



Analysis of the Role of Image Media in the Mathematics Learning Process Amid Technological Development

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Abstract: The research carried out aims to analyze the role of image media in mathematics learning amidst the rapid development of technology in order to help students understand and recognize the concept of numbers in mathematics learning. The approach in this research is a quantitative approach, with quasi experimental methods. This research was conducted at SDN 17/XI Simpang Sungai Duren. The population in this study was the first class. Meanwhile, the sample in this study was class 1B, totaling 15 people who were selected using a purposive sampling technique, namely based on the researcher's considerations using opportunity analysis of the material being taught. The data collection technique used by educators uses a test technique in the form of pictorial questions. Meanwhile, data analysis uses classical assessment by comparing the number of answers with the number of questions proportionally. In the research that has been carried out, it was obtained that the percentage of students' scores was very high before and after being given the picture media treatment, namely in terms of recognizing numbers, students' ability to recognize numbers increased from 20% to 90%, then in terms of addition ability, students' ability increased from 10% to 90. % and in the ability to reduce students' ability increased from 30% to 90%. This proves that image media has an important role in mathematics learning, especially for elementary school children.

INTRODUCTION

Education is a conscious effort made by teachers to achieve better learning goals. In mathematics learning, the main component that teachers must improve is how students are able to understand and apply the knowledge gained in everyday life. The problem is that in elementary school, many children don't like mathematics subjects, so many people think that mathematics is the most difficult subject and is avoided in elementary school (Karatekin, 2012; Starzinski & Starzinski, 2017; Stevens *et al.*, 2018). The paradigm of the difficulty of mathematics subjects is also proportional to the grades students get in the learning process or results, where many students get low grades and experience difficulties in learning mathematics (Meltzer, 2002; Sarsengeldin *et al.*, 2013; Sulman *et al.*, 2020). Regarding the issue of low participation and the value of student learning outcomes, the learning process needs special attention. This is because mathematics is a foundation of

knowledge for discovering and analyzing new knowledge. Therefore, efforts are needed to improve appropriate learning strategies that are able to encourage children to like and understand mathematics learning better (Baki et al., 2009; Legesse *et al.*, 2020).

Improvement in learning is a must for all parties, both teachers and schools. Therefore, there needs to be commitment from both the school as the main forum in facilitating the learning process and also the teacher as the direct implementer of the learning process. In the learning process nowadays, teachers in teaching must be able to put more emphasis on empowering learning technology, so that technology can be a tool in forming better media so that learning media can encourage students' abilities in class to master learning (Krause *et al.*, 2020; Pampaka *et al.*, 2015). Basically, technology will make it easier for teachers in the learning process. With technology, it is easy to carry out learning more effectively and efficiently.

The important role of technology creates an understanding that in the learning process this component needs to receive teacher attention. However, it is a shame that technological developments cannot stand alone and must also be accompanied by the ability of the users of the technology, which sometimes requires time and a good understanding of its use, so that the learning process can run according to expectations (Gallagher & Zahavi, 2007; Gustafsson, 2017). This gives researchers an understanding of how the use of image media, which is technologically the easiest and simplest thing to use and can also be made manually, means that researchers are able to improve student learning outcomes, especially in mathematics learning in elementary schools (Higgins & Thompson, 2002; Meltzer, 2002; Wahyuni Agustina *et al.*, 2020).

The learning process requires the teacher's ability to decide what will be applied in implementing the learning. The accuracy of the teacher's choice in choosing strategies, methods or learning media will be one of the determining factors for students' success in understanding the material presented. The role of the teacher will be very important, where in mathematics learning requires a medium that can be used easily and either via the internet or made directly classically (Putri *et al.*, 2018; Suparman *et al.*, 2020). The presence of media in the learning process really helps students to be more interested and at the same time understand what they are learning. Students will feel happy in carrying out the learning process (Utamai, 2020; Utami, 2018). Therefore, the selection and use of media must be truly appropriate so that the desired goals can be achieved easily. Utilizing media as an attraction in learning is a necessity for a teacher when making a selection. The importance of media in the learning process will enable teachers to provide good knowledge to students. teachers are able to teach not only effectively but also fun.

Basically, media is a form of means for transferring or conveying the best and most effective messages at the elementary school level. Media is able to communicate with students through observation in conveying messages in the learning process that are easily analyzed by the child's mind (Mutanaffisah *et al.*, 2021; Sulman *et al.*, 2021). In the process of understanding lessons, the use of media is very important, it is impossible to coordinate learning activities without media. One media that is able to encourage student activity and interest in learning is using image media. Image media in the learning process is flexible because it can be used at all levels, and can be obtained easily, no special technological

skills are required to obtain it, and can also be made classically (by themselves) by the teacher directly. Image media in the learning process can be said to be a media tool that contains information or instructional messages and can be used in the learning process which is able to attract students' attention and is easy to digest or understand (Amir, 2016; Silaban *et al.*, 2023; Suparman *et al.*, 2020). Image media in the learning process is a tool for conveying messages or information that contains a purpose or objective, which in this case is to improve students' mathematical abilities in terms of recognizing numbers, doing addition and subtraction and can be applied in students' lives (Amir, 2016; Hanna *et al.*, 2016; Pit *et al.*, 2020; Utamai, 2020).

The image media used in the learning process is very important because students acquire new concepts, skills and abilities. Teachers can use various types of image media in the teaching and learning process, but teachers must be very selective in choosing the type of image media. This is because the level of analysis for elementary school students is not yet good, so it is only focused on introducing and using the material that has been provided. Image media will be the right solution in conveying messages from teachers to students, in this case in the mathematics learning process. Therefore, the image media used must be chosen well, so that the learning process can run more effectively, efficiently and also have fun, so that students will become more motivated and interested in the learning process.

Image media in mathematics learning is a solution, especially for elementary school teachers who sometimes experience problems in using technology in their learning process. By using image media, teachers will be greatly helped and can increase students' enthusiasm for learning (Amir, 2016; Utami, 2018; Wora *et al.*, 2023). Learning by looking at an object will make students' understanding broader, because by looking students will be able to think and adjust in their minds the meaning of the images given, so that learning can take place more effectively. The effectiveness of the learning process will create learning that truly provides greater abilities to students and also makes it easier for teachers to carry out the learning process. Therefore, as a solution for both students and teachers in learning mathematics in elementary schools, researchers are interested in conducting an investigation into the impact of using graphic media in the mathematics learning process in terms of the ability to recognize numbers, add and subtract. This research process aims to increase students' abilities in order to train students' maturity in understanding the material better and more pleasantly.

METHOD

In the research process that was carried out, the researcher used a descriptive quantitative research approach. In this study, data was taken by providing treatment and tests were carried out both before and after the treatment, namely the image media was given. The method used is Quasi-experimental where the researcher thinks it is very difficult to control all variables (Creswell, 2012; Lehavi & Eylon, 2018), so that the variables observed are only a comparison of the initial test and the final test after the media images are given. The subjects in this research were students at SDN 17/XI Simpang Sungai Duren who were in the first class. The sample in this research was class 1B, totaling

15 students. Sampling used a purposive sampling technique based on considerations, namely students who were in first grade who had not studied the material on recognizing numbers and counting. The data collection technique in this research is to use graphic test questions which have been arranged based on 3 categories, namely the ability to recognize numbers, the ability to count and the students' ability to carry out subtraction analysis. The data obtained will be analyzed based on the 3 categories that have been determined as above. Where the analysis will be based on the proportion of question items and questions analyzed classically or through simple calculations.

RESULT AND DISCUSSION

In the research that has been carried out, there are 3 things that are the main reference for researchers in this research that will be revealed, namely the impact on student learning outcomes after providing image media in mathematics learning in the category of recognizing numbers, the ability to add and subtract in elementary school students. In this study, some information was obtained which was analyzed based on the perspective of the students' initial and final tests. The student scores based on percentage in recognizing numbers, addition ability and subtraction ability can be seen in table 1.

Table 1. Percentage of students' scores in recognizing addition and subtraction numbers.

No	Learning	Preetest percentage	Posttest presence
1	Number recognition	20%	80%
2	Summation	10%	90%
3	Subtraction	30%	70%

From the research data obtained in table 1, it clearly shows that image media in this case is used as a tool in the mathematics learning process for elementary school children, especially in class 1 with material on recognizing numbers, addition and subtraction when reviewing students' initial test scores and students' final tests experienced a significant increase. From the data obtained, information that the increase in knowing numbers has increased from 20% of students who know numbers, after being taught using picture media, it rose to 80% of the total students, although there are still 20% of students who have not experienced any change.

Meanwhile, in terms of the ability to add category, there was a very significant increase, where from the initial test, only 10% of students had the ability to add, and after being given learning using visual media, the ability to add was increased by 90% and only 10% of the students were not able to add. well. In addition, researchers tried to observe students' ability to reduce subtraction, so from the initial test information was obtained that the student's initial ability was 30% and had increased by 70% and only 30% of students experienced subtraction weaknesses. In the research process and it has been carried out, it is clear that graphic media is able to provide changes to student learning outcomes for the better, especially in mathematics learning.

Image media in mathematics learning provides an extraordinary impact. In the learning process the teacher must be able to provide knowledge or skills from the teacher to choose media that is truly appropriate to use in the learning process. In the learning

process, all forms of tools or materials are used in the learning process to help students understand and master the subject matter, which in this case is mathematics material specifically on recognizing numbers, adding and subtracting. This media can be in the form of physical objects, technology, or a combination of both. designed with the aim of communicating information more effectively and facilitating understanding and learning of concepts (Nasri et al., 2010; Sumirattana *et al.*, 2017).

The teacher's goal in using graphic media is to train students to focus more on what they are learning, so that in the learning process the teacher can keep students focused on paying attention to the material being taught. In visual media, focused and interesting media can increase students' understanding and enthusiasm in understanding the material presented (Putra *et al.*, 2020; Putri *et al.*, 2018; Suparman *et al.*, 2020). In the learning process, graphic media is able to create a more interesting, meaningful and interactive learning experience, thereby helping students understand the lesson content better.

Image media is one type of component in students' environments that can stimulate them to learn, so that mathematics which students consider difficult and boring can become an easy and fun lesson. The process of using learning media in the teaching and learning process can arouse new desires and interests, generate motivation and stimulation of learning activities, and even give students more confidence to understand the material better. In this study, the researcher collaborated directly with the teacher to practice the visual media. The description of the teacher in carrying out or providing image media can be seen in Figure 1.



Gambar 1. Proses Pembelajaran Menggunakan Media Gambar

The learning process using image media can have a significant impact on students in mathematics learning. In the learning process, it is clearly visible how students focus on receiving directions and instructions given by the teacher in class. The special attention that students have during the learning process is very important and is also a determining factor in students' success in the process of understanding or receiving knowledge from the teacher. Image media is able to play a role as a teacher's assistant in directing a more organized learning process (Amir, 2016; Utamai, 2020).

Students have high enthusiasm in understanding learning, so the media used has actually been proven to be able to push students' knowledge to a better realm. The encouragement or strength possessed by students is able to make students' main abilities in starting to understand knowledge become better and of better quality. Basically, the

learning process given by the teacher will run well if there is a clear learning structure or process used by the teacher so that students can follow and understand it. In the learning process for elementary school children, which in this case is grade 1 of elementary school, the learning process must be based on knowledge transfer only, in other words you are given the knowledge to know numbers, addition and subtraction. This can provide the basis for students to become better individuals and able to further analyze knowledge at the next level.

The initial ability students must understand is how to introduce numbers to students. The numbers introduced must be able to remain in students' memories for a long time. Students' abilities are of course different, there are students who are able to remember longer and there are also students who have difficulty remembering the information given. Differences in children's abilities will of course be a problem that must be found for a solution, so that the learning process can achieve the desired goals. Based on the perceived differences in ability, there must be a media image created by the teacher that is interesting and does not require high technological skills, what is clear is that the image can provide information to children directly and can be seen and understood easily. In this research, researchers created a media to increase children's knowledge about numbers, which researchers believe is able to attract children's attention. The media image can be seen in Figure 2.

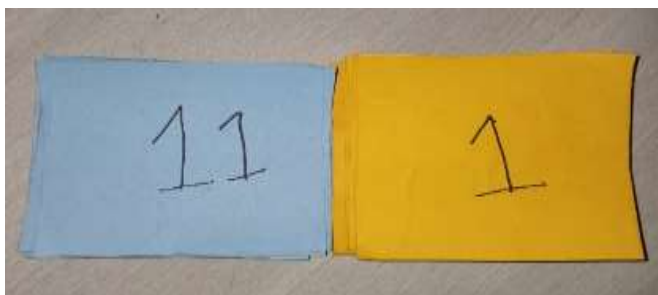


Figure 2. Image Media to Introduce Numbers

In Figure 2, you can see an example of a picture that the researcher has made to explain and provide an introduction to numbers to students. This image media is used to explain or introduce numbers which are used to increase knowledge or to introduce number knowledge to students, so that this knowledge of numbers can last longer in the child's memory. Where in the first picture is a medium for drawing numbers formed in a small box which is able to provide understanding to students, especially in introducing numbers. This media is able to increase students' enthusiasm and enthusiasm in the learning process so that in learning, extraordinary interest and enthusiasm can emerge from students to get to know these numbers better.

The results of the observations also provide a clear picture that there has been a significant increase where the percentage of students knowing numbers before using image media is 20%. However, after being given visual media and carrying out a final test, it was found that students' scores increased, where the percentage of students who knew numbers became 80%. This clearly shows that media, if done well and in the right way, will be able

to strengthen and improve student learning outcomes even though the media is simple media and is in paper form that is easy to obtain. Learning media is clearly capable of being a driver of teacher success in the learning process and can increase students' enthusiasm and enthusiasm for learning. Then, in line with that, researchers also looked at how media abilities could improve and influence students' ability to calculate. The students' answers using image media to see students' abilities in calculating and subtracting can be seen in Figure 3.



Figure 3. Students' Answers to See Students' Abilities In Calculating and Subtracting

In Figure 3 you can see how the ability of image media can increase students' ability and enthusiasm in answering or understanding the concept of addition and subtraction in calculations. Image media makes students able to calculate using knowledge or what they see. Students' mental abilities will try to store and analyze knowledge more deeply. The form of questions or image media that looks interesting provides answers that they consider correct. The answers given by students using image media can be analyzed not only through the material or knowledge that has been obtained in the learning process, but from the questions in the image media given by the teacher can be a tool to help students think further about the knowledge they want to conclude in answering questions. Students' answers to how many questions in the image media are provided can increase students' understanding of the learning process, so that in answering or providing answers students can increase the knowledge or information obtained in answering questions (Akbar & Tarman, 2018; Utami, 2018; Wora *et al.*, 2023). The ability of image media will be a teacher's strength in making it easier to provide students with basic knowledge in mathematics subjects.

Basically, the concept of understanding mathematics learning is material that students must master well. Mathematics is a basic learning that is related to other learning. The importance of basic understanding of mathematical knowledge is an understanding that teachers must have an appropriate method and strategy in providing understanding to students so that students can master or know numbers and can be remembered by students well, then from the numbers that are remembered students can improve their abilities or skills (Amalia, 2017; Jasija *et al.*, 2018; Kusmanto & Marliyana, 2014). perform arithmetic, both adding and subtracting, so that it can be used in everyday life and can

become a basis for understanding knowledge at the next level. The important role of media is an indication that a teacher must be able to create good and quality media (Messing & Westwood, 2014; Sastradika *et al.*, 2021). Good and quality media can be seen if the media is able to change student learning outcomes to be better and of better quality.

In the process of media development today, it is easy for teachers to create media, but image media is easier because it does not require complicated and difficult technology, image media can be made classically and does not require large funds which can encourage better and quality learning. The image media in this research has shown how effective the media is used in the mathematics learning process, especially material about recognizing numbers. The effectiveness of image media in mathematics learning is an illustration that the best learning media is not in terms of the technology used and also not from the price of the media used, but the best learning media is media that suits the problem being faced. This research clearly provides an overview of learning using image media which is very effective and is still very useful today.

CONCLUSION

This research provides an illustration that image media is able to provide satisfactory results even though it is applied in the current era which is full of technology. Image media is still an appropriate classical tool in learning mathematics, especially in the material of recognizing numbers in grade 1 of elementary school. In this study it can be concluded that the percentage of students' scores before and after being given image media treatment is very high, namely in terms of recognizing numbers, students' ability to recognize numbers has increased from before. 20% to 90%, then in terms of additional abilities students' abilities increased from 10% to 90% and students' decreased abilities increased from 30% to 90%. This proves that image media has an important role in mathematics learning, especially for elementary school children. The researcher also suggests that future researchers create better samples and test the validity of questions or test instruments. Researchers also hope that other researchers will create conditioning before the research process is actually carried out.

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