

# Students' knowledge and attitudes facing disaster preparedness volcanic eruptions: A case study in Merapi Mt. areas

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**Abstract.** This study aims to analyse the knowledge and attitude of disaster preparedness student who live around the Mount Merapi area in the face of natural disaster of volcanic eruptions. The research method used descriptive research using 56 students as respondents. The instruments of this study used tests and questionnaires. Data analysis techniques were performed using quantitative percentages. The results showed that students in the area around Mount Merapi had good knowledge about knowing danger signs of a volcano eruption by 29% and had a disaster preparedness preparedness category of 59%. This research can be used as a development foundation to help reduce the risk of volcanic eruptions.

**Keywords:** *disaster preparedness knowledge, disaster preparedness attitude, volcanic eruption*

## 1. Introduction

Natural Sciences (IPA) continues to evolve with the times. Science learning invites students to get closer to nature. Improved insight into learners on the surrounding environment, especially natural disasters integrated in science learning in the earth structure and dynamics of matter. The learning objectives are expecting material which is integrated with a natural disaster of learning, knowledge and attitudes of learners in the face of natural disaster need to be built.

The need for education in schools to provide insight to students about disaster preparedness to students from an early age can reduce the risk of natural disasters that very much. Knowledge of volcanic eruptions is needed to significantly reduce the damage caused by the disaster [1]. The role of the school is very important to build it. Natural disasters volcanic eruption is one of the natural disasters that frequently occur in Indonesia. Wary yourself against the eruption of the volcano needs to be done. Measures predict natural disasters, specially enhanced volcanic eruptions. Events volcanic eruption may occur approximately 1 to 5 years [2]. The importance of knowledge about natural disasters and volcanic eruption that disaster preparedness should be owned learners encouraged schools to provide early knowledge to learners.

Sleman regency is one area in Yogyakarta. The area is close to one of the most active volcano in the world, Mount Merapi and many residents living in the area. Ready to disaster preparedness is one of disaster management to anticipate and reduce disaster risk through knowledge and the proper and effective action [3], [4]. 4.0 urgently needed in the era of the successor generation of the Indonesian nation has a lot of ability. Education is not only related to the field of cognitive, but also affective and



psychomotor. Disaster education is one of the things right and true in the pre-disaster phase [5]. The most important component that teaches the parents, school, and community

Based on these problems, this study aims to analyze the knowledge and attitude of disaster preparedness for junior high school student in Sleman Regency. Knowledge about volcanic eruptions can help to find ways to protect themselves. Information from schools about the knowledge of natural disasters of Mount Merapi eruption to students understand how to protect themselves against disasters [6]. Psychomotor skills in learning can use an alert attitude to volcanic eruption disaster. Many volcanic events show the number of deaths caused by the weak attitude of disaster preparedness about the risk of volcanic eruption disaster [7]. Indicators used in this study for knowledge about volcanic eruption disasters include knowing about disaster hazards, knowing about signs of occurrence of disasters, knowing gathering points and signs and evacuation routes, knowing about disaster risks, and knowing about disaster management plans. The indicators of the volcano eruption alert attitude in this study include having disaster response information, identifying the impact of disasters on the environment, acting appropriately to prevent losses, being able to protect themselves from hazards, and recovering from disasters.

## 2. Research method

This research is quantitative descriptive. The sample in this research is the students of class VIII SMP Negeri 3 Depok, amounting to 56 learners. The sample is determined by simple random sampling were taken at random. About the test consists of 10 items essay test and questionnaire consists of 20 items that have been developed by researchers and has been validated by expert lecturers. Data analysis techniques in this research namely (a) the qualitative data analysis techniques, with the category SS (Strongly Agree), S (Agree), KS (Less Agree), and TS (Disagree). (b) quantitative data analysis techniques converted into quantitative data with measurements SS: 4, S: 3, KS: 2, TS: 1. Data from the analysis of the answers to the students and then converted into percentage form and then categorized

$$P = \frac{A}{B} \times 100\%$$

Where it means  $P$  represents percentage,  $A$  as score obtained, and  $B$  as ideal score. Category of analysis results can be seen in table 1.

**Table 1.** Criteria knowledge and disaster preparedness for volcanic eruptions learners [8]

Interval	Criteria
75% – 100%	Very ready
50% – 74.99%	Ready
25% – 49.99%	Less Ready
0% – 24.99%	Not ready

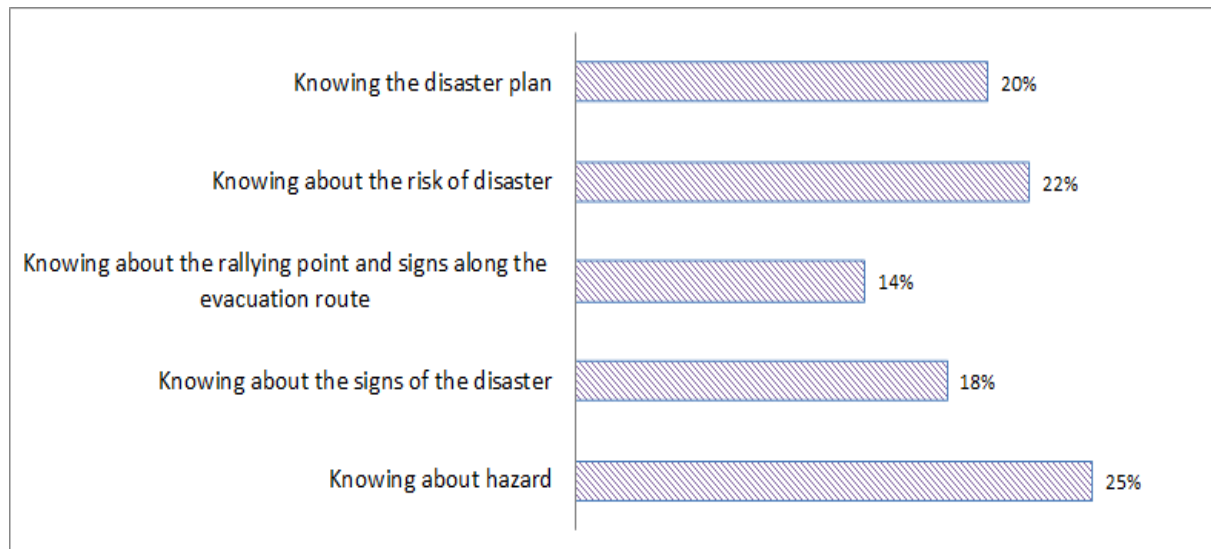
## 3. Result and Discussion

Natural disasters volcanic eruptions can occur at any time. Volcanic eruptions natural disasters often lead to loss of life, loss of property and objects. Volcanic eruptions can not be prevented, but can be reduced impact of the loss. One way to cope with the impact of natural disasters volcanic eruption is to prepare prior to the disaster by providing self-knowledge about disaster preparedness and disaster preparedness. Preparation for natural disasters already integrated into science lessons related to knowledge about the structure and dynamics of the earth. To determine the extent of knowledge and attitudes, then do the test and giving questionnaires to students.

### 3.1. Knowledge of Eruption of The Volcano Alert

Knowledge of disaster preparedness of learners measured using indicators quiet hazards know, know about the signs of disaster, knowing the rallying point and signs and evacuation routes, find out about

disaster risks and knowIng about the disaster plan. After the test, the results obtained to determine how much knowledge the students about the eruption of the volcano in the form of a percentage of the knowledge of students of class VIII SMP (Junior High School) in Sleman district which can be seen in figure 1.



**Figure 1.** Disaster knowledge volcano eruption.

Based on figure 1, the results of the analysis of knowledge about natural disasters volcanic eruptions learners about the dangers of catastrophic volcanic eruption of 25%, knowledge of disaster management plans volcanic eruptions by 18%, knowledge of the risk of catastrophic volcanic eruption was 14%, knowledge of signs of the disaster amounted to 22% and knowledge about the evacuation point at 20%.

*3.1.1. Knowing about Hazard.* Knowledge of learners about the dangers of volcanic eruptions showed by 25%. the category is ready. Knowledge about the dangers of volcanic eruptions owned learners who live in the region around Mount Merapi comes from the school, textbooks, and information on social media about the dangers that can be caused by the eruption. Learners who know what the dangers caused by the volcanic eruption can plan what should be prepared to avoid the danger of eruption. Knowledge about the hazard learners enter the category ready means of 56 learners 26% of them know the danger, caused by the eruption of the mountain before, during, and after the eruption occurred. However, for regions which are equally close to the mountain area according to [9] knowledge and perception of the risk of the eruption of a volcano in Hawaii tepatta at Mauna Loa and Huala lai still low. Learners who live in the area near the volcano should have known the dangers of volcanic eruptions because they have never felt any danger, caused by the eruption of the volcano.

*3.1.2. Knowing about The Signs of The Disaster.* Learners' knowledge about signs of volcanic eruption showed by 18% in the category is ready. If there are signs of eruption produced by the volcano learners can distinguish the danger signs of volcanic eruptions. Contrary to the results of the analysis are obtained, [10] the students do not have the knowledge to identify signs of catastrophic events in the environment around disaster-prone areas. Knowing about the signs of the eruption of the volcano need diperlajari deeper. [1] learners have a low understanding of the signs related to the occurrence of volcanic eruptions. Science learning related to natural disasters about volcanic eruptions that are given not only contains as they should but must be relevant to the area around the student's residence to help increase students' knowledge and understanding of volcanic eruptions.

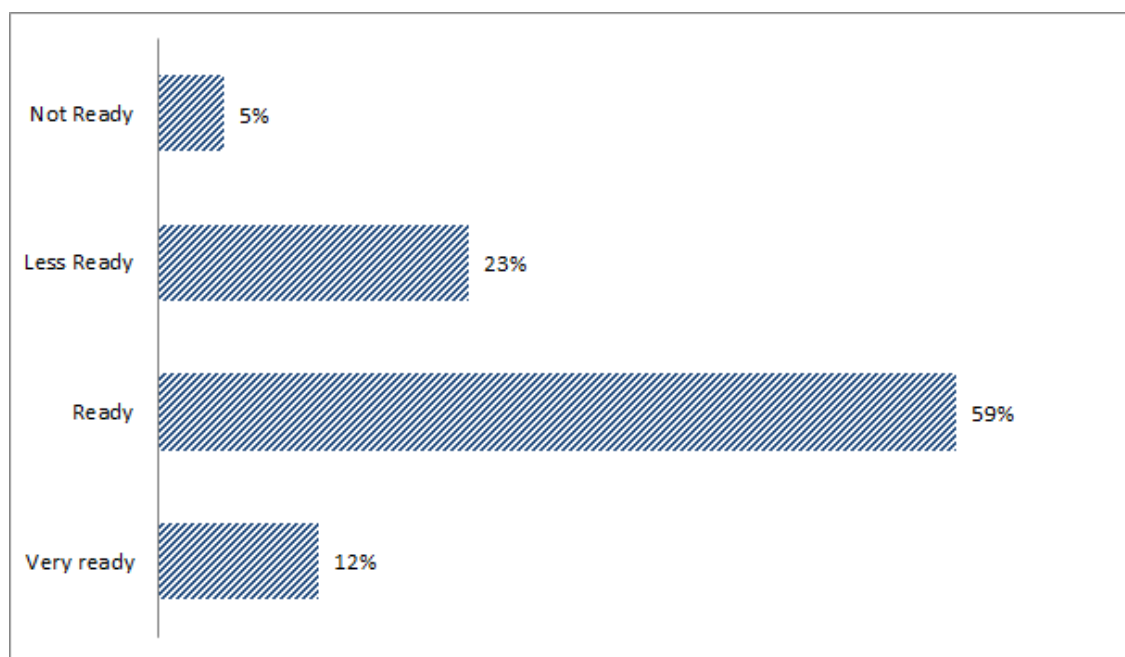
*3.1.3. Knowing about The Rallying Point and Signs along The Evacuation Route.* Knowledge of students who live in the area around Mount Merapi on the rallying point, signs and evacuation needs to be improved. After the incident a major eruption in 2010 [2] is a volcanic eruption that occurred at Mount Merapi, which killed 165 people and 225.000 people had to be evacuated. To reduce casualties, knowledge of a rallying point, as well as the evacuation route signs have to be notified to the whole society around Mount Merapi. Education in the school requires that the school give notice or disseminating information on where rallying point when the eruption of the volcano and a safe as well as a rallying point of disaster-prone areas. Evacuation is done in a disaster-prone region III, II, and I to reduce the risk of a larger [11]. This area should be abandoned because it can be affected by the impact of volcanic eruptions.

*3.1.4. Knowing about The Risk of Disaster.* Knowledge of the risk of volcanic eruption learners can show 9% in kateori not ready. Knowing what are the risks that can occur when a volcano is undergoing a process of volcanism, learners can prevent himself and his family in danger of volcanic eruptions. Knowledge of the risk of a volcanic eruption is necessary to minimize losses due to panic evacuation process when the eruption occurred [12]. Learners who have knowledge as a result of the risks that can arise due to the volcanic eruption natural disaster can help provide information to his friend. Students in Sleman Regency who live in the area around Mount Merapi have very low knowledge about disaster risk compared to knowledge about the dangers of volcanic eruption.

*3.1.5. Knowing the Disaster Plan.* Knowledge of disaster management plan showed 17% of students in the category of poorly prepared, showed that in case of volcanic eruption learners do not panic and can follow directions and save his family from the risk of a volcanic eruption. The results of the analysis of knowledge of students in the indicator to know a disaster plan into the category of previously prepared for learners who already had experienced no direct volcanic eruption [13]. Experience of dealing with the eruption of Mount Merapi make learners more prepared to overcome the results of the disaster.

### *3.2. Disaster Preparedness for Volcanic Eruption*

The results of the analysis of disaster preparedness for learners in the face of volcanic eruptions is shown in figure 2.



**Figure 2.** Disaster preparedness attitude volcano eruption.

Based on figure 2, disaster preparedness for junior learners who live in the area near Mount Merapi in Sleman district in the face of volcanic eruptions consist of several categories. Category disaster preparedness learner is ready to show by 12%. In the category of ready learners who have disaster preparedness by 59%, in the category of less ready to show by 23% and disaster preparedness is not ready by 5%. The results of the standby attitude of learners obtained through the conversion process assessment questionnaire supplied by the disaster standby attitude indicator is the attitude in the face of the eruption of the volcano; have information about disaster response; able to identify the hazards of risks, vulnerabilities and disaster impacts on the environment; act appropriately to prevent loss; able to protect themselves from danger; and the restoration and development of the natural disaster.

Disaster preparedness is a structured activity to carry out development and disaster relief [14]. Having a ready attitude means that when there is a disaster, during disaster and after the eruption of the volcano learners already know what needs to be done so that the fewer fatalities will occur. But still learners who are not yet prepared to deal with volcanic eruptions. Disaster preparedness eruption of Mount Kelud low because based on experience eruption in 2004 [8]. Attitude held by the students to face the volcanic eruption, especially in the area around Mount Merapi are already in good shape.

#### 4. Conclusion

Based on the analysis, knowledge and attitudes facing disaster preparedness volcano eruption of student class VIII SMP around Mount Merapi showed that students had a good knowledge about knowing the danger signs of volcano eruption by 29% and had a ready for disaster preparedness of 59%.

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