The Exploration of History, Potential and Management of Earthquake in the Context of Mapping and Empowerment of Learning Community

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The Exploration of History, Potential and Management of Earthquake in the Context of Mapping and Empowerment of Learning Community

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Abstract—One of frequent natural disasters in Lampung Province is earthquake. This natural disaster often cause loss for public, both properties and life. The earthquake threat shall be worse when people are unable to deal with. The perspective of earthquake disaster from form benefit point of view can bring a new paradigm toward the disaster threat into positive. The change of perspective of the earthquake threat can be a new opportunity for people to use the nature into capitals for effective regional development. The objectives of this research were to describe history, fact, potential, and disaster management model, especially earthquake disaster in Lampung Barat district. Outputs to reach in this research were 1) scientific publication in an international reputation journal and/or in an accredited national journal; 2) a text book concerning natural disaster as a supplement for teachers and a student's book for junior and senior high school that would be published by a national reputation publisher and distributed nationally; 3) to produce another output in form of intellectual property right in the education engineering. This research used qualitative and quantitative method (mixed method approach) that combined qualitative and quantitative data collections and analyses in a single research. There were four main types of designs of the mixed method; explanatory, exploratory, embedded, and triangulation. The research result showed that the earthquake disasters occurred in Liwa in 1908, 1933, 1994, and 23 August 2018. Most of people (95%) did not understand the standard of operation procedure for natural disaster. 56% people always worried about earthquake, despite that learning about earthquake was very important. A model of learning community was developed by involving stakeholders, especially parents as the members of school committee. Parents would be a vital part in determining success of school program in building students with characters to have resilience.

Keywords—earthquake; management; learning community

I. INTRODUCTION

One of frequent natural disasters in Lampung province is earthquake. For examples an earthquake occurred in 1908 in Tanggamus, 1933 in Liwa of Lampung Barat, and then it reoccurred again in 1994. The cause is that the tectonic condition in Lampung region shows some tectonic faults from Indian Ocean plate, Australian plate, and Eurasia plate. In addition, there are some active faults in Sumatera region. The potential of having earthquake in Lampung is high enough, and this can be seen from a research result that was conducted by Machmud et al. stating that there were 11 earthquakes during 1900 to 2010 [1].

Earthquake often causes loss for people, both properties and life. Earthquake in Liwa in 1994 caused 196 life loss and 2000 people injured. There were almost 75 thousand people lost their shelters [2]. The earthquake threat shall go worse when people are unable to deal with. The perspective of earthquake disaster from benefit point of view can bring a new paradigm to the earthquake threat to be positive. The change of perspective of the earthquake threat can be a new opportunity for people to use the nature into capitals for effective regional development.

Despites of many people becoming victims, especially children, it is as if that we as a nation were not yet having a collective awareness that becomes a culture and responsive to any disaster threat. Education as the main sector in developing characters and culture of this nation is not yet managed and taking role optimally in creating "literate" people that are ready for (aware) for disaster threats. Compared to Japan that already has disaster preparedness, that recently underwent earthquake and tsunami disaster with strength a little bit above what had occurred in Aceh seven years ago, the missing and died victims were recorded only 18,000 lives [3]. This shows that Japan as a nation is powerful and responsive in dealing with natural disasters. Based on this background, and development model for learning community for disaster mitigation needs to develop.

Disaster events are always associated with events that damage the environment and people. In Indonesia, the Law Number 24 in 2007 is very clear to define a disaster as a disturbing event, causing loss and even the loss of life. Unconsciously, we might forget what the disaster is. Disaster can change the environment conditions. These environment condition changes are often

This was a mixed of qualitative and quantitative method research (mixed method approach) that combined qualitative and quantitative data collections and analyses in a single research. There are four main design types of mixed method; *exploratory*, *embedded* and *triangulation* [4,5].

The mixed model to use in this research was sequential mixed. There are many approaches in collecting data, analyses, and inferences through sequential phases [5]. In the initial stage, this research uses qualitative-quantitative sequential. For the interest of data triangulation, as an effort to improve

"significance" of data interpretation, the qualitative phase is used in the end of this research.

The representation of sequential diagram is written as: Qual→ QUAN →Qual. The lowercase letter "Qual" shows that qualitative phase is only used to facilitate quantitative phase, and therefore the quantitative phase shall have bigger interest that qualitative phase. And so this is writes as "QUAN: with capital letters [6]. In sequential mixed, data analysis can be started before all of research data can be collected [7]. The following scheme below represents the research design to use that is adapted from Creswell & Clark [8].
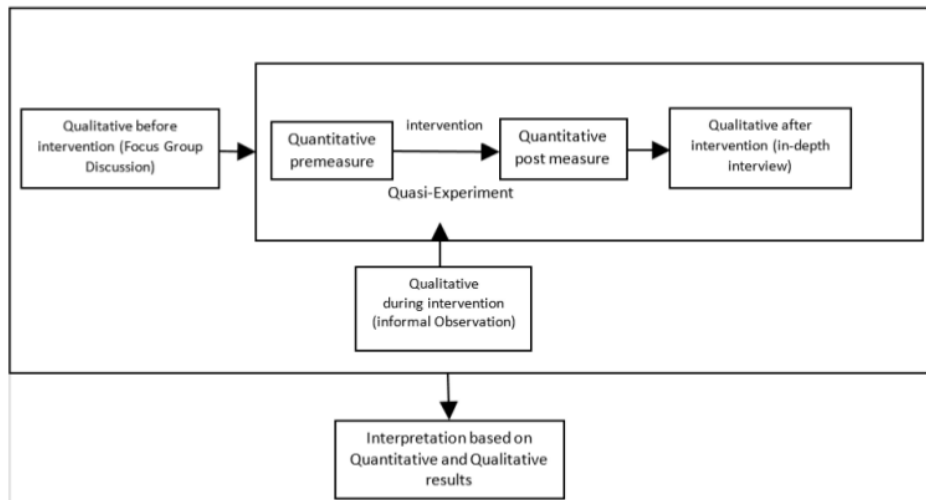

Fig. 1. Sequential mixed method design [8].

Subjects in this research were traditional figures, public figures, teachers, and students in Liwa and surrounding, in Lampung Barat district. Instruments to collect data were questionnaires, guide for interview, and observational sheet.

II. METHOD

This research used qualitative and quantitative method (mixed method approach) that combined qualitative and quantitative data collections and analyses in a single research. There were four main types of designs of the mixed method; explanatory, exploratory, embedded, and triangulation.

III. RESULT AND DISCUSSION

Earthquake disasters occurred in Liwa in 1908, 1933, 1994, and 23 August 2018. Most people (95%) did not understand the standard of operational procedure (SOP) for disaster. 56% people always worried about earthquake, despite that learning about earthquake was very important.

A model of learning community was developed by involving stakeholders, especially parents as the members of school committee. Parents would be a vital part in determining success of school program in building students with characters to have resilience. The main focus of this research was to build

and cultivate resilience value against the bad impacts of natural disaster through development of mitigation and recovery from natural disaster curriculum that involved public in the learning community system.

Some studies in the region showed that natural disaster caused psychological impacts to public suffering it, both adults and children. Many findings showed that children as victims of natural disaster experienced post traumatic syndrome (PTSD) and depression after experiencing the natural disaster [9,10]. In addition, they also experienced maladaptive coping, anxiety, grief, with the same intensity or even more than adults [10].

Furthermore, Elangovan and Kasi stated that the psychological impacts should be bigger at younger children, because they had difficulties with time coping, danger awareness, making decision on something, especially when they experienced an event providing a big stress effect such as natural disaster [11]. Latif et. al., categorized three forms of PTSD often occurred in children of natural disaster victims. They were affective, behavior, and cognitive [12].

The psychological impacts to people of natural disaster victims were influenced by the event they experienced and stress during recovery [10], who studied about things the children and adults needed after the natural disaster, found that children had abilities of being aware and dealing with

challenges after the natural disaster event, that contributed to decision makings that were important in their life. They made life adaptation to feel again the security and stabilities of physical, emotional, psychological, and social by using their surrounding environment and social connection that were familiar with them.

Researches in the past showed that there were some factors that could help children passing the psychological recovery after natural disaster event as follows:

- Parents, teachers, service providers [13-15].

- Colleagues [16].

- Places, especially that provided stabilities, adult and colleagues supports, and supervising [17-19].

- Activities such as drawing, writing, photography and other creative activities [20], and physical exercise [21].

There were many studies conducted to map characters according to resilient character. Based on these characters, the researchers made indicators that were able to show resilience inside an individual. For example, a resilience scale that was developed by Kobasa [22], feature framework by Rutter [23], items for resilience assessments by Lyons [24], and Connor-Davidson Resilience Scale or CD-RISC by Connor and Davidson [25].

From the discussion results in the Forum Discussion Group in the research location, we found some characteristics of owned by children of natural disaster victims who still lived in the disaster site. Amongst of them was anxiety that might rise when they were recalling the disaster event the experienced. However, many children also showed no more anxieties with the event, and this indicated resilience character had arisen from inside them. Based on studies of researchers in the past, we mapped resilience indicators that arose in children ever experienced natural disaster before as follows:

- Engaging supports of others; the ability of a child to involve supports from other people, where the existence of this support would reduce stress they experienced after experiencing natural disaster.

- Self-efficacy; self-confidence that the child has to response situation that was supposed to be dangerous for him and other persons based on his knowledge and experience. Self-efficacy was closely related to the child cognitive development [23], that correlated to his behavior in learning, self-esteem that the child had, and orientation of task and work strategy for the child.

Every person living in a disaster prone area should have some preparations as prevention efforts as well as resilience to deal with any natural disaster that might occur anytime. When the natural disaster occurred, the emergencies shall take place in many forms, and these require different actions to deal with and to keep the individual safe. Preventions before the disaster coming are not only done by adults, abut also children, to improve rescue efforts. Every prevention before the disaster coming are closely related to one important variable called as *disaster preparedness*. Disaster preparedness have been

recognized as the main element in reducing disaster effects in all over the world [26].

Disaster preparedness is a process to ensure that an individual (1) has obeyed prevention steps; (2) is ready to bear the estimated impacts of disaster event to minimize life loss, injuries, and property damages; (3) is able to provide salvation, helps, rehabilitations, and other services after the natural disaster; and (4) has abilities and resources to survive his/her basic functions without being burdened by requests that may asked to him/her. Based on this definitions, it can be concluded that the disaster preparedness is related to attitude and understanding concerning preparedness in dealing with disasters. Disaster preparedness is an important public education strategy, that delivers information about dangers, risks, and actions to public [27].

Disaster preparedness becomes an important variable in this research to see how influential the treatment we provide to students concerning the disaster mitigation shall be seen on how students are able to make preparations before disaster is coming. Indicators becoming focus of research in the disaster preparedness variable are values and attitude, methodology, individual skill, knowledge, and decision making. Some indicators were adapted from Scientific Literacy and Natural Disaster Preparedness by Lucille Gregario [28] and were adjusted to finding results concerning the students' attitudes that were categorized as less or weak in dealing with natural disaster that was obtained in the first and second year of the research.

IV. CONCLUSION

Instrument of student's resilience in the disaster prone area consists of 7 indicators: engaging the support of others, self-efficacy, strengthening effect of stress, realistic sense of control/having choices, adaptability to change, optimism, and faith. Instrument of student's preparedness in the disaster prone area consists of 5 indicators: values and attitude, methodology, individual skill, knowledge, decision making.

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