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MATHEMATICS LEARNING DIFFICULTIES IN DISTANCE LEARNING

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Abstract. Some students feel that mathematics is less fun because the students lack basic knowledge of mathematics which leads to a lack of confidence in learning. Especially during the COVID-19 outbreak, distance learning was needed, including mathematics, and many students had difficulties in learning. Learning difficulties that arise during distance learning can interfere with the subsequent learning process and have a significant impact on the students' academic performance in mathematics. This study aims to determine the students' mathematics learning difficulties in distance learning at Junior High School 13 Surakarta. The method used in this research is descriptive qualitative. Qualitative descriptive research aims to describe student learning difficulties during the pandemic with the distance learning system. The subjects of this study were students of eighth grade of Junior High School 13 Surakarta. Data collection techniques used are interviews and observation. The interview method used was a guided free interview which was then analyzed using an interactive model. Based on the results of the analysis of student learning difficulties in distance learning mathematics caused by several factors, namely internal and external factors. Internal factors, namely those that come from within the student, include the lack of interest and motivation of students to take part in online mathematics learning. While external factors are factors that come from within students, including difficulties in understanding the material provided by the teacher rather than in detail, unstable internet network, student learning environment that does not support learning, motivation, and encouragement from parents or closest family.

Keywords: Learning Difficulties; Mathematics; Distance Learning

I. INTRODUCTION

Education is an effort to help the soul and body of students both physically and mentally, from ignorance about something towards a better human civilization. Education is a continuous process that occurs throughout life (a neverending process) (Mulyasa, 2014). Junior High School (*SMP*) is one of the basic education levels. Basic education aims to equip students with basic competencies to improve life skills as individuals, community members, citizens, and humans, as well as prepare students for further and higher education. One of the important parts of the educational process is teaching and learning activities in schools.

At the end of 2019, the discovery of a virus originating from Wuhan, China, namely the coronavirus which is often known as COVID-19. This virus has spread so fast and claimed many lives around the world and has had a wide impact on various areas of people's lives, especially in the field of education, so that the world of education is forced to switch its education system from face-to-face learning to distance learning (Hendrawan & Hendriana, 2021). Referring

to the Letter of the Minister of Education and Culture Number 36962/MPK.A/HK/2020 concerning Policy on Education Implementation During the COVID-19 Pandemic, alternative learning policies for teachers and students are being implemented in the public and private sectors, they must conduct distance learning. Minister of Education and Culture Regulation Number 109 of 2013 defines distance learning as a teaching and learning process carried out remotely using media. This distance learning usually uses internet-based media called e-learning. With the rapid development of technology today, online learning is the best solution to prevent the spread of COVID-19. Therefore, all learning activities in schools must use the distance learning system, including mathematics.

Distance learning is learning using media that allows interaction between teachers and students (Prawiyogi et al., 2020). This distance learning process is often carried out online (within the network) and offline (outside the network). In the city of Surakarta and its surroundings, the distance learning process is carried out online and offline, including at Junior High School 13 Surakarta. The online learning process



is carried out by the teacher providing information to students about assignments via Whatsapp and Google Classroom, while offline learning is carried out by students by coming to school to take assignments and collect assignments without any tutoring process carried out by the teacher.

Mathematics is considered a universal science that supports the development of modern technology and plays an important role in various disciplines because every science contains mathematics and enhances human thinking (Sumartini et al., 2020). To improve students' thinking skills in the future, a strong understanding and learning of mathematics are needed from an early age, so that students can learn and make learning more meaningful. Therefore, mathematics subjects need to be introduced to all students since elementary school to equip students with the ability to think logically, analytically, systematically, critically, and creatively, as well as the ability to work together in facing the next life (Murzani, 2018).

In mathematics subjects, which are mostly abstract, so many students find it difficult to understand (Afriansyah, 2014). This should get a lot of attention from several parties, such as teachers, the school environment, parents of students, and the surrounding environment. Especially during this COVID-19 pandemic, teachers cannot provide direct learning and students still have difficulty learning and understanding mathematics when learning face-to-face (Alyaa et al., 2020). Mathematics is a subject that is considered difficult and a subject that most students hate (Kusrini, 2014). In online learning, the provision of mathematics material is a challenge for mathematics teachers to choose strategies so that the provision of material can be easily accepted by students.

Distance learning in mathematics has a significant impact on the development of student learning, for example, the way students learn must be changed from face-to-face learning, and the teaching and learning process is carried out directly by teachers and students in distance learning. Both teachers and students face difficulties in distance learning because mathematics material is not only written in the text but also must be given in the form of visual videos with maps or formulas that under the topic of mathematics subject matter (Masfufah & Afriansyah, 2021). Various obstacles faced in distance learning are the reasons why this activity does not run optimally. Constraints that arise include limited human resources, limited learning facilities such as student laptops or cell phones, difficulties in an unstable internet network, and the lack of teachers' ability in utilizing digital technology to provide material during distance learning.

Learning difficulties are problems that cause a student to not be able to follow the learning process well like other students in general, which is caused by certain factors so that students are late or cannot even achieve the expected goals. Learning difficulties are a condition where the competencies or achievements achieved are not under the provisions of the standards that have been set, both in the form of attitudes, knowledge, and skills (Subini, 2012). The difficulty in learning mathematics is because students are not enthusiastic about participating in distance learning in mathematics subjects and prefer to do direct learning. Learning difficulties

are also a condition that causes students to not be able to learn properly due to certain disorders (Darimi, 2016). Students' learning difficulties in understanding concepts, principles, and skills experience obstacles or obstacles both from within (internally) and from outside (externally) (Teli Latifah, 2021). Internal factors that cause students to have difficulty in learning are attitudes toward learning, students' interest in learning includes the attention and pleasure of students in participating in learning. External factors that cause students to experience learning difficulties include the surrounding environment such as the COVID-19 virus outbreak which affects the continuity of the teaching and learning process, the family environment, and an internet connection that is less stable to support the distance learning process (Fernandes et al., 2019). This situation should be seriously considered, considering the difficulties that students face in the distance learning system, especially in mathematics which will affect their academic performance. Understanding student learning difficulties in mathematics is very important for teachers as a reference in improving the learning process. This study will analyze the factors that cause junior high school students to have difficulty in learning mathematics at distance learning. Therefore, it is hoped that the teacher can take or determine the right strategy to improve and improve the distance learning mathematics process so that teaching and learning activities become better and maximal.

Several previous research results reveal that students' learning difficulties during distance learning mathematics are influenced by several factors. Difficulties in learning mathematics online on student learning outcomes do not meet academic standards caused by two factors, namely internal factors, namely factors originating from oneself, namely the lack of ability to understand the material well, and external factors originating from the environment, family, and infrastructure (Lily, 2021). Difficulties in learning mathematics through distance learning include students having difficulty understanding the material presented, unstable internet networks, and an unsupportive learning environment (Sari & Madio, 2021). The difficulty of learning mathematics for students during a pandemic using the distance learning method is that students are very difficult to understand the material without an explanation from the teacher who requires students to study independently to understand the learning material provided (Bonar et al., 2021).

Based on the exposure of the previous research above, it can be concluded that the problem of student learning difficulties during distance learning mathematics is that students have difficulty understanding the material given by the teacher and must be studied independently at each student's home, and several other factors that cause student learning difficulties during learning. remote math. However, the previous study did not provide information concerning the factors that may trigger the difficulties. Therefore, a study case is needed to dig up more information concerning the difficulties of distance learning. The purpose of the study was to determine learning difficulties and provide alternatives to overcome learning difficulties for eighth grade students



during distance learning mathematics at Junior High School 13 Surakarta.

II. METHODS

This study uses a qualitative research approach with the type of case study research, where students have difficulty understanding the material given in distance learning so students' achievement and mastery of the material decreases. The population and sample required in this study were eighth grade students at Junior High School 13 Surakarta who had difficulty learning mathematics during distance learning which had previously been chosen by the subject teacher in question.

The subject selection technique uses snowball sampling, namely by selecting subjects whose research data sources increase from time to time. If the required information is deemed insufficient, the data source can be added based on the researcher's considerations (Sutama, 2019). The subjects selected in this study were eighth-grade students of Junior High School 13 Surakarta who had difficulty learning distance learning mathematics. Researchers conducted this research with observations made directly to the field and took part in distance learning through Google Meet and Google Classroom provided by the school and the subject teacher in question. Researchers also conducted interviews which were conducted directly with teacher resource persons at schools, while student sources were conducted using Google Form. The data in this study are students' learning difficulties in mathematics during distance learning by collecting techniques using observation and interviews. The instrument in this study used the results of interviews with students and teachers. The data instrument test in this study was carried out in 2 ways, namely validity and reliability tests. The validity test used in this study is the validity test by experts (expert judgment). Expert judgment is asking for expert judgment to examine the instrument and evaluate systematically whether the items of the instrument represent what is intended to be measured (Sugiyono, 2017).

The instruments that have been prepared are consulted with supervisors and experts in their fields to get an assessment of whether the instrument is suitable for use or needs to be improved. The validators of this research instrument were 2 lecturers from the Department of Mathematics Education. Based on the assessment by the validator, it was found that the instrument was declared valid and could be used for research with some improvements. Improvements were made including the use of consistent terms and word selection in questions to get answers that fit the scale. A reliability test is needed in knowing the determination level of precision of a measure or measuring instrument. Reliability is the accuracy or constancy of the tool in measuring what is being measured (Sudjana, 2005). The reliability test is used as a research instrument, while in this study the researcher acts as an instrument so that the instrument in this study is reliable because the researcher conducts research directly according to conditions in the field.

Before conducting research with interviews, researchers conducted observations to find out a direct description of students' learning difficulties during the distance learning process. Interviews were conducted with eighth-grade students and teachers to obtain more accurate data.

The data analysis process is under the opinion (Sugiyono, 2018), namely through three stages, namely the data reduction stage, the data presentation stage, and the validation stage or concluding. During the data reduction phase, the researcher collects and deletes some unnecessary data to make the research results more concise and clear. Data reduction in this study is the analysis of the results of student interviews to identify the difficulties faced by students in distance learning mathematics. After the data is reduced, the next step is the presentation of the data, structured in a structured manner, in the form of a brief description for easy understanding, and finally data validation. At this stage, the researcher demonstrated the authenticity of the measurement data through the results of teacher interviews, which provided an in-depth understanding of the problem related to the research objectives and avoided subjective factors that could reduce the weight of the research.

Some indicators that determine student learning difficulties are the student cannot understand the content of the subject within the allotted time, the student's learning outcomes being lower than other students, the student's inability to achieve academic achievement according to his ability, and the inability to show a good personality, such as polite, and unable to adapt to the environment (Arifin, 2012).

III. RESULT AND DISCUSSION

Learning difficulties can be divided into two categories, namely learning difficulties related to academics, including reading, writing, and memorizing difficulties. Learning difficulties related to child development include impaired attention, motor memory, thinking, and language (Hayat, 2021). Mr. Zainal Arifin revealed that four indicators can cause learning difficulties, such as students not being able to understand the learning material within the specified time, student learning outcomes being low compared to other students in the same class, students do not achieve academic achievement according to the abilities, and students do not show good personalities, such as polite and have not been able to adjust to the environment.

In educational activities, students do not always do well, it is not uncommon to find some students still having difficulties while participating in PJJ activities. The following are some of the difficulties in distance learning mathematics experienced by students at Junior High School 13 Surakarta.

A. Students cannot understand the learning material within the allotted time during distance mathematics learning activities

This learning difficulty relates to students at Junior High School 13 Surakarta who are still lacking in understanding learning materials within the allotted time during distance learning activities, both materials provided during the pandemic and before the COVID-19 pandemic. In this case, the learning difficulties



experienced by students are not being able to understand the learning material within the allotted time.

Based on the results of interviews with students, saying that students have difficulty understanding the math material given by the teacher because the explanations given are not detailed and the material is only in the form of text that is distributed through Google Classroom, other students also said that giving practice questions but not accompanied by a method, work so that students have difficulty when working on problems in accordance with the mathematical material provided. Therefore, students become unfocused and have difficulty memorizing formulas related to the given mathematical material. For the subject, the teacher said that distance learning activities had not maximized students' understanding because teachers could not interact directly with students, so teachers could not monitor children's development significantly and continuously.

Based on the results of the interviews above, it can be concluded that there is a lack of direct interaction between teachers and students, students have difficulty understanding the material well during the distance learning process, and teachers cannot be optimal in providing material. Students feel bored because the material is only given in text form without a clear explanation video and students have difficulty memorizing formulas and have difficulty when facing questions related to the material given by the teacher.

B. Students get low learning outcomes compared to other students in the same class

This learning difficulty is related to students who are less able to understand the learning material compared to other students in their class during distance learning activities. In this case, the learning difficulties faced by these students are the low learning outcomes of these students compared to other students in the class.

Based on the discussion of learning difficulties that have been discussed above, students have difficulty understanding the material so student learning outcomes are also low because students cannot work on the questions given according to the material. Based on the results of interviews with students related to low student learning outcomes due to difficulty understanding the material, some students said when they had difficulty in doing assignments or questions given by the teacher, they would ask their parents/relatives to help them understand the material and questions given., while other students answered that they would look for other sources from the internet such as learning videos from YouTube to understand the material provided so that they could do the assignments or questions given. However, 3 students in one class are still having difficulty constrained by learning facilities such as cell phones due to family economic factors that are not able to meet the needs of students to take part in the distance learning mathematics process, so they have difficulty getting learning materials and doing assignments like other students. Based on the results of interviews with teachers, eighth grade students at Junior High School 13 Surakarta have low learning outcomes as many as 112 students, the average mathematics subject in eighth grade is 75 while students who have difficulty in distance learning mathematics have low results, namely the average 70, students have difficulty with the material on the flat side of the space.

C. Students cannot achieve learning achievement according to their abilities

This learning difficulty is related to the inability of eighth grade students at Junior High School 13 Surakarta to fully understand the material and have lower learning outcomes compared to other students. In this case, the learning difficulties experienced by students are the inability of students to achieve learning achievements according to their abilities. During distance learning mathematics, due to the COVID-19 pandemic, students are required to be able to study independently at home so that teachers cannot monitor student progress and abilities significantly.

Learning achievement is the ability of students in subjects after studying the material to achieve learning objectives within a certain period (Sugiyanto, 2009). During distance learning students are required to be able to understand the material provided, while the material provided by the teacher cannot be maximized where there is no direct interaction between the teacher and students, this is related to the exposure of the first indicator. Students are unique individuals, each student has different potential and abilities from one another. For this reason, each student has a different way of learning and understanding the material provided by the teacher, this is related to the second indicator, where students have their way of understanding the material such as looking for other references on Google or YouTube. Based on the results of observations made by researchers when taking distance learning using Google Meet the results showed that students who could not achieve learning achievement had low thinking skills compared to other students, this was based on observations when the students were asked about the material given, they found it difficult to understand the material in the allotted time. Based on the results of interviews with students, most of them require a detailed explanation of the material in the form of videos so that students more easily understand the material and student achievement is better because the material provided by the teacher is not accompanied by an explanation video.

D. Students show bad personalities, such as being undisciplined and arbitrary, and not adapting to distance learning mathematics

In this case, the learning difficulties experienced by students are showing bad personalities, such as being undisciplined and at will, and not wanting to adapt to distance learning activities. This is one of the difficulties of distance learning mathematics. In distance learning mathematics, teachers cannot monitor students' attitudes



and behavior during the distance learning process so the role of parents is needed to monitor students' learning processes during distance learning mathematics.

Based on the results of interviews with teachers regarding student attitudes during distance learning mathematics, it was stated that at the time of distance learning mathematics, very few students were actively learning following the rules imposed by the school, and even the percentage of students who took part in learning was not more than 20%. Therefore, many students are not disciplined in doing and collecting the assignments given. Parents and students' learning environment also influence students' attitudes in participating in distance learning mathematics. Parents play an important role in paying attention and monitoring students during distance learning so that students can participate in distance learning mathematics well, but not all parents can do that because there are other activities that must be done outside the home. The learning environment also affects the personality of students during distance learning, due to the pandemic period of the student learning environment, namely the environment around students' homes, so that if the home environment does not support the distance learning process, students cannot follow the distance learning process properly and focus.

Based on the results of the discussion above, it can be concluded that the personality of students to participate in distance learning mathematics is influenced by the learning environment and parents, parents play an important role in paying attention to and monitoring student learning activities, so that students' personalities become better and follow the distance learning process to the fullest.

IV. CONCLUSIONS

Based on the discussion of the research results above, it can be concluded that there are still many students who find it difficult to implement PJJ, especially in subjects. eighth grade students of Junior High School 13 Surakarta have difficulty in learning mathematics remotely because students cannot understand the material given within a certain time, students have lower learning outcomes than other students, students are unable to achieve learning achievement according to their abilities, and students shows a bad personality, such as being undisciplined and at will, and unable to adapt to distance learning activities.

There are two factors that cause difficulties in distance learning mathematics in eighth grade of Junior High School 13 Surakarta, namely internal factors, students feel bored and do not focus on understanding the material given by the teacher during distance learning mathematics, and the second factor is external factors where the teacher provides material, not in detail, parents who cannot accompany students during distance learning mathematics because they have other activities and students' social environment that affects students' personalities.

By paying attention to explanations related to the difficulties in distance learning mathematics, the solution that can be used as an alternative is the presentation of interesting, creative, and fun learning such as making interesting learning videos so that students do not feel bored and it is easier to understand the material.

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