Implementation of METAL GEGANA for Elementary School Students on the Slopes of Mount Merapi

Untari, Mei Fita Asri[1*] Dwi Prasetiyawati Diyah, H[2] Sukamto[3] Ardiyanto, Asep[4]

[1]*Department of Elementary School Teachers Education, Faculty of Education Science, Universitas PGRI Semarang, Semarang, Indonesia*

[2]*Department of Elementary School Teachers Education, Faculty of Education Science, Universitas PGRI Semarang, Semarang, Indonesia*

[3]*Department of Elementary School Teachers Education, Faculty of Education Science, Universitas PGRI Semarang, Semarang, Indonesia*

[4]*Department of Elementary School Teachers Education, Faculty of Education Science, Universitas PGRI Semarang, Semarang, Indonesia*

[*]*Corresponding author. Email : meifitaasri@upgris.ac.id.*

ABSTRACT

Metal Gegana Media (Digital Media for Disaster Mitigation) is media on volcanic disaster materials to improve understanding of volcanic disasters and disaster mitigation movements for elementary school students on the slopes of Mount Merapi, Magelang Regency. This research answers the development of information and communication technology that can be used as a learning medium. Teachers must innovate to create interesting and fun learning media that are suitable to the needs in the field. Digital learning media for elementary school learning will greatly assist teachers in delivering material and students more easily understand the material.

This is a Research and Development (R & D). The procedure for developing instructional media uses a development model from Borg and Gall which includes 10 stages. The effectiveness of METAL GEGANA media implementation can be seen from the results of the pretest and posttest conducted in 10 (ten) elementary schools on the slopes of Mount Merapi, Magelang Regency. The data analysis method used is a comparative test (T test) to find out the difference in the average of students understanding on disaster material before and after treatment is given.

The results of this study mentions there are differences in results with different learning methods. Furthermore, the calculation is done by using a two-sample separated test or a comparative test. Based on these results, it is obtained $t_{count} > t_{table}$ is 2.206> 2.021, then H_a is accepted and H_0 is rejected, so it can be concluded that students' understanding of disaster material in the experimental class is better than the control class.

Keywords : METAL GEGANA, digital media, disaster mitigation movement, elementary school

1. INTRODUCTION

The volcano disaster will adversely affect the continuity of community activities affected by the eruption. So there needs to be an effort of understanding and awareness about disaster response attitudes. Community activities after the eruption of Mount Merapi are almost paralyzed, including the world of education. This condition if not seriously considered will have an impact on children who incidentally are the nation's next generation and determinants of the nation's destiny

going forward. One effort that can be made to sensitize children, especially elementary school students, about the dangers of Merapi is the creation of disaster mitigation learning media related to Merapi volcano. This media can be an alternative in understanding and providing knowledge about the dangers of Merapi and how the attitude of disaster response or how to overcome it when the disaster comes. This media can be used as an additional supplement in primary school learning that has relevance especially the theme of disaster.

The most needed education for children on the slopes of Mount Merapi is knowledge about the mitigation of the eruption of Mount Merapi. Disaster management as a series of activities both before and during and after a disaster occurs to prevent, reduce, avoid and recover from the impacts caused by disasters. In general, the activities carried out in disaster mitigation / management are as follows: prevention, reduction of the impact of hazards, preparedness, emergency response, recovery (rehabilitation and reconstruction) and sustainable development that reduces disaster risk (UNDP Indonesia, 2007).

Therefore, the most appropriate education is designing learning media that can provide a good understanding of disaster material, especially volcanoes. Digital learning media is a necessity because it will keep students away from the abstractness of material. This digital media for disaster mitigation is a combination of audio and visual media. According to Sanjaya (2010) audio-visual media is a medium that combines two elements, namely sound and image elements. This media has great benefits because it has two functions, namely the auditive (listening) and visual (seeing) functions. So that the development of this media is expected to make it easier to apply disaster mitigation learning for elementary school children on the slopes of Mount Merapi.

Based on field observations, it can be seen from the lack of adequate facilities and infrastructure for the continuing education of children on the slopes of Mount Merapi, especially learning media for elementary school students, especially volcanic disaster material. Even though in the midst of difficult conditions after the eruption of Mount Merapi, education for children must keep rolling in order to contribute to the intelligence of the nation's life. Elementary students on the slopes of Mount Merapi in Magelang Regency need an interesting and fun audio-based learning media that makes children enthusiastic in learning and makes a good understanding of volcanoes and disaster mitigation movements when disasters come.

Based on the background described above, the researchers conducted a research on the implementation or application of METAL GEGANA (Digital Media for Disaster Mitigation Movement) for Elementary Students at Merapi slope in Magelang Regency. This research is a follow-up to the development of METAL GEGANA which has fulfilled valid and practical criteria based on expert assessments and student and teacher responses, so the application / trial run on a broader scale is continued.

2. THEORETICAL REVIEW

2.1 Learning Media

Media is communication channel devices (Heinick, et al in Hernawan, 2008: 3). The media comes from the Latin language and is a plural form of the word medium which literally means an intermediary, that is, the source of the message with the recipient of the message (a reciever). In learning in higher education, students not only act as communicants or recipients of messages, but students can also act as communicators or messengers. So that learning is expected to occur two-way communication (two way traffic communication) and even many ways communication (multi way traffic communication). Learning communication requires the role of the media to further enhance the effectiveness of achieving goals / competencies. The learning media developed in this study are learning media created by utilizing the inventore application technology in andriod gadgets. So with this media development it is expected that students will be more motivated in the learning process.

2.2 The Benefits of Learning Media

The use of instructional media is not an additional function, but has its own function as a means of helping to create a more effective learning situation. Learning media is an integral part of the whole learning process. This implies that learning media as one component that does not stand alone but are interconnected with other components in order to create the expected learning situation. The benefits of learning media are as follows: (1) make concrete abstract concepts; (2) can present something or object that is too dangerous or difficult in the learning environment; (3) can display objects that are too large or small for example, explain aircraft, ships, temples, bacteria, viruses; (4) can show movements that are too fast or slow for example showing the trajectory of bullets or bolted arrows can use slow motion techniques in the video.

2.2.1 Metal Gegana (Media Digital Gerakan Mitigasi Bencana) (Digital Media on Disaster Mitigation Movement)

The digital media of the disaster mitigation movement is a combination of audio and visual media. So that the presence of this media is needed, especially elementary school students who think concretely. This condition is in line with what Piaget said in the theory of learning at elementary school age children are still in the concrete operational stage. According to Sanjaya (2010) audio-visual media is a media that combines two elements, namely sound and image elements. This media has great benefits because it has two functions, namely the auditive (listening) and visual (seeing) functions. This Gegana Metal Media contains movements to overcome / mitigate disasters that often appear on the slopes of Mount Merapi in the village of Srumbung, Magelang Regency, Central Java Province. This media will be used in elementary school learning which in general still does not understand the dangers of disasters that often arise on the slopes of the mountain.

The strength of this Metal Gegana is that the media is very suitable for elementary school learning in various fields of science, for example Natural Sciences, Social Sciences, Indonesian Language, and it can be used in group learning, classes and even per individual. Metal Gegana is important because children today are always spoiled with television shows that adorn their lives. So that the presence of this media is expected to help children in disaster response attitudes that often appear on the slopes of Mount Merapi, precisely in the village of Srumbung.

Metal Gegana contains videos that explain movements that children must do in the event of a volcano eruption. So by utilizing this media the elementary school children in particular can learn it and it will be useful for them when the Mount Merapi disaster comes again. Metal Gegana also contains videos about signs of disaster, during disasters and post disasters. This media is very useful in order to identify signs of disaster on the slopes of Mount Merapi so that it can find out ahead of the coming disaster. In addition to the signs of the disaster, metal Gegana also contains videos about things that must be done when a disaster comes and the things that need to be prepared after the disaster.

2.2.2 Disaster Mitigation

According to Law No. 24 of 2007 concerning disaster management, it defines a disaster is an event or a series of events that threaten and disrupt people's lives and livelihoods caused, both by natural factors and / or non-natural factors and human factors so that the results are human casualties, environmental damage, property loss, and psychological impact. So that looking at disasters is not only important in the realm of prevention, but also in action or practical action. Practical actions in disaster management cover three aspects, namely (1) mitigation and preparedness, (2) emergency response, (3) post-disaster recovery. These three aspects are inseparable parts so they must be carried out simultaneously. According to the Tarjih and Tajdid PP Muhammadiyah Assembly, disaster mitigation is an action at the pre-disaster stage whose aim is to minimize the impact caused by the disaster. Disaster mitigation includes planning and implementing actions to reduce the risks of the impact of a disaster that were carried out before the disaster occurred, including preparedness and long-term risk reduction measures. Efforts to reduce the risk of disasters can be done both through physical development and awareness and increase the ability to face the threat of disaster. Disaster mitigation is an activity that acts as a measure to reduce the impact of disasters, or efforts made to reduce casualties when a disaster occurs, both fatalities and property. In carrying out disaster mitigation measures, the initial step that must be taken is to conduct a disaster risk assessment. So it is necessary to know the danger (hazard), vulnerability, and capacity. The main objectives of disaster mitigation are to prevent loss of life, reduce human suffering, provide information to the public and authorities about disaster risks, reduce damage to key infrastructure, property and loss of economic resources.

3. RESEARCH METHOD

This research is a Research and Development (R & D) or development research. The procedure of developing instructional media uses the development model of Borg and Gall which includes 10 stages. This research was carried out with the implementation / application of METAL GEGANA for elementary students on the slopes of Merapi, Srumbung District, Magelang Regency. In this study begins with the testing of the Merapi Volcano disaster understanding test instrument followed by the introduction of METAL GEGANA, pretest, learning by using METAL GEGANA and ending by the posttest. The results of the pretest and posttest of elementary school students' understanding of disaster material on the slopes of Merapi, Srumbung District, Magelang District were then analyzed using a T test to determine differences before and after treatment. After that, an analysis was carried out using the Normalized Gain Test to find out the increase in understanding of the Mount Merapi disaster in Lereng Merapi Elementary School students. This T-test is used to determine the effectiveness of the implementation of METAL GEGANA (Digital Media for Disaster Mitigation Movement) on students' understanding of disaster material for elementary school students in Srumbung Subdistrict, Magelang District.

4. RESULT AND DISCUSSION

Based on the results of the pretest and posttest on disaster material for elementary school students on the slopes of Merapi, Magelang Regency, the data is presented in table 1 as follows

Table 1 Result of Pretest and Posttest

Information	Experiment Class		Control Class	
	Pretest	*Posttest*	*Pretest*	*Posttest*
Highest score	88	100	90	98
Lowest score	50	70	46	58
Median	67,7	87,2	64,0	80,2

Based on Table 1 above, it can be seen in the pretest results of the two classes, the highest value difference is different from the lowest value. The highest score is 88 while the lowest score is 50 in the experimental class while in the control class the highest score is 90 the lowest score is 46. The average score of the experimental class is 67.7 and the control class is 64.0. After the posttest it can be seen as shown in the table above the highest score in the experimental class is 100 and the lowest score is 70 with an average score of 87.2 while in the control class the highest score is 98 and the lowest score is 58 with an average score of 80.2. Based on the normality test, information was obtained that the value of $L_0 < L_{table}$ is 0.184 <0.190 in the experimental class, as well as the control class normally distributed because the value of $L_0 < L_{table}$ is 0.133 <0.173. After being tested with the normality test then both classes were tested with a homogeneity test, to find out the variance of the two classes of homogeneity tests. Based on the calculation, it is found that $F_{count} = 1.49$ $F_{table} = 2.04$, it can be concluded that $F_{count} < F_{table}$, the two classes are in a homogeneous state.

Based on the results of calculations for the comparative test using the T Test, we get students' understanding of disaster material in experimental class by applying the METAL GEGANA, with the control class with learning media that has been applied by the teacher. The posttest results of the experimental class students gained an average of 87.2 while in the posttest in the control class students obtained an average of 80.2. This means that there are differences in results with different learning methods. Furthermore, the calculation is done by using a two-sample separated test or a comparative test. Based on these results, it is obtained $t_{count} > t_{table}$ is 2.206> 2.021, then H_a is accepted and H_0 is rejected, so it can be concluded that students' understanding of disaster material in the experimental class is better than the control class.

It also proves that the application of METAL GEGANA is more effective compared to other learning media in providing students' understanding of disaster material for elementary students on the slopes of Merapi, Magelang Regency.

REFERENCES

[1] Bappenas. (2014). Membangun Ketangguhan Bangsa Melalui Upaya Pengurangan Resiko Bencana. Jakarta: Kementerian Perencanaan Pembangunan Nasional.

[2] *Ibrahim Bafadal*.2006. Peningkatan Profesionalisme Guru Sekolah Dasar. Jakarta : PT Bumi Aksara, *2006.*

[3] PSBM UPN & Oxfam GB. (2009). Modul Wajib Latih Penanggulangan Bencana Gunungapi. Yogyakarta: PSBM UPN "Veteran" Yogyakarta.

[4] https://news.detik.com/berita/1496723/bnpb-jumlah-korban-tewas-merapi-275-orang

[5] Santrock, J.W. 2008. *Psikologi Pendidikan Edisi Kedua*. Kencana Prenada. Jakarta