

The Effect of Animation Video as Educational Media on Student Preparedness in Facing Earthquake Disasters

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Abstract

Based on data released by the United Nations International Strategy for Disaster (UNICEF), as many as 60% of children in the world are victims of natural disasters. This is a serious problem because in the next 10-20 years the disaster's impact will affect the child's physical condition and psychology. According to Indonesian schools, data shows that 75% of school locations are in disaster-prone areas. This study aimed to determine the effect of providing education with animated video media on the preparedness of elementary school students in facing earthquake disasters. This research used a Pre-Experimental design with one-group pre-post design. The number of samples was 30 people. Data was collected with the interview method using a dichotomy question questionnaire with 20 question items. Each parameter's index in disaster preparedness uses a standard formula developed by LIPI-UNESCO/ISDR. The statistical analysis used was paired t-test statistic test. The results of the study showed that the preparedness of elementary school students before being given education for animated video media was at an average of 52,40 and after being given education was at an average of 82,00. This research found there was an effect of education with animated video media on the preparedness of elementary school students in facing earthquake disasters with the results of a p-value = 0,000. It can be concluded that there is a significant influence on providing education with animated videos on the preparedness of elementary school children in facing earthquake disasters

Keywords: animated video, earthquake disaster, preparedness, media education

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1. Introduction

In the manufacturing sector today, human capital is still essential for most factories to carry out a variety of Indonesia is an archipelagic country located in a geographic, hydrological, and demographic area that tends to experience disasters. Theologically, Indonesia is located at the confluence of three important dynamic world structural plates, namely the Eurasian, Pacific, and Indo-Australian plates. The meeting of these plates causes Indonesia's territory to often experience disasters. The Indonesian region also has negative impacts in the form of earthquakes and volcanic eruptions. fiery. The Indonesian Pacific Plate is known as the Ring of Fire area. This makes Indonesia has many volcanoes and frequent natural disasters. One of the disasters that cannot be anticipated and cause loss of life and material is an earthquake (Idham, 2019). Indonesia is an active seismic area, during 1976-2006 there were 3,486 earthquakes with a magnitude of 6.0 on the Richter scale. From 1991-2009 there have been 27 earthquakes and 13 earthquakes generated tsunamis. Large-scale earthquakes often cause casualties and material losses. The earthquake in the city of Padang occurred on September 30, 2009, with a magnitude of 7.9 with losses reaching IDR 4.8 trillion with 1,195 people killed, and a total of 271,540 houses damaged (Putra, 2020).

In Bali Province there have been 75 earthquakes with the number of fatalities in 2014 reaching 11 people, in 2015 there were 13 fatalities, in 2016 there were 6 fatalities and in 2019 there were 31 casualties. With an average earthquake strength reaching 3 to 7 on the Richter scale from December 2014 to 2019. In three years, Bali experienced 16 tremors, Badung 12 earthquakes, Jembrana 9 earthquakes, and Bangli each experienced 4 times the scale earthquake while Karangasem experienced 14 earthquakes (Harini et al., 2020). Data on the Disaster Risk Index (IRB) for 2021 Karangasem Regency is included in the medium class with a national ranking of 347 with a score of 11.8, the number of fatalities in 2014 reached 11 people, in 2015 there were 13 fatalities, in 2016 there were 6 fatalities and in 2019 as many as 31 victims (Handayaningsih, 2020).

With the characteristics of the disaster, the eruption of Mount Agung that occurred in August 2017 resulted in periodic earthquakes, increased volcanic activity, and caused ash rain in the Karangasem area and even the Bali area. This has an impact on the increase in Mount Agung volcano, which requires people in areas that are included in the red and yellow zones near Mount Agung to evacuate and results in the cessation of community activities including educational activities which results in psychological impacts, especially on children (Rozikin, 2019).

Disaster according to Law No. 24 of 2007 is an event that threatens and disrupts life caused by natural factors, non-natural factors, and human factors resulting in casualties, environmental damage, loss of property, and

psychological impacts (Handayani et al., 2018). Disasters are uncontrollable, and can occur every day somewhere in the world (Kutbi & Sofar, 2020). Women and the elderly are the groups most vulnerable to becoming victims of disasters (Sumasto et al., 2019). Based on data released by the United Nations International Strategy For Disaster (UNICEF) as many as 60% of children in the world are victims of natural disasters. This is a serious problem because in the next 10-20 years the impact of disasters will affect the physical and psychological condition of children. According to Indonesian school data, it shows that 75% of school locations are in disaster-prone areas (Kumaresan & Rajapakse, 2019).

Children fall into the category of being vulnerable to becoming victims of a disaster (Suk et al., 2020). The risk of children's vulnerability is due to the factor of ignorance of disaster knowledge and the threats around them, which results in ignorance of steps to deal with disasters (Hansson et al., 2020). Based on data on disaster events in several victim areas which happens a lot, namely to school-age children both during school hours and outside school hours, this shows that the importance of knowledge and attitudes about disasters and disaster risk reduction is given early on to provide an understanding of what to do when a threat occurs around them (Widowati et al., 2021).

The government is making efforts to reduce risk through the Ministry of Empowerment, Women and Child Protection, of the Republic of Indonesia, which continues to reduce the risk of child vulnerability in disaster situations by strengthening the capacity of human resources so that they can provide the best services for children in disaster situations. Following the mandate of Law Number 351 of 2014 concerning Amendments to Law Number 23 of 2002 concerning Child Protection, the government, regional governments, and other state institutions are obliged to provide special protection to children in emergencies, including children who are victims of natural disasters. "The government must reduce risks to children by preparing children and families to face disasters, considering that the family is the first and main educational institution for children (Yanto et al., 2020).

Disasters have the greatest influence on the most vulnerable groups, especially the children's age group, the reaction after the earthquake disaster was to become angry, and self-deprecating, and changes in behavior such as fear of staying indoors, and being disturbed by sudden voices (Danese et al., 2020). What can be done to reduce disaster risk is by providing fun media to evoke a sense of preparedness in children to use video animation because it can provide an interesting and meaningful learning experience that will generate a greater stimulus compared to reading books that it creates the impression impressive for the audience (Idrus et al., 2019).

In this study, education was given to elementary school children with animated video media education which contained videos, images, and information related to earthquake disasters. This study aims to determine the effect of providing education using animated video media on the preparedness of elementary school students in dealing with earthquake disasters at Bebandem 2 Elementary School Karangasem in 2022.

2. Method

This type of research is a Pre-Experimental design with a One-group pre-post design using simple random sampling. The research sample consisted of 30 students in grades 4 and 5 of Bebandem 2 Elementary School. Bebandem is one of the earthquake-prone areas and is close to Mount Agung. Data on student preparedness in dealing with earthquakes was collected by structured interviews one day before and one day after the treatment. The measurement of preparedness refers to guidelines for measuring the level of preparedness of communities and school communities in dealing with disasters issued by the Indonesian Institute of Sciences (LIPI) in 2015. Students are given animated videos about earthquake disasters, including: disaster hazards, and escape procedures. Animated videos are given for 30 minutes for 6 days accompanied by questions and answers. The data analysis technique used to determine the effect of providing education with animated video media on student preparedness in facing earthquake disasters is a paired t-test. The intervention given is considered to have an effect on students' preparedness for earthquake natural disasters if the p-value <0.05.

3. Result

Based on age, the characteristics of respondents were mostly 10 years old as many as 12 people (40%). Most of the respondents were male 18 people (60%) and female 12 people (40%).

Student preparedness level before being given an animation video about disaster is shown in table 1.

Table 1. Distribution of respondents based on preparedness in facing earthquake disasters before being given animation video media education

No.	Preparedness	Frequency (n)	Percentage (%)
1	Ready	3	10,0
2	Almost Ready	12	40,0
3	Less Prepared	15	50,0
Total		30	100,0

Based on the interpretation of table 1 above, the results showed that the preparedness of elementary school children in the category of almost ready is 12 people (40%), 3 students ready (10%), and 15 students underprepared (50%). The results above prove that the preparedness category of elementary school children still varies, but there are still 15 students who are not ready and 12 almost ready students.

After being given an animation video about the disaster, the level of student preparedness for facing an earthquake is shown in table 2.

Table 2. Distribution of respondents based on preparedness in facing earthquake disasters after being given animation video media education

No.	Preparedness	Frequency (n)	Percentage (%)
1	Well prepared	22	73
2	Ready	8	27
Total		30	100,0

Based on the interpretation of table 2 above, the results showed that the most preparedness of elementary school children was in the well-prepared category 22 people (73,3%), and 8 people are ready (27,0%).

Analysis of student preparedness level before and after being provided with video as media education in facing earthquake disaster was shown in the table below.

Table 3. Results of the analysis of the effect of providing animated video media education on the preparedness of elementary school children in facing earthquake disasters

No.	Post-Pre	Mean	Percentage (%)	<i>p-value</i>
1	Pre-test	52,5	52,5	0,00
2	Post-test	82,0	82,0	

Based on the interpretation of table 3 above, it can be seen that the comparison of pre-test and post-test scores of elementary school children after being given animation video media education is that there is no smaller post-test value than the pre-test value, most students experience an increase in preparedness knowledge in facing disasters before and after provided animation video media education as seen from the results of the scores. The post-test was then obtained, and the score was greater than the mean pre-test score of 52,50. Based on the results of the Paired t-test statistical test, a value of $p\text{-value} = 0.000 < \alpha (0.05)$, this shows that there is an influence of providing education with animated videos as media education on the preparedness of elementary school children facing earthquake disasters Bebandem 2 Elementary School.

4. Discussion

Indonesian school data shows that 75% of school locations are in disaster-prone areas (Lozon & Bradin, 2018). Children are the most vulnerable groups in environmental disasters (Amorim et al., 2021). The risk of the vulnerability of children is due to the factor of ignorance of disaster knowledge and the threats that exist around them. The importance of knowledge and attitudes about disasters and disaster reduction is given from an early age to provide an understanding of what to do when there is a threat that exists around them (Kawasaki et al., 2021). The reactions after the earthquake disaster area, becoming angry, and self-deprecating, and changes in behavior such as fear of staying indoors, and being disturbed by sudden noises-suddenly heard (Gillies et al., 2016). The study of post-traumatic stress disorder (PTSD) in children who survived the Wenchuan earthquake found that 80% of children still had some symptoms 2 years after the earthquake and 66.25% of children had these symptoms up to 3 years (Chen et al., 2021). Research after the earthquake in Lombok found the prevalence of PTS in students reached 69,9% (Wahab et al., 2021).

The result of this study before the given animation video was similar to the study about disaster preparedness in the red zone schools 13 years post-tsunami 2004. The evaluation results show student preparedness in terms of the knowledge parameter was in the "medium" category and disaster emergency planning. However, the disaster warning system parameter was in the "low" category. Thus, the study concluded that student preparedness for the earthquake and tsunami disaster is in the "low" category with an index value of 52,12. Preparedness was low due to the lack of motivation and knowledge about disaster preparedness, this made some students feel confused about what actions should they do, and how to take independent evacuation routes that should be carried out in the event of an earthquake disaster (Yusuf et al., 2019).

Modern societies are not prepared for extreme disasters (Rockefeller, 2020). It is very important to control

disaster risk reduction from an early age. Frequent disasters can be an experience or a lesson for the importance of understanding the disaster response that must be possessed by every child from an early age such as at this research site close to the radius of the majestic mountain and prone to disasters making disaster preparedness important to have (Sari et al., 2014).

The results of the study after using animated video as media education were similar to the study about the influence of video media on preparedness in facing flood disasters in elementary schools in Bengkulu. At the time after being given video media, most respondents had a level of preparedness that was well prepared as many as 20 respondents (74,1%). Based on these results it can be seen that an increase in the level of preparedness of the respondents (Rahmawati et al., 2020).

Providing animated videos as media education is more effective in increasing student learning motivation to obtain an increased value in student preparedness in dealing with earthquake disasters. Providing education by viewing animation videos can make children more interested and are faster to be understood by children. Student achievement and enthusiasm for learning in schools are often associated with learning problems or student learning methods in understanding the material which is presented. Less interesting and effective learning factors are likely to indicate that students are not motivated in participating in learning (Geraldine Blomberg, Miriam Gamoran Sherin, Alexander Renkl, Inga Glogger, 2014). For this reason, researchers believe that the use of animation video media education makes students feel motivated in delivering earthquake disaster preparedness materials.

The results of this study show that animated video media education has a significant influence on improving student preparedness in dealing with earthquake disasters. Although not all students have experienced an increase and are in the category of being very well prepared, this game has increased most of the knowledge of students who were previously in the almost ready category to be well prepared.

The results of this study are in line with the research about improving student internalization of disaster knowledge by participating in learning package development. Before students were involved in the development of learning media, 47% of students had a level of preparedness in the low category, and 33% were in the medium category. But after students were directly involved in the development of various disaster learning media, including posters, poems, short stories, videos, and dances there was an increase in the number of students who had very high levels of preparedness (50%). Some students were in the high (27%), and moderate (23%) categories. These results indicate that the involvement of students in the development of instructional media could increase the level of student preparedness in facing disasters (Oktari & Kumala, 2020). The advantages of video media in learning are being able to display moving images and sound, which is a special attraction because audiences are able to absorb messages or information using more than one sense (Harthi, 2019). Animated videos can provide an interesting and meaningful learning experience that will arouse a greater stimulus compared to reading the book (Hill et al., 2016). Disaster response exercises for at-risk communities are part of disaster management procedures in the pre-disaster phase (Nuntaboot et al., 2020).

5. Conclusion

Before education about the disasters was given, only three students (10%) are ready to face earthquake disasters. After education was provided all students are ready (27%) and well-prepared (73%) to face earthquake disasters. The results of the study concluded that the average score of student preparedness in facing disasters before being given animation video media education obtained a score of 52,50 and the average score of student preparedness in facing disasters after being given animation video media education obtained a value of 82,20. There is a significant influence of providing education with animated video media on the student preparedness of Bebandem 2 Elementary School in facing earthquake disasters in 2022 with a p-value of 0,000.

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