Interactive animation media and students' learning interest in learning mathematics in elementary schools

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Abstract.

The low interest of students in learning mathematics has an impact on learning outcomes which is one of the efforts in achieving learning goals. One effort that can be made to increase student interest in learning mathematics is to present more interesting materials and guide students to be more active. Thus, teachers are required to be creative and innovative in choosing learning media by adjusting student characteristics and combining media to support student learning interests. This study aims to determine the effect of interactive media on student learning interests. And to determine the completeness of student learning in mathematics material. The type of research used is pre-experimental design with a One-Group-Pretest-Posttest design research design. The sampling technique uses a saturated sampling technique which is all the population in class IV of SD Negeri Rumpet Aceh Besar as many as 24 students, consisting of 11 male students and 13 female students. Data were obtained using a learning interest questionnaire and test questions. Based on the results of the hypothesis test using the Paired Sample t-Test with a significance level of 0.05 (2-tailed), a significance of 0.00 was obtained. This shows that 0.00 < 0.05, then it can be concluded that there is an influence of the use of interactive animation media on the learning interest of students at Rumpet Aceh Besar Elementary School. This is also supported by the percentage of classical completion reaching 100% complete with a KKTP of 75%. Thus, interactive animation media has an effect on students' learning interest with learning outcomes achieving completion.

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INTRODUCTION

Mathematics has a very important role in advancing human thinking power so that they can think logically and systematically. Teaching mathematics is not just about the ability to count quickly but also instilling concepts so that they understand what mathematics means and are able to reason to solve problems in everyday life in various logical and correct ways. Mathematics has abstract ideas consisting of symbols that are manipulated and must first be understood with mathematical concepts (Anggraeni et al., 2020), this is what makes it difficult for students to understand mathematics. Thus, there are still students who experience various problems in learning mathematics, resulting in low learning outcomes (Pramesti & Prasetya, 2021). One of the problems is the assumption of most students that mathematics is a difficult and boring subject, so many students do not like mathematics and even try to avoid the subject. Students' dislike of mathematics results in students having difficulty understanding mathematics materials during the

learning process and will have an impact on low student learning outcomes, so that the objectives of mathematics learning are not achieved properly and become an obstacle to the objectives of mathematics learning in subsequent materials (Hidayati et al., 2023). Excessive anxiety experienced by students in participating in mathematics learning has a negative impact on student achievement, so that students who have high levels of anxiety tend not to perform as well as students with low levels of anxiety (Utari et al., 2019).

Good learning outcomes are one of the ultimate goals of learning to evaluate the achievement of indicators that have been formulated, therefore, to achieve the expected learning outcomes, students are invited to review all the knowledge that has been obtained in class so that the expected learning objectives can be achieved. Mathematics learning outcomes are basically the results achieved in an effort to master material and knowledge which is an activity towards the formation of a complete student personality. To obtain better learning outcomes, it is also accompanied by maximum learning efforts such as reviewing lessons so that students really master what they are learning (Manurung & Halim, 2021). However, due to the lack of student interest in learning mathematics, there is a lack of student understanding of the basic concepts in mathematics. Such as students' difficulty in understanding arithmetic material which results in students having difficulty in understanding other mathematical material related to arithmetic, this is one of the factors that makes students dislike mathematics. However, almost all mathematical concepts learned in elementary school are often used in everyday life and are very important for students to master (Buyung et al., 2022; Isnayanti & Harahap, 2020).

One of the concepts in mathematics that must be mastered by students is the concept of solid geometry, namely three-dimensional figures that are often encountered in everyday life. A three-dimensional figure is a part of space that is limited by a set of points on all sides which are the surfaces of the figure (Suharjana, 2008). In studying three-dimensional figures, students must be able to formulate definitions of the properties of three-dimensional figures that they see from objects in the form of three-dimensional figures, not just explain their abstractness. This is because if abstract concepts are only memorized, students will find it difficult to apply these concepts in problem solving (Fitriani, Suryadi, & Darhim, 2018). Students' difficulties in learning geometry material, especially three-dimensional figures, are proven by research conducted by Nursyamsiah, Savitri, Yuspriyati, & Zanthy, (2020) which states that students have difficulty in understanding three-dimensional figures such as difficulty in identifying elements of flat-sided three-dimensional figures, and solving other three-dimensional problems, resulting in students' scores on three-dimensional figures still being low. This problem is caused by learning that tends to accustom students to solving problems using formulas that they have memorized without knowing the origin of the formula used. In addition, students have difficulty solving problems that do not match the examples given by the teacher, so that because of these difficulties, students are not enthusiastic and less interested in learning mathematics. This is in line with the results of research conducted by Jafar et al. (2021) that students' interest in learning, especially in mathematics, is quite low, because the teacher's teaching method also tends to explain concepts informatively and is less varied in using learning media. So that students are less interested in learning mathematics, instead tend to be lazy and busy themselves without paying attention to learning. In addition, there are also some students who still find mathematics difficult to understand and boring. This condition makes learning less meaningful and can reduce students' interest in learning mathematics which will have an impact on students' final grades.

The problem of learning difficulties in mathematics is also experienced by students at SD Negeri Rumpet Aceh Besar. Based on the results of observations, students are less interested in mathematics lessons because they consider mathematics lessons to be difficult and learning is not interesting, this has an impact on the learning outcomes obtained by students at SD Negeri Rumpet Aceh Besar not reaching the KKTP, which is 75. To overcome this problem, teachers are required to be able to choose and create media that is in accordance with the material presented in the learning process. One of them is by using interactive animated media which contains images, audio and text. Then the teaching and learning process will be more effective and can attract students'

attention so that the material can be easily understood and complete learning outcomes can be obtained classically. The use of appropriate learning media can increase students' interest in learning and can create a sense of pleasure in the learning process. The success of students in learning in class and the success of a school is influenced by several factors, including interest in learning, namely students' interest in the teaching and learning process in the classroom which is expected to run smoothly, then the presence of media in learning makes students active and does not do other activities besides listening to the teacher (Yulianti et al., 2022). This is in line with what was expressed by Setyawati et al. (2020) that the role of media is very important in the learning process which is used as an aid in the teaching and learning process; by using media it greatly influences students' motivation, interest and attention in learning, and is able to visualize abstract material taught by teachers so that learning becomes more interesting and not boring.

Various studies related to interactive animation media and students' learning interests have been conducted, including research conducted by Liani & Hasanah (2023) who developed animated video-based learning media on spatial geometry material, specifically on cube and block material. A similar study was also conducted by Asmayani et al. (2023), but in their study the researchers applied interactive animation media to see its effect on students' interest in science material. The difference between the two studies and this study is in the material used, namely the elements and properties of solid geometry studied in elementary school.

Based on the explanation above, one way to foster student interest is to use interactive animation media, namely the presentation of material using video recordings with computer control, so that students not only hear and see therapy but can also provide active responses during the learning process. The involvement of learning media can also help teachers explain material to students; by using more colorful media, it certainly fosters students' interest. Students' interest in learning can be aroused if there is something that makes students interested and things that make students have a high curiosity and are driven by a desire to prove it further. Thus, this study is important to be carried out to prove or obtain information on the influence of the use of interactive animation media on students' interest in learning.

METHOD

The research method used is a quantitative method with an experimental research approach, namely pre-experimental design. This study uses a One Group Pretest-Posttest design, namely a research design that includes measuring variables in the time before and after being treated to one group of subjects. This study was conducted at SD Negeri Rumpet Aceh Besar, with a population of all grade IV students of SD Negeri Rumpet totaling 24 students. The sampling technique used is saturated sampling, namely a sampling technique for the entire population as a sample (Sugiyono, 2017). The research instrument used is a student learning interest questionnaire sheet which is analyzed using a hypothesis test (Paired sample t-Test) and evaluation test questions which are analyzed with a percentage to determine the level of completion according to the KKTP. The statements in the questionnaire were formulated based on learning interest indicators comprising 26 statements. Examples of learning interest indicator statements are provided in Table 1.

Table 1. Student learning interest indicators and questionnaire statement numbers

No.	Learning Interest Indicator	Statement Number	Examples of questionnaire statements
1	Feeling happy	1, 2, 4, 5, 22 and 26	I enjoy math lessons
2	Interest in learning	8, 9, 17, 19, 21, and 25	I don't get bored easily doing math problems
3	Showing attention while studying	6, 11, 14, 15, 16, 18, 24, and 23	I ask the teacher if I don't understand the material
4	Involvement in learning	3, 7, 10, 12, 13 and 20	I actively discuss with friends when studying math

The questionnaire used to measure students' learning interest was previously validated by

experts and tested on grade IV students who were not research samples. Furthermore, the results of the trial were analyzed using validity and reliability tests and obtained Cronbach Alpha 0.924 > 0.70, which means that the learning interest questionnaire can be used in this study. As for the evaluation test questions, only expert validation was carried out by a lecturer and a teacher, with a total of 10 questions. Furthermore, this study began by giving a pretest to students, then continued by providing lesson materials using interactive animation media until the end of the lesson, and continued with a posttest and closed by giving evaluation questions to students to see their learning outcomes.

RESULTS AND DISCUSSION

The initial activity carried out in this study was the provision of a pretest with the aim of determining students' initial learning interest before being given learning using interactive animation media, and continued with the provision of a posttest after learning was carried out with the aim of determining students' learning interest after being given learning using interactive animation media. Furthermore, the data was analyzed using a normality test on the pretest and posttest values to determine whether the data from the pretest and posttest were normally distributed or not, the normality test carried out by the researcher was using the Shapiro-Wilk test, namely if the significance value > 0.05 then the data is normally distributed, while if the significance value < 0.05 then the data is not normally distributed. The results of the normality test are presented in Table 2.

Table 2. Normality test results

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pretest interest in learning	.119	24	.200*	.953	24	.313
posttest learning interest	.100	24	.200*	.979	24	.877

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Based on Table 2, the results of the normality test obtained a Sig. pretest value of 0.313 and a Sig. posttest value of 0.877. In accordance with the interpretation of the conclusion drawing, if the significance value is > 0.05. Then Ha is accepted, meaning the data is normally distributed. Thus, it can be concluded that the pretest and posttest data are normally distributed. Then after conducting the prerequisite test, namely the normality test and obtaining normally distributed data results, it is continued with a parametric test, namely a hypothesis test used to see the effect of interactive animation media on students' interest in learning mathematics in grade IV of SD Negeri Rumpet Aceh Besar. Hypothesis testing was conducted employing the paired sample t-test, utilizing the SPSS version 26 application. The results of this analysis are presented in Table 3.

Table 3. Paired sample statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	69.24	24	6.585	1.317
	posttest	94.16	24	5.475	1.095

As evidenced by Table 3, a distinct disparity exists between the pretest and posttest outcomes. Notably, the application of interactive animation media elicited a notable increase in students' interest in learning. In the pretest obtained an average of 69.24 while in the posttest it was 94.16. To ascertain the existence of a substantial influence, the outcomes of the hypothesis test are presented in Table 4.

Table 4. Paired samples test

		Paired Differences				t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1	pretest - posttest	-24.920	8.789	1.758	-28.548	-21.292	-14.177	24	.000

Based on Table 3 above, the hypothesis test conducted using the paired sample t test shows that the significant value is 000 < 0.05, so it can be concluded that H_a is accepted and H_0 is rejected. Thus, it can be said that there is an influence of interactive animation media on students' interest in learning mathematics at SD Negeri Rumpet Aceh Besar. Furthermore, to ascertain whether the augmentation in students' interest in learning has a positive impact on their learning outcomes, an evaluation test was administered, with the results presented in Figure 1.
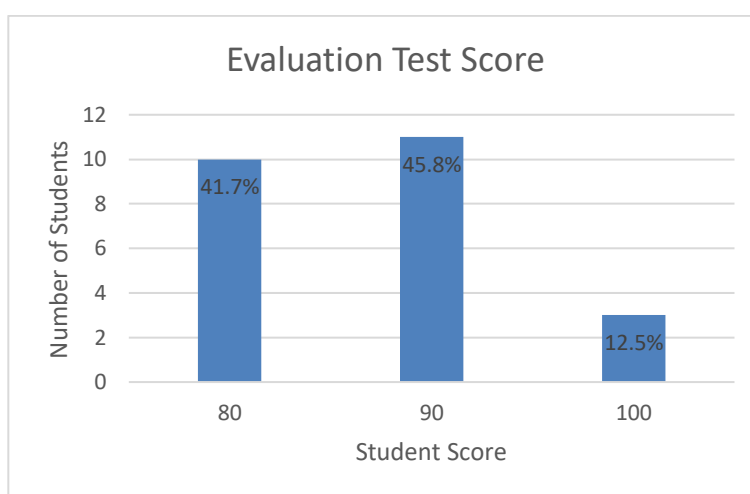
Figure 1. Learning evaluation test results

Referring to Figure 1, it can be seen that the scores obtained by students are above 75 which is the KKTP in the material of three-dimensional figures. This shows that all students have achieved KKTP, so it can be concluded that the learning outcomes of students after using interactive animation media on the material of three-dimensional figures have reached 100% classical completion. This study aims to determine the effect of interactive animation media on the learning interests of fourth grade students of SD Negeri Rumpet Aceh Besar. And to find out the completeness of student learning in the material of three-dimensional figures. Based on the results of the data analysis, the objectives have been proven, namely based on the hypothesis test using the paired sample t-Test test, a significant value of 000 < 0.05 was obtained, which means that there is a significant influence of the use of interactive animation media on students' learning interests in mathematics subjects at SD Negeri Rumpet Aceh Besar. And it can also be proven from the average obtained before using interactive animation media and after it increased, namely from 69.24 to 94.16. With the difference in the average obtained before and after using interactive animation media, it shows that students' learning interests are influenced by the use of the media. Learning interest or motivation to learn is obtained from a learning atmosphere that provides motivation and freedom to explore and analyze learning experiences. Thus, a conducive learning design and the use of appropriate media will provide students with the freedom to express ideas and motivate students in learning so that students' interest in learning increases (Trismayanti, 2019).

The impact of students' interest in learning using interactive animation media is that students feel happy and active in learning, and enjoy the learning process so that it affects student learning

outcomes. The learning outcomes obtained by students after using interactive animation media in mathematics subjects on solid geometry material in grade IV reached 100% completion classically, with a KKTP of 75. This can be interpreted that the better the students' interest in learning, the better the learning outcomes obtained by students. Learning outcomes, especially mathematics learning outcomes, are the results achieved in an effort to master the material which is an activity so that the student's personality is formed as a whole. Good learning outcomes will be obtained through good learning activities (Manurung & Halim, 2021).

This study has proven that the use of interactive animation media, namely learning media designed using Canva and made into interactive animation videos on solid geometry material, has an effect on students' interest in learning, because when learning takes place, students are more active and their curiosity about the material is higher. High student enthusiasm can also be seen from the attitude of students who focus on paying attention to the teacher's explanation and are active in learning, such as being enthusiastic about working on LKPD and interacting well with teachers and peers. Interactive animation media has the potential to be developed as a mathematics learning medium because it has several advantages, including: having great potential in increasing students' interest in learning and understanding concepts, increasing students' creativity and imagination, being interesting and entertaining and encouraging critical thinking, developing visual thinking and bringing out students' creative ideas (Melati et al., 2023). In addition, by using interactive animation media, the average student response can increase. Because by using interactive animation media, students are very enthusiastic in following the learning process, by paying attention to every component that appears on the media, such as interesting videos, sounds, and images so that learning is more meaningful for students (Asmayani et al., 2023). In addition, students' responses to interactive animation media also increased from the low category to the very high category. And based on the interview results, it was found that students really enjoy learning using interactive animation media (Hariati et al., 2020). In mathematics learning, interactive animation media has a very good contribution in helping and making it easier for students to master the material, because interactive animation learning media can not only be heard and seen by students but also presents material in an interesting and easy-to-understand way so that it can arouse students' motivation in learning (Jafar et al., 2021; Laura & Sahronih, 2022).

According to the description, it can be concluded that interactive animation media can influence the interest in learning mathematics of fourth grade students of SD Negeri Rumpet Aceh Besar as evidenced by a significance value of $0.000 < 0.05$, which means that H_a is accepted and H_0 is rejected. This study can be used as a reference for further research, although there are still limitations in the use of interactive animation media in schools that do not yet have supporting facilities and infrastructure.

CONCLUSIONS

Based on the results of the study and discussion, it can be concluded that with the use of interactive animation media in mathematics learning, students' interest in learning is better than before using interactive animation media. This is also proven by the results of the hypothesis test using the Paired Sample t-Test with a significance level of 0.05, the sig value (2-tailed) = $0.000 < 0.05$ was obtained, which means that H_0 is rejected and H_a is accepted so that it can be concluded that the average difference is different and it can be said that the use of interactive animation media has a significant effect on the interest in learning mathematics of class IV students of SD Negeri Rumpet Aceh Besar. The increase in student interest in learning is also supported by the completeness of learning outcomes obtained after the use of interactive animation media in mathematics subjects for class IV of SD Negeri Rumpet Aceh Besar reached 100% classically complete, with a KKTP of 75. Based on the results of the study obtained, there are still limitations in this study such as limitations in the material that only discusses the elements and properties of geometric shapes and does not cover all geometric shapes. Thus, for further research, it is recommended that it can be applied to all geometric shapes so that the research becomes better and more perfect.

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