THE EFFECT OF USING CONCRETE MEDIA ON STUDENT LEARNING OUTCOMES IN SCIENCE LEARNING

Azizah[1] , Ni Made Rika Setiawati [2]

Elementary School Teacher Education, Faculty of Teacher Training and Education, Tadulako University

Email: azizahrosnadi@gmail.com, rikamade13@gmail.com

This study aims to determine the effect of the use of Concrete Object Media on Student Learning Outcomes in Science Learning Class II SD Inpres 2 Kotaraya. The method used is a quasi experiment with the equivalent pretest-posttest design. The population in this study amounted to 28 students with a sample of 28 students. Sampling technique by means of saturated sampling. Class II A at Inpres 2 Kotaraya as the experimental class and class II B at Inpres 3 Kotaraya Elementary School as the control class. The learning outcome instrument is a multiple choice test that has been validated. Based on the results of the posttest given to the experimental and control classes, the average value of the control class pretest was 64.21 and the experimental class pretest was 61.35. The average posttest value in the control class was 73.85 and the experimental class was 88.78. The average value of the experimental posttest has increased from the average value of the pretest and this is reinforced by the results of the hypothesis test. Based on the results of the final hypothesis test, it was found that the significant value was 0.000 because the significant value obtained was <0.05, so Ho was rejected and Ha was accepted. The results showed that there was an effect of using concrete objects media on student learning outcomes in science learning Class II SD Inpres 2 Kotaraya.

Keywords: Concrete Object Media, Learning Outcomes, Science learning.

This study aims to determine the effect of using concrete objects media on student learning outcomes in science learning for class II SD Inpres 2 Kotaraya. The method used is a quasi-experimental with the equivalent pretest-posttest design. The population in this study amounted to 28 students with a sample of 28 students. Sampling technique by saturated sampling. Class II A in Inpres 2 Kotaraya as the experimental class and class II B in SD Inpres 3 Kotaraya as the control class. The learning outcome instrument is a validated multiple choice test. Based on the results of the posttest given to the experimental class and control class, the average value of the pretest control class was 64.21 and the pretest was 61.35 for the experimental class. The average value of the posttest in the control class was 73.85 and the experimental class was 88.78. The average value of the experimental posttest has increased from the average value of the pretest and this is reinforced by the results of hypothesis testing. Based on the results of the final hypothesis test, it was obtained that the significant value was 0.000 because the significant value was <0.05, then Ho was rejected and Ha was accepted. The results showed that there was an effect of using concrete object media on student learning outcomes in science learning for Class II SD Inpres 2 Kotaraya.

Keywords: concrete object media, learning outcomes, science learning**.**

1. INTRODUCTION

Education is an effort to mature humans and be responsible for themselves and others. With education, humans or students can guide themselves from ignorance, ignorance and knowledge intelligence. Education has an important role in order to educate the nation's life and develop Indonesian people as a whole. The priority of education development starts from elementary schools, which are educational units that equip and prepare students to be able to follow further education to a higher level. Therefore, improving the quality of education in primary schools must be optimized.

Susanto (2013) revealed that science or IPA is a human effort in understanding the universe through precise observations on target, as well as using procedures, and explained with reasoning

so as to get a conclusion. Prasasti, P in (Trianto, 2014) says that science is a systematic collection of theories, its application is generally limited to natural phenomena, born and developed through scientific models such as observation and experimentation and demands scientific attitudes such as curiosity, openness and honesty in more detail. Therefore, science learning in SD / MI emphasizes providing direct learning experiences through the use and development of process skills and scientific attitudes. It can be said that science is a science that studies the universe and its contents through scientific processes, scientific products and scientific attitudes.

Azizah (2016) Science learning is learning that emphasizes giving direct experience either using experiments or observations or others, so that the data obtained is truly valid and can be accounted for (Samatoa, 2006). Science learning requires students to be able to use scientific methods, namely exploring knowledge through observing, classifying, predicting, designing, carrying out experiments communicating their knowledge to others by using thinking skills, and using scientific attitudes such as being curious, careful, objective, and honest.

Azizah (2019) learning outcomes are changes in behavior obtained by students after experiencing learning activities. The acquisition of these aspects of behavior change depends on what the students learn. Susanto (2016) argues that learning outcomes are the abilities that children acquire after going through learning activities, while according to Wingkel in Bundu, P. (2016) argues that learning outcomes are changes that result in humans changing in their attitudes and behavior.

Rizal (2019) Learning outcomes are the ultimate goal in carrying out learning activities in schools. Learning outcomes can be improved through conscious efforts that are carried out systematically to affect positive changes which are then called the learning process. The results of student learning in the classroom are collected in the set of class learning outcomes. all of these learning outcomes are the result of an interaction between educators and students in the teaching and learning process.

Based on the results of observations and interviews conducted by researchers at SD INPRES 2 Kotaraya with the second grade homeroom teacher regarding the problems faced by teachers in the teaching and learning process, one of which is that students' lack of understanding of the material provided causes learning outcomes below KKM. Many students are not active in teaching and learning activities and are only busy playing alone, talking to each other with their friends and disturbing their friends without paying attention to the explanation from the teacher and that is done during science learning. This happens in the learning process because during the learning process, the teacher uses limited learning media so that student learning outcomes have not reached the KKM. In the learning process the teacher only uses the lecture method and the LKS book. Teachers do not provide enough space for students to experiment so that student motivation is also low. The low motivation of students towards science learning has an impact on student learning outcomes so that the scores obtained by students are still below the Minimum Completeness Criteria (KKM).

One way to overcome the above problems is by using learning media. The media in question is concrete object media. Shoimah, (2019) concrete object media are all tools or real objects used to help achieve learning goals.

Muliani Sumantri in (Nazifah, 2013) is the function of concrete object media as a tool to realize effective teaching and learning situations, an integral part of the overall teaching situation, laying concrete foundations and abstract concepts so as to reduce verbalism understanding, develop student motivation, and improve the quality of teaching and learning. By using concrete objects, students will more easily learn through concrete objects to understand abstract concepts, students need concrete (real) objects as intermediaries. Furthermore, abstract concepts learned through concrete objects will construct children's understanding of abstract concepts.

By using concrete objects media can provide direct learning experiences that are real and meaningful to students. So that it can increase the cognitive knowledge of students in science learning outcomes. So the researcher intends to conduct a study entitled "The Effect of Using Concrete Object Media on Learning Outcomes in Science Learning class II SD Inpres 2 Kotaraya".

To find out how far the hypothesis that has been formulated is supported by the data collected, the hypothesis must be tested. If the data distribution is normally distributed and homogeneous, the data obtained is analyzed using a parametric statistical test (t-test) with the pair of hypotheses being:

1) H0 : There is no effect of using concrete objects media on student learning outcomes in science learning class II SD Inpres 2 Kotaraya.
2) H1 : There is an effect of using concrete objects media on student learning outcomes in science learning class II SD Inpres 2 Kotaraya.

The purpose of this study was to determine the use of concrete objects media affecting student learning outcomes in science learning class II SD INPRES 2 Kotaraya.

1. RESEARCH METHODS

The type of research used in this study is a quasi-experimental design. Where this design has a control group, it cannot function fully to control outside variables that affect the implementation of the experiment (Sugiyono, 2014).

The research design used an equivalent pretest-post-test design. This type of design is usually used in experiments that use existing classes as groups, by selecting classes that are expected to have the same conditions (Sugiyono, 2014).

Table 1. Research Design.

Group	Initial Test	Treatment	Final Test
Experimental class	O_1	X_1	O_2
Control Class	O_1	X_2	O_2

This research was conducted at SD INPRES 2 Kotaraya in Kotaraya Village, Mepangan District, Parigi Moutong Regency, Central Sulawesi Province and was conducted from March 2022 to August 2022.

The sample in this study were second grade students of SD Inpes 2 Kotaraya, the sample size was 28 people. The technique of drawing samples by means of saturated sampling is a sampling technique where all members of the population are used as samples. In this study, researchers took a sample that is class II SD INPRES 2 Kotaraya because this research is an experimental study, a comparison class (control class) is needed while at SD INPRES 2 Kotaraya there is only one class II group, with these considerations, the researcher chose class II SD INPRES 3 Kotaraya as the control class.

There are two variables in this study, namely the independent variable and the dependent variable. In this study, the independent variable is concrete object media while the dependent variable is students' science learning outcomes.

The type of data used in this study is ratio. The data source in this study was grade II students of SD Inpres 2 Kotaraya, Mepanga District, Parigi Moutong Regency using primary data in giving multiple choice tests.

The data collection technique in this study was to use a test. The test used is the initial test (pretest). The initial test was conducted before giving treatment or applying learning using book media and LKS. While the final test (posttest) is done after giving treatment or applying learning using concrete objects media.

The instrument used in this study is a multiple choice test of 12 questions that have been valid and reliable to measure learning outcomes. This test is also to determine the difference in students' science learning outcomes in the class that became the research sample. Carried out twice, namely at the beginning (*pretest*) and the end (*posttest*) of treatment.

Analysis of test instruments can be done in the following way:

1. expert validity

In this study, validity testing from expert opinion was used, the questions and results that had been made were consulted with experts and then validated and revised.

2.   Validity of test item items   :

$$\gamma_{pbi} = \frac{Mp - Mt}{St} \sqrt{\frac{p}{q}} \qquad \text{(Arikunto, 2016)}$$

3.   Determining Test Reliability   :

$$r_{11} = \left(\frac{n}{n-1} \right) \frac{s^2 - \sum pq}{s^2} \text{ (Arikunto, 2016)}$$

Data analysis of the research results was carried out in the following way:

1. Testing the normality of the data: For this normality test, the SPSS 25 program was used. Testing with SPSS is based on the *One-Sample Kolmogrov-Smirnov test*.

2. Testing the homogeneity of variance $: F = \frac{S_1{}^2}{S_2{}^2}$ (Sugiyono, 2014)

3. Hypothesis testing   :

$$titung = \frac{\overline{X}1 - \overline{X}2}{S\sqrt{\left(\frac{1}{n1} + \frac{1}{n2} \right)}}$$

$$S = \frac{\sqrt{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}}{(n_1 + n_2) - 2}$$

2. RESULTS AND DISCUSSION

2.1 Results

In this study using *pretest* and *posttest*. The *pretest* was conducted to determine the initial ability of students, both in the experimental class and in the control class before learning was carried out. The *pretest* and *posttest* results are presented as follows.

Table 2. Description of *pretest* scores of student learning outcomes for experimental and control classes.

Description	*Pretest of* control class and experimental class	
	Control class (IV B)	Experimental class (IV A)
Sample	14	14
Lowest Score	50	42
Highest score	75	75
Average Score	64,21	61,35
Standard deviation	8,42	9,64

The maximum score for the experimental class is 75 and the control class has a value of 75. The minimum score in the experimental class is 42 and the control class has a value of 50, the average value of the experimental class *pretest* is 61.35 while for the control class 64.21 and the standard deviation for the experimental class is 9.64 and for the control class 8.42.

Table 3. Description of *posttest* scores of experimental and control class learning outcomes.

Description	Posttest of control class and experimental class	
	Control (IV B)	Experiment (IV A)
Sample	14	14
Lowest Score	67	75
Highest score	83	100
Average Score	73,85	88,78
Standard deviation	6,162	7,865

The experimental class obtained a minimum score of 75 and a maximum score of 100, an average value of 88.78 and a standard deviation of 7.865. The control class obtained a minimum score of 67, a maximum score of 83, an average value of 73.85 and a standard deviation of 6.162.

The normality test in this study used the help of SPSS 25 *shapiro wilk*, with a significant level in the normality test, namely $a=0.05$. For the results of testing the normality of *pretest* data from experimental and control classes, each of which has 28 students. The significant value for the control class is 0.114 and the significant value for the experimental class is 0.057. While the number of students is 24 students. The significant value for the control class is 0.071 and the significant value for the experimental class is 0.051.

Table 3. Normality test results

Class	Kolmogorof-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Control pretest	.268	14	.007	.886	14	.052
Experimental pretest	.210	14	.096	.895	14	.096

Based on the results of this analysis, the significant value of *Shapiro Wilk* on the control class *pretest* is 0.052> 0.05, and the value for the experimental class *pretest* is 0.096> 0.05. These results state that the experimental and control class *pretest* data are normally distributed. While the significant value of *Shapiro Wilk* on the *posttest of the* control class is 0.063> 0.05, and the value for the *posttest of the* experimental class is 0.059> 0.05, these results state that the *posstest* data of the experimental and control classes are normally distributed.

The Homogeneity Test in this study used the help of SPSS 25 with a significant level of $a = 0.05$. The results of the calculation using SPSS 25 obtained a significant value for the *Pretest of the* control class and also the experimental class, namely 0.448. Based on the results of the Homogeneity Test with a significant level ($a = 0.05$), from these results it can be seen that 0.448> 0.05, so based on the decision-making criteria it can be concluded that

there is no difference in variance between the *Pretest of the* experimental class and the control class or in other words the *Pretest* variance between the experimental class and the control class is the same or homogeneous. The *Possttest* Homogeneity Test in this study used the help of SPSS 25 with a significant level of a = 0.05. Based on the results of calculations using SPSS 25, the significant value of the control class and also the experimental class is 0.225. Based on the results of the Homogeneity Test with a significant level (*a = 0.*05), from these results it can be seen that 0.225> 0.05, so based on the decision-making criteria it can be concluded that there is no difference in variance between the experimental class and the control class or in other words the *Posttest* variance between the experimental class and the control class is the same or homogeneous.

The calculation of the t test was carried out with the *Paired Samples Test* test using the SPSS version 25 program.

Table 4. Mean difference test (two parties) *Possttest* of experimental class and control class.

Mean			Std.De viation	St d.Error mean	L ower	U pper		f
Post_control Post_experiment	0.285	-	1.589	.4 24	- 1.203	- 632	7.492	- 4

The significant value at the 5% level is 0.000 <0.05, so Ho is rejected, meaning that there is an effect of using concrete object media on learning outcomes in science learning in grade II SD INPRES 2 Kotaraya.

2.2 Discussion

This research was conducted at SD Inpres 2 Kotaraya in class II. At the beginning of the study both classes were first given an initial test (pretest), used to determine the initial ability of students. The final test (posttest) was given to determine the final ability of students in both classes, namely the control class and the experimental class and as research analysis data to see if there were differences in learning outcomes between the two classes.

In the results of the final hypothesis test, it is known that the significant value at the 5% level is 0.000 <0.05, so Ho is rejected, meaning that there is an effect of using Concrete Object Media on Learning Outcomes in Science Learning class II SD INPRES 2 Kotaraya. Based on the hypothesis testing that has been done, it can be concluded that the application of Concrete Object Media can provide better results than using the Lecture method.

The teaching and learning process in the experimental and control classes actually had the same learning objectives, namely making students understand more about the lessons given by the teacher. Both classes have higher learning outcomes after the learning model is applied. In addition to similarities, the two classes have differences, namely in the use of Concrete Object Media which leads students to be more active, eager to learn and understand every material presented by the teacher. Whereas in the control class students tend to be more passive, because learning is carried out only using the lecture method which involves less students.

When the teaching and learning process was carried out, the researcher found an increase in student learning outcomes in science learning by using Concrete Object Media. With the increase in student learning outcomes, it can be said that the teaching and learning process using Concrete Object Media affects the enthusiasm of students to take part in the learning process and students understand the material provided because students can see the real object directly.

As for the advantages of concrete objects media in learning by Moedjiono Daryanto (2013: 29), the advantages of concrete objects are;
1. Presentation in a concrete manner and avoid verbalism
2. Can show the object as a whole both in terms of construction and how it works.
3. Can show the organizational structure clearly
4. Can show the flow of a process clearly.
5. Provides hands-on experience.

Based on these advantages, the use of Concrete Object Media in learning helps students in problem solving. Problem solving that is done by students themselves and involves many sensory organs makes students easy to solve problems and feel satisfied with the results. This makes students able to understand the material being studied. Thus affecting the improvement of student learning outcomes.

Learning by using concrete objects media can overcome obstacles or difficulties that occur in the science learning process. A good learning process will support the success of a learning activity. On this basis, researchers conducted an experiment using concrete objects media in science learning that had never been implemented before.

Erviana, (2014) improving student learning outcomes on the subject of plant life through concrete media in class 2 SDK remote Punsu. This study describes the low learning outcomes of students in grade 2 SDK remote punsu on the material where plants live, there are several things that cause these problems, namely the application of the learning model used by the teacher is less interesting so that students are lazy and reluctant to learn.

To improve student learning outcomes, it is necessary to apply innovative learning methods, one of which is concrete media. This learning method conditions students to see, hear, smell, touch and tinker, with an emphasis on utilizing the environment as a learning resource. By using concrete media, students can be more active and enthusiastic in learning while the teacher acts as a guide or provides instructions in the learning process.

3. CONCLUSIONS

Based on the results and analysis of the research data obtained, it can be concluded that there is an effect of the use of concrete object media on student learning outcomes in Science Learning Class II SD INPRES 2 KOTARAYA. This is because students get a more real learning experience. The effect of using Concrete Object Media makes a difference to learning outcomes because the use of Concrete Object Media can improve student learning outcomes in science learning in class 2 SD INPRES 2 Kotaraya.

4. LITERATURE

Azizah. (2016). *The Effect of Using the Discovery Guide Method on the Learning Outcomes of Grade IV Elementary School Students.*

Azizah. (2019). *The Influence Of Reading, And Sharing (RMS) Learning Models On Results Of Learning Science In Students Of Class V SDN Werdoyo Grobogan.*

Daryanto. (2013). *The role of learning media is very important in achieving learning goals*. Yogyakarta: Gava Media.

Didik. Susanto. (2016). *Improving Student Learning Outcomes in Science Learning Using Discussion Methods in Class IV Elementary School.*

Erviana, V. (2014). *Improving Student Learning Outcomes on the Subject of Plant Life Through Concrete Media in Grade 2 of SDK Terpencil Punsu.*

Komsyah, Indah. (2012). *Learning and Learning.* Yogyakarta: Teras.

Nazifah. (2013). The *use of Concrete Media Increases Student Activity in Mathematics Class I Sdn 07 Sungai Soga Bengkayang*. Tanjungpura University.

Rizal. (2019). *Inquiring Mind Want To Know to Improve Learning Outcomes at SDN Inpres 3 Tondo*

Shoimah, R. N. (2019). The *Use of Concrete Learning Media to Increase Learning Activity and Understanding of Fraction Concepts in Mathematics Subjects Class Iii Mi Ma'arif Nu Sukodadi-Lamongan*. Darul Islamic University.

Siyoto, S., & Sodik, M. A. (2015). *Basic research methodology.* Yogyakarta: Literacy Media Publishing.

Sugiyono. (2014). *Educational Research Methods.* Alfabeta.

Sugiyono. (2016). *Educational research methods (Quantitative, qualitative and R &D approaches*. Bandung: Alfabeta

Susanto. (2013). *Learning and Learning Theory in Elementary School.* Kencana Prenada Media Group.

Trianto Ibnu Badar. (2014). Designing Innovative, Progressive and Contextual Learning Models. Jakarta: Prenadamedia Publishing

Wingkel in Bandu P. (2016). Improving Science Learning Outcomes Through Discovery Learning Model for Class IV Students of SDN Gedanganak 02.