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Middle School Students' Perceptions About Online Mathematics Learning

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Abstract. This study aims to determine the perceptions of high school students in the Eastern Indonesia Region, especially the provinces of Central Sulawesi and North Maluku about online mathematics learning. The sample selection was carried out in a descriptive study with this survey technique using incidental sampling consisting of 212 high school students. The findings of this study indicate that more students are not happy with online mathematics learning. The main causes are students cannot understand the teacher's explanation well, the tasks given are quite a lot, the lack of face-to-face interaction, the internet network is not optimal, and the learning methods are less fun. In addition, students who experience obstacles in participating in online mathematics learning are more than those who do not experience obstacles. The main obstacles experienced are inadequate internet network, limited data package quota, lack of motivation, difficulty focusing while studying and limited communication and interaction. In overcoming these problems, students take ways including asking teachers, friends or family about material that has not been understood, utilizing various online learning resources, making savings on the use of internet data packages and looking for locations with adequate internet networks.

INTRODUCTION

The spread of the Covid-19 virus has reached all countries in various parts of the world, including Indonesia. Various prevention efforts have been carried out by the Indonesian government to reduce the risk of its spread, including through the implementation of physical distancing, Large-Scale Social Restrictions, the prohibition of holding activities that gather large numbers of people and other things that of course have an impact on various fields of life, including in the field of education [1]–[4]. Policies and pandemic phenomena that occurred so quickly and had a significant impact of course forced the world of education to change the implementation of learning activities. The Minister of Education and Culture of the Republic of Indonesia, Nadiem Makarim issued circular letter Number 4 on March 24, 2020 which regulates the implementation of education during the emergency period of the spread of Covid-19. The circular is in the form of a "Learning from Home" policy which is implemented to prevent the spread of Covid-19 in the school environment. Each school carries out "Learning from Home" activities both offline and online by utilizing various available media or platforms. This online learning has become a new challenge for students because so far learning has been carried out directly through face-to-face, including in learning mathematics

During the Covid-19 pandemic, online learning has been carried out almost all over the world [5]. Online learning is a learning process that does not require direct face-to-face meetings between teachers and students but utilizes the internet network and is assisted by various applications that support the learning process [6]. Through

online learning, students able to interact with teachers using various platforms such as Google Classroom, Moodle, WhatsApp, video conferencing applications, and other e-learning applications. However, this drastic change in the implementation of learning has various impacts on both teachers and students [7]–[10]. In general, the success of online learning in Indonesia during the Covid-19 pandemic is determined by the readiness of technology which is in line with the humanist curriculum, as well as the support and cooperation of the stakeholders involved [9].

Mathematics as a science with an abstract object of study requires relevant teaching methods in order to achieve the learning objectives to be achieved. Learning mathematics that is done online is a new problem that must be faced by teachers. Several studies have shown that mathematics teachers in Indonesia face major challenges in implementing online learning during the “Learning from Home” period [9], [11]. The most significant obstacles encountered were the limited ability of teachers to use technology, the lack of knowledge and skills of students in using e-learning and limited internet access and quotas. It is necessary to improve the quality of learning from various aspects including preparation, facilities and infrastructure, teaching materials, and learning methods used as an effort to achieve the desired goals [12]–[15].

Apart from teachers, students are also one of the subjects directly affected by the implementation of online learning. Students reported experiencing several difficulties such as lack of interaction with the teacher, slow feedback from the teacher and the absence of direct face-to-face learning [16]. Therefore, the study in this article focuses on discussing the perceptions of high school students regarding online mathematics learning which includes (1) student responses about online mathematics learning; (2) the obstacles experienced by students in learning mathematics online; and (3) solutions made by students in dealing with problems when learning mathematics online. This study was conducted on students in Eastern Indonesia because based on the survey results of the Indonesian Internet Service Providers Association (APJII) in 2018 the number of internet users in the region which includes Sulawesi, Maluku and Papua only reached 10.9% of the total users throughout Indonesia. The limitations of internet users are certainly one of the important factors in assessing the implementation of online learning.

METHOD

This research is a quantitative descriptive research. The population in this study is all high school students both public and private in the Provinces of Central Sulawesi and North Maluku in the 2020/2021 school year which is estimated to be around 300,000 students. The sample was selected using incidental sampling technique totaling 212 students. The sample consisted of 84 SM/MA/Equivalent students and 128 SMP/MTs/Equivalent students. The reason the researcher uses incidental sampling technique is because the number of populations is not known with certainty.

The data in this study were collected through questionnaires distributed online with the help of google forms from August to September 2020. Questionnaires were distributed to students via the link <https://docs.google.com/forms/d/1vy-WotrZGV2btdhSDIHAHrm7FUyGKO4AbhHBV5Asyd8/edit?usp=sharing>. The questionnaire consists of 14 questions that can explore information from students about their perceptions of online mathematics learning which includes responses, obstacles experienced and solutions they did. The data obtained were then analyzed descriptively using Microsoft Excel and then interpreted in depth.

RESULT AND DISCUSSION

Learning mathematics online is a new experience for students which was previously very rarely applied, especially in the provinces of Central Sulawesi and North Maluku. Therefore, of course there are various responses given by students after participating in learning activities. Not all students feel comfortable with the implementation of online mathematics learning. In this study, findings were obtained about student responses regarding online mathematics learning which are presented in Fig 1.

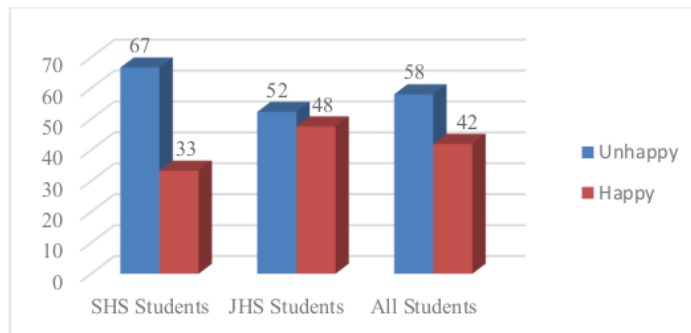


FIGURE 1. Percentage of Student Responses on Online Mathematics Learning

Based on the research results presented in Figure 1, it appears that both overall and seen by school level, the number of students who are not happy with online learning is more than students who are happy. The student's displeasure is caused by many factors. The most dominant causal factors are students cannot understand the teacher's explanation well, the assignments given are quite a lot, cannot interact face-to-face with teachers and classmates, internet networks are not optimal, and the learning methods used are less pleasant. However, there are also students who like online learning because it is a new experience and challenge for them. There are teachers who teach by using instructional video media so that it generates student interest in following it. In addition, students feel that independence and learning discipline can be further improved.

The current Covid-19 pandemic requires every educational institution to carry out distance learning both offline and online. Online learning is a positive response during the learning period from home due to the Covid-19 pandemic [17], [18]. Online learning is an unavoidable alternative to be applied during the Covid-19 pandemic [19]. The implementation of online learning, especially in the field of mathematics, has become a new experience for teachers and students, especially those in the Provinces of Central Sulawesi and North Maluku. Adjustment to new things is common, including the emergence of a sense of discomfort related to the changes that occur.

In this study, it was found that most students did not like the online mathematics learning process, which was mostly caused by an inadequate internet network and the use of monotonous learning strategies. Even though online learning can take place effectively, including if it is supported by adequate facilities and infrastructure and the use of effective learning strategies [13]. Learning methods used in online learning need to be developed to improve student understanding, including the means used such as integrating the Google Meet application into e-learning [20]. As an abstract science, mathematics is difficult if only explained in a limited way in online learning without intense interaction between students and teachers [21]. Therefore, to be able to develop the learning process, student involvement in online learning must be optimally encouraged [9]. Teachers must be able to arrange good teaching materials according to the conditions and needs of students [22]. The learning process using media such as GeoGebra and Edutainment Media is one solution that can be applied during the learning period from home [23], [24].

The process of learning mathematics in schools that is carried out online can certainly cause various obstacles, especially for students. The research results obtained are presented in Fig 2.

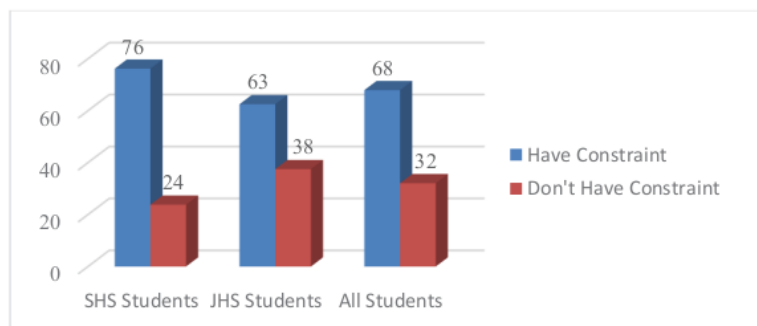


FIGURE 2. Percentage of Student Constraints on Online Mathematics Learning

Based on Figure 2, it is obtained data that in general students experience many obstacles in participating in online mathematics learning. It appears that in all middle school students and specifically for junior high and high school students, the number of students who experience problems is twice as high as students who do not experience problems in participating in learning activities. According to the data obtained, the main obstacles experienced by students are inadequate internet networks, limited data packet quotas, lack of motivation, difficulty focusing while studying and limited communication and interaction. This is in line with the findings of several previous studies [1], [4]. The lack of presence, personal touch, and interaction due to connectivity problems are the main weaknesses of online learning [25].

The obstacles that have been described above are an obstacle that can interfere with the comfort of students in participating in learning activities. Therefore, anticipatory steps are needed as a solution in dealing with these problems. In particular, in this study, it was found that the steps applied by students in dealing with these obstacles were asking teachers, friends or family about material that had not been understood. Utilizing various available online learning resources such as YouTube, Google, Ruangguru, etc., saving on the use of internet data packages and finding locations with adequate internet networks. Thus, efforts and involvement of many parties are needed to be able to minimize the obstacles faced by these students.

CONCLUSION

The implementation of online learning is something new for high school students, especially those in Central Sulawesi and North Maluku. Adjustment to this drastic change with all the existing limitations is a must. Therefore, more students feel dissatisfied with learning mathematics online. Students feel unable to understand well the explanation given by the teacher during the learning process. In addition, the tasks given by the teacher are quite a lot. Other causes are an inadequate internet network, unable to interact face-to-face with teachers and classmates, and the learning methods used are less pleasant. There are also more students who experience difficulties in participating in online mathematics learning than those who do not experience problems. The main obstacles experienced by these students are inadequate internet networks, limited data packet quotas, lack of motivation, difficulty focusing while studying and limited communication and interaction. In overcoming the problems faced, students take ways including asking teachers, friends or family about material that has not been understood, utilizing various available online learning resources such as YouTube, Google, Ruangguru, etc., saving on the use of internet data packages, and finding a location with an adequate internet network.

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