



EFFECTIVENESS OF USING ANIMATION MEDIA IN MATHEMATICS LEARNING FOR GRADE V ELEMENTARY SCHOOLS

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ABSTRACT

This study aims to develop and test the effectiveness of animated video-based learning media on Data Processing material for elementary school students. The materials taught include data collection, data presentation in the form of tables and bar charts, and the ability to read and interpret data. Animated video media was chosen because it is considered capable of increasing students' interest in learning and understanding through interesting and interactive visualizations. The study used a classroom action research method with two cycles. The subjects of the study were fifth grade elementary school students. Data collection instruments included comprehension tests, observation sheets, and interviews. The results of the study showed that the use of animated videos in data processing learning was able to significantly improve students' understanding, especially in the ability to organize data in the form of tables and bar charts and in reading and interpreting the data that had been presented. In addition, students showed higher interest and were more active in the learning process. The conclusion of this study is that animated video learning media is effective in improving students' understanding of data processing material. Animated videos have also been proven to be a learning aid that can increase student involvement in the learning process as well as critical and analytical thinking skills. Therefore, this media is recommended as an alternative learning method in teaching mathematics, especially on the topic of data processing.

Keywords: Animation Video, Data Processing, Elementary School

A. INTRODUCTION

Mathematics is one of the core subjects that is important to study in the world of education. In its learning, mathematics requires a good understanding of concepts because to understand each existing concept, a prerequisite understanding of the concepts in the previous material is necessary. Mathematics is organized from undefined elements, definitions, axioms, and theorems, where these theorems, after their truth is proven, apply generally; therefore, mathematics is often referred to as a deductive science. (Ruseffendi, 1988:23). Of course, due to this, in the implementation of mathematics learning activities, this subject often becomes a frightening specter for many students, who believe that mathematics is a difficult subject. This assumption causes students to have even more difficulty in understanding the material. So, students lack the motivation to succeed, which instead leads them to despair in learning it.

Learning difficulties experienced by students can be caused by both internal and external factors. The internal factors refer to those originating from within the students themselves, such as health, interests, motivation, intelligence, and so on. Meanwhile, external factors are those originating from outside the students, such as the school environment, family environment, and community environment. It is very common for students to face difficulties in learning mathematics, with the main issue being difficulties in understanding concepts. Of course, these learning difficulties will eventually impact

students' learning outcomes, which in turn will affect the achievement of the learning goals that have been set. In mathematics learning, Rusfendi (2009) argues that for students to understand and grasp mathematical concepts, they should be taught in the sequence of pure concepts followed by applied concepts, and it should also be adjusted to the stages of the learning process of the students.

It has become common knowledge in our nation's education system that mathematics learning activities are one of the main challenges in the world of education, especially when the topics taught are considered abstract or difficult for students to understand. Furthermore, mathematics is deemed too difficult and complicated, easily causing students to become bored. One of the reasons is the lack of creativity from teachers in creating or modifying engaging learning media while using aids in the learning activities.

One of the topics that often faces comprehension barriers is data processing. Conventional teaching that is textual and theoretical often makes it difficult for students to connect the concept of data processing with real-life situations. Data processing is part of the fifth-grade elementary school mathematics curriculum, where at this stage they are introduced to the processes of collecting, processing, and presenting data to draw conclusions.

It has been previously stated that the mathematical mindset as a science has a deductive nature. Properties or theorems determined inductively or empirically are then proven true through deductive steps according to the existing structure. In order for mathematics education to achieve the desired competencies, it is necessary to design a learning model that aligns with the intellectual development of the students, making the learning process engaging. (Jazimah, 2020). Therefore, innovation in teaching methods is needed to make the material more interesting, interactive, and easy for students to understand.

One of these innovations is the use of learning media that keeps up with the times. Learning media itself is a tool that can assist the learning process, making the conveyed message clearer and the learning objectives achievable. (Nurrita, 2018). Sumianto and Aprinawati (2021:77) also argue that learning media is an auxiliary tool or technology that facilitates the learning process to achieve learning objectives more effectively and efficiently, used both indoors and outdoors as previously planned. The use of learning media will have a significant impact on students. This is because the use of learning media can help clarify the message that needs to be conveyed in the learning process, as often the material or information delivered verbally is not fully understood by the students. (Supartini, 2016).

Learning media will be very beneficial if used in the learning process because it can have various positive impacts on students. The use of technology, particularly animated videos, offers a potential solution to address this issue. Research shows that animated video media can enhance students' learning motivation and is also an effective alternative method to improve the learning process (Siregar, 2018:621). Animated videos have the ability to present complex information in a simple, visual, and dynamic way, thereby significantly improving students' understanding. Furthermore, research conducted by Mahendra et al. (2020:130) also emphasizes that students engaged in learning through animated video media show a higher level of learning interest compared to students who do not use any media in the learning process. This is supported by the ability of this media to allow students

to directly see the application of mathematical concepts in real contexts and help them build connections between theory and practice.

This research aims to evaluate the effectiveness of using animated videos as a learning medium in mathematics teaching, particularly on the topic of data processing. By examining its impact on student learning outcomes, motivation, and concept understanding, this study is expected to provide new insights into how technology can be effectively integrated into the mathematics learning process.

B. RESEARCH METHOD

This research uses a qualitative research method, where by using this method, the research employs a natural setting with the aim of interpreting a phenomenon that occurs and is carried out by involving various existing methods. (Denzin & Lincoln, 1994). This research was also conducted using two approaches, namely interviews and observations, where the sources and subjects of this research were five fifth-grade students from UPTD SD Negeri 5 Metro Barat. The research was carried out by conducting interviews related to mathematics learning conducted at the school and their understanding of data processing material. Subsequently, observations were made of their abilities before and after using the selected learning media to determine the effectiveness of this learning media. The data analysis technique in this research was carried out in three processes, which include data reduction, data presentation, and conclusion drawing. (Miles & Huberman, 1992).

C. RESULTS AND DISCUSSION

Based on the results of the conducted interviews, it is known that the students lack understanding of the concept of data processing in more depth, with the main concept they do not understand in this material being the mean. Based on the results of the observations, the reason why the students have not yet understood this material is the rushed implementation of the teaching and the teaching materials that are not concise and instead confuse the students. As for the implementation of learning in schools, it is said to be more often in the form of group work conducted together, resulting in uneven understanding because passive students are embarrassed to ask questions if there is something they do not understand.

The results of the research on fifth-grade elementary school students attending SD Negeri 5 Metro Barat were conducted by administering pretests and posttests to five selected students. The scores obtained from the pretests and posttests are presented in the following table:

No.	Value	Number of Students	
		Pretest	Posttest
1.	<70	3	0
2.	70	1	0
3.	75	1	2
4.	80	0	1
5.	>80	0	2

Table 1. Student Learning Outcomes Based on Pretest and Posttest

	Pretest	Posttest
Number of Students	5	5
Average	65.8%	81.2%

Table 2. Average Pretest and Posttest Results

	1	2	3	4	5
Question number	1	2	3	4	5
Score of the question	20	5	5	10	10
Pretest (%)	60	20	30	40	50
Posttest (%)	170	50	50	90	80

Table 2. Percentage of test items

Based on the data results shown in the table, where the average pretest score of five sixth-grade students was 65.8%, while in the posttest with the same questions, the five students achieved an average score of 81.2%. From this, it can be concluded that the use of video animation-based learning media in elementary school mathematics data processing lessons has a positive impact on the results.

Table three shows the percentage of questions along with the score per question, from which it can be seen that the difficult questions in the attached test are in numbers one, four, and five, while the other two numbers are basic questions that are easy considering the few points given. If observed, each question shows a significant improvement in its completion, whether it is an easy or difficult question. This means that the learning media developed in detail can enhance children's understanding and also encourage them to attentively follow the explanations provided through the learning media.

In the pretest, only two students had KKM scores (70), one achieved the KKM score and the other scored just above KKM, while three others scored below KKM. Then, from the posttest results, it can be seen that three students scored above KKM, with two others scoring exactly KKM. Like the service conducted by (Mayasari et al, 2019), where the use of learning media has been proven to result in student enthusiasm in participating in learning and an improvement in student academic achievement.

In the use of animation-based learning media in this research, a video with the use of cartoon animations was utilized in its entirety, where in the attached video, student models were chosen in numbers almost equal to the students who were the subjects of the research. This was done so that students would feel curious and enthusiastic about following the material to be presented. Animated videos themselves are the movement of one frame to another, differing in duration, creating the impression of motion, and also include sounds that support the movement of the images, such as conversations or dialogues and other sounds. (Yusuf & Zuliani, 2022).

Additionally, the opening topic in the video material was chosen to be something enjoyable, such as a trip to the zoo. The use of the recreation concept at the beginning of this animated video aims to help students maintain their focus while watching the educational video. In the selected learning media based on animated video, the explanation of the

material is divided into four parts, namely the introduction of the material in the form of data collection models and data presentation methods, the calculation of the median or middle value, the calculation of the mode, and the calculation of the mean or average value.



Chasing Dreams. (2022, Oktober 22). Opening Material. Introduction to Data Collection Methods



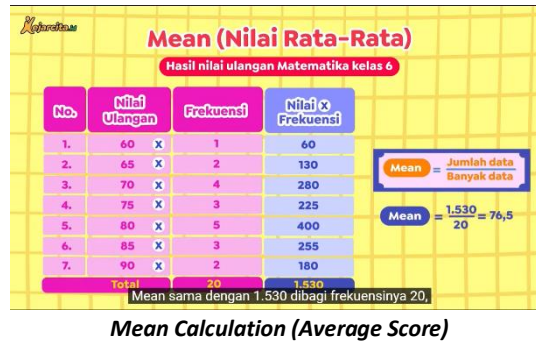
Data Collection Methods and Presentation of Data Tables



Form of Data Presentation Diagram



Calculation of Median and Mode



Based on the attached video, it can be seen that the appearance of the learning media has been made as attractive as possible with eye-catching colors that complement each other and the selection of animations that do not clash, making it comfortable to look at. The explanation of the material is also made as brief as possible so that students do not get bored and can maintain their attention on the material, which is feared to make them confused and not understand.

This animated media has proven to be very effective in helping students understand the concepts of data collection and presentation in data processing material. By using simple visualizations, this video allows students to comprehend the data collection process and organize it into various forms of data presentation.

The animated video media used has two main focuses, namely the data collection process and its presentation in the form of tables and diagrams. It has been shown in the introduction section, in the first discussion, the video explains how data can be collected through relevant sources. Furthermore, the attached video animation also shows the process of organizing data into structured tables; in addition to tables, various diagrams are also presented as other forms of data presentation. The video is also equipped with simple icons and colors that help clarify the information. In addition, this video teaches students to read and interpret data patterns from the provided visualizations. Research conducted by Fujiyanto et al. (2016:848) also supports the success of animated videos in this regard by showing that the use of animated video media in learning can facilitate the understanding of abstract concepts by transforming them into more concrete forms, thereby improving students' academic performance.

D. CONCLUSION

The study results found that the use of animated video-based learning media significantly improves students' understanding in mathematics teaching, particularly in data processing material for fifth-grade elementary school students. The average student score increased from 65.8% on the pretest to 81.2% on the posttest, indicating the effectiveness of this media in learning. The animated videos used successfully captured students' attention and facilitated the understanding of abstract concepts such as data collection and presentation, including the calculation of median, mode, and mean. This study recommends the use of animated videos as an alternative teaching method to enhance the understanding of mathematical concepts.

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