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## SIMULATION METHOD AS AN INTEGRATION STRATEGY OF DISASTER EDUCATION IN PRIMARY SCHOOLS IN DISASTER PRONE AREAS

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### ABSTRACT

Implementation of disaster education integration strategy with simulation method has been applied to elementary school in Sleman Regency after eruption of Mount Merapi eruption 2010. The simulation of disaster that is implemented is simulation of eruption of Mount Merapi disaster because the school is in disaster prone area eruption of Mount Merapi. This study aims to analyze the implementation and constraints in disaster education integration strategy using the simulation method in primary schools in disaster prone areas III Sleman District. This research is a qualitative research described descriptively. Data collection using in-depth interviews, observation, and documentation. The results showed that primary schools in disaster-prone areas III of Sleman Regency have conducted disaster simulation as one of disaster education education strategy. Disaster education integration strategy using disaster simulation method implemented by school is a school initiative and cooperation with Education Department, BPBD, and NGO. Constraints in the implementation of disaster simulation that disaster simulation has not been implemented in a sustainable manner. Support from the Education Department, BPBD, NGOs and the community is urgently needed in the implementation of disaster simulation activities.

**Keywords:** Integration Strategy, Disaster Education, Elementary School, Volcano Eruption, Disaster Prone Area

### INTRODUCTION

In recent years, the incidence and impact of natural disasters have drastically increased. Schools are responsible for not only teaching disaster management knowledge but also serving as evacuation shelters. Occurrences of disasters are highly unpredictable. If a disaster happens during school hours, schools must consider the risks that students are exposed to and respond early to such an event(Wang, 2016). With volatile social, economic, and geologic environments and the real threat of typhoons, earthquakes, and nuclear disasters, the government has made a public appeal to raise awareness and reduce the impact of disasters. Disasters not only devastate property and the ecology, but also cause striking and long-lasting impacts on life and health. Thus, healthcare preparation and capabilities are critical to reducing their impact. Relevant disaster studies indicate children as a particularly vulnerable group during a disaster due to elevated risks of physical injury, infectious disease, malnutrition, and post-traumatic stress disorder. Primary school teachers are frontline educators, responders, and rehabilitators, respectively, prior to, during, and after disasters(Lai, Lei, Fang, Chen, & Chen, 2012).

Given the importance of public disaster education, efforts have been made to integrate disaster risk reduction in the school system (Adiyoso

& Kanegae, 2013), while (Alim, Kawabata, & Nakazawa, 2015) the training and drill improved the knowledge and ability of disaster preparedness. A disaster-preparedness curriculum including simulation-based training had a positive effect on residents' knowledge base and ability to respond to disaster. However, this effect had diminished after one year, indicating the need for reinforcement at regular intervals(Summerhill et al., 2008).

The level of preparedness for disasters can be increased using simulation models in conjunction with drills. With the simulation model, "what-if" analyses are performed to predict the consequences of conceivable scenarios(Maria Joseph Christie & Levary, 1998). Simulation in different ways involving low to high fidelity simulators, virtual simulation and live actors. Content and length of the programs were greatly varied but stayed focused on the general principles of disaster management and appropriate for the level of the students within the programs(Jose & Dufrene, 2014).

Despite recent natural and man-made disasters, there is no national consensus on a disaster preparedness curriculum. A national curriculum should be developed with aspects that promote knowledge retention(Jasper et al., 2013). The main intervening factors between resource promotion and school teachers' awareness of the resource are word of mouth among school teachers and teachers' proactive

lesson plan research. The strongest facilitating factor was school-wide use of the resource. Lack of awareness of the resource and the perceived need for teacher training are the greatest deterrents to use of the resource (Johnson, Ronan, Johnston, & Peace, 2014). However, within these guidelines, the focus of elementary school disaster prevention education is on disaster prevention and mitigation. Little guidance or focus has been given to disaster nursing response protocols necessary to handle issues such as post-disaster infectious diseases, chronic disease management, and psychological health and rehabilitation (Lai et al., 2012). Disaster spread simulation and rescue time analysis in resource networks are key problems in disaster prevention and relief (Hu & Sheng, 2015). Simulation is currently used to model teamwork-communication skills for disaster management and critical events, but little research or evidence exists to show that simulation improves disaster response or facilitates intersystem or interagency communication (Kaji et al., 2008).

The simulation method as one of the integration strategies of disaster education has been implemented after the eruption of Mount Merapi in 2010. Implementation of simulation in schools still faces various obstacles such as: (1) simulation has not been carried out continuously, (2) simulation activity not implemented effectively because not all school residents follow the simulation activities.

Based on the introduction that has been described above, it can formulate the problem in this research is (1) How the implementation of the simulation method as the integration strategy of disaster education, (2) What are the constraints in the implementation of the simulation method as the education education integration strategy?

## **RESEARCH METHOD**

This research is a qualitative descriptive research. Primary subjects in this study were principals, teachers, students at three schools in disaster-prone areas (KRB) III Sleman District. Secondary subjects are Local Board Disaster Agencies of Sleman Regency, Education Office, and NGO. Data collection was done by in-depth interview, observation, and documentation. The data analysis procedure in this research is (1) data reduction, (2) data presentation, and (3) conclusion. Data validity is done by triangulation of source and method triangulation.

## **RESULT AND DISCUSSION**

### **Implementation of Simulation Method as Integration Strategy of Disaster Education**

The simulation method as one of the

integration strategies of disaster education has been implemented in elementary school in KRB III of Sleman Regency after eruption of Mount Merapi in 2010. Post eruption of many disaster risk reduction program which contains disaster simulation that implemented in school. Disaster risk reduction programs are implemented by schools with the support of Education Department, BPBD, and NGOs. The objective of disaster simulation is to enable the school community to carry out the disaster emergency response procedures and to ensure that the school's citizens have good preparedness in the face of disaster. Disaster simulations have proven to be effective as a disaster education integration strategy. The same opinion was also expressed (Goto et al., 2012) that the tsunami evacuation simulation proved to be effective in disaster education and city planning and was improved by their suggestions.



Figure 1. Implementation of disaster simulation

Primary schools in KRB III have different criteria in the implementation of disaster simulation. The results showed that one school has very good criteria, one school has good criteria, and one school has less criteria. Elementary schools with very good criteria are caused by schools already having school residents who are implementing emergency response plans and are skilled at running their duties in accordance with the disaster emergency response procedures. Each school's residents have served as refugees, founders of tents, communications systems, public kitchens, first-aid teams, and victims. Schools have also run disaster simulations that are carried out independently. Self-directed simulation is carried out by the school by involving all members of the school and is conducted routinely at least once a month. In addition, school residents also participated in simulation activities organized by BPBD, Education Department, and NGOs. Simulation activities that are followed by all the citizens of the school will increase disaster preparedness and students will also

have direct experience of actions to be taken in the event of a disaster. It is in accordance with opinion (Austin, Hannafin, & Nelson, 2013) parents reported that the exercise was positive, that they would participate again, and that their children enjoyed the experience.



Figure 2. Coordination of School Disaster Preparedness Team

The good criterion in implementing the integration of disaster education with the simulation method is caused by some of the residents of the school did not follow the simulation of disaster, so it can not perform *tupoksi* in accordance with the fixed procedure of disaster emergency response. This is because schools have not been able to condition low-grade students in the implementation of the simulation. Primary schools have low-grade students who are still difficult to be directed to implement emergency response plans. Some students are still less serious and more likely to want to play than to carry out emergency response plans. There are some teachers and students who do not follow the simulation so they can not implement emergency response plans. The reason teachers do not follow the simulation so that they can not run the emergency response is due to the condition that is sick and there are also teachers who are pregnant. Some sick students are also unable to follow the simulation so they can not carry out emergency response plans.

The less criterion in the implementation of integration of disaster education with the simulation method caused by the disaster simulation is only followed by representatives of teachers and students. The simulation which was only followed by teacher and student representatives caused not all school residents to implement emergency response plans. Schools only send teacher and student representatives at the time of the simulations organized by NGOs, so only the teacher and student representatives are running emergency response plans. Representatives

of teachers and students participating in simulation activities may not be able to disseminate the knowledge gained to schoolchildren. The school community has actually implemented an emergency response plan but it was implemented prior to the eruption in 2010, so that the school community needs to carry out simulations on a regular and ongoing basis.

### **Constraints in the implementation of integration of disaster education by simulation method**

Implementation integration of disaster education by simulation method has many obstacles in its implementation. This is due to internal and external factors of the school. Internal factors are influenced by the participation of school residents in the implementation of disaster simulation, completeness of facilities and infrastructure, and disaster preparedness teams in the implementation of simulation, and the availability of permanent procedures for disaster emergency response in schools. External factors are influenced by support from other parties in the implementation of disaster simulation.

Internal factors that become obstacles in the implementation of the simulation associated with not all school residents follow the simulation. Simulation activities that are not followed by all school residents result in the skills of running a permanent disaster emergency response procedure not shared by all school residents, so that schoolchildren can not run their duties during emergency response. Facilities and infrastructure in the implementation of simulation also have an effect on creating atmosphere such as during emergency response. The lack of facilities and infrastructure resulted in the school's residents unable to maximally perform their role in accordance with the *tupoksi* in the fixed procedure of disaster emergency response. Simulations are closely related to the school's permanent disaster response emergency procedures. The school's permanent emergency response procedures should be regularly reviewed and updated so as to truly accommodate schoolchildren during the emergency response. In fact the permanent procedures held by schools have not been reviewed and updated regularly. This is caused by schools that have not been able to implement the review and renewal independently. Structures in the disaster alert team should also be considered as disaster alert teams are an important factor in the implementation of the simulation. It is in accordance with opinion (Mustapha, Mcheick, & Mellouli, 2013) the organizational structure and the policies are important elements that have to be taken into account to simulate a real emergency activity.



External factors are influenced by support from other parties such as BPBD, Education Department, and NGOs in the implementation of simulation. BPBD, Education Department, and NGOs support simulation activities implemented in schools, but support has not been implemented in a sustainable manner. Support from BPBD, Education Department, and NGOs is only carried out during disaster simulation by providing the necessary facilities and infrastructure, and coordinating the simulation implementation with several schools located in KRB III. Evaluation of simulation implementation has not been implemented BPBD, Education Department, and NGOs can also monitor the implementation of the evaluation of the simulation implementation so that schools can know the advantages and disadvantages of simulation. (Kobayashi et al., 2006) suggests that while several simulation tools are available for examination and evaluation of disaster prevention plans, they are limited to use on traditional computers and displays, and rarely used in collaborative planning sessions.

#### CONCLUSION AND SUGGESTION

The simulation method as one of the integration strategies of disaster education has been implemented in elementary school in KRB III of Sleman Regency after eruption of Mount Merapi in 2010. The three schools that are the subject of research have different criteria related to disaster simulation as disaster education integration strategy. The results showed that one school has very good criteria, one school has good criteria, and one school has less criteria. These criteria are caused by internal factors and external factors associated with the simulation method as a disaster education integration strategy.

Implementation of the simulation method as one of the integration strategies of disaster education requires support from various parties so that the school community can run the emergency response procedures according to their respective duties. Review and updating of fixed procedure documents also require support from BPBD, Education Department and NGOs so that schools have up-to-date document procedures so that schoolchildren can run their duties according to the fixed procedures already in the document. Evaluation of simulation activities is also important to be carried out by schools with support from BPBD, Dinas Pendidikan and NGOs so that schools can know the advantages and disadvantages during simulation activities.

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