THE EFFECT OF ANIMATED VIDEOS ON ELEMENTARY SCHOOL AGE CHILDREN IN IMPROVING KNOWLEDGE ABOUT EARTHQUAKE DISASTERS

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Abstract

Manokwari Regency is an area prone to earthquakes, this is influenced by its location on the Pacific tectonic plate fault. In an effort to minimize the impact that occurs, providing earthquake disaster mitigation needs to be provided starting from elementary school to increase awareness among students. There is one media that can be used in its implementation, namely animated videos. This study aims to determine the extent of the effect of providing simulations using animated videos on the level of knowledge, using a quantitative approach with an experimental design in the form of Paired Sample T-Test testing using measuring instruments, namely Pre-Test and Post-Test questionnaires. During the implementation, the questionnaire was distributed to respondents who were students of grades 5 A and B at SDN 02 Amban. In data processing, it was found that the questionnaire results were not normally distributed, so the Wilcoxon test was used as a benchmark. From the test results, a significant value of 0.000 was obtained. When referring to decision making, if the significant value <0.05 then the hypothesis can be accepted. Therefore, it can be concluded that in this study there was an increase before and after treatment using animated video media.

Keywords: *Mitigation, Earthquake, Simulation, Disaster, Animated Videos*

INTRODUCTION

Indonesia's tropical location does not make it immune to natural disasters. The confluence of three major tectonic plates makes Indonesia highly vulnerable to disasters, particularly earthquakes. These disasters not only cause moral and material losses but can also lead to trauma and even loss of life. Furthermore, earthquakes can trigger other disasters such as tsunamis, fires, clean water shortages, and landslides, further exacerbating their devastating impact.

In an effort to reduce impacts, mitigation is necessary to prevent the worst possible outcomes. With the rapid advancement of globalization, the role of technology in helping to improve disaster awareness is necessary to simplify and streamline the process of raising disaster awareness.

There are various types of technological media that can be utilized, one of which is animated video. Theoretically, this research is useful in developing more efficient and targeted disaster simulation methods, and practically, it can be useful in increasing students' knowledge of earthquake disaster mitigation. This study aims to describe the effect of providing simulations using animated video media on increasing knowledge about earthquake disasters in elementary school-aged children.

LITERATURE REVIEW

As a technology-based learning medium, animated videos have various benefits in supporting learning activities, including improving learning knowledge and making it easier for students to solve various problems related to the material taught by the teacher (Andrasari, 2022). Compared to written media, the advantages of learning using animated videos include the ability to be shown repeatedly, shortening teaching time, and being easier to understand because students can directly see how the material is applied through the video media. Thus, the role of learning methods in earthquake disaster mitigation in schools plays a significant role in shaping students' responsiveness to earthquake disasters.

Maulana (2024) conducted a study on "The Effect of Animated Videos on Earthquake Disaster Preparedness in Students of SDN 6 Banda Sakti" and found a significant effect after providing earthquake disaster education using animated videos, indicated by a significant difference in percentage values during the pretest and posttest. The results of his study explained that during the pretest, students' preparedness attitudes were still relatively low because only 12.9% of respondents had high preparedness. However, after education using animated videos, the level of preparedness of respondents increased to 45.2%. This proves that the implementation of earthquake disaster mitigation with animated video media for elementary school students can influence preparedness while increasing knowledge and insight about the importance of earthquake disaster mitigation. The implementation of this simulation should be intensified in elementary schools throughout Indonesia, especially in areas that are earthquake-prone red zones.

There are six provinces in Eastern Indonesia, one of which is West Papua Province. This region is prone to earthquakes because it lies along several active faults and tectonic plate junctions, resulting in frequent earthquakes of small to large magnitudes (Saputro & Momot, 2020). The capital of West Papua Province, as seen on the map, is Manokwari Regency, located directly above the bird's head of Papua Island.

The capital of West Papua Province is Manokwari Regency, located at the tip of Papua Island on the map. This region lies along the Pacific tectonic plate fault line, making earthquakes frequent (Tethool et al., 2021). Given Papua's earthquake-prone location, earthquake mitigation should be taught as early as possible, starting in elementary school.

RESEARCH METHOD

Research Design

This study will measure the effect of providing an earthquake disaster simulation using animated video media in improving the preparedness attitude scores of fifth-grade elementary school students at SDN 02 Amban, Manokwari Regency. This study uses a quantitative approach with a pretest and posttest method to collect questionnaires needed to analyze differences in knowledge scores from the presentation of the earthquake disaster simulation using animated video.

Population and Sample

A population is the total number of elements in a study. A population includes subjects and objects with specific characteristics. In this study, the population was obtained from all 59 fifth-grade students at SDN 02 Amban. This total population was obtained from two classes: 30 students in grade 5A and 29 students in grade 5B.

In this analysis, the sample used was all fifth-grade students at SDN 02 Amban. The sample categories used in this study were questionnaires distributed before and after an earthquake disaster simulation using animated videos to determine the impact of the treatment. Several criteria had to be met, namely:

a. Inclusion Criteria: All students were present during the activity.
b. Exclusion Criteria: Students who did not participate in the simulation activity.

To determine the total sample size for this analysis, the researcher used the Slovin formula:

$$n = \left[\frac{N}{1+Ne^2}\right] \quad \text{.....(1)}$$

n = total number of samples
N = total research population
E = desired constant (5%)
Obtained :

$$\text{n} = \left[\frac{N}{1+Ne^2}\right]$$

$$\text{n} = \left[\frac{59}{1+59.0{,}05^2}\right]$$

$$\text{n} = 51{,}416 = 51$$

From the results of the analysis using the Slovin formula, the number of samples was rounded to 51 people.

Data Collection

Questionnaire data collection was conducted using a pretest and posttest method. Before the treatment, a pretest was distributed to assess respondents' basic knowledge of earthquake disaster mitigation. After the simulation, a posttest was administered to assess the impact of the earthquake disaster simulation using animated video media on students' preparedness attitudes.

To measure students' knowledge about earthquake disasters, a first questionnaire (pre-test) was administered to assess their prior knowledge before the activity. Students participating in the study were asked several questions before the educational video was shown. After the pre-test, the researcher showed a video about earthquake disaster mitigation using animation. Finally, a second questionnaire (post-test) was administered to respondents to determine the extent to which the animated video influenced students' knowledge. The post-test questions were the same as those in the pre-test.

Based on the questionnaire administered to respondents, assessment criteria were developed to measure the quality of student learning and knowledge. The research questionnaire consisted of five questions, each worth 20 points. The Likert-based assessment is as follows:

$$\frac{Respondent\ Point\ Value}{Maximum\ Point\ Value} x100 = \% \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (2)$$

Level of Understanding:

SS = 81% - 100% (5) Very good
S = 61% - 80% (4) Good
TT = 41% - 60% (3) Enough
TS = 21% - 40% (2) Not Enough
STS = 0% - 20% (1) Very Less

Data Analysis Techniques

1. Validity Test

In research, validity tests are used to determine the validity of questionnaires (Janna & Herianto, 2021). A questionnaire is considered valid if the statements and questions within it adequately explain what is being measured. When the correlation coefficient for each value is positive and the calculated r value is greater than the table r value, the survey results can be validated.

2. Reliability Test

One way to evaluate the reliability of a measuring instrument is through observation (Janna & Herianto, 2021). The reliability of a measuring instrument is determined when it produces similar findings when measured. The research tool used in reliability testing is a questionnaire with multiple-choice questions, and the reliability test uses the Cronbach's alpha formula.

3. Normality Test

According to Fahmeyzan et al. (2018), regardless of data distribution, a normality test is used to evaluate the normality of the variables under study. This study used SPSS to test for normality. If the data is normally distributed, the Paired Samples T-Test is used as a parameter, and if not, the Wilcoxon test can be used as an alternative.

4. Statistical Test

Statistical tests are divided into two types: parametric and non-parametric. If the data is normally distributed, a parametric test, in the form of a Paired Samples T-Test, can be used as a reference. If the data is not normally distributed, a non-parametric test, in the form of a Wilcoxon test, is used as a determining parameter.

RESULT

Respondent Data Processing Results

Based on the research conducted, in this section, the researcher provides an explanation of the questionnaire data collected from respondents, who were fifth-grade students at SDN 02 Amban, Manokwari Regency, West Papua Province. The following are the characteristics of the respondents summarized by the researcher:

a. Number of Respondents

The research was conducted on February 20, 2025, at SDN 02 Amban, Manokwari Regency, West Papua Province. The researcher used two classes as samples, with a total of 51 respondents: 25 students from class V A and 26 students from class V B.

b. Gender

After determining the total number of respondents, the researcher identified the respondents' gender. There were 23 males and 28 females.

Validity Test

To determine the validity of a measuring instrument, in this case a questionnaire, researchers conducted a validity test to ensure its accuracy. The following are the results of the validity test using SPSS:

Table 1. Validity Test

No	Correlation	Information
1	0,487	Valid
2	0,667	Valid
3	0,730	Valid
4	0,702	Valid
5	0,588	Valid

Source: Personal Data Processing, 2025

From the analysis above, it was found that the five questions the researcher created met the decision-making requirements. The r-table value < r-calculated. In this study, the researcher used 51 people as a sample, resulting in an r-table value of 0.271. Therefore, it can be concluded that each questionnaire is valid.

Reliability Test

To determine the consistency of a measuring instrument, a reliability test is necessary. In this study, the reliability test was conducted using software. The following are the results of the reliability analysis using SPSS:

Table 2. Reliability Test

Cornbach's Alpha	N of Items	Information
0,620	5	Reliabel

Source: Personal Data Processing, 2025

From table 2, it can be seen that of the 5 questions in the questionnaire, there is a Cronbach Alpha value of 0.620, so it is concluded that the questionnaire used in this study is reliable because the Cronbach Alpha value obtained is greater than 0.60.

Normality Test

From the analysis that the researcher carried out using SPSS software, the normality test aims to ensure the normality of the data distribution, so that it can be useful in decision making during statistical testing.

Table 3. Normality Test

Test of Normality			
Kuesioner	***Statistic***	***df***	***Sig.***
Pre-Test	0,184	51	0,000
Post-Test	0,319	51	0,000

Source: Personal Data Processing, 2025

The analysis results in Table 3 show a significance value of 0.000, so in making a decision on the Kolmogorov-Smirnov normality test, it can be concluded that the data is not normally distributed because the Sig. value is less than 0.05. Therefore, further testing is carried out using the Wilcoxon test as an alternative if the data is not normally distributed.

Wilcoxon Test

In the previous analysis using SPSS, the data in this study were not normally distributed so the Wilcoxon test was used as an alternative in non-parametric testing.

Table 4. Wilcoxon Test

Ranks	**N**	***Mean***	***Sum of Ranks***	**Z**	***Sig. (2-tailed)***
Negative	0	0,00	0,00	-6,053	0,000
Positive	47	24,00	1128,00		
Ties	4				
Total	51				

Source: Personal Data Processing, 2025

Based on table 4, it can be explained that in negative ranks, there were no respondents who experienced a decrease in the average and total ranking. In positive ranks of 47 respondents, there was an average increase of 24 and the sum of ranks was 1128. When conducting this test, a Sig. (2-tailed) value of 0.000 was obtained, so based on the basis of decision making for the Wilcoxon test, if the Significance value <0.05 then the hypothesis is accepted. So in this test it was concluded that there was a difference in knowledge before and after the earthquake disaster mitigation treatment using animated videos was carried out on elementary school-aged children.

DISCUSSION

Based on the research problem formulation, the researcher intends to discuss the effect of providing animated videos on the level of knowledge in elementary school-aged children. The sample used was 51 students in grades 5A and VB at SDN 02 Amban.

This study used a pre-test and post-test questionnaire to measure knowledge levels before and after treatment. The questionnaire consisted of five questions, each weighted at 20%, calculated using a Likert scale. It was then processed using SPSS software.

Data processing consists of several tests, including a validity test that functions to test the accuracy of the questionnaire, a reliability test to determine the consistency of the measuring instrument, a normality test as a reference in making non-parametric parametric decisions, and a Wilcoxon test that plays a role in making the final decision when the data is detected as not normally distributed.

In the validity test of the r-table value < r-calculated, it is proven that when conducting the test, the r-table value obtained is 0.271 and the r-calculated value when seen in table 1 gets a result greater than the r-table value, in accordance with the decision-making requirements, if r-table < r-calculated then it is said that the questionnaire is valid. Then during the reliability test, a Cronbach Alpha value of 0.620 was obtained so that based on the decision-making requirements, if the Cornbach Alpha value is greater than 0.60 then the questionnaire is considered reliable. Next, when the normality test was carried out, it was found that the data was not normally distributed so the researcher used the Wilcoxon test as an alternative in non-parametric statistical testing. From this test, it was found that there was a difference in the level of understanding before and after being given an animated video.

From the results that have been obtained, it indicates that by providing animated video media as a learning medium, it can increase students' knowledge, in order to increase knowledge about the dangers of disasters in elementary school-aged children, it is appropriate for every school to provide education using animated videos to their students to become useful insights in the future.

CONCLUSION

According to the results of the analysis conducted regarding the effect of animated videos on increasing knowledge of earthquake disasters in elementary school students, it was concluded that there was a difference in knowledge before and after being shown animated videos. This increase can be seen in the Wilcoxon test, where the analysis results obtained a Sig. (2-tailed) value of 0.000. When viewed from the basis of decision making, if significant <0.05 then the hypothesis is accepted and means that there is an increase from Pre-Test to Post-Test. Of the total 51 samples, 47 students experienced an increase and there was an increase in the average value of 46.6%. Based on these results, it is concluded that providing learning using animated videos can be a supporting medium in the teaching and learning process because it has been proven to increase student knowledge.

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