Learning Media Model Development CD Interactive about Disaster Mitigation: Volcanic Eruption to Improve Self Awareness Early Childhood

1st Dhita Paranita Ningtyas
Trilogi Universty
Early Childhood Education Departmen
Jakarta Selatan, DKI Jakarta
dhita@trilogi.ac.id

2nd Duana Fera Risina
Trilogi Universty
Early Childhood Education Departmen
Jakarta Selatan, DKI Jakarta
fera_risina@trilogi.ac.id

Abstract-Indonesia is a country that has many volcanoes, about 150 mountains in Indonesia is still an active volcano. Volcanoes in Indonesia are part of the Pacific fire ring. The most active volcanoes are Kelud and Merapi on Java Island, which is responsible for thousands of deaths from its eruption in the region. Early childhood is the golden age of children, so it takes education self-awareness of children around the volcano in the prevention and mental readiness of children in the event of a disaster. This study aims to find the model of learning planning Mitigation of eruption of mountain erupted by using Interactive CD volcanic learning media to improve self-awareness of children. Research approach using Research and Development (R and D) which modified in three step of research that is: Preliminary research, model development, and validation test model. The preliminary study contains literature studies for the learning themes of Disaster Mitigation and the study document of Rural PAUD learning planning in Samiran village, Boyolali district, Central Java. The development of the model has three steps developed from three concepts, namely the identification of themes into sub-themes, theme analysis into activities and the planning of the theme unit. The model validation test is an expert validation. The result is significant, effective and feasible. The findings of this research are the creation of learning media in the form of disaster mitigation videos, game tracks, and tracks that can be adapted to the eruption of existing volcanoes in Indonesia and can be applied in all regions with similar geographical conditions, aiming to increase self-awareness of children against disasters.

Keywords-Learning Media, Interactive CD, Disaster Mitigation, Eruption Mountain, Self Awareness, Early Childhood

I. INTRODUCTION

The archipelago of Indonesia is included in the Pacific Ring of Fire (archipelago Pacific) region which is curved from the north of Sumatra island-Java-Nusa Tenggara to North Sulawesi, the Indonesian archipelago is also located at the meeting of two tectonic plates of the world and is influenced by three movements, namely the Movement The Sundanese system in the western part, the movement of the Eastern Asian Fringe System and the Australian Circumcision Movement, these two factors caused Indonesia to be particularly vulnerable to disasters, especially volcanic eruptions and earthquakes [1]. In addition, the dominant eruption of Merapi resulted in damage or even the destruction of all life that is at the point of prone to Mount Merapi. Indonesia has 127 volcanoes, at present, there are about 22 volcanoes that are declared active. One of them is the Mount Merapi volcano of Central Java which gets the title "Merapi never breaks the promise" because the eruption of Mount Merapi is in short cycle every two to five years, intermediate cycle every five to seven years and long cycle to 30 years. The eruption of Mount Merapi in 2010 is a series of volcanic events occurring in Mount Merapi Indonesia, seismic activity began in late September 2010 and caused a volcanic eruption on Tuesday, October 26, 2010, resulting in at least 165 people killed [2].

Implementation of disaster management in situations where a potential disaster occurs as referred to in Pasal 34 huruf b covers preparedness, early warning and disaster mitigation (Undang-Undang Republik Indonesia No 24,2007). Samiran Village Selo District Boyolali District is an area under the foot of Mount Merapi and the foot of Mount Merbabu, is one of the areas prone to disaster. So that disaster mitigation activities are also needed for Samiran village community, especially for Early Childhood. The results of initial observation conducted by researchers by conducting interviews to teachers of Samiran Kindergarten 1 and Samiran 2 and early childhood in Samiran Village Selo Boyolali District concluded that learning about disaster response has not been given to early childhood in detail, there is a discussion about the theme of the child's environment only know that there are 2 mountains that are close to them but they do not understand if the 2 volcanoes erupt what kind of disaster will occur. The theme used during the eruption of volcanoes is the theme of natural phenomena, in which the teacher discusses some disasters such as floods, landslides, volcanoes. Learning focuses on LKS books with coloring, counting, letters. The lesson plans have not been properly applied to the theme so that the children have not been taught about the eruption of volcanic eruptions in detail. Early childhood

empowerment to understand disaster mitigation is the first step in building a disaster-conscious society. So that when disaster strikes students, teachers and communities no longer confused and panicked because they have understood how to reduce disaster risks. In the hope that the knowledge gained is transmitted to the surrounding environment in order to reduce disaster risk.

Disaster mitigation is a series of efforts to reduce disaster risk, both through physical development and awareness and capacity building in the face of disasters, disaster mitigation is an activity that acts as a disaster reduction action or efforts taken to reduce casualties when the disaster occurs both fatalities and treasure[3]. Mitigation itself is interpreted as any continuous action taken to reduce or eliminate long-term risks to human assets and lives, in this connection, mitigation can be said as a mechanism so that people can avoid the impact of potential disasters[4]. In general, mitigation practices can be grouped into structural and non-structural mitigation. Structural mitigation relates to physical construction efforts, while non-structural mitigation includes land use planning, enacting development regulations, and through education to prepare the community to get used to living together with disasters, especially for the environment that has already been built, so that the community can feel security and comfort in his life (Rusilowati, et., el, 2012). From the conclusion above, it can be said that disaster mitigation is an effort for the community to be aware of the occurrence of disasters and can avoid the harmful effects of disasters that occur by carrying out disaster management activities and awareness of disasters.

The mental toughness of children in the face of disaster does not appear. Some of the factors that shape it are the child's personality, environmental factors such as family and positive experiences that children have. All these factors interact with each other so that the child's mental toughness that will ultimately show the variation between children with one another. In relation to disaster prevention efforts for child communities, the impact of these environmental factors can be given in the form of appropriate attitudes and support in the face of disasters, thus minimizing the adverse impacts of disasters.

Self-awareness A complex multidimensional phenomenon that comprises various self-domains and corollaries. To illustrate, one can think of one 's past (autobiography) and future (prospection). Similarly, one can focus on one's emotions, thoughts, personality traits, preferences, goals, attitudes, perceptions, sensations[5], interpreted freely by researchers Self-awareness represents a complex multidimensional phenomenon consisting of various self-domains and consequences. As an illustration, people can think of the past (autobiography) and the future (prospecting). Similarly, one can focus on one's work emotions, thoughts, personality traits, preferences, goals,

attitudes, perceptions, sensations, intentions, and so on. Self-understanding is a necessary condition before starting the process of understanding others[6]. Self Awareness is having a clear personality, including strengths, weaknesses, thoughts, beliefs, motivation, and emotions, self-awareness allows you to understand other people, how they perceive you, your attitude and your responses to them at the moment [7], means having a clear perception of your personality, including strengths, weaknesses, thoughts, beliefs, motivations, and emotions, self-awareness allows you to understand others, how they perceive you, your attitude and your response to them at this time.

From the definition above self-awareness is how one can have awareness for himself to motivate, regulate emotions, confidence, and bring confidence about himself to be responsive to the surrounding environment. Early childhood really needs knowledge of self-awareness early on, because they must begin to understand how they should be aware of the differences around, the environment, and understand about themselves earlier.

Given Indonesia's disaster-prone areas, preparing children's mental toughness in dealing with disasters is something that needs attention. This is not only to prevent them from disrupting the disaster but as a younger generation with a longer future, they should have enough stock to be comfortable and productive in disaster-risk areas [8]. Therefore, it is necessary to understand the picture of mental toughness of children in the face of disaster and the factors that influence it. Tuswadi's [9] research results, there are still problems regarding students 'knowledge, attitudes and effective behavior towards natural disasters caused by several factors, including ineffective teaching practices, it is strongly recommended that local governments and schools make strategic efforts in the field, to improve teachers' performance in teaching natural disasters and their prevention, including in developing their skills in creating and using diverse teaching media.[10]

Some notions of media are interpreted by several experts including Sudirman [11] media are "components of learning resources or physical vehicles that contain instructional material in the student environment that can stimulate students to learn". Meanwhile, according to Sukiman[12] what is meant by media is anything that can be used to channel messages from senders to recipients so as to stimulate the thoughts, feelings, attention and interests and willingness of learners in such a way that the learning process occurs in order to achieve goals effective learning. Thus the learning media is an intermediary that is used to convey information or lessons in order to stimulate students to learn. Whereas the use of instructional media is a way to convey information in the form of learning material

The success of a learning process is influenced by many factors, not only teachers and students who play a role in the success of education but also must be supported by other

aspects. One of the most important aspects in achieving educational goals is methods and media. Selection of suitable methods can make the learning process. Therefore, the researchers create a learning media Interactive CD Disaster Mitigation volcano erupts to teach early disaster response to children Early Age. The purpose of this research is to make the model of learning media interesting and can be easily understood by the child in teaching the eruption disaster mitigation volcano. So the children already understand the dangers of mounting eruption early and have awareness of disaster. Output target of this research is beside media of Interactive CD mitigsi mount erupted, research result can also be published in national and international scientific journal and material enrichment material for the child of KB / TK which is expected to become a compulsory subject of curriculum for early childhood that can be taught in children learning.

II. MATERIALS AND METHOD

Learning CD Development is based on an instructional development model that focuses on product-oriented development. The instructional development model that can be selected is the J. Moonen Prototype development model. This development model is chosen because it has several reasons, namely: (1) according to the needs of students and teachers in the field, (2) provide opportunities to improve product quality based on expert evaluation, (3) procedural and systematic nature that is widely used in education, and (4) involving experts (expert review) in order to have an academic level
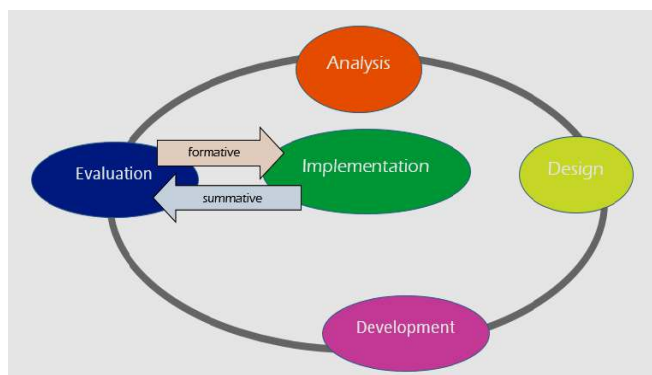

Fig 1. Development model prototipe j.moonen

The stages of development research used refers to the prototype development model is as follows:

1) stage analysis

Previous product development begins with needs analysis, this is done to get a picture and belief whether the product to be developed is really needed and visible to be developed, both in terms of time and cost. It takes about 3 months, then for the required cost is attached.

2) stage design

At this stage will be determined by learning products from two sides, namely learning and functional perspective. On the learning side, it is designed and formulated every component of learning, objectives, material composition, tasks, learning strategy, the form of interaction, and also evaluation procedure as outlined in GBIM. In a functional perspective, the textual description of product development design is presented. For the development of ICT-based products, such as multimedia, this step contains a verbal overview accompanied by a visual (sketch) of the product to be developed. Results obtained from the stage of "script" or "storyboard".

3) development stage

With reference to the results of the second stage, ie the form of learning design and functional design "script" or "storyboard development begins to develop from the Outline of media content and the material jujaran of the planned product, so obtained what is called the product draft. The research design concluded: (i) collecting preliminary data with for preparing existing research proposals and problem findings, (ii) design and manufacture of learning media of Interactive Disaster Mitigation CD, (iii) expert review, the development result of learning CD will be validated by 2 experts, namely media expert and material expert. All use questionnaires and interviews to get feedback and improvements, (iv) one-to-one test, to get the product that really meets the needs will be tested one to one, with objects of kindergarten children as much as 1-3 people from TK Samiran 2 in District Selo, Boyolali District which is a village on the slopes of Mount Merapi, (v) small group trials, in small group trials of 3-5 students, the target is kindergarten B Samiran 2 just like the previous trial, and (vi) field test (field test), the last in this process is a field trial, namely in all kindergarten in Samiran village, Selo district Boyolali district. In this trial will be tested pretest and post test

Data collection techniques in the development of learning media are observation sheets, interviews, and questionnaires or questionnaires containing a number of written questions used to obtain information from respondents. Data analysis is done by using quantitative statistics, the data is presented in the form of tables and graphs. The data that have been collected will be processed using the Likert scale with scale value 1-4. To interpret quantitative data using the following references:

score 4: very good

score 3: good

score 2: average

score 1: less good

The reference is used to interpret quantitative data into qualitative data generated, ie data in the form of statistical calculation results and interviews and observations that will

be explained in the form of a deep description of the product development results.

III. FINDINGS AND DISCUSSION

Literature study results from the study Development of interactive learning media cd disaster mitigation to improve self-awareness of early childhood was developed by using a reference from the curriculum used at the age of Kindergarten and researcher using 5W1H questions to identify the required media needs, the questions used as a reference are: (1) What is the right media for introducing the eruption of eruption ?, (2) Why is the media needed to introduce mitigation of mountain disasters to erupt into early childhood? (3) Where can disaster mitigation media be used? (4) When can disaster mitigation media be used? (5) Who is the target of developing disaster mitigation media? (6) How can disaster mitigation media improve self-awareness of young children?

These data are used to identify the need of learning media to mitigate the eruption of volcanic eruptions to improve self-esteem of early childhood, namely: (a) Learning CD media containing audiovisual that can attract children, (b) Due to the very minimal media needed to improve the ability self awareness of children in response to mountaineering catastrophes, (c) All schools of Kindergarten under the volcano, researchers selected in Samiran village Selo Boyolali sub-district, (d) Can be used for learning in the theme of natural phenomena, (e) Group B Kindergarten throughout Samiran Village Selo Boyolali Sub-district, (f) With material content focusing on improving Self Awareness of Children it is expected that this media can aim to improve self-awareness of children against eruption disaster eruption.

a. media feasibility through expert judgment

Media is declared as feasible by an expert on Early Childhood Education. Expert evaluation is done through interviews and instrument filling. There are 3 suggestions for the development of mitigation media: (1) The media content in the video is more complete for post-disaster, (2) The location of the order in the media content is converted into video, song and game, (3) media can be used for all schools is located in Selo district not just Samiran village. The media has been improved according to suggestions and will be further developed for all Selo Sub-districts.

b. field study results

The result of field study from research Development of instructional media of interactive CD of disaster mitigation to improve self awareness of early childhood is obtained by data that with this interactive CD media understanding about child disaster mitigation more increase, seen from result of percentage from appraisal of activity of media use this interactive cd and children are given questions about the

material contained in the learning CD, along with the average percentage of child value:

TABLE I. RECAP VALUE OF USE OF INTERACTIVE CD MEDIA MITIGATION OF MOUNT MERAPI DISASTER MITIGATION

No	School name	Understanding media content (%)	Media usage (%)	Child activeness (%)
1	TK PERTIWI 1	85.29	95.59	94.12
2	TK PERTIWI 2	88.28	95.31	96.09

From the above chart shows that from 3 assessments obtained from the large group test in two schools showed that in the understanding of content in the media TK Samiran 1 get the percentage of 85.29% and TK Samiran 2 earned 88.28%. This percentage is seen from after a child sees a video about disaster mitigation teacher giving a question related to the content in the video and the child is proven to answer correctly after the child sees a mountain disaster mitigation video erupting. The second assessment is the use of media, children are used to using the gadget so that when playing the game the child can operate properly and the media can be used easily by children.

The third assessment is the activity of the child in learning, TK Samiran 1 earns 94.12% and Samuran Kindergarten 2 obtains a value of 96.09% This judgment is seen during the learning after the child sees the teacher's video asking questions that make the child answer, the children look active and at the time of playing child maze game is very enthusiastic.

From the above calculation results can be seen that this medium is effective for use as a media disaster mitigation. In addition to media assessments, self-awareness assessments of children's self-awareness after viewing the disaster mitigation video, along with the results of self-awareness assessment of children:

TABLE II RECAP EARLY SELF-AWARENESS SELF-ASSESSMENT VALUES

No	Name of school	Self motivate	Regulate emotions	confidence	Obey the rules	Be responsible
1	TK Pertiwi 1	80,05	87,56	91,35	86,35	84,88
2	TK Pertiwi 2	82,33	84,82	90,48	92,49	87,93

From the calculation result of self awareness assessment recapitulation for Kindergarten Children at N 1 and 2 schools of Samiran Village obtained the result that the ability of self-awareness of children is very good seen from the value of self-motivating ability in TK Pertiwi 1 seen from the percentage of children get 80.05% and

kindergarten Nisa 2 get the result of 82.33% percentage, the ability to regulate the emotion of TK Pertiwi 1 get result 87,56% and TK Pertiwi 2 get 84,82, self-confidence ability TK Pertiwi 1 get result 91,35% and TK Pertiwi 2 90,48% ability to comply with Kindergarten Regulation 1 86.35% and TK Pertiwi 2 get 92,49%, last is the ability of responsible for TK Pertiwi 1 get result 84,88% and TK Pertiwi 2 get result 87,93%. From the results of the above values can be concluded that the media is appropriate to improve self-awareness of Early Childhood that focuses on erupting mountain disaster mitigation.
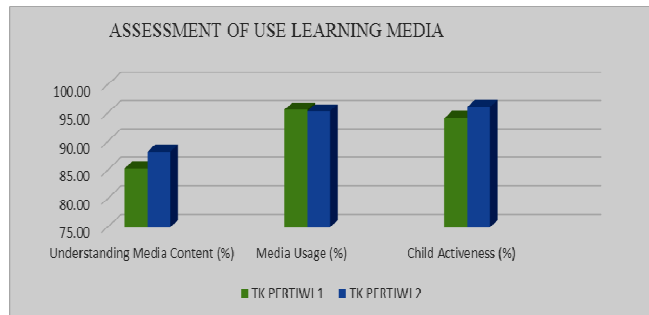
Fig. 1. Assesment of use learning media

The product developed in this research is Interactive Mitigation CD of Mount Merapi Eruption aimed at Kindergarten of Group B in TK Pertiwi 1 and 2 Samiran Selo Boyolali Subdistrict. The material presented is the material about the eruption of mounts, mitigation before and after the disaster and game looking for traces.
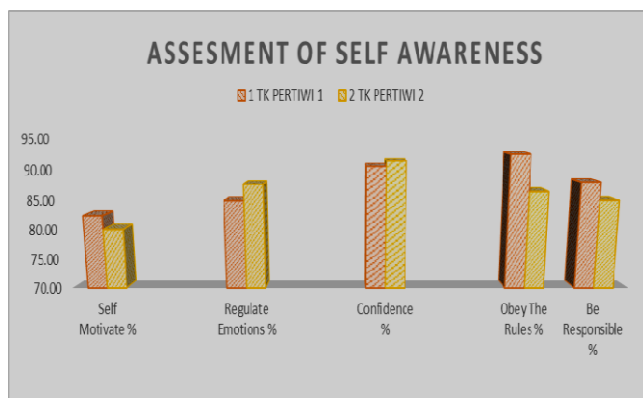

Fig. 2. Assesment of self-awareness

Interactive Learning CD is a tool to help teachers in facilitating students to understand the material to be delivered. In this CD is about a video in which the teacher explains how the mountain erupted and what children should do before the volcano erupts and after the volcano erupts, in the video there is also a song about what to do when a mountain erupts. In this Interactive CD, there is also a game media looking for a trail to a safe place when a volcano erupts, using this game the child is given the concept that in case of disaster the child must go to a safe place that is the refugee point of refuge. The advantages possessed by the development of learning media CD Interactive Mount Merapi Mitigation Disaster this is:

1. The Learning CD is organized on the basis of the needs of the schools that are close to the volcano so that this CD can be used in all schools near the volcano.
2. Full media content, consisting of clear, acceptable audio-visual videos and songs with children.
3. The material used can easily understand children so that children more quickly understand the purpose of the material of this Learning CD.
4. A comprehensive revision has been made in accordance with the steps of the selected development model so that the product produced has met the needs analysis undertaken.

Disadvantages for learning media Interactive CD Disaster Mitigation of Mount Eruption is:

a) Requires electrical devices, computers along with LCD Projector to display Learning CD media during the delivery process of the material for the child, so that if the process does not have the facility then the process of delivering this material cannot be implemented.

b) The material presented in the Learning CD is only the material that becomes the focus as needed. Therefore, the development of materials in the Learning CD can proceed.

In the process of developing Interactive CD CD Mitigation of Mount Merapi disaster, there are some limitations, among others: (i) technical constraints related to the preparation of electrical equipment, computers, LCD projectors that take a little longer than the usual learning, and (ii) limitations of researchers in developing software to make the Flash Player media in making Learning CDs make the time of media work requires careful preparation and workmanship time of almost 3 months

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