathematics learning in primary schools during the COVID-19 pandemic took place online in both the affective, cognitive and psychomotor aspects. However, the process of assessing the affective, cognitive, and psychomotor aspects during the COVID-19 pandemic cannot be assessed in 100% real. This is due to the limitations of the teachers in monitoring the learning progress of students.

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Keywords:

Assessment process, COVID-19 Pandemic, Mathematics Learning.



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INTRODUCTION

Mathematics is a field of study starting from primary school to higher education. In primary school, mathematics learning in low and high grades. Mathematics learning in low grades is integrated into thematic learning, while mathematics learning in high grades is separate. This is because of the different materials in low and high grades. If mathematics learning in high grades is thematic, it is feared that students will not be able to understand in deep understanding. Based on these considerations, mathematics learning in high grades is taught separately.

Mathematics learning in primary schools that before took place conventionally/offline must be transformed into online learning. This is because of the COVID-19 pandemic that has hit Indonesia. Corona Virus Disease or COVID-19 is a disease that has never existed, but the spread of the disease is so fast that in a short time it can spread to all countries around the world (Untari, et. al., 2020). Increasingly, the number of victims infected with the virus increases. To reduce the spread of the virus, the government implemented a policy called social distancing. This policy was implemented as an effort to cut the spread of the COVID-19 outbreak. To support this policy, the government physically closes schools starting from early childhood education to tertiary education. The closure of schools not only occurred in Indonesia, but also occurred in various countries around the world (Lancker & Parolin, 2020; Ahmed, Allaf & Elghazaly, 2020). Closing schools does not mean that learning is not carried out, but learning must still be carried out, including learning mathematics. This is because in everyday human life it cannot be separated from mathematics. The COVID-19 pandemic encourages various components of education to be able to make new breakthroughs in mathematics learning. One of the breakthroughs made in mathematics learning is to make use of various technologies in learning to support the study from home policy. The implementation of study from home of mathematics is performed by online and this is a challenge for all components of education, especially the teachers. It is because the teachers have to make sudden changes in the learning process. This resulted in the lack of learning preparation so that the process of mathematics learning boldly ran less optimally.

Online mathematics learning can be performed anywhere and anytime, this learning is not easy to do. Especially for primary school students, whose development and way of thinking are still at a concrete operational stage. In addition, mathematics learning is also abstract learning. Based on a preliminary study conducted at three different primary schools, there are several problems; and obstacles experienced by teachers, students, and parents in the process of online mathematics learning. The teachers are forced to engage in a learning process that requires taking advantage of technology. This is not easy to do, especially for teachers who live in rural areas. There are still many teachers, students and parents who still have difficulty using technology and do not have adequate facilities. In addition, teachers also experience difficulties in communication and monitoring the development of students. In the learning process, students tend to have difficulty concentrating and easily feel bored in the online learning process if the learning process is not packaged in an attractive way. Meanwhile, students are often burdened with disproportionate tasks that need parents to become teachers at home. Based on this reason, good cooperation is needed for teachers, students, and parents to make the online mathematics learning process successful (Rasmitadila, et al., 2020).

The learning process cannot be separated from the assessment process. This is because every learning process requires an accountability in the form of learning outcomes. The learning outcomes are obtained through an assessment process in the form of affective, cognitive, and psychomotor assessments. In mathematics learning, the assessment process should be able to cover all three aspects of the assessment so that mathematics learning will be more meaningful (Rusmawan, et al., 2017). However, be the COVID-19 pandemic resulted in not carrying out the three assessments optimally because there were several obstacles during the assessment process. This is by the results of research conducted by Kisno, et al. (2020) where there are several obstacles in implementing the assessment, even though the assessment is considered good enough. Meanwhile, according to Fitrah & Ruslan (2021) the learning assessment given by teachers during the COVID-19 pandemic is limited to a form of responsibility to schools, students and parents only so that the assessment is considered not good enough. The assessment given did not have clear instructions and encountered many obstacles.

Both of these studies show that the online learning assessment process is subject to constraints and obstacles. However, there are differences between the two studies which Kisno, et al. (2020) states that the implementation of the assessment is considered good enough, while according to Fitrah & Ruslan (2021) the assessment is only a form of accountability. Based on this reason, a deeper study is needed on the process of assessing mathematics learning during the COVID-19 pandemic as well as the obstacles and obstacles to the mathematics learning assessment process during the COVID-19 pandemic.

THEORETICAL FRAMEWORKS

Mathematics as a field of study taught in primary schools is a science related to thinking skills, communication skills, and math problem solving skills (Uno, 2009). Mathematics learning in primary schools during the COVID-19 pandemic is taking place online with the aim of supporting the study from home policy and to break the chain of the spread of COVID-19. Online learning is internet-based learning that is offered in the form of syncronus and asyncronus. (Rasmitadila, et al., 2020). Syncronus learning is a form of learning in which teachers and students interact directly using a video conference platform. Meanwhile, asyncronus learning is a form of learning indirectly (not done at the same time) using an independent learning approach and is usually done by giving assignments to students. The platforms commonly used are google classroom, whatsapp group, and other platforms. The platform is available for free, but there are still some obstacles that are felt by teachers, students and parents during online learning. Skills to use technology and the availability of facilities are considered the main obstacles for teachers, students and parents (Mastura & Santaria, 2020). Parents should also take extra time to be teachers at home.

Mathematics learning cannot be separated from mathematics assessment. Mathematical assessment is an activity to measure students mathematical abilities so that information

can be obtained about students understanding, strengths, and weaknesses in mathematics (NCTM, 1989). The assessment of mathematics learning can also be used as material for reflection to make mathematics learning even better. The assessment of mathematics learning consists of attitude, knowledge, and skills. These three aspects are interrelated, inseparable, and guide each other. The assessment of mathematics learning must include all three aspects that have been mentioned so that it will produce meaningful learning for students.

Cognitive assessment is carried out by means of tests related to knowledge and thinking skills. Meanwhile, affective and psychomotor assessments appear when learning activities take place. Affective assessment is related to attitudes, emotions, values and morals while psychomotor is related to the motor skills of students. Affective and psychomotor assessments are carried out by non-testing through assessment of attitudes, performance, projects, products, and self-assessments (Sesanti & Ferdiani, 2017).

During the COVID-19 pandemic, the implementation of learning has adjusted according to the dynamics of life. This adjustment requires the readiness and skills of teachers. There are obstacles that are felt by teachers during the COVID-19 pandemic, namely the lack of teachers skills; difficulty in designing assessment instruments; reduced participation and activity of students; lack of understanding of students about the material and lack of availability of facilities (Fitrah & Ruslan, 2021).

METHODS

This research is a descriptive research with a qualitative approach. This research was conducted with the aim of obtaining information on the assessment process of mathematics learning in primary schools during the COVID-19 pandemic. The data collection method was carried out through semi-structured interviews and literature studies. Semi-structured interviews as the primary data source were conducted with teachers from four different primary schools. Meanwhile, literature studies were used as a secondary data source. The interview method was carried out online via WhatsApp and video conference. The following is the profile of the research subject.

Table 1 Research Subject						
Code	Role					
T1	Grade V Teacher					
T2	Primary Math Teacher					
Τ3	Grade V Teacher					
T4	Grade IV Teacher					

After the data are collected, then data analysis are analyzed using the Miles and Huberman model (Bungin, 2015) which includes data reduction, data presentation, and drawing conclusions. Credibility tests of the data are done by triangulation of sources and techniques. Source triangulation was carried out with four different teachers, while technical triangulation was carried out using interview techniques and literature studies.

RESULT AND DISCUSSION

In this study, interviews were conducted with four teachers from four different schools. There are four teachers who are classroom teachers and some are math teachers. This is because there are several schools where mathematics learning is taught by special mathematics teachers and some are taught by classroom teachers. The interviews in this study were conducted online, namely through WhatsApp and video conference. The following is an excerpt from teacher interviews from four different primary schools where the four teachers both carried out online learning during the COVID-19 pandemic.

Researcher: Was an assessment of the learning process of primary school mathematics during the COVID-19 pandemic? If yes, how the teachers assess primary school mathematics learning during the COVID-19 pandemic? (In terms of affective, cognitive and psychomotor aspects)

T1: Yes. During the pandemic the assessment of learning is only on the cognitive and psychomotor aspects. For cognitive assessment in the form of assessment of students learning outcomes related to the questions given and how to solve them. For the psychomotor aspect in the form of students skills in solving problems in new ways with the right answers.

T2: Yes, an assessment was carried out. Affective assessment was seen from the student's attitudes when google meet; did the students listen carefully; did the students follow from beginning to end; when they did not strange; and did the students focus. Cognitive assessment was seen through google classroom whether the assignments was submitted on time or not; did they feel that the task was too heavy; seen from how many times he did the task; did he do it directly continuously; and did he procrastinate. As teachers, we shouldn't immediately judge students not to do assignments because they are lazy. This is because we don't know who during the pandemic was at home with whom, their parents worked or not. In the current pandemic situation parental help is very important. There are students who do not want to google meet without parental help. Besides that, we also have to look at the quota reason. For the psychomotor assessment seen from the assignment, the assignment is in the form of exploratory math questions so students are free to explore. However, in the low grades, students cannot be given a full assignment abstractly, but the pictures are reproduced while in the high grades students are able to understand abstract assignment.

T3: Yes, an assessment of mathematics learning is still carried out, namely by giving assignments to children after the material/explanation is given online. The assignment is given as in the book. So during this pandemic the teachers at my school were only doing real assessments on cognitive and psychomotor. For affective, the teacher cannot check the attitudes of each student through direct observation. The teacher only looks at the habit and discipline of children in collecting assignments and honesty in doing these tasks. Sometimes the writing that is collected is not the writing of the students themselves. For psychomotor, it was taken from assignments every day, while for cognitive it was taken from daily tests, midterm assessments an final semester assessments.

T4: Yes. Cognitive assessment is carried out with assignments through the google form, skills by making works such as analog clocks for time material in grade 4 then the results of student assignments are collected through photos and sent via google classroom, for the

affective the teacher sees the student's attitude when answering the questions given one by one student about the material, which is taught online.

Based on the interview excerpt, the implementation of learning assessments during the COVID-19 pandemic is still being carried out. The affective assessment is seen from the attitudes of students when doing video conference, attitudes when answering teacher questions, the habits of students collecting assignments, timeliness in collecting assignments, and the honesty of students doing assignments. Cognitive assessment is seen from the acquisition of student assessment scores such as daily assessment scores, midterm assessments, and final semester assessments. Psychomotor assessment is seen from the skills of students in doing assignments.

Affective, cognitive, and psychomotor assessments were carried out using assessment instruments. However, in the affective aspect, most teachers use non-standard instruments, namely only using separate notes or student's attitudes and spiritual journals. This is in line with state Fitrah & Ruslan (2021) that the online assessment process is not carried out by the rules and regulations as in normal situations. The affective assessment is carried out every time online learning. The cognitive assessments are carried out once a week as a daily assessment, once a half semester for midterm assessments, and once a semester for final semester assessments. Meanwhile, the psychomotor assessments are carried out every time an assignment is given. This is by quote the interview as follows.

Researcher : What are the tools or instruments used by the teacher to implement it? Why use this tool? (In terms of affective, cognitive and psychomotor aspects)

T1: The learning instrument is carried out by the rules of the school, namely point assessment and studen psychomotor assessment. This assessment is considered capable of providing an appropriate assessment in the midst of the COVID-19 pandemic like this where there is no face-to-face learning.

T2: During the pandemic, production tools are used to measure, and psychomotor without standard tools. So the teacher has notes. For affective, it can be seen from the severa times students following Google meet. How are the attitudes during learning and how are the students ask questions, it will be a special fee. For measurement, at school we use two assessments for the 365 application (after the test results come out) and the questions in the book are then collected through google classroom. For the psychomotor, it is seen from how students complete the assignments.

T3: As I explained earlier, for psychomotor use the provided book which has material along with examples of questions that children can do. For cognitive/knowledge, the tools are assignments that have been provided by the teacher themselves, namely questions that are done for daily tests, midterm assessments, and end-of-semester assessments. For daily tests, the teacher usually made the midterm assessment by the school; the end of semester assessment for the high grades was made by the district education office, and the final semester assessment for the low grades was made by the sub-district UPTD office. For the affective tool, namely by observing the collection of children's assignments, then recorded on the assessment instrument, namely the student's attitude and spiritual journal.

T4: The assessment instruments we use are in the form of assessment sheets, skills and attitudes adapted and modified from the pre-pandemic assessment instruments.

Researcher : How many times was learning handled during the COVID-19 pandemic? (In terms of affective, cognitive and psychomotor aspects)

T1 : Assessment is carried out at the end of each theme in low grades and each material in high grades.

T2: Often yes, almost every material I assess in terms of affective, cognitive and psychomotor aspects.

T3: For psychomotor assessments carried out after giving mathematics material, three times a week. For cognitive given 1x/sub-theme. So during the daily tests, they usually do a theme test, mathematics and Javanese language. It is usually done once a week. For the mid-semester assessment and the end-of-semester assessment as a cognitive assessment, it is carried out once each for one semester. For affective, student's attitude were recorded once under one theme. One theme is usually completed within three weeks-one month.

T4: For cognitive skills, once a week. For skills, it can be done through assignments, which is given once a day or once a week or once a month for project assignments. For attitudes, each learning takes place because every school day is entered online through Google Meet.

During the assessment of mathematics learning during the COVID-19 pandemic, the questions given to students tended to be memorized and procedural. This is in line with the statement of Rahma & Rohman (Kisno, 2020) that most teachers use understanding and procedural math problems during the COVID-19 pandemic. However, contextual problem-solving questions were still given even though they were not as intense as when learning was done face-to-face (Kisno, 2020). This is because problem-solving is one of the explicit goals stated in the mathematics curriculum in various countries (Bokhove & Jones, 2018). Problem-solving questions will be able to give valuable experience for students in the morning (Tabach & Levenson, 2018). The contextual-based problem solving questions given to students during the COVID-19 pandemic have been summarized in handbooks/teaching materials given to students, but some are made by the teacher themselves. This is by the quotation from the interview as follows.

Researcher : Have students ever been given assignments and questions based on contextual problem solving? How often is it given? How about an example of the problem?

T1: Once, these questions were summarized in the Mathematics practice questions for grade 5 MBP Erlangga that we used. We insert numeric AKM practice question for the students every weekend.

T2: Students have been given questions that are contextual based. Often yes, problem solving questions are usually given at the end of the number around 1-2 numbers in each question at each meeting.

T3: During this online learning, it seems that the problem is more of a problem in the book. The questions in books are usually memorized, procedural and story problems. Well, this problem solving problem is usually found in story -shaped questions. The questions given were more memorization and procedural questions, while the problem solving questions were given less frequently.

T4: Once, the question was found in teaching materials made by schools and questions that were made by the teacher himself.

Researcher : Is there any feedback on the results from students and parents?

T1: Most of the students showed enthusiasm in the assessment with the support of the parents.

T2: The feedback from students and parents at my school is really amazing because students and parents are very active, they contact directly via whatsapp personal chat. For

example, about learning through google meet, production. At my school, the parents are very active except for some parents who work and the entrepreneur. They are more indifferent because their children are taken care of by their assistants, their baby sisters, their drivers, etc.

T3: For now, I think the feedback from students and parents is okay. None of which is based on mathematical requests because math is an exact science so when the answer is wrong it's wrong.

T4 : Yes, parents always command and children's development during courageous learning at our school.

Based on the interview excerpt, students and parents actively give feedback on the assessment of mathematics learning. Students and parents actively show enthusiasm for mathematics learning and its assessment. Parents also actively check their child's development, but there are some parents who tend to care less about their child's development. Parents who do not care about their child's development are usually parents who are busy with their work. During the current COVID-19 pandemic, parents have an important role in providing guidance and mentoring for their children, especially for primary school students who are still in the 6-11 year age range and their way of thinking is still at the concrete operational stage (Bujuri, 2018), especially during the COVID-19 because more time is spent at home. Parents can help children understand subject that children cannot understand during online learning (Rasmitadila, et al., 2020).

As with the online learning process, the assessment of mathematics learning in primary schools during the COVID-19 pandemic also has obstacles. The following are the constraints and obstacles presented by the four primary school mathematics teachers.

Researcher : What were the obstacles in the process of assessing mathematics learning in primary schools during the COVID-19 pandemic?

T1 : Assessment is not necessarily 100% real and right because we only make remote observations when online activities via video conferencing and online assignments via uploading assignments on Microsoft Form.

T2: The first obstacles in the process of assessing mathematics learning during this pandemic that we do not know which students can really do mathematics when they take the test. This is because when he did the test he could have been assisted by parents, we don't know unless the assessment on google meet suddenly and students are not informed beforehand. Well, it usually appears there because I usually ask for a full face when Google meets. If I can't get a full face, it usually shows whether he memorized it or not, he reads a book or not, he sees a full camera or not. When I do the assessment, I am more inclined to google meet. This is because there I can know how the students answered and most of them on Google Meet there are parents, but they can't be seen, 'Oo ... this is the answer 'because I've heard that there are parents who support their children like that and the parents are very enthusiastic and ask their children to actively answer the questions given. Now the obstacle is, we also don't know whether the student is held by his own cellphone or not, whether the student is full of doing it alone. Besides, the flaws in the 365 math scoring system are like this. Actually the 365 system can be locked to do it only once using the schools account, but before using the students account, someone can break into it, he can do answer many times. However, now our school uses the assessment policy taken is the first work. Well, I once gave the wrong answer key, students and parents were so enthusiastic they

immediately asked and confirmed the answer. In addition, the homeroom teacher also gave his own meet and direction to students and parents.

T3: The obstacles to learning costs during COVID-19 is that we cannot measure the real abilities of children because we do not know when given tasks at home whether the children actually do them or not. There are many cases of children where when they learn directly, they are classified as normal/mediocre grades, but during this pandemic they always get relatively high/very good scores. We cannot claim that he/she can master the material because we don't know who did the task so the child gets very good grades, we can't answer directly when the child is doing it, so we can't really judge the child. However, we still have to stick to values, so we judge based on what they collect.

T4: There are no obtacles. Almost all the children will be able to complete the assignment well and have good grades, even though there are one or three children who scored below average. For children's skills always run without exception. It's just that there is a problem with trust or honesty in children, whether the child does it alone or is assisted by parents/looks at Google. Sometimes there are also children who are late collecting assignments, but at our school, the teacher always reminds someone who is responsible for the assignment.

Based on the interview excerpts, all teachers have a major obstacle related to students' honesty. Students who in face-to-face learning have standard abilities are suddenly smart when online learning (Ardiyanti, et. al., 2020; Kisno, 2020). The student's score tends to be high and perfect so that the teacher often doubts the student's score. This is because the teachers cannot check the attitudes and behavior of students through direct observation. Teacher only seen through video conference, the habits and discipline of students in collecting assignments and honesty in doing assignments. Sometimes, students are late in submitting assignments not because they are lazy, but can be caused by other factors such as constraints due to internet quota and poor internet network (Rasmitadila, et al., 2020). Meanwhile, cognitive and psychomotor assessments are the same, teachers do not know whether when students work on assignment or evaluation questions they do themselves or are assisted by others.

Based on the presentations from four teachers, the COVID-19 pandemic not only had an impact on the mathematics learning process, but also had an impact on the assessment of mathematics learning (affective (A), cognitive (C), and psychomotor (P)). The following table presents the results of the analysis of the assessment of mathematics learning during the COVID-19 pandemic.

Table 2 Results of Analysis of Mathematics Learning Assessment in the COVID-19	Table	le 2 Results of Analysis of Mathematics Learni	ng Assessment in	the COVID-19
Pandemic		Pandemic		

Teacher	Assesment	Α	С	Р	Description
T1	Implementation	-			Numeric AKM questions are inserted in
					every material
					162

Teacher	Assesment	Α	С	Р	Description
	Instrument	-			Instrument modification
	Feedback	-			Students show enthusiasm and parents
					show support
	Obstacles	\checkmark	\checkmark		Not 100% right
T2	Implementation				Given 1-2 contextual questions on every
					material
	Instrument				Non-standard instrument
	Feedback				Students show enthusiasm and parents
					show support
	Obstacles				Unable to know 100% math ability
T3	Implementation				The questions used are limited to
					memorization, procedural and story
					questions
	Instrument				Non-standard instrument
	Feedback				Students show enthusiasm and parents
					show support
	Obstacles				Unable to know 100% math ability
T4	Implementation				Teaching materials contain contextual
					questions
	Instrument	\checkmark			Instrument modification
	Feedback	\checkmark			Students show enthusiasm and parents
					show support
	Obstacles	\checkmark	-	-	The honesty of students in doing
					assignments

Based on Table 2, the process of assessing mathematics learning in primary schools during the COVID-19 pandemic was carried out online on affective, cognitive and psychomotor aspects. Different from the face-to-face mathematics learning assessment process, the online mathematics learning assessment process is not carried out perfectly both in its implementation, the instruments and the results of student scores. Three teachers use contextual problems in every math material, but there is also one teacher who only uses memorial, understanding, procedural and story questions during the COVID-19 pandemic. Three teachers used modified instruments and one teacher used non-standard instruments to measure students' affective, cognitive, and psychomotor abilities during the COVID-19 pandemic. All teachers also said that the results of the three abilities assessment not be assessed in 100% real. This is in line with previous research conducted by Ardiyanti, et. al. (2020) and Kisno (2020) that the process of assessing mathematics abilities in affective, cognitive, and psychomotor aspects during the COVID-19 pandemic cannot be assessed in 100% real and teachers often feel doubt. This is one of the obstacles in the assessment of online mathematics learning. This is different from the statement by Fitrah & Ruslan (2021) that the participation and activeness of students during the COVID-19 pandemic tended to be poor, but all teachers in this study said that students were enthusiastic about learning and parents also showed great support.

Educators as the spearhead of the implementation of online learning and assessment must be able to condition all the instructional components. Educators have tasks and responsibilities that are not easy when learning and assessment are transferred to an online system. Especially since the online learning and assessment experience has never been implemented before. Educators must be able to overcome all problems during online learning and assessment responsively, so they can make the determined targets (Rasmitadila, et al., 2020). Based on these problems, further research is needed to find solutions and strategies that can overcome the obstacles in online mathematics learning assessment.

CONCLUSION AND IMPLICATION

The process of assessing mathematics learning in primary schools is carried out online both on the affective, cognitive and psychomotor aspects. The process of assessing the affective, cognitive, and psychomotor aspects during the COVID-19 pandemic cannot be assessed in 100% real. This is because teachers cannot check the attitudes and behavior of students through direct observation, but only see from the attitudes of students when doing video cenference, attitudes when answering questions, habits of collecting assignments, timeliness in collecting assignments, and honesty in doing assignments. Meanwhile, cognitive assessment is seen from the acquisition of student evaluation scores such as daily assessment scores, midterm assessments, and end-semester assessments. Psychomotor assessment is seen from the skills of students in doing assignments. Cognitive and psychomotor assessments are the same. Teachers do not know with certainty the results of the assignment's work and the evaluation questions are the results of the work themselves or assisted by others.

During the COVID-19 pandemic, the process of assessing primary school mathematics learning must be carried out as much as possible. Teachers must prepare online assessment instruments on the affective, cognitive and psychomotor aspects as well as possible. Good cooperation and collaboration for teachers, students, and parents are also very much needed.

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