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The Relationship Between Using Video Learning Media and Science Learning Outcomes

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Abstract

This research aims to determine the significant effect of using learning video media on learning outcomes for Energy and its Changes in science subjects in class IV SDIT Ar-Rayhan for the 2021/2022 academic year. This research is a quantitative research, quasi-experimental method and nonequivalent control group design. The population of this study was 34 class IV students at SDIT Ar-Rayhan, Bekasi City, from 2 groups. One class was given treatment, namely learning with learning videos (experimental class) and another class as a class with conventional learning (control class). The sampling technique in this research is a saturated sampling technique. The instruments used are multiple choice questions and student questionnaires. The results of the posttest research obtained an average score for the control class of 69.88, while the experimental class obtained an average of 79.29. From the results of hypothesis testing using the independent sample T-test on the posttest data, a sig (2-Talled) value of 0.006 was obtained. With the results obtained Sig 2-Talled < 0.05 then H_0 is rejected and ⟦H⟧_a is accepted. The results of the questionnaire also showed that students responded very well to the use of learning videos, as proven by the questionnaire calculation results of 84.12%. So this research concludes that learning videos are proven to influence learning outcomes in energy science and its changes.

Keywords: Experimental Research, Learning Video Media, Science Learning Outcomes

1 INTRODUCTION

Learning outcomes are the abilities possessed by students after receiving their learning experience and can be seen through evaluation activities. The aim is to obtain evidentiary data that will show the level of students' abilities in achieving learning objectives. Student learning outcomes for parents are to measure their child's ability to understand how much the child understands lessons at school. As a tool to measure the child's talents and interests for the future. What needs to be explored from the child and what should be reduced. Student learning outcomes for schools are very influential in improving the quality of schools in the eyes of the community. If the school's student learning outcomes rise and are above average, it can be said that the school is of quality because it is able to produce students who are talented and have high grades. If student learning outcomes are maximum, it is certain that the student will be able to compete out there. If student learning outcomes at a school are only average, it is certain that the school is of low quality. Because students who have the best results are obtained from quality teacher education and are supported by complete facilities and infrastructure. For a teacher, learning outcomes are to find out the extent of weaknesses and strengths in his teaching. Knowing the strengths and weaknesses in teaching will be capital for teachers to determine future efforts. Meanwhile, the learning outcomes for the students themselves are to find out their status in front of their friends, whether they are classified as smart, ordinary or weak in learning.

According to Hamalik, learning outcomes are changes in a person's behavior that can be observed and measured in the form of knowledge, attitudes and skills. These changes

can be interpreted as an increase in and better development than before and those who don't know will know(Kurniati, 2022). According to Rusmono, learning outcomes are changes in individual behavior which include the cognitive, affective and psychomotor domains. These behavioral changes are obtained after students complete their learning program through interaction with various learning resources and learning environments. Learning outcomes are behavior that can be observed and show a person's abilities (J, 2017)

Learning outcomes can be interpreted as changes in behavior shown by students. These behavioral changes cover three domains, namely the cognitive, affective and psychomotor domains. The cognitive domain is related to intellectual thinking abilities and skills, the affective domain is related to the ability to behave and master emotional aspects such as feelings, and the psychomotor domain is related to physical movement skills. In this way, students will get science learning outcomes if the students experience cognitive changes that are influenced by skills in practicing the material and explaining it orally and in writing in a conceptual and structured manner, both in the classroom and at home.

In the educational process and also technological development, science learning plays a very important role, because science has an effort to arouse human interest and the ability to develop science and technology as well as understanding of the universe which has many facts that have not been revealed and are still secret. So, the results of the discoveries can be developed into new natural sciences and can be applied in life to explore creativity, create and innovate practical products in science lessons.

Natural Sciences in Elementary School is a very important subject to learn, because natural science education is expected to be a vehicle for students to learn about themselves and the natural world around them, as well as prospects for further development in applying it in everyday life. Science learning in elementary schools forms a concept that is still integrated, because it is not yet divided like in higher schools.

The implementation of science learning should be carried out in a conducive atmosphere, meaning that the learning activities carried out are active, effective and enjoyable. To be able to create conducive learning, of course there are many ways that can be done, one of which is by choosing the media that will be used in the learning process.

As technology develops, learning media are now becoming varied, there are various groups of media that can be used in the learning process. Based on these technological developments, learning media can be grouped into 4 groups, namely: media resulting from print technology, media resulting from audio-visual technology, media resulting from computer-based technology, and media resulting from a combination of print and computer technology.

Learning media is a tool to assist teachers in teaching material to students or can be said to be a teaching aid so that it can make it easier for students to receive and understand the material presented by the teacher. With the right media, it can change the stigma of education which is still dominated by the view that knowledge is a set of facts that must be memorized, because the learning process only involves listening to the teacher's explanation. Where the teacher uses a textbook or is more advanced using a simple PPT which essentially contains a summary of the material from the textbook. so that students only listen to lectures or explanations of the material. This also happens at SDIT Ar-Rayhan, Bekasi City, especially class IV in science (Natural Science) learning. We know that material about energy and its changes contains abstract things, so concrete objects are needed to make it easy to understand. For this reason, media is needed that can provide a picture like the original object, such as video media.

Video media, which is one of the media resulting from audio-visual technology, is a tool that can involve many things such as verbal (language), visual (spatial) and musical (rhythm) intelligence of students in the learning process, especially in the independent learning process. This can help students in describing something. Video media provides a clear and real picture, making it easier for students to remember or become more familiar

with a particular discussion in a lesson because not only the ears can hear but the eyes can also see concrete examples through video.

According to Riana in 2007, learning video media is media that presents audio and visuals containing good learning messages containing concepts, principles, procedures, theories, application of knowledge to help understand learning material. (Daryono, 2020). The advantages of video media are that it provides excellent information, can be received more evenly by students, is useful for explaining a process, overcomes space and time limitations, is more realistic, can be repeated and stopped according to needs. Video media will help students understand important information, and students will more easily understand abstract learning material. Apart from that, video media also provides entertainment for students. Video media teaches students to find the answer to a problem themselves through the process of looking at the images in the video. Of course, learning like this has a positive influence on learning outcomes because it attracts students' attention in following the learning process.

Vulnerable students aged 7-12 years are in the concrete operational phase. Thus, students need concrete objects to understand abstract material. Inaccurate media selection makes students feel bored, shows a lack of enthusiasm for learning and a lack of interest in the learning material which ultimately affects their learning outcomes. This also happened in class IV of SDIT Ar-Rayhan, Bekasi City, where the results of science learning achievement, especially energy and its changes, were relatively low because there were still many students who had not completed it. It can be seen from the daily tests of 35 students that 18 students or 54% got a score below the Minimum Completeness Criteria (KKM) of 70. Especially in the matter of energy and its changes, many students have not been able to identify forms of energy, sources. energy, understanding, and benefits of various energies.

Based on the description above, it shows that in the learning process there is a need for appropriate learning media in order to achieve maximum results, that is the reason why the researcher chose the title The Effect of Using Video Learning Media on Science Learning Outcomes Material Energy Sources and Their Changes in Class IV SDIT Ar-Rayhan Kota Bekasi. With this research, it is hoped that we can find out the influence of the use of video media in the learning process, especially in this case on energy material and its changes in class IV SDIT Ar-Rayhan, Bekasi City.

2 RESEARCH METHODS

The method used in this research is quasi-experiment. Quasi means pseudo, so sampling is based on existing class groups, not on individuals (Sugiharto, 2015). The research design used was nonequivalent control group, which means this research was conducted in two groups, namely the experimental group and the control group. or described as follows:

Table 1. Research design

Group	First Test	Treatment	Final Test
Experiment	O1	X1	O3
Control	O2	X2	O4

(Sugiyono, Metode Penelitian Kuantitatif, 2019)

This research was conducted at the Ar-Rayhan Integrated Islamic Elementary School (SDIT), Bekasi City. The subjects in this research were all class IV students, totaling 34 students from two groups, namely class IV Al-Muhaimin, totaling 17 students as the control class, who would be given conventional learning, and class IV Al-Aziz, 17 people as the experimental class, would be given treatment. in the form of learning using learning videos. The sampling technique is saturated sampling because the population is relatively small, less than 30 people. A saturated sample is also known as a census, where all members of

the population are sampled. The flow of this research includes three stages, namely the preparation stage, implementation stage and final stage. The details are as follows:
The preparatory stages carried out to conduct this research were: (1) Preparing a research permit addressed to SDIT Ar-Rayhan; (2) Conduct observations at SDIT Ar-Rayhan (3) Create learning tools, namely in the form of learning implementation plans (RPP) for control classes and experimental classes; (4) Create test instruments in the form of multiple choice questions, prepare learning videos and questionnaires (5) Validate research instruments; (6) Revise research instruments; (7) Conduct trials of instruments that have been validated; (8) Analyzing trial result data, namely calculating validity, reliability, level of difficulty and different power tests.

The second stage is the research implementation stage, where the researcher will apply learning using the media that will be tested. At this stage, research data is also collected. The following are the steps taken when carrying out the research, namely: (1) Giving a pretest to the two sample groups; (2) Providing treatment to the experimental class in the form of learning using learning video media, after that giving students questionnaires; (4) providing treatment in the control class in the form of conventional learning; (5) Give a posttest to both sample groups.

The final stage is that researchers carry out: (1) Analyze research data, namely student learning outcomes in experimental classes; (2) Analyzing research data, namely student learning outcomes in the control class; (3) calculating student questionnaire results; (4) Draw conclusions from test analysis results and research suggestions; (5) Preparation of research reports.

3 RESULTS AND DISCUSSION

The research results are in the form of descriptions of learning outcomes from the pretest and posttest, questionnaire data analysis tests, data analysis prerequisite tests (normality and homogeneity tests), and hypothesis tests. The data that will be presented in the learning results is a reference measure which includes: average value (mean), middle value (median), and the highest frequency that appears (mode). In the questionnaire data, the results of the questionnaire calculations are presented. Meanwhile, the prerequisite test for data analysis is normality using Shapiro Wilk in the SPSS for Windows version 16 program and homogeneity testing with the Shapiro-Wilk test of homogeneity of variance and hypothesis testing, namely the independent sample t-test (2-tailed Sig value).

3.1 Descriptive Learning Outcome

The description of the learning outcomes data explained is the data from the pretest and posttest results of the experimental class and control class. In the experimental class when learning uses video learning media, this research can see the influence of video learning media on learning outcomes in science and technology regarding energy and its changes. To measure learning outcomes, a test instrument is used in the form of 25 multiple choice questions with 4 alternative answers A, B, C and D. This test instrument has been tested for validity, reliability, level of difficulty and also its differentiating power. In this research, a questionnaire was also given to the experimental class with the aim of knowing students' responses to the learning videos used. The student questionnaire consists of 10 statements consisting of 6 positive statements and 4 negative statements. The scale used is the Guttman scale.

3.1.1 Pretest Learning Result Data for Control and Experiment classes
The pretest learning results of the experimental class and control class can be seen in the descriptive data below:

Table 2. Recapitulation of Pretest

Centering and Data Dissemination	*Pretest* Class Control	*PretestClass* Eksperiment
The highest score	76	72
Lowest value	48	48
Mean	59,76	59,06
Mode	48	60
Median	60	60
Standard Deviation	9,43	7,42
Varians	88,94	55,06

From the table above it can be seen that the highest score for the experimental class is 72, the lowest is 48 and the average score is 59.06. The highest score for the control class is 76, the lowest is 48, and the average score is 59.76. From the data obtained, it can be concluded that the learning abilities of the experimental class and the control class during the pretest were almost the same.

3.1.2 Posttest Learning Result Data for Experimental and Control Classes

After carrying out the pretest, the experimental class and control class were given different treatment in the learning process. To see the learning outcomes after being given treatment, a posttest was carried out. Posttest data on energy learning results and changes can be seen in Table 3 below:

Table 3. Recapitulation of Posttest Data

Data Centralization and Dissemination	*Posttest* Kelas Control	*Posttest* Class Eksperiment
The highest score	88	96
Lowest value	56	64
Mean	69,88	79,29
Mode	72	68
Median	72	80
Standard Deviation	8,96	9,82
Variance	80,24	96,47

From the table above, it can be seen that the posttest results for the experimental class obtained the highest score of 96, the lowest score of 64 and the average score of 79.29. The control class had the highest score of 88, the lowest score of 56 and the average of 69.88. Both classes experienced increased learning outcomes. The recapitulation of the pretest and posttest learning results for the experimental class and control class can be seen in the diagram below:

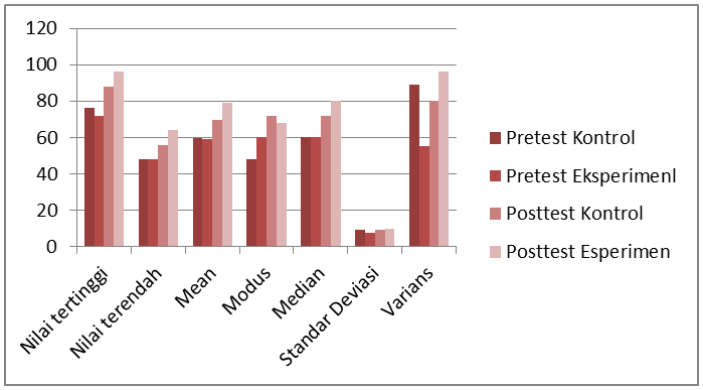

Figure 1 Histogram of Recapitulation of Learning Results

From the table and graph above, it can be seen in the average score section that the two classes were initially at almost the same ability. The average pretest score for the control class was 59.76 and the pretest for the experimental class was 59.06. However, when looking at the posttest results, there was a difference where the average score of the experimental class was superior to the control class, the average score of the experimental class was 79.29 while the control class was 69.88. To improve the learning outcomes of each class, it can be calculated from the difference in the average pretest and posttest scores. The difference between the control class and the pretest and posttest was 10.12%, while the experimental class had 20.23%. It can be concluded that the experimental class using videos during learning is superior to the control class

3.2 Student Questionnaire Calculation Results

Analysis of non-test instrument data in this study used descriptive data analysis techniques. The questionnaire used in this research is the Guttman scale questionnaire model. With this type of measurement scale, you will get clear answers, namely "yes and no", "true-false", "never-never", positive-negative" and so on. Research using the Guttman scale is carried out if you want to get a firm (consistent) answer to a problem being asked (Sugiyono, Quantitative Research Methods, 2019). This questionnaire is divided into two statements, namely a positive statement which if you agree gets a score of 1 and if you disagree you get a score of 0 and a negative statement which if you agree you get a score of 0 and if you disagree you get a score of 1. Then the questionnaire results from filling in the questionnaire that has been given to students, then analyzed. The first stage in the analysis is to calculate the percentage of student responses using the following formula:

$$\text{Presentase} = \frac{\textit{Total score obtained}}{\textit{Score ideal}} \text{ x100\%}$$

Next, the percentage results of student response questionnaires in learning mathematics subjects are classified according to the following criteria:

Table 4. Student Questionnaire Classification

Value Range	Criteria
81% - 100%	Very good
61% - 80%	Good
41% -60%	Not goog
≤40%	Not Good

(Riduwan, 2012)

After carrying out calculations, it was obtained that the average questionnaire score was 84.12%, which means that the learning video received a very good response in learning science material on Energy and its Changes.

3.1 Uji Normalitas

The normality test is a test of whether the distribution of the data to be analyzed is normal or not. The condition of normally distributed data is a requirement for testing hypotheses using parametric statistics (Sugiyono, Quantitative Research Methods, 2019). In this research, the pretest and posttest data normality test used Shapiro Wilk in the SPSS for Windows version 16 program with a significance level of 5% (α=0.05). The way to determine significance (Sig.) is if the significance value obtained is < α (0.05), meaning the sample is not normally distributed, but if the significance obtained is > α (0.05), then the sample is normally distributed. In this study, a normality test was carried out. Researchers used Shapiro-Wilk because the sample size was small (<100) in the SPSS version 16 program with a confidence level of 95% (α=0.05) (Noor, 2017).

Table 5. Recapitulation of Normality test

	Kontrol		Eksperimen	
Statistics	*Pretest*	*Posttest*	*Pretest*	*Posttest*
Sig	0,147	0,542	0,329	0,473
Conclusion	Normal	Normal	Normal	Normal

Table 5 shows that the four data are normally distributed. The control class had a sig value of 0.147 at the pretest, and a posttest value of 0.542, while the experimental class had a sig value of 0.329 at the pretest, and a sig value of 0.473 in the posttest. All four had a sig value of more than Sig. (α=0.05).

3.2 Uji Homogenitas

After the two sample classes in this study are declared to be from a normally distributed population, the homogeneity of variance test will then be carried out. The homogeneity test is carried out to determine whether the two variances come from a homogeneous population or not. The homogeneity test can be tested using Fisher's test, with the formula:

$$F_{Count} = \frac{s_1^2}{s_2^2} = \frac{\text{varians terbesar}}{\text{Varians terkecil}}$$

(Riduwan, 2012)

If F count ≥ F table then the data is not homogeneous, and F count ≤ F table then the data is homogeneous. In this research, researchers carried out a homogeneity test with the SPSS for Windows version 16 program with a confide (J, 2017)nce level of 95% (α=0.05) using the Shapiro-Wilk test of homogeneity of variance. To decide whether it is homogeneous or not, you need to pay attention to the number in the Sig column. If the significance value obtained is < α (0.05), then the variance is not homogeneous, but if the significance value obtained is > α (0.05), it means the sample variance is homogeneous.

Table 6. Recapitulation of Homogeneity Test Results

Statistik	Pretest Class control and class eksperiment	Posttest Class control dan kelas Eksperiment
Hasil Sig	0,221	0,529
Conclusion	Homogen	Homogen

From table 6 it can be seen that the pretest and posttest sig values are greater than the sig level (α=0.05). The sig of the pretest was 0.221 and the posttest was 0.529, so it was concluded that all had the same variance or had homogeneous abilities in both the pretest and posttest of the control and experimental classes.

3.3 Hypothesis Testing

This research hypothesis uses a parametric statistical hypothesis because all data is normal and homogeneous. The t test at the significance level α = 0.05 uses SPSS version 16 software. The hypothesis that will be tested in this research aims to explain the influence of learning video media on science learning outcomes in energy saving material and its changes at SDIT Ar-Rayhan Bekasi. The results of hypothesis testing using the t test for pretest and posttest data are as follows:

Table 7 Hypothesis Test Results

Parametric Hypothesis Test	Pretest	Post Test
Result Sig 2-talled	0,81	0,006
Significance Level (α)	(Sig 2-talled ≥ 0,05 = Ho Accepted)	
Decision	Accepted	Rejected

The hypothesis decision is taken based on the testing criteria, namely if the Sig. (2-tailed) ≥α, then H_o is accepted and H_a is rejected, whereas if the Sig. (2-tailed) < α, then H_o is rejected and H_a is accepted. From Table 7 it can be seen that for the pretest data the Sig value was obtained. (2-tailed) of 0.810. Sig value. (2-tailed) ≥ 0.05, so the null hypothesis is accepted and the alternative hypothesis is rejected. So it can be concluded that there is no significant influence of learning videos on student learning outcomes regarding the material and changes, this is because during the pretest the learning videos were not used. In the posttest data, the Sig value was obtained. (2-tailed) of 0.006. The Sig (2-tailed) value ≤ 0.05 means that the alternative hypothesis is accepted and the null hypothesis is rejected. It can be concluded that the use of learning videos has been proven to have a significant effect on science learning outcomes regarding energy and its changes.

4 CONCLUSION

Based on the results of research by conducting a parametric statistical t test because the data is normally distributed and homogeneous, the use of learning videos is proven to have an effect on science learning outcomes regarding Energy and its changes. This can be seen from the results of hypothesis testing on post-test data which shows that the Sig. < 0.05, namely 0.006, so H_a is accepted and H_0 is rejected and this means that the use of videos has been proven to have an effect on student learning outcomes in science learning about energy and its changes. Meanwhile, in the pretest hypothesis test, the sig. ≥ 0.05, namely 0.810, so H_a is rejected and H_0 is accepted, it can be concluded that the use of learning videos has no effect on student learning outcomes in science learning about energy and its changes. This is due to none other than because during the pretest the experimental class had not been given treatment, namely in the form of learning using videos, whereas during the posttest the experimental class had received treatment. So it is very clear that learning videos have an influence on science learning outcomes regarding Energy and its changes. The results of this research are the same as the results of research conducted by Rizka Kagum Irawan who concluded that there was a positive influence of the use of video media on the science learning outcomes of class IV students at SD Negeri Pajang III No. 206 Surakarta. (Irawan, 2015) Apart from that, these results are also supported by the student response questionnaire to the learning video which is in the very good category (84.12%). Using science learning video media, energy material and its changes become easier to understand and energy material and its changes are conveyed well.

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