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### **THE REVIEW OF DISASTER PREPAREDNESS SCHOOL PROGRAM IN INDONESIA ELEMENTARY AND HIGH SCHOOL**

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#### **Abstract**

Schools are an essential avenue for youth to learn about disaster resilience. A critical success factor for the uptake of disaster resilience learning in schools is the ability to embed learning activities in school programs that are linked to relevant curriculums. The introduction of Disaster Preparedness School (DPS) hoped students were able to identify disaster resilience learning and face the disaster occurring. In 2009, the government started developing a pilot project by combining the curriculum disaster education to the curriculum of Disaster Preparedness School (DPS). The purpose of this study was to analyze the cause of inhibition and make a strategy to solve the problem. This study used a literature review approach and source of data search from the literature that obtains via the internet in the form of results of an online library of local, national, and international, and also from books and related regulations. The results of this study are: a) The cause of inhibitions included four indicators like program target inexact, program of socialization less strength, program goal less power, monitoring program less document incomplete; b) The strategy to the development program of DPS would be successful under following conditions: 1) insertion curriculum of disaster mitigation education into several subjects, and into extracurricular activities that exist in schools. 2) conducting DPS Program by proper training that has been done by the ways: right participant, the subject that relates to a local disaster, functional modules, good time setting, monitoring equipment, done routinely and systematically, and also involving the whole stakeholder.

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## INTRODUCTION

Indonesia can be categorized as a vulnerable country for its high frequency of disaster (Sutopo, 2018). Because Indonesia located in a ring fire of three plates that are meeting points, Indo-Australia plate, Eurasia plate, and Pacific plate. Indo-Australia plate moves to the north direction and infiltrates the Eurasia plate, while the Pacific plate moves to the west direction. The caution of tsunami more than 90 % result of earthquakes from the sea, and only 9% from the eruption and also 1% from landslides. So from this situation, Thus, disaster management in terms of facing natural disasters is highly needed in the unpredicted situation effectively.

The biggest earthquake, on December 26, 2004, in Aceh and North Sumatera-Indonesia and followed by a tsunami, approximately affected more than 166.080 fatalities, 6.245 loss, and 2.507 injured (Media Center Lembaga Informasi Nasional NU Online, 2005). The earthquake at sea, on the September 28, 2018, that result of tsunami in Palu and Donggala Center of Sulawesi province 2,113 fatalities, 2.010 loss, and 4.612 injured as well as the collapse of over 6.632 buildings and more than 3 billion US dollars economics loss (BMKG, 2018). Recently, the eruption of Krakatau Volcano occurred on December 22, 2018, at the area of the coast of Sunda Strait of Banten-Indonesia, the result of the tsunami was, 437 fatalities, 1.495 injured, as well as 159 loss (Sutopo, 2018). Besides these three big events of the tsunami, Indonesia has faced 11.274 disasters that result in 193.240 fatalities and also loss Rp. 420.000.000.000 in the period 2015-2019 (BNPB, 2014).

Government, national and international institutions, and non-government organizations (NGOs) have given social education so that the community is more aware and better to manage the disaster. Children and youth are included in the vulnerable group of disasters, so the government introduces disaster education by trying to enter the school curriculum.

Ronan and Johnston (Ronan & Johnston, 2005) stress the importance of school disaster education and the youth-school-family network in building community resilience to disasters. These findings support the purposes of education is a conscious and well-planned effort to shape the character students through the planting of knowledge and skills (Law No. 20, 2003) about the National Education System. And also It can introduce at the curriculum of elementary and high school hoped to make more aware of disasters and skills in dealing with natural disasters (BNPB & Mendikbud, 2019).

Based on Law No. 24 of 2007 (Law No. 24, 2007), in 2009, government, in this case, the Center of Curriculum Development of Ministry of Education has developed disaster curriculum for elementary school, junior high school, and senior high school. It had launched a teaching module to reduce disaster risk by types of disasters, like, earthquakes, tsunami, fire, landslide, and flood. At the same time, the Indonesian Scientist Institution (ICI) collaborated with UNESCO developed Disaster Preparedness School (SSB) that has experienced success in several places. Circular Letter of Ministry of National Education No. 70a/MPN/SE/2010 (Circular Letter of Ministry of National Education No. 70a/MPN/SE/2010, 2010) about Disaster Mainstreaming at School. First Program of SSB of Ministry of National Education has been done in Aceh that supported by ICI, UNESCO, and TDMR

DPS contains structure like school building, and no structure like improving knowledge, expertise, module, early warning, emergency planning, empowering school resources. A pilot project conducted in Aceh by making Tsunami Disaster Management Research Centre (TDMRC) (2011) supported by Disaster Risk Reduction on Development (DRR-A), fund by the United Nations Development Programme and Government of Indonesia (UNDP). TDMRC project makes it training

to teachers and students that separated from the time of school lessons. But on the fact, the knowledge of disaster risk reduction does not include educational curriculum yet in Indonesia (Ministry of Education and Culture, 2014). Even though there are 113 countries on the world that have applied disaster mitigation education by in elementary and high school, likes on Bangladesh, Iran, India, Mongolia, Filipina, Turkey, dan Tonga (UNCRD, 2009).

According to the Rule of Education and Culture Ministry No. 62 of 2014 (Ministry of Education and Culture, 2014), disaster mitigation education is an essential requirement that students need to reduce the impact of natural disasters both now and in the future. Disaster mitigation education can be inserted into several subjects. Besides, disaster education is also into extracurricular activities that exist in schools. So with these strategies can have a positive impact on the development of ready-made characters of students. But, currently, disaster education matter is still little studied in schools in Indonesia. Although students have been taught some ways to cope with natural disasters, they are still lacking (Rizaldy, 2018).

This condition confirmed by Perwira (Yanuardi., 2015) showed several factors that inhibit the effectiveness of the programs were time limitations in the socialization process so that the level of understanding previous of teachers and students about the disaster risk reduction and disaster management were less, and the lack of supporting facilities for creating secure conditions in the elementary school Bangunrejo 1 and 2, Yogyakarta. Findings of Prasetya (Prasetya, I, 2018), showed that teachers in State Vocational High School of 1, Seyegan got inhibitions about how to make learning design, how to make a student more active, and how to make assessment indicators. Finally, Rizaldy (Rizaldy, 2018) got inhibition about the absence of special subjects to study natural disasters, less learning time and lack of

disaster simulations taught in schools.

So, from the previous explanation clearly that the executing of the DPS Program is not successful yet and encountered many planning curricula, conducting of process, and also on assessment. Therefore, the opportunity to develop curriculum disaster education in elementary and high school is a need that is not separated from disaster management. Therefore, this study aims to analyze the cause of the inhibition to develop the DPS Program and a strategy to solve the problem of the curriculum of the DPS Program.

## **METHODS**

This study used a literature review approach and the method of this study used qualitative with designed descriptive and using data analysis of Miles and Huberman concepts (Matthew B. Miles, 2014). This qualitative method hoped able to meet information and data deeply and widely about DPS Program in Indonesia so that it can catch the meaning of this phenomenon in form description of words and scientific context (Lexy, 2007).

The sources of data in this study obtained via the internet in the form of the results of an online library of local, national, and international levels, related journal comprehensive reports from the year 2000 up to April 2019, and also from books and related regulations. The qualified or criterion meet article were selected systematically. The keywords were used to obtain those articles including disaster management, curriculum DPS program, and laws related to the purpose of this study.

Data analyze used Mile and Huberman (Matthew B. Miles, 2014) that consist of 1) collecting data from documentation study; 2) data condensation with choose, clarify, abstraction and simplify to get themes, categories and focus at the important data; 3) data display in form of a brief description, correlation among categories, and combine the data into meaningful; 4) conclusion drawing/ verifying that become

new findings or clarify the phenomena so that become a problem solution.

## **RESULT AND DISCUSSION**

### **The Cause of Inhibition to Develop the DPS Program.**

The rule of Disaster Management National Agency (DMNA) Chief No. 4 of 2012 (BNPB, 2012) about The Guidelines of Applying for Disaster Preparedness School (DPS) Program. This rule aims to develop culture disaster preparedness and safety in school and develop resilience in facing disaster for whole school citizens. DPS Program is a collaboration program between DMNA and MNC to introduce disaster management in the student of elementary and high school since 2013. DPS program in 2013 based on disaster curriculum and training in a school that has a high risk of disaster. Before deciding the curriculum, it needed to make curriculum mapping. Technically, it can explore the primary elements of curriculum: what is taught; how instruction occurs; and, when instruction is delivered (Rubicon, 2013). Besides that, it needed to determine indicators to assess the running of the DPS Program.

According to Budiani (2009), there are four indicators to assess schools that applied SSB:

- a) program target like on curriculum or subject or matter of learning, exact people, time, learning method and media, focus on student-centered;
- b) program of socialization like on facilities supporting, stakeholder participation (student, parents, school education staff, local government, communities, collaboration, and coordination;
- c) program goal like on the achievement of cognitive (knowledge), affective (attitude, psychomotor (skill);
- d) monitoring program like assessment indicator, document form, files, next action.

The factors that inhibit the effectiveness of the Disaster Preparedness School program:

1. the absence of special subjects, and less of time's learning (Rizaldy, 2018);
2. less of student-centered, and less of correct assessment (Prasetya, I, 2018);
3. not exactly media, less of collaborative with their parents (Indriasari, 2018);
4. students and teachers as target program did not comprehend the subject matter of risk reduction and disaster prevention, less of time to socialization, less of the material of program socialization, fewer facilities, less of achievement of the affective and psychomotor aspect of the student, and incomplete assessment form (Yanuardi., 2015);
5. less active of Local Disaster Management Agency (LDMA) (Hapsari, 2015).

### **The Strategy to Solve the Problem of the Curriculum of the DPS Program.**

According to Budiani (Budiani, 2009), there are four indicators to assess schools that applied for the DPS program:

1. Program Target
  - a. Curriculum
 

According to Law No. 20 of 2003 (Law No. 20, 2003), Education means conscious and well-planned effort in creating a learning environment and learning process so that learners will be able to develop their full potential for acquiring spiritual and religious strengths, develop self-control, personality, intelligence, morals, and noble character and skills that one needs for him/herself, for the community, for the nation, and the State. To achieve the goal of national education, needed a curriculum. A Curriculum is a tool for educators and learners within the learning and teaching process. The curriculum must be referred to as Pancasila and the 1945 constitution and also the challenging and the development of times.

Curriculum directed the student to be independent more and educators to be more active in learning and teaching. The curriculum educates the student to have good character. It is hoped it could be a comprehension of subject matter, active in discussion, and able to a presentation, have high politeness and discipline. Finally, educators must facilitate the process of learning and teaching to be student-centered. Then, recently curriculum in elementary and high school must be designed by the development of an environment that contains mitigation and management disaster (Ministry of Education and Culture, 2012). So, the curriculum participates in developing national interest and also local interest to establish society and nation and state's live.

The last statement corresponds to The National Strategy for Disaster Resilience (Council of Australian Governments, 2011) that focuses on the common characteristics of disaster-resilient communities, individuals and organizations. They have characteristics are functioning well while under stress, successful adaptation, self-reliance, and social capacity. The incident of the disaster looks like to happens again and maybe continues. So, it is very important to embed the knowledge about the disaster and reduce risk as early as possible to childhood and youth, and also how to face disaster when coming (Sunarto, 2012).

Kriewaldt et al. (Kriewaldt et al., 2003), found that disaster education 'applied in years 5-6 and more comprehensively addressed in years 7-10 in across state and territory curriculums in Australian. The development of the Australian Curriculum by 2016 on Educational Goals for Young Australians (the Curriculum by 2016 that has been overseen by the Australian Curriculum, Assessment and Reporting Authority

(ACARA). It is hoped that Australian schools will be implementing all learning across Australia. So that teachers and students can identify through teaching programs and education resources relevant to building disaster resilience as guided by the National Strategy for Disaster Resilience.

One of the essential things in prepared school is the subject matter. According to Law No. 24 of 2007 (Law No. 24, 2007), defined mitigation is a series of efforts to reduce disaster risk by physical development as well as by awareness and improve how to face disaster threatening. Mitigation can expose about the type of disaster, signs of disaster, disaster impact, reducing risk disaster, and vulnerability of disaster. Implementation of disaster subject matter can be done by insertion disaster subject matter to a certain subject; and extracurricular activities (Ministry of Education and Culture, 2014).

- Insertion disaster subject matter to a certain subject like Geography, Sociology, History, Indonesia Language, and local curriculum:
  - Geography subject directed students to comprehend that Indonesia stands on Pacific Ring of Fire: Indo-Australia on the south side, Eurasia on the north side, and Pasifik on the east side. This geographic make it Indonesia become vulnerable to the disaster of volcanoes eruption, earthquake, and tsunami, but on the other side, become fertile area and also rich in biodiversity, and also taught how to face disaster with theoretically and practically.
  - Sociology subject directed students to comprehend the culture of society like about disaster view and how to face the result of disaster toward effect with local wisdom. Maybe a local society assumes that eruption disaster

mystically because of the angry of volcanoes safeguard. From this case, students taught how to make it local society comprehend the exact cause of the disaster and involve local wisdom to handle the bad effect of disaster.

- Indonesia Language subject directed students about the cause of the disaster, signs of disaster and background of disaster by storytelling that students are easy to know and comprehend the values of disaster.
- History subject directed students to comprehend disaster about start when of disaster in Indonesia, from the series from the ancestor and the archipelago's royal period until now, and how did they reduce and manage disaster each. Student-directed to identify the differentiation and the similarity of how to handle the disaster.
- Local curriculum depends on the characteristic of school or local wisdom. For example, Java language contains with wayang performance, visit volcanoes of Merapi mountain to reforestation, making traditional handicraft that contains disaster reduce risk and et cetera.

- Extracurricular

Extracurricular activities can be used to facilitate the talents and interests of the student beyond academic ability like sport, scout, arts, crafts, and others. Another extracurricular can be chosen was training disaster mitigation simulation. Training started by theory and simulation in the classroom and then be practiced in the field with disaster equipment. Training in schools can involve local government and Local Disaster Management Agency (LDMA).

The important finding was that the effect of the implementation of the curriculum-based disaster proven to

be able to the school children's preparedness behavior by visiting disaster education programs and disaster emergency facilities at schools (Adiyoso, W., dan Kanegae, 2013). Siregar (Siregar, 2017) found that the insertion curriculum of disaster mitigation in Aceh's school, especially in elementary and high school.

- b. Method and Media of Learning

Hamzah & Nurdin (Hamzah, B., 2011), learning can use the TAIECA approach (Teaching by actively, innovatively, environment by creatively, and attractively ) for childhood. This approach was supported by Iskandar, Dadang, and Narsim (2015), that the learning method is the way that is used educators conduct their function and tools to reach the learning goal. So that's why the education target of preparedness can begin from elementary school or concrete operational phase according to Piaget (Suhardjo, 2015). Applying the exact learning method must fit with the subject goal and the age of the student. The simulation learning method has proven more effective to applied at age 7-11 years, because according to the cognitive development phase of Piaget (Santrock, 2012). At the phase, children need mental activities that focus on real objects and concrete. This phase is mentioned as the concrete operational phase. At this time, children did not focus on five sensory sources anymore. They began to get the differentiation information which is seen by eyes with the real. At this phase, children have very high curiosity and want to join the game with their close friend, that is easy to involve in many kinds of activities.

Widja (1989) learning media is everything that can be used as an aids to support the success of learning strategy and method to achieve the target of learning and teaching. So learning media can connect information from messenger to recipient (Rumampunk,

1988). To success program of DPS needed good learning media that student is easy to receive knowledge and skill from educators. Several learning methods and media that have been a success in the frame of supporting DPS program are:

- Simulation.

Steward & Wan (Steward & Wan, 2007) simulation method in disaster management can assess the preparedness of someone to face disaster. Other findings showed that simulation methods that use games could result in disaster preparedness better than didn't use the simulation method (Olson, Scheller, Larson, Lindeke, & Edwardson, 2010). The simulation method can use an artificial tool to comprehend concepts, principles, or skills. The simulation also can use role-play to create actual incidents or future incidents. Simulation with role play is a safety game for children and youth, and it can be done by drama. The dramatic form gives chance youth and children to interpret and act out and experience directly what something has happened. Finally, children will show the improvement of social skills and speaking skills (Siska, 2011). According to Dale (Dale, 1963), the combination of drama and simulation with real experience will achieve 90% of learning.

- Audio-Visual.

The student must be stimulated to be interested in media (Degeng, 1989). Method of learning that active and creative is applying CD or VCD. CD contains a matter of disasters like slide PowerPoint and disaster video. Finding of Suprpto, et al (Wasis et al., 2011) showed that the use of CD or DVD could improve the knowledge (cognitive, affective, and psychomotor) of the students.

According to Dale (Dale, 1963), the combination of drama and simulation with real experience will achieve 30% of learning.

American Academy of Pediatrics (American Academy of Pediatrics, 2008) said that one of the critical aspects in the frame of facing disaster at school is the comprehension of parents about the emergency plan, the reunification process, and make use of communication's tool like TV, radio, and HP as preparedness strategy of disaster management. Therefore, good communication between school and parents must be established.

The use of media aims to clarify the message that not too verbalizes. Media must fit goals and people target. According to Wasis et al. (2011) proved that with using CD media could improve the knowledge of the students of SMPN 2 Sanden. Because CD was one of the ways to provide students with the knowledge of how to carry out mitigation earlier through an active, innovative, and fun study.

- Song

There are several regents and municipal in Indonesia that have a traditional song like Potong Bebek from Java, Nandong Smong from Aceh and other provinces. According to Suhardjo (2015), the teaching of the local song is a moral message and warn when disaster will happen and how to handle it. Maulana et al. (2018) showed that the Nandong Smong song could improve students in Aceh to aware and ready for mitigation disaster especially disaster preparedness be better than others.

- Storytelling

Storytelling media that be done by Bustan (2016) showed that students comprehended the material of mitigation and emergency disaster

aids well.

- Training

According to Business Dictionary (2019), training is organized activity aimed at imparting information and or instructions to improve the recipient's performance or to help him or her attain a required level of knowledge or skill. Zalukhu (2013) Found that training of the DPS program with the use theory and role-play in class and recruit exact people proved able to improve the capacity of preparedness and disaster emergency response to a member of NGO after participating the LEARN II Project. Maulana et al. (Maulana et al., 2018) by trained Nandong Smong song could improve students in Aceh to aware and ready to mitigate disaster especially disaster preparedness be better than others.

## 2. Socialization Program

One socialization program that more effective is participation parents and societies and school staff involved directly on the DPS Program. According to Handayani (2006), anticipation is the involvement of people voluntarily without pressure and far away from the government's influence. Teachers and students play an important role in raising public awareness, spreading correct knowledge about the disaster and promoting behavioral preparedness on the disaster in the wider community rather than limited in school. It is important to give society's awareness and equalize perception and ready to face coming disasters. Paton (2003) stated that critical awareness determines societies' preparedness facing disaster. Besides that, there is a relation between common awareness and disaster preparedness.

School's leader invites stakeholders that pay attention to DPS Program like local government, local legislative, volunteer that related to the educational world, and public figure. The

involvement of the whole stakeholder aimed to get supporting that the DPS program can be executed as long as possible. Because higher risk perception of societies is higher of the motivation of societies to taking disaster preparedness (Ronan & Johnston, 2005). Shaw (Shaw, R., Shiwaku, K. & Takeechi, 2011) found the school that has a disaster preparedness program gave more contribution to developing knowledge and good perception from earthquake disasters, especially disaster preparedness to school netizens and surrounding communities.

## 3. Program Goal

Program goal aims to reach the top performance of cognitive, affective, and psychomotor. By combining several methods and media of learning. Training would become effective, if they have a procedural emergency condition, making evacuation pathways mapping, evacuation pathways, gathering points, early warning tools, and assessments of training results. For training, every school must have built that near office and have evacuation mapping pathways, evacuation beacon, early warning by *kentongan* (communication equipment made of bamboo or teak tree that use to call prayer, danger signals like theft and disaster) arrows to close to evacuation pathways, and gathering point (Burhan, 2016).

## 4. Monitoring

Monitoring is a process for gathering data routinely and assess the improving an ongoing program. SSB Program must be monitored to know the success and the inhibition factors. Like the successful of DRR-A Project 2009-2012 had given a significant contribution to Regional Disaster Management Agency (RDMA) and the Disaster Risk Reduction Forum (DRR Forum), implementing the Community Based Disaster Risk Reduction (PRBBK) Program, improving the Tsunami Disaster Mitigation Research Center



(TDMRC), establishing a Master degree for disaster management program at Syiah Kuala University (UNSYIAH), the establishment of Public Awareness Coordination Committee (PACC), the establishment of Journalists of Aceh Disaster Cares Forum (ADCF), and integrating the comprehension of Understanding Disaster Risk Reduction to the school curriculum (Siregar, 2017).

But results from the study that were less satisfactory: (a) according to Hapsari (Hapsari, 2015) stated that if there was no good in monitoring and evaluation of DPS program, and there was no report to LDMA so that LDMA could not monitor and guide the continuation; (b) Perwira & Yanuardi (Yanuardi., 2015) found that elementary students were less ready to get DPS program (lack of program target), teacher lack of mastery the subject matter (lack of socialization program), lack of increase affective and psychomotor of students (lack of program goal), lack of school preparedness document and lack of effective assessment (lack of monitoring).

## 5. Strategy

The success of the DPS should do:

- a. Disaster mitigation education can be inserted into several subjects, and into extracurricular activities that exist in schools. These strategies can have a positive impact on the development of ready-made characters of students (Rizaldy, 2018);
- b. Involvement participation parents, local governments, and NGO, like that happened successfully in Aceh (Siregar, 2017);
- c. The conducting of DPS Program by good training should be:
  - DPS Program in that equipped with good monitoring like there was a comprehension of the matter of disaster mitigation and prevention, questionnaires,

interview documents, and observation documents completely (Burhan, 2016);

- Training must be conducted routinely and involve school citizens and communities surrounding communities (Burhan, 2016);
- Making a model that related to reduced risk disaster with using language that easy to understand, and delivery to participants informal and dynamic, so it can improve cognitive and affective and also psychomotor (program goal). Adding new subject matter that according to dominant knowledge, condition of psychiatric;
- The target of training chooses right people like a student, NGO, disaster volunteer, related institutions, because they face directly with disaster and close to communities so that easy to empower communities (program target);
- Timing setting must be right, for example, how many groups, how many times every year, and how many days must be conducted, how many waves, how many weeks, and making active coordination with local government (program target);
- The program goal must be settled with choosing a subject that related old and new disasters that were available in that area (monitoring program).

## CONCLUSIONS AND RECOMMENDATION

The conclusions of this study are:

1. The cause of inhibition includes four indicators like program target inexact, program of socialization less strength, program goal less power, monitoring program less document incomplete.

2. The strategy to the development program of DPS much success if:
- a. Disaster mitigation education can be inserted into several subjects, and into extracurricular activities that exist in schools.
  - b. Conducted DPS Program by proper training that has been done in several elementary and high schools.
    - Target to train must choose the right people.
    - The program goal must be set with changing the subject matter that related new disasters that are available in that area and subject matter flexible.
    - Making modules that related to reducing risk disaster by using language that easy to understand, and delivery to participants informal and dynamic so it can improve cognitive and affective and also psychomotor.
    - The timing setting must be right related to the goal and number of participants.
    - DPS Program in that equipped by proper monitoring like there was the comprehension of the matter of disaster mitigation and prevention, questionnaires, interview documents, and observation documents thoroughly.
    - Training must be conducted routinely and involve school citizens and communities in surrounding communities.
    - Training must be conducted routinely and systematically.
    - Involve the whole stakeholders like school citizens, parents, surrounding communities, local governments, and NGOs.

Therefore, this study recommends that the Ministry of Education and Culture have to commit to issue the rule that obligates to form disaster preparedness school with apply mitigation disaster curriculum for elementary and high school for the region

that happened disaster or potency to disaster occurs.

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