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TSUNAMI MITIGATION – ONLINE LEARNING EFFECTIVENESS BY USING OMBAK LEARNING MODEL

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ABSTRACT

Many communities in Indonesia are potentially affected by tsunamis but do not have adequate preparedness in dealing with such disasters. This study aims to improve the preparedness capacity of the people living around the coast that are potentially affected by the tsunami through tsunami mitigation learning by using OMBAK learning model. The learning is done online to avoid the transmission of covid-19. Before the online learning begins, the student community is asked to work on the tsunami mitigation pre-test. The number of people living around the coast who took part in this learning was 62 people, ranging in age from 13 to 55 years old. Furthermore, students were briefed via a zoom meeting (synchronous) about the implementation of this online learning, especially relating on how to learn tsunami mitigation by using disaster mitigation video media. In this tsunami mitigation learning process, students are allowed to learn asynchronously. We also allow students to discuss tsunami mitigation materials through the WhatApp Group (WAG) during the learning process. After completing the learning process, students were asked to work on post-test questions. Based on the results of the percentage analysis on the learning implementation, it was found that the implementation of tsunami mitigation learning by using OMBAK learning model was carried out very well. In addition, based on the analysis of t-test and gain score from pre-test and post-test data, it was obtained that there was a significant increase in the students' tsunami mitigation ability.

Keywords: *OMBAK learning model, online learning, tsunami mitigation capabilities, tsunami potential*

1. INTRODUCTION

Several areas in various parts of the country have the potential for a tsunami occurrence, but there are still many communities that are potentially affected by the tsunami that do not have the preparedness in dealing with a tsunami disaster. Therefore, learning about disaster mitigation that aims to improve their preparedness capabilities in dealing with a tsunami disaster that may come at any time is very important. Tsunami mitigation learning models that have been tested for their feasibility include the ORSAEV learning model (Madlazim et al., 2020; Madlazim, Supriyono, 2014), and the OMBAK learning model (Madlazim and Haryono, E., 2020; Sunarti, T. et al., 2018). In this study, the OMBAK learning model was used to improve community preparedness in dealing with the tsunami disaster because this learning model could be applied to online learning. This research is focused on people who live in East Java areas that are potentially affected by the tsunami; they are Trenggalek, Tulungagung, Blitar, Malang, and Pacitan Regency-Indonesia. This is based on the analysis results of the Meteorology, Climatology and Geophysics Agency (BMKG) in 2021 regarding the potential for a tsunami in East Java that the video can be accessed at the following link: http://bit.ly/VideoDaerahPotensiTsunami.

In general, disaster mitigation practices can be grouped into structural mitigation and non-structural mitigation. Structural mitigation is related to physical construction development efforts, while non-structural mitigation includes land use planning, enacting development regulations, and through education to prepare people to get used to live together with disasters, especially for environments that have already been built, so that people can feel the security and comfort in their life. (Rusilowati et al., 2012; Hariyono E. et al., 2016)). Disaster mitigation education can be done with various models or approaches in learning. Medias like posters, videos and comics are very suitable media in increasing students' understanding, especially disaster education materials. This is in accordance with Edgar Dale's theory about the cones of experience (https://en.wikipedia.org/wiki/Edgar_Dale#Cone_of_Experience). The cone of experience proposed by Edgar Dale illustrates that the learning experience can be obtained through the process of action or experiencing by us what is learned, the process of observing, and listening through certain media and the process of listening through language. This theory explains that the level of student involvement through verbal, visual, engaging and action approaches has a different effect on students' understanding and memory. The hope in the future is that the online learning will not be stopped and people are expected to have knowledge, skills, and positive attitudes in dealing with the tsunami disaster through integration in continuous learning from generation to generation so that a community with disaster education and awareness of disaster response will be created (Nugroho, A., 2019).

Learning in the 4.0 era requires more technology and information, especially in this era of the covid-19 pandemic that forces us to apply online learning. Tsunami mitigation learning cannot be carried out optimally because learning is carried out online so that some tsunami mitigation skills cannot be trained online to the maximum extent. In this study, we apply the OMBAK learning model to improve preparedness in dealing with tsunami disasters through online learning. The problem to be solved is how effective online learning on tsunami mitigation by using the OMBAK learning model is.

2. METHOD

The applied method in this research can be explained as follows. Learning is done online to avoid the transmission of covid-19. Before online learning begins, the student community is asked to work on the tsunami mitigation pre-test questions that can be accessed online at the following link https://forms.gle/8Ai4iaPMiX7eHeUWA. The number of people living around the coast who

participated in this study were 62 people ranging in age from 13 years to 55 years old. Furthermore, students were briefed via zoom meeting (synchronous) about the implementation of this online learning, especially those related to how to learn tsunami mitigation by using disaster mitigation video media. In this tsunami mitigation learning process, students are given the opportunity to learn asynchronously either independently or in groups. We also give students the opportunity to discuss tsunami mitigation materials through the WhatsApp Group (WAG) during the learning process. Students can ask questions or discuss with fellow students or with us as trainers.

In this learning process, the OMBAK learning model has been applied. Four phases in the OMBAK model learning, which are **Orientation, Understanding, Action, and Correction** (Madlazim and Hariyono, E., 2020) have been applied in this online learning. The orientation phase has been carried out synchronously by the trainer through a zoom meeting. In the understanding phase, students have been given the opportunity to learn either independently or in groups, either synchronously or asynchronously, and in a reasonable time. Students are also given tsunami mitigation video media to be studied online and can be accessed at the link: https://drive.google.com/drive/folders/14pRBXZuKAZvAp17wvELF3N0YQoy4xrpw?usp=sharing .

The action phase can be trained independently by students after watching the tsunami mitigation video. In this correction phase, participants can correct the training stages that have been carried out and recorded and then compared with the training stages available in the video. Furthermore, this correction phase is also carried out by the trainer on the video recording that has been done by the students. After completing the learning process, students are asked to work on post-test questions which can be accessed online at the following link http://bit.ly/PostMitigasiTsunami.

This learning implementation sheet was observed and assessed by two observers consisting of a learning expert and a practitioner (lecturer) who used the percentage criteria of learning implementation (PK) (Yamansari, 2010). Percentage criteria PK < 50% (not good), 50%≤*PK*<70%2 (good enough), 70%≤*PK*<85% (good), and *PK*≥85% (very good). The pretest and posttest data were then analyzed for the significance of the difference by using t-test and the increase by using a gain score (Hake, 1999). Observational data in the form of percentage criteria of learning implementation (PK) were analyzed by Yamansari criteria (2010).

3. RESULTS AND DISCUSSION

The results of this study are in the form of solutions whether online learning on tsunami disaster mitigation that applies OMBAK learning model is carried out well or not and effective or not. To answer these problems, pre-test, post-test data and observational data on the learning implementation are needed for each phase of the OMBAK learning model, from all the domain of knowledge, skills and attitudes towards tsunami mitigation preparedness. The results of the N-gain score analysis are shown in Table 1.

Table 1. Results of N-Gain Score Analysis for Attitudes, Knowledge and Skills of Tsunami Mitigation

No	Name	N-Gain Score		
		ATTITTUDE	KNOWLEDGE	SKILL
1	Respondent 1	0.38	1.00	0.67
2	Respondent 2	1.00	1.00	0.50
3	Respondent 3	0.80	0.50	0.67
4	Respondent 4	0.25	0.50	0.25

5	Respondent 5	0.50	0.60	0.67
6	Respondent 6	0.67	0.33	0.67
7	Respondent 7	0.67	0.67	0.25
8	Respondent 8	0.33	0.20	0.50
9	Respondent 9	0.22	0.67	0.67
10	Respondent 10	0.67	0.50	0.75
11	Respondent 11	0.36	0.67	0.00
12	Respondent 12	0.25	1.00	1.00
13	Respondent 13	0.67	1.00	0.67
14	Respondent 14	0.25	1.00	0.33
15	Respondent 15	0.50	1.00	0.33
16	Respondent 16	0.67	1.00	0.00
17	Respondent 17	0.75	0.50	0.67
18	Respondent 18	0.50	0.75	0.50
19	Respondent 19	0.40	0.33	0.50
20	Respondent 20	0.67	1.00	0.50
21	Respondent 21	0.50	1.00	0.33
22	Respondent 22	0.50	0.75	0.67
23	Respondent 23	0.60	1.00	0.50
24	Respondent 24	0.30	0.67	1.00
25	Respondent 25	0.67	0.75	0.60
26	Respondent 26	0.70	1.00	1.00
27	Respondent 27	0.67	1.00	0.50
28	Respondent 28	0.33	0.75	0.50
29	Respondent 29	0.67	0.75	0.67
30	Respondent 30	0.50	0.50	0.67
31	Respondent 31	0.75	0.33	0.50
32	Respondent 32	0.40	0.50	1.00
33	Respondent 33	0.43	0.67	0.60
34	Respondent 34	0.75	1.00	0.33
35	Respondent 35	0.43	1.00	0.50
36	Respondent 36	0.33	0.75	1.00
37	Respondent 37	0.30	0.50	0.67
38	Respondent 38	0.67	0.75	0.00
39	Respondent 39	0.25	1.00	1.00
40	Respondent 40	0.30	0.67	0.67
41	Respondent 41	0.20	1.00	1.00
42	Respondent 42	1.00	1.00	1.00
43	Respondent 43	0.75	0.50	0.50
44	Respondent 44	0.56	0.80	0.75
45	Respondent 45	0.30	0.25	0.33
46	Respondent 46	0.22	1.00	1.00
47	Respondent 47	0.67	0.67	0.50
48	Respondent 48	0.50	0.67	1.00
49	Respondent 49	0.33	0.75	0.75
50	Respondent 50	0.70	0.67	1.00
51	Respondent 51	0.50	0.33	0.75

52	Respondent 52	0.70	0.75	1.00
53	Respondent 53	0.75	0.67	0.25
54	Respondent 54	0.25	1.00	0.67
55	Respondent 55	0.25	0.33	0.50
56	Respondent 56	0.33	0.67	0.67
57	Respondent 57	0.67	0.33	0.50
58	Respondent 58	0.67	0.50	0.67
59	Respondent 59	0.33	0.67	1.00
60	Respondent 60	0.67	1.00	0.67
61	Respondent 61	0.42	0.67	1.00
62	Respondent 62	0.75	0.50	0.67
Total		32.08	44.27	38.97
Average		0.52	0.71	0.63
Category		MEDIUM	HIGH	MEDIUM

The ability of tsunami disaster mitigation in the attitude aspect was measured by using a tsunami disaster mitigation attitude test in the form of a questionnaire consisting of 10 attitude statements, both positive and negative statements with four answer choices adopted by using a Likert scale. The level of tsunami disaster mitigation capability in the aspect of community attitudes towards tsunami mitigation increased to the moderate category (Table 1). The increase in the attitude aspect of tsunami mitigation is the lowest compared to the increase in the aspect of knowledge, and skills because to improve this attitude aspect, it requires habituation in the practice of daily life repeatedly and continuously and also requires an example. This thing cannot be fully obtained through online learning. The results obtained from observing the implementation of online learning on tsunami mitigation are used as an indicator of the researchers' success in carrying out each phase of the OMBAK learning model. The results of the observations are shown in Table 2 below:

Table 2. Recapitulation of Learning Implementation of OMBAK Learning Model

Activities of Each Phase	Score	Criteria
Orientation (Synchronos)	89%	Very Good
Understanding (Understanding the concept/knowledge of tsunami mitigation) (Asynchronos)	87%	Very Good
Action (Asynchronos)	78%	Good
Correction (Combination of synchronos and Asynchronos)	86%	Very Good
Average	85	Very Good

The main strategy in the disaster learning process is learning by doing. Based on these considerations, the learning strategy is carried out with conceptual learning at an early stage, and then followed by practical learning, and it is hoped that the community will have a strong attitude in dealing with the tsunami disaster. Conceptual learning is carried out to provide basic knowledge about tsunami disasters. This basic knowledge of tsunami disaster includes knowledge of the potential tsunami disaster threat, vulnerability, capacity, and tsunami disaster risk. Practical learning is carried out with the aim that the community can have skills in tsunami disasters, which include

preparedness, emergency, and recovery exercises, as well as preparing disaster management plans and contingency plans both independently and in groups. The outcome of the tsunami disaster learning process followed by the community was the profile of the community with an insight into tsunami disaster risk reduction (Munadi et al., 2019). Habituation is a process of forming attitudes and behaviors that are relatively permanent and automatic through a repetitive

learning process. Attitudes or behaviors that become habits have characteristics; The behavior is relatively permanent, generally does not require a high enough thinking function, for example, to be able to say greetings, the thinking function is in the form of remembering or imitating only, not as a result of the maturity process, but as a result of experience or learning, and appears repeatedly. in response to the same stimulus (Amirulloh, Syarbini, 2012).

The learning outcomes of tsunami mitigation knowledge aspects are measured by using a tsunami disaster mitigation knowledge test in the form of multiple-choice questions consisting of 10 items. The learning outcomes of tsunami mitigation knowledge aspects experienced the highest increase in online learning by using the OMBAK learning model and based on the results of the gain score analysis as shown in Table 1, it was in a high category, but still not optimal because the control in online learning carried out by the community was very weak, so it is very possible for people who do not have high learning motivation, that they learn not optimally. For for the results of this online learning to be optimal, the instructor needs to implement a more stringent online learning control system. However, motivation is not enough, people must be able to manage time well. As a reference, people can imitate the Pomodoro technique, namely: 1. Make a list of tasks that must be done. 2. Do the task for 25 minutes. 3. Check the list of completed tasks. 4. Rest for 5 minutes. 5. Back to study for 25 minutes + 5 minutes rest. This is a Pomodoro activity. 6. After carrying out 4 Pomodoro activities, take a long break of about 30 minutes (Shinoda, K., 2020).

The learning outcomes of the tsunami mitigation skills aspect were measured by using a tsunami disaster mitigation skills test in the form of multiple-choice questions consisting of 10 items. The learning outcomes for tsunami mitigation skills in this study reached the medium improvement category. Although the increase in tsunami mitigation skills in this study did not reach the high category, in online learning this achievement was classified as effective. Piaget argues that learning interactions in the aspects of knowledge, skills and attitudes take place continuously, which are carried out by individuals with their environment, while the environment itself is constantly changing. With the change in the environment, it means that the learning function is constantly evolving. Hamalik, U. (2001) defines learning as a systematically arranged combination of humans, materials, facilities, equipment and procedures, to achieve learning objectives. Humans involved in learning include teachers, students and administration, materials in the form of books, blackboards, photos, videos and audiovisuals. Procedures include schedules and methods of delivering information including learning models, practices, exams, and so on. In this online lesson, the ability of tsunami mitigation skills can be improved through the examples provided in 4 tsunami mitigation videos. Furthermore, people imitate as in the video.

4. CONCLUSIONS

The implementation of online learning on the topic of tsunami mitigation by using the OMBAK learning model has very good criteria and can significantly increase the ability of tsunami mitigation preparedness. This learning has made students have the ability to prepare for tsunami mitigation, in the domain of knowledge, skills, and attitudes of students towards tsunami mitigation preparedness. They are also more enthusiastic and actively involved in the learning process even though it is carried out online. This can be seen from the number of questions submitted via the WA group. Based on this study results, it can be conveyed that OMBAK becomes an effective learning media of tsunami lessons for coastal communities in dealing with tsunami disasters, especially in the pandemic era.

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