A TRANSFORMATIVE EDUCATION MODEL FOR DISASTER-RESILIENT CHILD

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Abstract

Purpose of study: An objective of disaster-safety education unit program in Indonesia is to empower students (schoolchildren) in dealing with disaster. This research aimed to describe the transformative learning process about disaster mitigation to students and to analyze the changing process and the learning achievement.

Methodology: The research method chosen was Participatory Action Research (PAR)'s approach putting school children as the subject of research. The research took place in Kampong Sewu and Semanggi Solo that was always exposed to flood disaster during rainy season. Paulo Freire's Transformative Learning Theory was used to analyze the result of analysis with children's knowledge production (cognitive), critical reflection (affective), and action plan (psychomotor) approaches.

Finding of study: The findings of research were as follows. Firstly, knowledge production approach was accomplished through exploring the children's knowledge on a variety of disaster vulnerabilities in village and school environment s through illustrative picture. Secondly, critical reflection approach was carried out through identifying types of disaster and effect resulting through traditional game and docudrama. Thirdly, action plan approach was conducted by mapping evacuation map, meeting point, and disaster overcoming strategy with disaster simulation technique, and utilizing school and village resources.

Applications of study:These three approaches in transformative learning process concerning disaster mitigation were expected to improve capacity and to reduce the students' vulnerability, thereby realizing the students' powerfulness in dealing with disaster.

Novelty/Originality: The novelty of research was that it built school children's powerfulness integrated into commonness and local wisdom values of Kampong Sewu and Semanggi.

Keywords:*Transformative Learning, Disaster Resilient Child, Vulnerability, Children's Capacity and Powerfulness*

INTRODUCTION

Asian area has highest disaster rate including natural and man-made disasters (Stromberg, 2007). In 2011, Asian area experienced 137 natural disaster incidences or 45 percent of total disasters in the world and at the same time contributed 85% of total disaster victims (Guha, 2013). Recalling that Asia has about 60 percents of world populations (United ,2011), disaster problem is a serious one, including the one occurring in Indonesia. National Agency for Overcoming Disaster's Data (2017) shows that the number of disaster incidences in Indonesia increases almost threefold in the last 15 years (2002-2016). More than 90% of disaster incidences in Indonesia were due to flood and landslide, by which more than 28 millions people were affected during 2012-2016 (Amri, 2017).

Sociologically, man-made disaster instead results in more victims compared with the natural one does (Wisner, 2003). The explanation of natural factor becomes dominant in triggering disaster incidence, for example, geotectonic, climate, and other biological factor (Dilley, 2006; Yasuhara, 2012; Tobin, 1997). Such factor social as conflict, poverty and inequality often result in disaster vulnerability, including the product of social, political, and economic environment resulting in disaster problem complexity. Asia, including Indonesia, has a complex disaster problem exacerbated with the effect of climate change (Prevention, 2014; Guha, 2013).

A variety of disasters has different "triggers" coming from human activity and behavior either directly or indirectly. Those two triggers are due to interaction three between overlapping systems: human social and cultural systems, built environment, and natural environment where they live (Youngman, 2009). All of disaster effects are related directly to how and where people govern themselves. Disaster vulnerability increases in Indonesia, particularly due to coastal area development, population growth, industrialization, and urbanization.

Sociologists distinguish many types of vulnerability, particularly physical (e.g. living near likely damaged dam or embankment or in the hill slope vulnerable to landslide) and social vulnerabilities. Social vulnerability is a condition stemming from social inequality, affecting the disaster victims' ability of securing their life, surviving, and or "reawakening" from disaster, including race, class, sex, age, disability, health status, and etc. Physical and social vulnerabilities are often intertwined complexly at individual, household, or society level. Climate change and its effect in Asia, particularly Indonesia, are the good example of how physical and social vulnerabilities can be connected to each other, and how man action and natural disaster are related complexly (Islam and Lim, 2015). Departing from that vulnerable situation, disaster handling and overcoming strategy and policy should be formulated.

Indonesia has 497,576 schools or 75% of total school distributed in 34 provinces located in vulnerable-to-disaster area or having physical vulnerability. Mount Sinabung explosion, Aceh Tsunami, and Jogja Earthquake disasters led to the damaged school buildings thereby harming the teaching-learning process at school. Meanwhile, it took time to reconstruct schools, so that students should learn in emergency places. When the natural disaster occurs at school hour, school citizens including students and teachers will be the victims due to non-standardized building condition. Considering the fact, Ministry of National Education arranged a Disaster-Safety Education Unit Program (*SatuanPendidikanAmanBencana*, thereafter called SPAB)(Amri,2017).

SPAB program is aimed at realizing a disaster resilience education thereby requiring a child-centered comprehensive attempt. This attempt is accomplished by means of understanding that children have specific needs in dealing with disaster hazard, so that they should be invited to participate actively according to their capacity and interest. The attempt of realizing the disaster resilience school is accomplished through three pillars: safe school facility, disaster management at school, and disaster risk education, prevention, and reduction (Amri, 2017). Children become a group vulnerable to be exposed with disaster due to either their weak physical factor or limited knowledge on disaster. As such, the attempt of empowering children in order to have disaster resilience is very desirable.

Surakarta is an area vulnerable to annual flood disaster. Considering the mapping made by Local Agency for Disaster Management (*BadanPenanggulanganBencana Daerah*, thereafter calledBPBD) of Surakarta, there are 25 out of 51 Kelurahans (villages) in Surakarta City belonging to flood-vulnerable areas. Those flood-vulnerable Kelurahans (Village) distributed in Bengawan Solo River, Pepe River, Anyar River, Jenes River, and Premulung River watersheds (S_zunariyah,2017). BPBD still needs accurate data related to population, evacuation path orientation, refuge location, public kitchen location, and medical management location. As a part of response to disaster management, Indonesian Red Cross (*PalangMerah Indonesia*, thereafter called PMI) establishes Community-Based Disaster Risk Management (*SiagaBencanaBerbasisMasyarakat*, thereafter called SIBAT) located in KelurahansSewu, Sangkrah and Semanggi areas. Meanwhile, BPBD launched Disaster Resilience Village on March 2018 as the response to flood disaster befalling most Surakarta areas. Nevertheless, the two communities have not put children on important position in the programs formulated. Therefore, Disaster-Safety Education Unit (SPAB) should be integrated into disaster management and overcoming community established. An approach used is through disaster education, prevention, and risk reduction using transformative learning model about disaster mitigation for students.

LITERATURE REVIEW

Transformative learning originates from Paulo Freire's critical education paradigm not agreeing with the positivism of science considering that science is something positive, constant, and exact (Freire, 1986; Freire_Shor, 1986). Transformative learning is conducted widely to survive and to adapt to disaster and other environmental change. In this context, learning is conceived as an attempt of changing knowledge, believe, behavior, and attitude. Transformative learning leads to the change of individual's reference framework, can be identified as a set of concepts, values, feelings, and responses to condition and a product of experience all at once that can fine an individual's life. Individual reference framework consists of cognitive construct supporting the fundamental change of values, attitude, and behavior important in developing life strategy amid the threat of disaster and other environmental change (Sharpe,2016).

The effect of transformative learning is an individual's ability of reflecting any challenge and problem encountered. Learning outcome can be seen from the change of individuals' values and behavior related to learning experience, what he/she has learnt and how to reinforce it. Transformative learning enables the students to question their assumption today and previously as to which one has potency to change as the product of experience. So, the outcome of transformative learning is to build individual's freedom, autonomy, and responsibility to the ability of moving from critical study on experience to the real action (Armitage , 2008; Meziraw ,2009).

Paulo Freire in his book entitled Pedagogy of the oppressed (Freire,1986) mentions that in transformative learning approach the learning participants have active ability of planning unilaterally, choosing material considered as useful, thinking the best way to write, to analyze, and to conclude, and benefiting from the learning, so that a critical room is established about economic, political, ideological, gender, environment, and human right structures. Transformative learning process is put onto social change system framework and functions to be an independent process for social transformation.

Departing from that assumption, this research aims to describe the transformative learning practice conducted by students in the attempt of reducing and preventing disaster risk. Transformative learning is conducted to enable the students to produce knowledge on disaster flood, to reflect the experience of those affected with flood disaster, to change their value and behavior to disaster in order to be disaster-resilient children. Thus, the attempt of reaching cognitive, affective, and psychomotor aspects can be realized.

METHODOLOGY

This research was taken place in Elementary Schools located in KelurahansSewu and Semanggi areas, Surakarta, having SIBAT community so that SPAB program can be integrated. Participatory Action Research (PAR) approach was chosen as it can put human beings to be a main factor in the study on disaster, because PAR consists of investigation, action, and reflection (Kemmis,2005). PAR model was based on sociological conception that disaster has roots and is constructed

socially (Wisner,2003). It can be explained in two steps: firstly, vulnerability is constructed through a series of social decisions taking into account the access to power and resource, proximity to hazard, built environment, political decision, and social relation; and secondly, its process is screened through cultural network and others that in turn defines how people perceive and respond to the event affecting them (Islam, 2015).

In this model, hazard is viewed as "triggering" event only, interacting with the vulnerability of hazard-vulnerable areas to create disaster. In PAR model, the development of vulnerability consists of three components: cause, dynamic pressure, and unsafe condition. The cause is inculcated historically and structurally into society with limited access to power, structure, resource, and ideology of political and economic systems. It creates some dynamic pressures within society; in the same way, dynamic pressure plays an important part in producing unsafe condition – the mixed product is vulnerability. Vulnerability should be taken into account in applied disaster practices to release the vulnerable people from dynamic pressure. Thus, practitioners applying it can identify variables leading to the increased vulnerability, and as a result develop variables that can reduce vulnerability (Asgary,2011).

This action research was conducted in three steps: knowledge production by children concerning potential disaster and analysis on disaster vulnerability likely occurring surrounding them, using illustrative picture technique. The next step is critical reflection on types of disaster and effect resulting from either natural or man-made disaster using docudrama technique in which each of children would play certain role in a drama about disaster. The last step was to arrange an action plan based on the result obtained in knowledge production. Action plan was accomplished by means of arranging evacuation map, meeting point development utilizing the existing resource, and practicing its use through disaster simulation. Those three steps were taken to build the students' powerfulness in dealing with disaster.

DISCUSSION/ANALYSIS

Children empowerment in disaster mitigation is a preliminary step in building a disaster-conscious community. One of its examples is disaster mitigation in the scheme of Disaster-Safety Education Unit (SPAB). Mitigation is a series of attempts taken to reduce disaster risk (earthquake, tsunami, flood, and other natural disaster) in the form of either physical infrastructure construction or growing the consciousness of and improving the ability of dealing with disaster (RekompakJRF). Coburn et al.stated that "mitigation is defined as taking some actions (measures) in order to reduce the effect of a hazard before the hazard occurs". The activities in pre-disaster stage s closely related to term *disaster mitigation*, constituting the attempt of minimizing the effect resulting from disaster (Coburn, 1994).

Disaster mitigation involves action planning and implementation to reduce the effect risk of a disaster conducted before the disaster occurs, including preparedness and long term measures to reduce risk, action to be done to reduce the risk of disaster. Thus, when the disaster occurs, the effect resulting can be minimized. Those actions include, among others: (1) reengineering and construction actions, involving the actions producing stronger construction structure more resistant to earthquake disaster and those creating a structure functioning to be safeguard against earthquake disaster; (2) institutional actions and disaster mitigation management also require certain procedural action and organization. Significant reduction achieved in potential disaster takes a long time.

Effective disaster mitigation should have three main elements: hazard assessment, warning, and preparedness (Coburn,1994) as explained below. (1) Hazard assessment is required to identify the threatened population and asset, and the level of threat against disaster hazard. This assessment needs knowledge on the characteristics of disaster source in the past. (2) Warning is required to warn all people or community members about the threatening disaster (such as tsunami due to earthquake, volcanic mudflow due to volcanic explosion, and etc. (3) Preparedness, the activity in this category I s dependent on previous mitigation elements (hazard assessment and warning), requiring knowledge on the areas likely affected by disaster and on warning system to find out when evacuation should be done and when they should go home after the situation has been safe.

Disaster mitigation learning conducted currently still uses traditional learning method focusing on theory and knowledge. Learning model encounters two important challenges: the ability of motivating students to express their experience with disaster. Learning model plays a key role in improving the students' interest and participation (Fujiwara, 2012). Without experiencing the disaster simulation condition actually, students can make assessment only based on theory and conceptual knowledge when dealing with disaster (Lave, 1991; Wenger, 1998).

Many studies showed that students receiving experience-based learning model are more motivated significantly (Appelman,2005;Crawford, 1984; Gee, 2003; Prensky, 2003; Salen, 2004). Using Learning media in the form of game, children can conceive disaster mitigation through learning while playing. The experience with simulation game can be used to practice the children's motor development and to improve their conception and respond in the attempt of reducing disaster risk.

This disaster mitigation using transformative learning was conducted in 10-11 year Elementary School students. This transformative learning model about disaster mitigation was divided into three stages and explained three aspects all at once. In knowledge production (cognitive) stage, this learning model emphasized on students' ability of producing their knowledge on disaster they have ever experienced through illustrative picture technique. In this stage, each of students will make drawing (picture) based on the disaster experience they have ever encountered. In addition, children could also identify and map asset and object potentially affected with hazard. Each of children would have varying experience stories

about disaster and varying hazard assessment on asset and object existing surrounding. Experience-based learning is the learning method putting the students in the past imagination. In the experience, students were asked to answer and to find out how everything can run without teachers' help and guide. To get solution themselves, students unconsciously work harder along the process, so that they learned to think independently in disaster situation (Kebritchi, 2008).

The attempt of producing students' knowledge on hazard assessment was taken by growing awareness of and sense of belonging to asset and resource existing surrounding. Knowledge underlies the establishment of belief and belief underlies the consideration to determine attitude. Knowledge production is a phase in which an individual's knowledge authority is not higher than others. Knowledge on disaster is dominated by government so far, through a series of rules and policies, so that disaster in children's perspective obtains inadequate attention. Similarly, children's ability of identifying hazard and new knowledge becomes a part of social process for the children to be familiar with their surrounding environment. It will highly support the children's process in designing their need and interest related to the disaster risk prevention and reduction program.

Knowledge production was conducted interactively and dialogically between students and facilitators, the process in which facilitator should listen to many children's experience with and knowledge on disaster. In education context, dialog process becomes an important part of emancipatory knowledge model. Dialogic learning model can produce non-one-dimensional knowledge, just like positivism knowledge (Freire,1986). Emancipatory knowledge model builds on dialectic relation aiming to criticize knowledge and to explain ideological interest behind social reality form and, then to contribute to create the form of reality based on democracy and justice principles. Emancipatory knowledge aims to deal with mechanistic perspective of technical knowledge and to realize self-reflection in order to generate reformation. This process builds on critique and action, and meaning contained, as the part of historical process in criticizing social reality and taking action to change it. Learning process is designed to improve critical awareness and personal freedom needed to create individual self; it is how to make the students powerful.

Paulo Freire firmly shows that the knowledge production process should be conducted dialectically and related to knowledge reception process. The separation of knowledge from its creation process results in a learning process that removes important points necessary to develop inside students such as critical reflection, curiosity, dialog, and so on (Freire_Shor, 1986). Otherwise, learning process not conducted dialectically will make the critical subjectivity infertile, because it makes the students oriented to legitimating and to reinforcing the existing knowledge and social system without providing critical vision the need to articulate their voice and to create their future history (Gintis, 1972).

In critical reflection (affective) stage, learning about disaster mitigation is conducted using traditional game and docudrama. Traditional game chosen was *GobakSodor* game giving the students an understanding on the importance of maintaining solidarity and cooperation between the members of community during disaster incidence. Solidarity and cooperation becomes an element composing social capital of community in managing and reducing disaster risk. As such, people can be powerful and independent. Meanwhile, docudrama is an instrument in affective domain to practice and to simulate disaster management and prevention. Students will feel as if dealing with disaster through role and responsibility distribution technique. As such, the awareness of taking initiative during disaster exposition can be practiced so that risk and effect of disaster can be mitigated.

In this action plan preparation stage, it can be found the importance of inculcating understanding on rescuing measure during the disaster incidence. The understanding is effective to be done and understandable to students. Moreover, it is accomplished by utilizing the resources existing surrounding and related directly to their life. Waste previously becoming the problem is then changed into resource that can help the rescuing system during disaster incidence.

Learning about disaster warning will give the students an experience with taking necessary action (measures) when the disaster occurs, for example, when earthquake occurs, they will take table as refuge or protect their head with certain object. In addition, warning process with this disaster simulation method enables the students to practice disaster risk prevention and reduction measures in order to minimize the number of victim. This stage is responded to very enthusiastically by the students as it is conducted with game and fun. Thus, the understanding and knowledge can be absorbed easily.

Action plan (psychomotor) approach was accomplished through organizing evacuation path map in school and developing meeting point by utilizing resources owned including waste and unused object. It is very effective to do recalling that their schools do not have evacuation path map and meeting point becoming the important instrument during disaster incidence. Based on children's knowledge product and previous hazard assessment, children are equipped with a skill of developing evacuation path map and meeting point using *ecobridge* method. By designing the need for supporting infrastructure during disaster incidence, students can practice the use of infrastructure through disaster simulation activity.

Action plan approach in disaster management will be determined by an ability of identifying types of hazard and potential threat existing. This stage is the culmination of the process of transforming cognitive and affective knowledge into real action to reduce disaster risk. All process was conducted by and for students, in which the change becomes the objective to be achieved. The process of building dialog and interaction between students becomes a part of being together and becoming, constituting the precondition for transformation. It becomes a new and innovative learning process because conventional learning system uses monolog technique with teachers being the learning source. As such, students can also

be learning source and subject of the process of transforming existing knowledge. Transformative learning can connect cognitive, affective, and psychomotor domains among students. Transformative learning can create a space for the students to be the subject and center of all disaster prevention and reduction attempt. Students can build self-confidence through knowledge production. Thus, the learning process will run more completely and social change will occur, thereby producing children who can deal with disaster resiliently.

CONCLUSION

Child-based disaster mitigation is very desirable because children are vulnerable physically and have needs different from other community groups'. Giving preliminary knowledge to students is the precondition for the implementation of disaster mitigation learning. The attempt of building critical awareness among children group is taken through transformative learning model to change the children into those dealing with disaster resiliently. Transformative learning is conducted in 3 domains: cognitive, affective, and psychomotor, each of which involves knowledge production, critical reflection, and action plan stages.

In this knowledge production, each of children can identify the type of potential disaster vulnerabilities existing surrounding, including physical and social vulnerabilities. This stage can produce varying knowledge on disaster from many perspectives. In addition, the identification of physical and social capacity can be done as a part of an attempt of organizing action plan. Critical reflection can produce ability and awareness of awakening and alertness during disaster incidence. This stage can grow critical attitude to reduce the effect of disaster. Furthermore, in action plan stage, the children's ability of organizing action plan in the form of evacuation path map and meeting point can develop by utilizing resources they have particularly, used object or waste.

Using the existing resources, children can be able to build their self-confidence and independency without dependency on others. Independency and self-confidence are reinforced with the practice of dealing with disaster through simulation held. Through those three stages, the knowledge can give the students a capital to determine the action they can take during disaster incidence. Dialogical and interactive process enables the students not only to have knowledge but also to be able to change the disaster reality. Production and establishment processes run concomitantly so that students can think reflectively, create curiosity, and learn to build equal and egalitarian dialog. Thus, it becomes the space for reinforcing knowledge and social system existing with the ability of designing action as the response to hazard threat due to disaster existing surrounding us.

LIMITATION AND STUDY FORWARD

This study only look at twoKampong and School in Indonesia, but in the fact there are many Kampong and School that always exposed to flood. Therefore it, it cannot be used to generalize the experience of Kampong and School in other area. Comparing for many more Kampong and School for further study will enrich understanding of disaster resilient child in Indonesia as well as other country.

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