



The Effectiveness of The Use of Diorama Teaching Aids on Students Interest and Learning

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Abstract

Teaching aids are considered an important tool because they are used by educators in the delivery of education. The problem of facilities and infrastructure is considered an important issue in education, therefore it is necessary to update the existing facilities and infrastructure starting from updating school buildings to learning facilities. This research to determine the effectiveness of using teaching aids on the interest and learning outcomes of science in class VII students at Junior high school 9 Kendari. The type of research used is Quasi-Experimental Design research in the form of Non-Equivalent Control Class Design. Data collection methods are carried out through questionnaires and tests. The population of this study was all seventh grade students of Junior high school 9 Kendari which amounted to 11 study class, with the research sample being class VII 10 which amounted to 27 students as the control class and class VII 8 which amounted to 30 students as the experimental class. Data analysis techniques used are descriptive and inferential data analysis techniques. From the research conducted related to the effectiveness of the use of diorama teaching aids obtained research results that in learning, there are differences in interest and learning outcomes between the control class that does not use teaching aids with experimental classes that use teaching aids. In addition, based on the N-gain test, the use of diorama teaching aids proved to be effective with the category of medium effectiveness level.

Keywords: Effectiveness, Teaching Aids, Interest in Learning, Learning Outcomes, N-Gain

A. Introduction

Complete facilities and infrastructure can provide implications for the learning process that runs smoothly. The problem of facilities and infrastructure is considered an important problem in education, therefore it is necessary to update existing facilities and infrastructure starting from updating school buildings to learning facilities such as learning media. (Amaliyah et al., 2021) stated that the majority of students at junior high school think that science subjects are difficult subjects. This statement is reinforced by data from the Ministry of Education and Culture (2019), which shows that for science subjects, the average national exam results obtained by students for the last four years is 48,79. This score is below the standard set by the Ministry of Education and Culture, namely 55. (Mustika & Rahmi, 2019) stated that good or bad learning outcomes can be caused by several reasons which can determine the learning outcomes obtained. The elements or reasons that can have an impact on learning outcomes consist of internal and external elements. Interest in something being studied will influence the recognition of interest and subsequent teaching results. In this way, it must be possible to instil interest and learning outcomes in students by involving demonstration assistance as a component of creative and imaginative learning. Complete facilities and infrastructure can provide implications for a smooth learning process. The issue of facilities and infrastructure is considered an important problem in education, therefore there is a need for newness in existing facilities and infrastructure, starting from updating school buildings to learning facilities.

Learning media is considered an important tool because it is used by educators in delivering education (Nur, 2015). (Tafonao, 2018) believes that learning media is something that complements the world of education and cannot be ruled out. Apart from that, learning media has the ability to transmit information from the message giver to the recipient, thus creating students' interest in learning, including teaching aids. Teachers must have the ability to select, create and apply teaching aids that are in harmony with the material being discussed or being discussed so as to improve the quality of education. (Seprianty, 2018). The use of teaching aids by teachers can make students' learning more interesting to overcome problems in the learning process such as low interest and student learning outcomes. The use of these teaching aids as creative learning is confirmed by the opinion of Prihatini (2017) who states that educators, in focusing on interests and science learning outcomes which were initially low, should utilize learning strategies according to Paikem (dynamic, imaginative and fun learning) as one of the one element that supports the progress of science-oriented learning. The difference between the research conducted by researchers and previous studies is that this research uses diorama teaching aids that are designed by researchers with learning materials on the interaction of living things with the environment. In addition, this study used the NHT type cooperative learning model in the learning process.

From the statement of one of the science teachers at junior high school 9 Kendari, it was stated that some of the class VII students at Junior High School 9 Kendari, during science learning, were found to be less serious and bored when learning in class, which resulted in poor learning results. Apart from that, although the facilities and infrastructure for teaching aids are quite complete, there are still certain science learning material topics that require teaching aids but the teaching aids are not yet available in schools, so the use of teaching aids themselves is not yet massive. When conveying learning topics, teachers usually only use textbooks. The problems that occur are in line with the opinion of (Insani, 2016) who states that educators are also faced with a lack of supportive learning references and strategies that have not been implemented effectively, this is what teachers experience when teaching science material. The emergence of student failure in learning is a response to the difficulties faced by teachers, giving rise to a paradigm of thinking among students that science is difficult to learn. Based on the theory and problems that have been explained, the researcher then wants to conduct research related to the use of teaching aids by testing their effectiveness on the interest and learning outcomes of class VII science at Junior High School 9 Kendari. In the research carried out, the researchers designed their own teaching aids, namely diorama teaching aids, which tested their effectiveness on the science subject, the subject of interaction of living things with their environment, for class VII, second semester at Junior High School 9 Kendari.

B. Literature Review

1. Teaching Aids

According to (Kahar, 2017), it is explained that teaching aids can support the ability of students or students to communicate as well as speak when carrying out learning is the intended behavior, and teaching aids are tools that can be used to accommodate students' understanding in assembling theory and behavior during learning. In line with (Murdiyanto & Mahatama, 2014) who state that the tools used by educators in the classroom in helping students understand what they are teaching and minimizing verbal behavior in students are called teaching aids. (Nurrita, 2018) states that teaching aids as teaching tools, teaching tools are tools that can support learning activities by explaining the meaning of messages and facilitating the achievement of educational or learning goals efficiently and effectively. The definition of teaching aids is then emphasized by (Galung, 2020) opinion which states that inside and outside the classroom, teaching aids contribute to the learning process. Based on the previous opinion, it can be concluded that teaching aids are teaching tools that can support learning activities and help students to more easily receive and understand messages, information or learning materials presented.

2. Interest to Learn

I. Lestari, (2015) reveals that interest is a stimulus of enthusiasm that grows from students to increase learning norms. According to (Kurniasari et al., 2021), a person's interest in learning is a psychological trait that is reflected in several symptoms, including; lust, desire, and desire to change one's behavior through various activities, including seeking knowledge and experience. According to (Yuwanita et al., 2020), interest in learning is a single passion in having fun that does not involve coercion, therefore it can bring about changes in ideas, skills and traits. Meanwhile (Ratnasari, 2017) feels happy and interested in an activity without being told, including interest in learning. In line with (Fadillah, 2016) who reveals that interest in learning is a predisposition, taste, which can support the smooth running of learning activities. Attention can lead to fondness, so interest can mean like an action-reaction relationship between attention and the learning chain. So it can be seen that interest in learning is a feeling of like, pleasure, interest, by students in the progress of learning activities so that students follow learning happily and without coercion.

3. Learning Outcomes

According to (Nabillah & Abadi, 2019), learning outcomes are skills that are controlled by students when they have had the opportunity to develop. Various experiences gained by students such as mental, emotional, and psychomotor fields. Learning outcomes are comprehensive changes in behavior and not only in one human capacity (Diani, 2016). According to (Sari, 2020) after going through the learning process, learning outcomes are defined as changes in behavior that occur due to the impact of learning. Self-advice produces stimuli and dreams for success, and environmental influences produce impulses for motivational management. Learning outcomes are a consequence of a person's learning activities. Changes in learners are related to learning outcomes. (Nurdyansah & Toyiba, 2018) reveal that learning outcomes are qualities controlled by students after they have made opportunities to improve in learning activities. Learning outcomes are also emphasized by (Saleh et al., 2015) learning outcomes are the skills obtained by students after their learning activities. Based on previous opinions, it is known that learning outcomes are changes in the attitudes and knowledge of students after going through their learning activities.

C. Methodology

1. Research Design

This research uses a quasi-experimental design or pseudo-experiment with the form of Nonequivalent Control Class Design. Researchers used control classes and experimental classes as research samples. This research uses purposive sampling technique. Purposive sampling is a type of non-random sampling technique in which the researcher takes action by setting an explicit model or criteria according to the research objectives. The population of this study is all VII grade in Junior High School 9 Kendari with a sample of VII class 8 as the experimental class and VII class 10 as the control class. The following is the research design used in this study:

Table 1. Quasi-experimental research design (nonequivalent control class design)

Class	Pre test	Treatment	Post test
Control	01	-	02
Experiment	03	X	04

With:

- 01 : Pre test class control
 02 : Post test class control
 03 : Pre test class eksperimen
 04 : Post test class eksperimen
 - : Learning without teaching aids
 X : Learning with teaching aids

2. Instruments

The instruments used in this study were questionnaires and tests. The questionnaire was used to collect data related to learning interest and the test was used to collect data on learning outcomes. The questionnaire instrument amounted to 20 statement items in the form of positive and negative statements and the test instrument used in the form of multiple choice objective test questions totaling 28 questions.

3. Techniques of Data Analysis

The data analysis technique in this study is to use descriptive statistical tests and inferential statistical tests. Inferential statistical tests used are: 1) data normality test, 2) homogeneity test, 3) hypothesis test, and 4) N-Gain test. The N-Gain test is used to see the effectiveness of learning to provide an overview of the increase in learning outcomes scores between before and after when using a strategy and others. To test the effectiveness related to the use of teaching aids, calculations can be made using the N-Gain test with the N-Gain effectiveness formula as follows:

$$N - Gain = \frac{Sp_{post} - Sp_{pre}}{Smaks - Sp_{pre}} \dots\dots\dots (1)$$

With:

- Sp_{post} : post test score
 Sp_{pre} : pre test score
 Smaks : maximum score

D. Findings and Discussion

1. Findings

a. Descriptive Statistics Test

The results of the descriptive analysis test in this study are as follows:

Table 2. Results of descriptive analysis of pre-learning questionnaire

Class	Mean	N	Standard Deviation
Control	72,85	26	6,265
Experiment	61,60	30	8,775

(Source: Data Processing Results of SPSS 16.0 Program)

Table 3. Results of descriptive analysis of post-learning questionnaire

Class	Mean	N	Standard Deviation
Control	82,46	26	4,111
Experiment	86,70	30	4,602

(Source: Data Processing Results of SPSS 16.0 Program)

In table 2 the results of descriptive analysis of pre-learning questionnaires in the control class there were 26 students who filled out the questionnaire, the average student score was 72,85 with a standard deviation of 6,265. While in the experimental class there were 30 students who filled out the questionnaire with an average student score of 61,60 with a

standard deviation of 8,775. Furthermore, table 3 of the descriptive analysis results of the post-learning questionnaire obtained for the control class there were 26 students who filled out the questionnaire with the acquisition of an average student score of 82,46 with a standard deviation of 4,111. While in the experimental class there were 30 students who filled out the questionnaire with the acquisition of an average student score of 86,70 with a standard deviation of 4,602. The following is a graphical image of the comparison of the average value of interest in learning the control class and the experimental class.

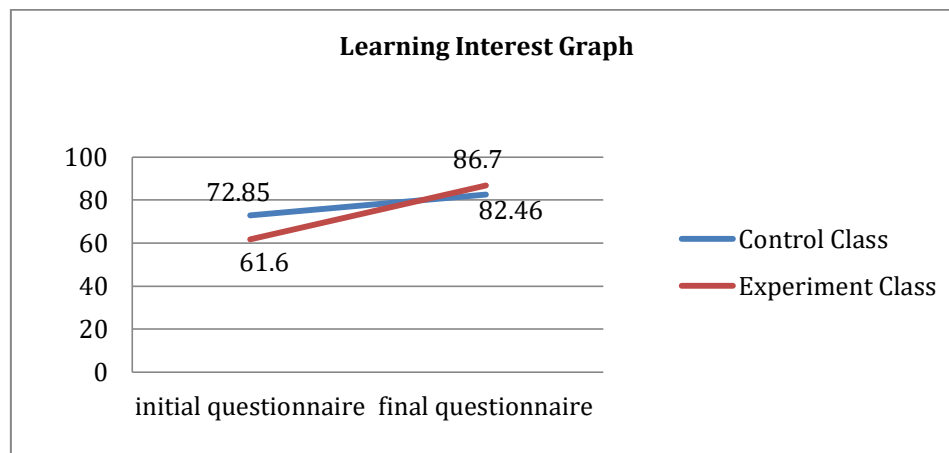


Figure 1. Comparison chart of the average value of students' interest in learning

Table 4. Pre-test descriptive analysis results

Class	Mean	N	Standard Deviation
Control	45,81	26	13,390
Experiment	44,40	30	14,55

(Source: Data Processing Results of SPSS 16.0 Program)

Table 5. Post test descriptive analysis results

Class	Mean	N	Standard Deviation
Control	67,23	26	9,374
Experiment	76,90	30	8,092

(Source: Data Processing Results of SPSS 16.0 Program)

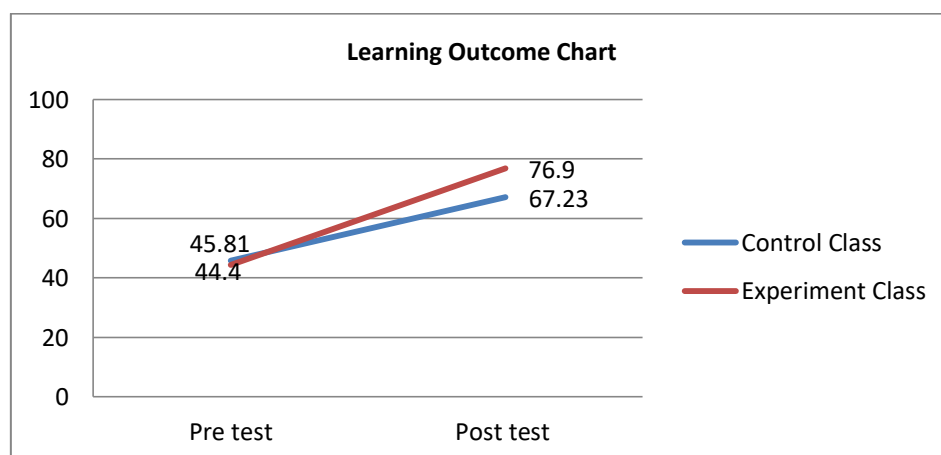


Figure 2. Comparison chart of the average value of student learning outcomes

In table 4, the results of the descriptive analysis of the pre-test in the control class there were 26 In table 3, the results of the descriptive analysis of the pre-test in the control class there were 26 students who filled out the test questions with the acquisition of an average student score of 45,81 with a standard deviation of 13,390. While in the experimental class there were 30 students who filled out the test questions with the acquisition of an average student score of 44.40 with a standard deviation of 14,55. Furthermore, in table 5, the results of descriptive analysis of the learning post test obtained for the control class there were 26 students who filled in the test questions with the acquisition of an average student score of 67,23 with a standard deviation of 9,374. While in the experimental class there were 30 students who filled out the test questions with the acquisition of an average student score of 76,90 with a standard

deviation of 8,092. The following is a graphical image of the comparison of the average value of the learning outcomes of the control class and the experimental class.

b. Hypothesis Test

The hypothesis in this study is as follows:

- H01 : There is no difference in interest in learning science between learning that uses teaching aids and learning that does not use teaching aids for seventh grade students at Junior High School 9 Kendari.
- Ha1 : There is a difference in interest in learning science between learning that uses teaching aids and learning that does not use teaching aids for seventh grade students at Junior High School 9 Kendari.
- H02 : There is no difference in science learning outcomes between learning that uses teaching aids and learning that does not use teaching aids for seventh grade students at Junior High School 9 Kendari.
- Ha2 : There is no difference in science learning outcomes between learning that uses teaching aids and learning that does not use teaching aids for seventh grade students at Junior High School 9 Kendari.

Table 6. Post test descriptive analysis results

Variables	Df	Table	tcount	Sig. (2-tailed)
Interests	54	2,004	3,610	0,001
Learning Outcomes	54	2,004	4,144	0,000

(Source: Data Processing Results of SPSS 16.0 Program)

Based on Table 6, the significance value (2-tailed) of learning interest is 0.001 and the tcount value is 3.610. Significance value (2-tailed) $< \alpha = 0,05$ or $tcount > ttable$ value, then H01 is rejected and Ha1 is accepted. So that the Significance value (2-tailed) of learning interest obtained is $0,001 < \alpha = 0.05$ and the tcount value obtained is $3,610 > ttable = 2,004$ indicating H01 is rejected and Ha1 is accepted. Furthermore, the Significance value (2-tailed) of learning outcomes is 0,000 and the tcount value is 4,144. Significance value (2-tailed) $< \alpha = 0.05$ or $tcount > ttable$, then H02 is rejected and Ha2 is accepted. So that the significance value (2-tailed) of the learning outcomes obtained is $0.000 < \alpha = 0.05$ and the tcount value obtained is $4,144 > ttable = 2,004$ indicates H02 is rejected and Ha2 is accepted.

c. N-Gain Effectiveness Test

The results of the N-Gain test of interest and learning outcomes in this study are as follows.

Table 7. N-Gain effectiveness test results

Variables	Class	Statistic		
		Mean	Minimum	Maximum
Interests	Experiment	0,6388	0,27	0,91
	Control	0,3376	0,05	0,56
Learning Outcomes	Experiment	0,5742	0,11	0,81
	Control	0,3806	0,09	0,72

(Source: Data Processing Results of SPSS 16.0 Program)

The N-Gain test on student interest in learning can be seen that the control class has a mean gain score of 0,3376 with a moderate category, with 0,56 as the highest gain score and 0,05 for the lowest gain score. Meanwhile, the experimental class obtained a mean gain score of 0,6388 with a moderate category with the highest value of 0,91 and the lowest value of 0,27. The results obtained on students' learning interest showed that the experimental class gain score (0,6388) was higher or better than the control class learning interest score gain (0,3376), where $0,6388 > 0,3376$. The results obtained indicate that learning in the experimental class using teaching aids is effective with a moderate category. Furthermore, the normalized gain test output of learning outcomes can be seen that the control class has a mean gain score of 0,3806 including the medium category with the highest gain score of 0,72 and 0,09 for the lowest gain score. While the mean gain score with a value of 0,5742 was obtained by the experimental class

and included the moderate category by obtaining the highest gain score of 0,81 and the lowest of 0,11. From the results obtained, it can be concluded that the gain score of learning outcomes (experimental class) $0.5742 > 0.3806$ (control class). The results obtained indicate that learning in the experimental class using teaching aids is effective with a moderate classification.

2. Discussion

a. Differences in Learning Interest between Experiment Class and Control Class

Based on the results of research obtained by researchers in the field that the experimental class and control class have different learning interests. Researchers in the learning that is done make the atmosphere of student learning takes place actively when following the lesson by conditioning the atmosphere of student learning with the right teaching aids. The teaching aids in question that are appropriate and applied in this study are diorama teaching aids. Diorama teaching aids are made well according to the teaching material so that it can be applied well and cause students to be more enthusiastic when learning so that students are able to understand the teaching material discussed by the researcher. Researchers with teaching aids used can influence students to be more active in speaking, discussing, asking, answering, or expressing their opinions. The process of paying attention to learning materials with the help of teaching aids can create a high enthusiasm for student learning, student activeness, and minimize boredom among students. Students' interest in learning can trigger students' curiosity and curiosity so that they can understand the learning material taught well.

The teaching aids that were designed by the researchers themselves with some of the materials used and the colors of the components of the teaching aids varied enough to attract students' attention. In addition, the teaching aids displayed can provide illustrations that are in accordance with the actual situation. When the researcher explained the learning material with the help of teaching aids, students were seen observing and paying attention to the teaching aids displayed, so that their interest and curiosity were quite increased in learning with these teaching aids. Students who use diorama teaching aids in learning are seen learning happily and actively in exploring the learning material so that they can understand it well. Students who learn by applying diorama teaching aids, tend to be able to understand the learning material easily. This is different from students in the control class who did not use teaching aids in learning which caused them to be less enthusiastic and less active to respond to the learning material presented. These findings are supported by the theory of (Suwondo, 2021) which states that the function of teaching aids is a tool that is able to flow information by the sender to the receiver in order to stimulate ideas, interest, interest, and concern of students in such a way as to facilitate learning. The use of teaching aids in the learning process causes the presentation of material to be easily conveyed. Students will get a direct picture of the material presented so that they are more interested in following the learning process (Pambudi et al., 2019). Diorama teaching aids make students more involved in learning so that it involves all students to participate in a fun way. Diorama teaching aids can foster student interest in learning, so as to increase independence and creativity of learning with an active atmosphere in the classroom (Amalia et al., 2018) In addition, diorama teaching aids are able to provide students with direct learning experiences so as to make students more enthusiastic, excited, and able to understand the material easily (Nujum & Hamidah, 2023).

b. Differences in Learning Outcomes of Experimental Class and Control Class

The difference in learning outcomes can be influenced by several things including the use of teaching aids. The diorama teaching aids used by researchers in learning can provide illustrations and actual images so as to provide experience to students in experimental classes to observe directly related to the material being presented by researchers. Understanding of the material is quite increased for the experimental class, this can be seen when the researcher gives questions or quizzes, the response of experimental class students is quite brave and confident in channeling their opinions without waiting for the researcher to let them. Furthermore, learning without the application of teaching aids was carried out in the control class, which resulted in boredom for students. When the learning process took place, control class students did not take the learning seriously, they looked busy and chatted with their class mates. When researchers gave quizzes, students were reluctant to answer the quizzes given and tended to be afraid to channel their opinions. This can have implications for their low interest in learning and will affect the learning outcomes obtained less than optimal.

The difference in treatment of the control and experimental classes is the cause of differences in student attitudes in participating in classroom learning. The enthusiasm in learning was reflected in the experimental class students. Students were seen occasionally messing with the teaching aids displayed by the researcher. The optimal learning outcomes obtained by the experimental class cannot be separated from the teaching aids used which are able to provide stimulation to many senses of students to respond related to the learning material being discussed. This is in accordance with the opinion conveyed by (Dusalan, 2020) that while watching, touching, and controlling teaching aids, members of the learners can experience real encounters in life about important ideas. One of them is by using teaching aids in learning. The emergence of real experiences and experienced by experimental class students causes easy understanding of the context of the material being taught. This is emphasized by (Aris & Afina, 2022) which states that diorama teaching aids are able to provide direct experience to students and show objects and materials discussed as a whole and explain how they work. In its application, diorama teaching aids are able to make students involved and participate in a fun way in the learning process (Amalia et al., 2018). By using diorama teaching aids, the learning process will get good results, students are very active in participating and encouraged to follow the course of learning (R. Lestari et al., 2024).

c. Level of Effectiveness of Teaching Aids on N-Gain Score

Based on the findings obtained by researchers in the field that diorama teaching aids are effective on student interest and learning outcomes. The effectiveness of teaching aids on interest can be known based on the results obtained for the average gain score of learning interest of the control class that did not use teaching aids was 0,3376 while the average gain score of the experimental class that used teaching aids obtained a value of 0.6388. So it can be seen that the average gain score of learning interest of the experimental class $>$ control class, ($0,6388 > 0,3376$), which means that the interest results of the experimental class increased more with the application of teaching aids than the control class without using teaching aids. The results obtained are supported by previous research conducted by (Bhaswika, 2019) which shows that learning by applying diorama media can increase students' interest in learning science. Furthermore, in addition to seeing the effectiveness of diorama teaching aids on student interest in learning, researchers also conducted the N-Gain score test to see the effectiveness of teaching aids on student learning outcomes.

Based on the data obtained, the control class obtained an average gain score of 0.3806, while the experimental class obtained an average gain score of 0,5742. So it can be seen that the average gain score of the experimental class learning outcomes $>$ control class, ($0,5742 > 0,3806$) which means that the learning outcomes of the experimental class increased more with the application of teaching aids than the control class without using teaching aids. The results obtained by researchers related to the effectiveness of teaching aids on learning outcomes are also supported by relevant research conducted by (Asmaningrum, 2017) whose research conclusion is that the use of teaching aids effectively improves chemistry and physics learning outcomes in class IX students of SMP Satu Atap Wasur Merauke. (Rahmawati & Sati, 2021) diorama teaching aids are effective in improving student learning outcomes on the theme of ecosystems in class V of SD Negeri 2 Jatirenggang, Pabuaran District, Cirebon Regency. The learning outcomes of students after using diorama media based on local wisdom in the subtheme of the uniqueness of the area where I live are said to be complete (Rohmwati, 2017). The diorama teaching aids used by researchers are in fact effective for stimulating students to carry out learning activities, this is because in the learning process students are also active without sitting still listening to explanations and descriptions from researchers just like that. The diorama hichteaching aids displayed by the researcher caused more interesting learning displayed so that it was able to generate a sense of student interest, make student understanding more concrete, and able to provide a real description of the material taught to them.

In addition, the diorama teaching aids used by researchers effectively foster student interest in learning, allowing the learning objectives to be mastered by students well. Observing, analyzing, doing, and demonstrating caused students to understand the material more easily with the use of this teaching aid. The diorama teaching aids used caused an increase in the value of student interest and learning outcomes from before. This shows that the diorama teaching aids used by researchers are effective in the learning process. Based on the results obtained by researchers in the field, it can be concluded that the effectiveness of teaching aids used on interest in learning has an average gain score of 0,6388 and the effectiveness of teaching aids on

learning outcomes has an average gain score of 0,5742. These results when referring to the N-Gain score criteria have a value that is in the $0.3 \leq g \leq 0,7$ category with a moderate effectiveness classification.

E. Conclusion

Based on the results of research and discussion, there are differences in interest and science learning outcomes between students who use teaching aids and students who do not use teaching aids in learning. This can be seen from the interest in learning obtained a value of Sig. (2-tailed) = $0.001 < \alpha = 0.05$ and the results of the independent sample t-test where $t_{count} = 3.620 > t_{table} = 2.004$ and learning outcomes with the use of teaching aids obtained a Sig value. (2-tailed) = $0.000 < \alpha = 0.05$ and the results of the independent sample t-test where $t_{count} = 4.144 > t_{table} = 2.004$. The effectiveness of teaching aids in increasing student interest and learning outcomes in science subjects is included in the medium effectiveness category, with an average N-Gain value of 0.6388 for interest and 0.5742 for learning outcomes. From the results of the effectiveness test carried out, it is hoped that further research can make diorama teaching aids that are more interesting, creative, and innovative so that the results of the effectiveness test carried out will get better results than this study.

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