

The Effectiveness of Poster Media to Improve High School Students' Tsunami Disaster Mitigation Preparedness

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ABSTRACT

This study aims to determine the effectiveness of poster media in improving the students' readiness in preparing Tsunami disaster mitigation preparedness. This study uses a quantitative descriptive method with a Quasi-Experimental design. The type used in this research is one group Pretest-Posttest. The research population is students at a state senior high school in Pematang Sawa, class X-XII, in the Academic Year 2021/2022. The sample in this study was 30 people. Data were collected through tests and documentation for three months, from October to December 2021. Then the data were analyzed using descriptive statistics. Analysis of the data used was the paired t-test with the result that there was a significant difference between the pre-test and post-test scores for preparedness in 30 students with $p < 0.000$. Based on these results, it can be concluded that poster media is quite effective in increasing tsunami disaster mitigation preparedness. Further studies are recommended to complete this current study's weaknesses.

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1. INTRODUCTION

Learning activity is a process that involves a teacher and students' actions. These activities also recreate innovation in order to achieve the learning objectives. This process is commonly done in any lessons, such as geography as one of the lessons that is studied at senior high schools (hereafter, SMA), and which is included in the social sciences program. In connection with this, Sugandi (2015) states that geography is one of the lessons in SMA, which is taught partially, while in SMP (Junior High Schools) was included as part of the Social Sciences lesson. Geography lessons are intended to make human beings, both as individuals and as nations, acknowledge Indonesia's state and nation environment and other countries in the world. Most developed and developing countries view geography as one of the essential subjects in developing students' abilities individually and in groups. In line with this, Parjito

(2016) also explains that both developed and developing countries view geography as an important subject and plays a significant role in developing students' abilities through geography skills.

The object of geographic study consists of 5 branches, including (1) the atmosphere, (2) the biosphere, (3) the hydrosphere, (4) the lithosphere, and (5) the anthroposphere. Pramanata & Ismanati (2017) explain that the object of geographic study consists of five aspects: the atmosphere, biosphere, hydrosphere, lithosphere, and anthroposphere. The Geography lesson aims to provide knowledge about space, environment, and territory. Furthermore, Alwan (2017) explains that the purpose of learning geography is to make students particularly acknowledge spatial, environmental, and regional patterns and the related processes so that students master essential skills in obtaining data and information, communicating and applying knowledge of geography, as well as to be able to display behaviour that cares about the environment and utilizes natural resources wisely and has tolerance for the cultural diversity of the community. In line with the geography lesson objectives, the impact is for all living things, especially humans. The importance of natural disaster mitigation as one of the topics in geography lessons is to provide an overview and reference for human life to socialize, anticipate, and manage natural disasters that directly impact human life. The characteristics of the natural disaster mitigation topic relate to how students understand, be prepared, and anticipate various natural disasters. In class XI, natural disaster mitigation topics are studied, especially in the second semester.

Geography lessons allow students to solve problems and think logically, critically, analytically, and communicatively. Additionally, Parjito (2016) believes that geography learning can equip students to think logically, analytically, systematically, synthetically, critically, and creatively and solve actual problems, where these abilities are the basic abilities needed in 21st-century education. However, the facts that occurred in learning activities were not expected. This is relevant to what Sugandi (2015) explains; the reality between the implementation of geography lessons in schools theoretically and the reality on the ground is practically an imbalance. This is due to the unintegrated learning process, which is the goal of geography lessons. This is under observations and interviews with geography teachers at a senior high school in Pematang Sawa. Several problems occur in geography learning activities, such as students' lack of motivation to learn geography. The lack of student motivation is caused by students' mindset that geography is a less exciting lesson to learn. In addition, Mulya (2021) explains that it is essential for an educator to understand the motivation needed by each student. Educators, lecturers, and teachers must improve two types of motivation: intrinsic and extrinsic.

Learning media contributes positively to improving students' learning motivation. In this regard, Fathurrochman et al. (2021) support that learning motivation could be increased by using various learning media. Each student has a unique and potential character. This uniqueness is sometimes not understood by the teachers. As a result, students have not been able to optimize their abilities. In line with this, Astuti et al. (2021) explain that character learning can be through character education. This includes character knowledge or character awareness, knowledge of character values, ability to take lessons, face problems, and knowing oneself. Furthermore, the problem with learning methods is teacher-oriented activities (teacher centre), resulting in students not getting enough opportunities to explore the lessons.

Many teachers still do conventional learning, only using textbooks or monotonous learning media. Rahmawati & Mukminan (2017) also agreed that many teachers carried out teacher-centred learning, and not many used multimedia for learning in the classroom. This proves that during the geography learning activities, the teacher only used one medium, such as textbooks, which cannot facilitate learning optimally. In connection with this, Alwan (2017) explained a need for innovation, both from learning models, methods, and media that are applied in the learning process, based on student's level of education and relevant to the characteristics of these students. Accuracy in choosing models,

methods, and media greatly influences students to understand the concepts of learning geography, emphasizing how students understand natural phenomena such as the lithosphere, pedosphere, etc. Likewise, Sadiman et al. (2012) explained that messages, message sources, media channels, and message recipients are components of the communication process. However, the communication process in learning activities does not just run well. Learning activities that use inappropriate, ineffective, or efficient media will hinder learning. As a result, the role of media as a communication tool in learning activities must be a particular concern to create effective and efficient learning activities. Moreover, Putra & Nisa (2021) explained that the media could channel messages more quickly to students to understand and achieve learning goals.

Eventually, these problems also impacted the learning outcomes of students in the geography subject. Putra (2018) obtained data on the average results of semester tests for geography subjects in material X. Class X students of SMAN 1 and SMAN 2 Plakat Tinggi in the odd semester of the 2017/2018 academic year were still below the KKM of 60. Class X. IPS 3 in SMAN 1 Plakat Tinggi obtained an average score of 45, and the average value in class X. IPS 2 SMAN 2 Plakat Tinggi obtained 50. Furthermore, Rahmawati & Mukminan (2017) also explained that many students' learning outcomes were below the KKM, and the learning independence of students was still relatively low. Based on the research results and description of the problems, the teacher needs to design an engaging learning activity that makes students actively participate in these learning activities, such as utilizing visual media for students' learning activities. It can create a learning atmosphere that involves students in learning activities by using valuable and effective media to increase tsunami disaster preparedness. One of the facilities or media is tsunami disaster mitigation poster media included in the geography material for class XI at a senior high school in Pematang Sawa.

Poster media is also considered a visual learning media that can describe or visualize information through words, numbers, and symbols. In line with this, Purwani et al. (2019) explained visual media as learning media are designed to communicate facts, ideas, and messages clearly and powerfully. The elements contained in visual media are images and writing. Visual graphic media in teaching materials and in designing teaching media is necessary to pay attention to expressing facts or ideas through words, numbers, and symbols. Furthermore, Harsono et al. (2019) also explained that poster media is a potential learning medium because it integrates theory, sketches, pictures, graphics, and other ideas with attractive designs. Thus, it can be said that poster media is advantageous for students in learning geography.

Tsunami disaster mitigation is closely related to the geographical elements around the research site. This high school, which is included in the coastal area, is not far from the shoreline that has significant potential for tsunami disaster. In this regard, BNPB (2017) explained preparedness as a series of activities carried out to anticipate disasters through organization and appropriate and efficient steps. In addition, Jokowiarno (2011) explained that mitigation was one part of disaster management activities focused on reducing the potential impacts that may be caused by disasters that were predicted to occur in the future. Furthermore, Heryana (2020) defines a disaster as widespread ecological destruction, both physically and functionally, between humans and the environment, caused by nature or humans, in the form of serious or invisible events (or slow, as in drought), on a scale that existing resources cannot handle, and the affected communities require extraordinary efforts to deal with the damage caused, even requiring assistance from the international community. Furthermore, the BNPB tsunami (2017) explains a tsunami consists of a series of ocean waves capable of spreading at speeds reaching more than 900 km/hour or more in the middle of the sea. This type of disaster is caused by several factors, including earthquakes that occur on the seabed, debris on the seabed, or volcanic eruptions at sea.

Poster media as an alternative media to improve students' preparedness in dealing with the tsunami disaster. Lakoro et al. (2021) explain that the media allows humans to be the only creatures on earth who can accumulate knowledge and pass it on to the next generation. Using poster media in geography learning is one of the studies in learning technology. Learning technology is essentially learning about learning problems. Learning problems are related to anything, especially in the learning aspect. The definition of learning technology in theory and practice is in the design, development, use, management, and evaluation of processes and resources for learning (Seels and Richey, 1994). Meanwhile, learning technology, based on Januszewski & Molenda (2008), is the study and ethical practice to facilitate learning and improve performance through creating, using, and appropriately managing technological processes and resources.

The study was conducted based on the description of the problems, and the basic foundation of learning technology is the use of learning media. Learning media, especially poster media in the geography learning process, can facilitate and improve students' performance in tsunami disaster mitigation preparedness. How significant the influence is in increasing students' mastery of material on natural disaster mitigation still needs to be tested, and further research is carried out. The research conducted is to answer the question, "Is Poster Media Effective in Improve Tsunami Disaster Mitigation Preparedness?"

2. METHODS

This study uses a quantitative descriptive method with a quasi-experimental design, but the research subjects are not chosen entirely randomly. The type used in this study was One Group Pretest-Posttest Designs, a research design that contained a pre-test before being given treatment and a post-test after being given treatment. The research population is students at a state senior high school in Pematang Sawa class X-XII for 2021/2022. The research population was 150 students starting from class X-XII. With the random sampling technique, the sample was 30 people, consisting of 15 students from XI IIS 1 and 15 students from class XI IIS 2. Data was collected through tests and documentation for three months, from October to December 2021. Then, the data was analyzed using quantitative descriptives.

3. FINDINGS AND DISCUSSION

Media posters were used to measure the extent of the impact of increasing tsunami disaster preparedness. The posters were used classically, where students could see and examine the tsunami disaster mitigation poster media.



Picture. 1. Presentation of tsunami disaster mitigation posters

When presenting the tsunami disaster mitigation poster media, students were divided into several small groups consisting of 4-5 people who acted as presenters, and the other groups listened and provided responses to what had been presented. It appeared that during the presentation activity, most of the students were interested and enthusiastic about participating in the learning activities.

Table 1. Differences in Pretest and Posttest scores

No.	Name	Experiment	
		Pre-Test	Post Test
1	AS	30	75
2	AM	40	80
3	AY	20	80
4	AZ	25	85
5	AN	40	90
6	AU	30	80
7	AI	40	85
8	DA	40	90
9	DS	45	75
10	ET	25	80
11	EW	30	85
12	ER	50	80
13	FUB	50	80
14	FK	20	75
15	FP	25	80
16	IS	35	85
17	INF	50	75
18	MY	30	75
19	MS	25	85
20	ML	30	90
21	MR	25	85
22	MRF	20	80
23	NRA	20	85
24	RZ	30	80
25	ST	40	75
26	SO	35	80
27	SY	50	75
28	SW	40	75
29	TR	50	80
30	YS	40	85

During the learning activities using poster media, the students showed an increase in the value of tsunami disaster mitigation preparedness after the participants presented the poster. The highest score before learning using poster media was 50, and the lowest was 20, while after learning using poster media, the highest was 90, and the lowest was 75.

Table 2. Differences in the Value of Disaster Mitigation Preparedness Before and After Using Poster Media

	Mean	N	Std	t	p
Pretest	34,33	30	10,063	-38,879	,000
Posttest	79,50	30	6,345		

Based on the data analysis using a paired t-test, the pre-test and post-test values of preparedness on 30 students obtained significant differences with p-value < 0.005. This shows that each student has well captured the learning materials when using poster media in the applied learning activities. Table 2 also shows the average value of students' preparedness before participating in learning activities using poster media which is 34.33. It means that it belongs to low preparedness. Meanwhile, in the post-test results, the average value of the participants' preparedness rose to 79.50, which means that they are included in the category of high preparedness.

Table 3. The Effectiveness of Using Poster Media

	Mean	Std
N Gain	69,22	6,48

Table 3 shows the effectiveness of poster media with an average value of 69.22. The average value obtained from the use of poster media is classified as quite effective. As a result, the effectiveness of using poster media is a benchmark in using poster media in learning activities as an alternative media in increasing students' tsunami disaster mitigation preparedness. In this regard, Carayannis (2014) argues that multimedia approaches can provide learning media for activities that function as an early warning system for potential disasters in the future. Such media may include photojournalism exhibitions, picture handbooks, and radio documentaries on disaster management. The use of multimedia photojournalism, picture handbooks, and radio documentaries This research uses multimedia as an alternative media in facilitating learning media that functions as an early warning system in improving tsunami disaster mitigation preparedness.

Furthermore, Weniza et al. (2017) state that as the country with the fourth highest population in the world and with a high threat of earthquakes and tsunamis, the dissemination of local information through LBS for the dissemination of early warning to coastal communities is essential. The early warning system is planned to be implemented in all tsunami-prone areas in Indonesia, consisting of the western part of Sumatra, the southern part of Java, Nusa Tenggara, the northern part of Papua, Sulawesi, Maluku, and the eastern part of Kalimantan. This study describes the relationship between coastal areas and the potential for earthquakes and tsunamis. LBS is an alternative media used to increase preparedness for natural disasters, especially earthquakes and tsunamis in coastal communities.

Moreover, Waddell (2018) argues that training activities can support an early warning system in tsunami disaster mitigation efforts. Exercises can be adjusted to the student's schedule. Exercise activities can be; orientation (seminars), table exercises, functional exercises, or full-scale exercises. A description of each exercise is provided in the handbook. This study also illustrates that training can increase students' preparedness by providing several pieces of training in the form of orientation (seminars), table exercises, functional exercises, or full-scale exercises. In this regard, Rahayu et al. (2008: 4) said the structural components include the construction and development of high-tech infrastructure to detect earthquake events and potential tsunamis to the dissemination of potential tsunami warnings to related parties, including, among others: local governments, in addition to increasing the capacity of related institutions. This study illustrates the construction and development of high-tech infrastructure are projected to improve preparedness and reduce the impact caused by earthquake and tsunami disasters.

In addition, Imamura et al. (2012) suggest the use of a high-building model as a vertical evacuation location. One of the efforts to prevent the earthquake's impact with 7.6 Mw in 2009 was chosen to be further analyzed for antiseismic deficiencies based on the ground motion design obtained from the analysis of micro-tremor and waves synthesized in Padang. This study explains that a relatively high building model that can detect ground motion obtained from micro-tremor and wave analysis can increase earthquake disaster preparedness, especially in the Padang area. Furthermore, Rezaldi & Soeprihantoro (2015) explained the results of their research that the use of 3D documentary film media is included as a reasonably effective media. Respondents have a good understanding of tsunamis. However, many people do not understand the signs of an impending tsunami and do not know the steps to take if a tsunami occurs one day. The study explains that most people know about the tsunami disaster but do not know what mitigation steps should be taken. Therefore, 3D documentary media has a reasonably effective impact in increasing tsunami disaster mitigation preparedness.

4. CONCLUSION

Based on the results and discussion, poster media is an alternative media used to improve student preparedness for the tsunami disaster. Data analysis using paired T-test scores of pre-test and post-test preparedness on 30 students found a significant difference. with p-value < 0.005. This shows that each student has well captured the use of poster media in the applied learning activities. Analyzing the data using a paired T-test, the value of the pre-test and post-test of preparedness on 30 students found a significant difference. with p-value < 0.005. This shows that each student has well captured the use of poster media in the applied learning activities. The effectiveness of using poster media got an average score of 69.22. The average value obtained from the use of poster media is quite effective. Of course, the effectiveness of using poster media is a benchmark in using poster media in learning activities as an alternative media in increasing students' tsunami disaster mitigation preparedness. As a reference for further research, poster media is a reasonably effective medium in increasing students' tsunami disaster preparedness. Therefore, there is a need for innovation in the use of poster media to improve tsunami disaster preparedness, such as the development of 3D poster media, tsunami disaster mitigation training using media posters, multimedia-based poster media, etc.

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