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The effect of vide learning media on fourth-grade students' mathematical learning achievement on fractions

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ABSTRACT

This study examines the effect of video learning media on fourth-grade students' mathematics learning achievement on fractions. The study aimed to determine if video learning media could enhance students' understanding and improve their mathematical performance in comparison to traditional teaching methods. The subject of this study is 62 fourth-grade students from a public elementary school in Jakarta. The students were divided into 2 classes which an experimental class and control class. This study used quasi experimental design with quantitative method and non-probability sampling. The results indicated a positive influence of video learning media on fourth grade students' achievement on fractions, with $t_{count}(8.034) \geq t_{table}(2.0003)$. This study implies that the video learning media is an effective teaching tool in mathematics education.

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INTRODUCTION

Mathematics lessons at the basic education level or elementary school are the main foundation and fundamental foundation of science to develop further mathematical material at a higher level later. Mathematics lessons are taught to students as a provision to have logical, systematic thinking skills and creative thinking (Rashidov, 2020).

The problem that is often encountered in schools in dealing with mathematics lessons is the difficulty in accepting the delivery of material and understanding that can be attached to students' minds (Lely et al., 2020; Oktasari et al., 2022). As a result of which students are less fond of and tend to have a great fear of mathematics lessons. So that it affects the learning outcomes of these students (Cassibba et al., 2021).

According to data from the Ministry of Education and Culture, the results of learning mathematics materials at the elementary or elementary to upper or high school levels throughout Indonesia are still far from expectations or still lacking. Mathematics lessons nationwide are still lagging behind or lacking, at 77.13 percent (Tanudjaya & Doorman, 2020).

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In mathematics subject matter, fractions include mathematics material learned in fourth-grade. A fraction is a symbol for the scale of part of an object. In other words, an object is divided into equal parts, then compare each of them. One of the components in a fraction is a fraction of worth (Zhang et al., 2020)

With so many components consisting of achieving a learning goal, the application of media is something that can be implemented. Thus, the selection and proper use of media can influence and help the process during the student's time studying at school. In the context of the world of education (Bai et al., 2020).

The estuary of learning is the learning outcome in which every understanding or ability of the learners after they have received the experience of the learning process. A series of tests can be a measure of learning outcomes. During the learning process, the learning outcomes of the students are largely determined from the learning method chosen by the educators (Yusuf, 2021).

Based on the results of observations through interviews with homeroom teachers and seeing student learning outcomes in first semester at elementary school in fourth grade in center of Jakarta, it is stated that there are still many students who have not reached Minimum Completeness Criteria (MMC) in mathematics subjects, only 16 out of 31 students achieved MMC scores with the MMC number to be achieved was 69. The MMC's inability is because when distance learning usually only uses *Google Classroom* and uses Zoom several times.

Video media in students aged 7-12 years is very important because they are in concrete operational stages or phases. The effectiveness of learning will be obtained by learning using video media because attention from students will be obtained until the learning process becomes more interesting (Amrullah et al., 2021).

Therefore, researchers chose video as a learning medium because it quickly attracted the attention of students because the learning media contained material in the form of animations – character animations, and images. This will optimally attract the attention and concentration of students so that students can easily understand the material presented and are able to achieve the MMC target set by the school.

The results of this study are in line with the results of previous research conducted by Wijaya et al. (2020) that the application of video learning media can affect the results of learning mathematics for fractional number material fourth grade elementary school.

LITERATURE REVIEW

Learning Process

Learning is a process of activities carried out by individuals so that there is additional knowledge, skills, attitudes as a series of activities towards the development of the whole human person (Asad et al., 2020).

The learning process in mathematics involves four main steps: preparation, presentation, practice, and evaluation. In preparation, the foundation of prior knowledge and skills is built, goals are set, and a positive attitude is established. During presentation, new concepts and ideas are introduced through direct instruction and examples. Practice involves working through problems and exercises to reinforce understanding and build mastery. Evaluation involves regular assessments and feedback to measure progress and identify areas for improvement (Ponidi et al., 2020).

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Learning Outcomes

Learning outcomes are one very important aspect in the process of learning activities. Learning outcomes are used as a benchmark for the level of students' understanding of the material presented by the teacher (Mursid et al., 2022).

Learning Process

Mathematics is a pattern of thinking, a pattern of organizing logical proofs, organized structured knowledge containing: properties, theories made deductively based on elements that are not defined, axioms, properties or theories that have been proven true (Guerrero et al., 2020).

Based on the above review related to the study of theory and framework of thinking, the following research hypotheses can be proposed:

H_o: There is no significant effect on the use of media audiovisual learning on learning outcomes of mathematical fractions fourth grade elementary school students at Jakarta.

H_I: There is a significant influence on media usage audiovisual learning on learning outcomes of mathematical fractions fourth grade elementary school students at Jakarta.

METHOD

This research selects experimental quantitative research methods. The quantitative approach was obtained from validation, on the occasion of this study two classes were used, first as the class that gained control and the second as the experimental class. The type of research used is *quasi-experimental design using a* quantitative approach. According to (Maciejewski, 2020) *Quasi Experimental Design* there is a control group or groups, but it cannot function entirely to regulate each variable from the outside in influencing the implementation of the research. In table 1, the design or design of this study is used, namely "*Post-test Only Control Design*".

Table 1. Research design

Class	Treatment	Post-test
Experiment	X	O_1
Control	-	O_2

Information:
O_1: posttest carried out by the experimental group
X : Treatment using video learning media
O_2: posttest implemented control group

The design of this study the entire population was divided into two groups. After that, it was continued to give *posttests* to both groups so that the final state of affairs was known. Whether the control group as well as the experimental group found differences. If significant differences are found in the control group, significant influence will be exerted.

All students are used as a population, especially fourth-grade in elementary school in Jakarta on even semesters of the 2021-2022 school year with a total population of 62 students involving fourth-grade class Experimental with 31 students, and fourth-grade class Control with 31 students. In this study, researchers selected fractional number material.

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Data collecion this research consists of 3 stages, first the preparation stage, the second implementation and the third final stage. The preparation stage consists of: a) the researcher has determined a sample of the research to be carried out, b) continued the preparation of learning tools such as Lesson Plan, Student Assessment Sheet, and learning media, c) then the researcher organizes or compiles instruments for the research to be carried out, d) continues to determine the validation of the instrument, e) then the researcher revises on his research instrument this is based on the results of the validity test.

The final implementation stage consists of: a) the value that has been obtained is calculated, b) normality and homogeneity tests are also calculated, c) analyzing the results that have been calculated with the t-test analyzed by the researcher, d) the last stage of the research results is stated in a scientific paper in the form of a research report.

RESULTS

Based on the results of data analysis and hypothesis testing that the researcher has described in the previous section, the results of *post-test* learning in the experimental class on fractional number material worth showed an average value of 87 with the highest value of 100 and the lowest value of 74, a median of 86, a mode of 76, and a standard deviation of 8.5**.** Meanwhile, the *results of post-test* learning in the control class showed an average score of 68 with the highest score of 79 the lowest score of 35, a median of 68, a mode of 64 and a standard deviation of 10.7 (Table 2).

Table 2. Test results of learning outcomes

	Experimental group	**Control group**
Valid	10	10
Mean	87	68
Median	86	68
Mood	76	64
Std. deviation	8.5	10.7
Range	26	44
Minimum	74	35
Maximum	100	79

From the results of the calculation of normality using the *liliefors* test, *the results of the Post-test* in the experimental group were obtained, namely $L_{\_count}$ = 0.038 with the number of n = 31 and $L_{\_table}$ = 0.268, then $L_{\_count} < L_{\_table}$, namely 0.038 < 0.268 the data were normally distributed. While the *post-test* results in the control group obtained the results of $L_{\_count}$ = 0.007 with the number of n 31 and $L_{\_table}$ = 0.22 then $L_{\_count}$ < L the data *table* is normally distributed (Table 3). And it has been known that the data of both is sourced from normal data.

From the results of homogeneity using the *Fisher* test, the results at a significant level of α = 0.05 obtained $F_{\_count}$ = 0.63 and $F_{\_table}$ =1.841. Based on the examiner's criteria, namely $F_{\_count} < F_{\_table}$, then 0.63 < 1.841 and the alternative hypothesis was rejected (H0) so that the sample taken in this study had homogeneous properties.

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Table 3. Calculation Results

Data	N	l_{count}	l_{table}	Data conclusion
Post-test Experiment	31	0,038	0,268	Normally Distributed
Post-test Control	31	0,007	0,22	Attributable Usual

The normality test and homogeneity test are the next stages. That is a hypothesis based on the t-test obtained by the result of the T_{count} of 8.03. As well as T_{tabel} 2.00 because $T\_{counts} > T\_{table}$, H0 cannot be used or rejected, which means that learning media with video media has an influence on the learning outcomes of fractional numbers mathematics fourth-grade elementary school in Jakarta.

DISCUSSION

Various studies state that low student learning outcomes in several subjects including mathematics materials are the face of education in Indonesia. The low level of ability of these learners is partly due to the routine of the learning process carried out in which talents or interests cannot be developed by educators towards learners. According to (Sukardjo, 2020), he said that an educator has a great contribution in the teaching and learning process. In a sense, the great influence of teachers in providing learning methods is the key to the success of the students.

The results of this study can show that there is an influence on video learning media on mathematics learning outcomes on fractional numbers mathematics of fourth grade elementary school students in Jakarta. This can be observed from the difference in the average *post-test* value of the experimental class and the control class.

This proves that video learning media affects the results of learning mathematics in fractional numbers in fourth-grade elementary school students at Jakarta. At the same time, it proves that there is an influence on the results of mathematics learning for fourth-grade students and is not a coincidence. However, because of the influence of the different treatment given to the two classes.

Based on the explanation according to Hariyono et al. (2020), "By using video as a learning medium will increase the attractiveness for students in the learning process, this interest will increase motivation and concentration will be maximized. The memory and absorption of students will increase for students because by using video media learning methods the sense of hearing and sight works optimally, of course, this is directly proportional to the learning outcomes of the students.

CONCLUSION

There are various things that can be extracted from this research, that the use of video as a learning medium can affect the results of learning mathematics on fractional number material fourth grade class at elementary school in Jakarta. There is a good and useful influence and there are differences in values in students who are treated with video as a video learning medium and without using learning media in the form of videos. Classes that were treated with video learning media, were shown to get higher scores than students who were given conventional treatment.

There is limitation in this research, that this research has a huge impact by the pandemic of Covid-19 on this research implementation, and for the future research, the researcher suggest to use this method of video as a media learning in other subject of lesson to prove that this method can work in various subject.

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