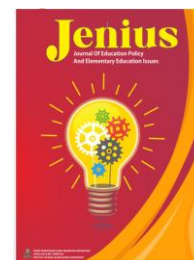




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The Impact of Online Learning on Mathematics Subjects in Elementary Schools

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ABSTRACT

Mathematics is one material that looks quite draining. Learning Mathematics requires special objects and explanations from the teacher. The coronavirus outbreak has allowed all learning to be online, including Mathematics. This study describes the learning process during the coronavirus pandemic and the impact of online learning in mathematics learning. This research method is a qualitative method using interviews and literature research. The results of this study are that the Mathematics learning process is carried out online at school, and some still require parents to bring their children's homework to school. In this pandemic, teachers, students and parents feel various influences during online learning, some of which are positive or negative.

INTRODUCTION

Learning mathematics is a process to develop the ability to count, measure, derive and use mathematical formulas in solving problems in everyday life to obtain a relatively permanent behaviour change. Both observable and not directly observable, that is, as a result of training or experience in interaction with the environment (Nuraini, 2022). Learning mathematics transfers knowledge, and students must become subjects in the learning process (Annisa & Marlina, 2019). Mathematics learning applied in schools has not created a pleasant and individual atmosphere (Nugraha et al., 2022).

Sometimes these unpleasant experiences are passed on to other people so that people who will study mathematics also perceive mathematics as a complex field of study (Mailani, 2015). Currently, the elementary school level uses thematic learning in the learning process. Thematic learning contains material for all subjects grouped by theme, including mathematics. Mathematics learning at the elementary level in grades I, II, and III are combined into one theme.

While learning mathematics for grades IV, V, and VI is separated from other subjects.

Learning mathematics for elementary school students, mainly grade III, does not only aim to master the material but also as a forum for students to improve their abilities and skills. The characteristics of learning mathematics are abstract, so most elementary school students experience difficulties in learning mathematics (Wiryanto, 2020). Learning mathematics is an activity that uses reason to study science and has a structured plan. There are three principles in learning mathematics, namely: 1) attention and motivation are the driving force in student learning activities, 2) a positive attitude is a motivation for students to take the initiative to carry out learning activities, 3) must be directly involved through experience so that children can build their knowledge through activities that there is. Mathematics study involves concrete thinking and a relatively high level of intellectual activity.

One of the factors that can influence students' success in learning mathematics is the ability possessed by the teacher to plan, implement, and evaluate the process of learning mathematics. However, the existence of Corona Virus Disease 2019 (COVID-19) has an impact on all aspects of people's lives. Starting from the social, economic, tourism, and even education. Many schools in various countries have been asked to conduct remote or online learning to minimise the spread of COVID-19. According to data from UNESCO, the number of affected students reached 421,388,462 children in 39 countries (Purwanto et al., 2020). Teachers must start thinking about maintaining the learning process during the Covid-19 pandemic and utilising technology as a means and infrastructure for implementing learning (Wisnu, 2022).

Furthermore, the Minister of Education and Culture of the Republic of Indonesia issued Circular Letter Number 4 of 2020 on 24 March 2020, containing educational policies during COVID-19. Closing schools is one of the government's positive responses to protecting students from COVID-19 because the school environment is a gathering place for hundreds of students, making schools a dangerous place for the rapid spread of disease (Sintema, 2020). The circular also stated that the learning process is carried out online without meeting face-to-face with students, so students can still get learning experiences during a pandemic.

Online learning can make teachers and students communicate anytime and anywhere. This learning requires teachers, students, and parents to be able to adapt quickly and requires teachers to innovate in the learning process. Online learning is learning to use the internet in the learning process (W. A. F. Dewi, 2020). Online learning is carried out to enable the world of education to continue, even though it is during a pandemic. Online learning occurs in a network where teachers and students do not meet face-to-face (Nurmitasari et al., 2022). The application

of online learning should still be able to provide students with meaningful learning experiences. Online learning utilises information technology as a learning medium.

This learning requires applications such as WhatsApp, Zoom, Google Meetings, and so on to support learning. Internet use for educational purposes is increasingly widespread, especially in developed countries. This fact shows that this kind of media can indeed be used in the learning process so that it is more effective. The use of these learning applications is an innovation in the education industry and a challenge for teachers to prepare for online teaching. The use of technology should be a reference for teachers to produce a learning process that provides space for students to explore, interact and collaborate between students and students as well as students and teachers, thus providing a good foundation for students to study mathematics.

Online learning is a breakthrough that can be carried out effectively and efficiently to meet student's educational needs. But online learning cannot allow all students to have all the e-learning literature, as this depends on the learning environment and student characteristics. If teachers, students and parents can work together, then the implementation of online learning can run well. Using the internet as a learning medium will also negatively impact all students. This is because many factors influence student success in carrying out online learning. Factors that influence these students' success include their environment and characteristics. Environmental factors include the role and readiness of parents in guiding online learning and the spread of internet access in various parts of Indonesia.

Limitations in the online learning process are certainly a challenge for teachers to provide a meaningful learning process. The teaching and learning process will be more successful when there is a two-way interaction between the teacher and students. This is because students' active participation in learning can improve understanding and mastery of subject matter, especially in learning mathematics. Therefore, the purpose of this study was to describe mathematics learning during the COVID-19 pandemic and obtain information about the impact of the COVID-19 virus on mathematics learning for class III at Raudhatul Jannah Islamic Elementary School.

METHOD

This research uses a qualitative approach with the type of exploratory case study to obtain information about learning mathematics during the COVID-19 pandemic and what are the obstacles. The research was conducted at Raudhatul Jannah Islamic Elementary School

Payakumbuh. The data collection method uses semi-structured interviews as the primary data. While supporting data adopts the form of library research. Interviews were conducted in a semi-structured manner. Interviews were conducted by telephone, with an average time of 12 minutes. The telephone interview was designed to support physical distancing to prevent transmission of COVID-19. This study interviewed six interviewees, including two teachers, two parents or guardians of students, and two students. To maintain confidentiality, the data provided by the sources all start with the code R1-R6. The following is a description of the respondents in this study.

Table 1. Respondent Profile

Initial	Gender	Role
R1	Male	3rd-grade teacher
R2	Female	3rd-grade teacher
R3	Male	3rd-grade parents
R4	Female	3rd-grade parents
R5	Female	3rd-grade students
R6	Male	3rd-grade students

This study uses non-statistical data analysis. The data is organised and sorted into patterns, categories, and basic descriptions to obtain themes and working hypotheses, as the data suggests. Furthermore, the steps in data analysis are as follows: 1) data reduction, 2) data presentation, and 3) conclusion. Reducing data means summarising, choosing the main things, focusing on the essentials, looking for themes and patterns and removing unnecessary ones. After the data is reduced, the next step is to present the data in the form of narrative text. Presenting data will make it easier to understand what happened and plan further work based on what has been understood. The final step is concluding. After the data was presented, a conclusion was made regarding the third-grade mathematics learning at Raudhatul Jannah Payakumbuh Islamic Elementary School during the pandemic.

RESULTS AND DISCUSSION

The process of learning mathematics that was carried out in class 3 of Raudhatul Jannah Payakumbuh Islamic Elementary School during the COVID-19 pandemic obtained information that the learning process was conducted online. This is shown in the results of interviews with the six respondents. The grade 3 teacher said that mathematics learning in grade 3 was done online. Teachers encourage the use of online applications to help students learn. Initially, the

teacher explained the material briefly to students through a video made by the teacher and shared via the WhatsApp group. Not only videos, teachers sometimes provide material to be summarised for concrete math material. Then proceed with the question and answer activity that the teacher usually does through Google Classroom. In addition, the teacher also gives homework related to the material being taught. This task is usually done through the Google form or assignments in the student book, then takes a picture of the work and sends it via the WhatsApp group. However, learning mathematics for grade 3 at Raudhatul Jannah Islamic Elementary School is conducted by online learning, so it cannot be applied effectively and optimally.

This is also in line with the results of interviews conducted with parents of grade 3 students, namely, learning mathematics at school is done by giving homework to students. Students work on assignments given by the teacher online via WhatsApp. Then send it through the WhatsApp group or sometimes ask students to study student books. Students are given time to complete the task. Students can submit these assignments by taking pictures of their answer sheets or photos of their work and then sending them to the WhatsApp group that has been provided. Parents with Android phones who are part of a WhatsApp group can send their children's work. However, some parents don't have smartphones, so sometimes children ask other children around the house for help.

Following what was said by the teacher and parents of grade 3 Raudhatul Jannah Islamic Elementary School Payakumbuh, the results of interviews with grade 3 students, namely that school mathematics lessons are usually carried out using the zoom application. Usually, students will be given homework shared by the teacher via WhatsApp. Then their work will also be sent via WhatsApp. Student worksheets are distributed by the teacher once a week and are taken directly at school by parents. Parents must also submit homework completed one week ago via the WhatsApp group. Therefore, it can be concluded that the mathematics learning process in grade 3 of Raudhatul Jannah Islamic Elementary School Payakumbuh is carried out online via the WhatsApp group. However, parents can also take assignments given by the teacher by coming to school in person.

The impact felt during the mathematics learning process during the COVID-19 pandemic, according to the grade 3 teacher, was that students could not learn optimally. Teachers cannot provide feedback directly and quickly when students ask questions. In addition, the teacher could not explain the teaching material adequately because some students suddenly left their cell phones while discussing through Google Classroom. When asked why he was leaving, the

student found it difficult to get a signal in the area where he lived. This makes the teacher's explanation not absorbed by students to the fullest. Teachers, students, and parents are less prepared to implement online learning. Some of the student's parents do not have smartphones, so students cannot study effectively and optimally. Of the 30 students participating in WhatsApp classes, only 20 were active in the learning process. The rest is limited through communication. Students who have smartphones should tell other friends who live nearby to do their homework and hang out together. The next obstacle is that not every parent has an internet quota, so collecting student work takes a long time. The following negative impact is about value. Teachers cannot evaluate the entire student learning process. Teachers can only assess students through the work that students submit.

This is also in line with the results of interviews conducted with parents of grade 3 students; students do not understand the material because mathematics is abstract when not using media to explain. This makes parents have to spend more time teaching their children. Some parents feel that they are not tech-savvy in guiding their children to learn through the online system. Learning mathematics online still requires guidance or explanation from teachers or parents. Therefore, when studying mathematics during the COVID-19 pandemic, parents played an active role in teaching their children to understand the material explained by the teacher. Parents should spend more time helping their children. Parents also have to buy more internet quota every month.

Following what was said by the teacher and parents of grade 3 Raudhatul Jannah Payakumbuh Islamic Elementary School, the results of interviews with grade 3 students. Learning by zoom is usually carried out on days when parents have work that cannot be missed, so sometimes students cannot take part in learning online because parents bring the cell phones used for online learning to work. When the teacher explains through the zoom application, sometimes the signal is terrible, so students suddenly leave the zoom application. This makes the teacher's explanation not conveyed correctly. Some material becomes unclear and should be asked of parents. The presence of COVID-19 prevented grade 3 students from going to school and meeting teachers and friends. Students are not enthusiastic about learning because their activities are only doing homework.

Since the emergence of the COVID-19 pandemic, teaching and learning have been carried out by studying at home online, online learning is carried out according to the abilities of each school. Online learning can use digital technology such as Google Classroom, learning houses, zoom, video conferencing, telephone or live chat and others. However, the teacher gives

assignments through monitoring and mentoring by the teacher via the WhatsApp group. Then teachers also work from home in coordination with parents, either through video calls or photos of children's learning activities at home to ensure interaction between teachers and parents (Juliawan et al., 2021). Studying at home is not a problem because learning can be done anytime and anywhere, especially supported by an online system. The learning process can occur at home, school or in the community so that everything can run smoothly and is supported by facilities such as the internet.

The results of this study indicate that the COVID-19 pandemic has had a negative impact on the world of education, especially in the teaching and learning process for grade 3 at Raudhatul Jannah Payakumbuh Islamic Elementary School. Elementary school students can think logically and systematically but cannot grasp abstract things. Students can easily grasp the concept if the concept is presented to students. Students can observe and build cognition. This shows that the media and teachers' explanations must still assist in learning mathematics in grade 3 elementary school. However, learning mathematics during the pandemic was done using an online system. Many things have been done. In general, the process of learning mathematics in elementary schools during the COVID-19 pandemic was via WhatsApp. The teacher gives students explanations, material, and assignments via the WhatsApp group. The teacher gives time to students to do the assignment. Teachers do this to allow students to achieve the expected ability. Through WhatsApp, teachers can also carry out teaching and learning processes online through various face-to-face applications such as Zoom and Google Classroom. This application can provide a more enjoyable learning experience because they can immediately listen to the teacher's explanations.

During the COVID-19 pandemic, teachers, students and parents felt many effects. Previously only through face-to-face learning, now teachers, students and parents are familiar with WhatsApp, Google Classroom, Zoom and others. They started to form a culture where they could study online. The positive effect is that teachers and students can now carry out the learning process anywhere and anytime without being constrained by space. The use of technology in online learning can save costs and increase quality and efficiency, but online education requires a clear framework to implement in schools. Some of the factors that can create a fun online learning experience are the ability to build a learning community, create and maintain a positive learning environment, provide appropriate feedback, and use various technologies to provide the right content.

The state of the school where you study also influences the level of success in learning.

The negative impact felt by teachers is enormous. For example, teachers and students cannot provide feedback quickly, children's understanding of the material is not deep enough, and they only evaluate through assignments. Lack of communication tools, internet quota requests soar, students cannot submit homework on time, parents are fully focused, and children feel bored because they only do homework. Teachers' explanations are not clear when the signal is not good, so the material becomes unclear. Facilities and infrastructure must be prepared carefully. Teachers who teach online and only give homework do not mean they are not doing the online learning process well. This is because no internet signal enters the village, so teachers cannot use online learning applications with the type of video conferencing. In addition, parents sometimes do not have facilities such as smartphones, so the teacher only gives homework to students. In addition, some parents still stutter using technology, so they cannot participate in learning with their children. These different things provide a gap between reality and expectations when integrating learning interactions as part of online activities.

Distance learning media, with the application of the method of giving assignments online to students via WhatsApp groups, is considered effective in emergencies due to the current coronavirus. Many teachers apply online learning in different ways. Some use the concept of online learning. Some continue to teach in class but send their videos to the students' WhatsApp application. Some use free content from various sources. (Juliawan et al., 2021). Facilities and infrastructure, especially the internet, support the implementation of online learning. The availability of the internet is very necessary because of the nature of learning that uses the internet network. This is a common challenge for all schools throughout Indonesia because the internet network in Indonesia is generally still very apprehensive. Relatively slow access speeds are experienced in remote areas and villages and in big cities (Priyastuti & Suhadi, 2020).

Students learn best when actively developing their understanding of what is being learned. Through this opinion, it can be seen that online learning has advantages in developing the knowledge possessed by students. Through online learning, students are free to create knowledge that they can master. The knowledge mastered by students will be more meaningful because it is obtained through the final result, not memorisation (Syarifudin, 2020). Based on the problems of implementing online learning, there are efforts made by schools, teachers, students and parents. The school is trying to create a communication network and monitor and evaluate the online learning process. Meanwhile, the efforts made by the teacher always remind students to be absent and present on time. There is coordination between the subject teacher and the teacher. The teacher helps with everything. Efforts made by students to overcome the

obstacles faced by repeating existing material. Efforts made by parents are to meet the needs of their children to support online learning (T. A. P. Dewi & Sadjarto, 2021).

Several factors influence students' learning and teaching process in online learning, including learning motivation. According to Hamzah in (Fitriyani et al., 2020), there are 8 indicators of learning motivation, namely: 1) concentration, where the aspects are in the form of attention to the delivery of competence, understanding the instructions given by the teacher, concentration on teaching materials and materials, listening carefully to each explanation of the material presented, paying attention to the teacher's delivery and explanation, noting material conveyed during learning and comply with the rules given during learning takes place, 2) curiosity, which is characterised by aspects of interest in the material and material presented, asking questions about the material being taught, 3) enthusiasm, which is characterised by aspects of enthusiasm in convey ideas and opinions during learning, 4) independence, with aspects of being able to answer or do well the tasks given, 5) readiness, with aspects of being enthusiastic and ready to answer or do the tasks given, 6) enthusiasm or encouragement which is characterised by aspects of having keing desire to get the best value from each task, 7) never give up, with serious aspects in doing tasks, 8) self-confidence, which is characterised by aspects of self-confidence in doing tasks.

CONCLUSION

Class 3 math lessons at Raudhatul Jannah Payakumbuh Islamic Elementary School are conducted online through WhatsApp, zoom and google classroom applications. The purpose of learning mathematics through this application is to explain abstract concepts through teacher explanations and provide learning videos, notes or abstracts made by the teacher so students can accept the topic. Student concepts must still be explained through various media. The positive impact of online learning during COVID-19 is that teachers identify various online applications to facilitate online learning. In addition, learning becomes more flexible because it can be done anytime and anywhere.

The negative impact of online learning during COVID-19 is that teachers and students cannot provide feedback quickly, and children's understanding of the material is less in-depth. Students cannot submit assignments on time. Parents concentrate on their work, and children feel bored because they only struggle with homework. Teachers' explanations are unclear when studying through online applications when the signal is terrible. This is because during the

COVID-19 pandemic, teachers, students and parents were not ready to carry out online learning, as well as the lack of learning facilities and infrastructure during online learning. Suggestions that learning Mathematics during the COVID-19 pandemic can run well is that the teacher should be able to prepare various materials properly so that students don't feel bored with the impression that the teacher is only giving assignments to students. Parents must also participate actively to build their children's learning motivation and continue to accompany the learning process. Students must take advantage of their free time to constantly explore the available materials.

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