

[Research Article]

PROFILE OF EARTHQUAKE DISASTER LITERACY IN DISASTER MITIGATION UNDERSTANDING AND ABILITY TO STUDENTS IN KUNINGAN

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ABSTRACT

Physics learning is oriented to the facts contained in natural phenomena in the surrounding environment. An earthquake disaster is a related event involving many physics concepts in terms of processes and other points of view. Indonesia is a region that feels in the ring of the fire zone, which causes several areas in Indonesia to be prone to earthquakes. Therefore, a general and initial description is needed to explain the profile of students' scientific literacy abilities because not a few victims swallowed by the earthquake were educated people. The method used in this research is pre-experimental by distributing questionnaires containing questions related to four aspects of scientific literacy regarding earthquakes and their mitigation efforts. The sample of this research is 30 students in class XI IPA 2 at MAN 1 Kuningan in the 2021/2022 academic year. Overall, the scientific literacy ability of students at MAN 1 Kuningan is still relatively low. The results of this study are expected to be used as a primary reference in making models, media, or teaching and enrichment materials that contain natural earthquake events related to their physical concepts.

Keywords: Disaster mitigation, scientific literacy, earthquakes

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1. INTRODUCTION

Earthquakes in Indonesia occur on a reasonably frequent scale. The meeting of the three main plates, namely the Eurasian plate, the Pacific plate, and the Indo-Australian plate, is the main factor causing Indonesia to be prone to earthquakes. Plate shifts occur on land and in the oceans (Sasma et al., 2020). Several areas in Indonesia are active seismic areas with a reasonably high-frequency speed (Simanjuntak & Olymphina, 2017). As stated by Sri in his research (Nugroho, 2019) that the ring fire area is a fault area that is prone to earthquakes, and Indonesia is located in that zone, especially in the Kuningan area, West Java. Based on this background, it is necessary to have a general description of the study of earthquake literacy in the Kuningan area to determine the level of understanding and ability, and literacy profile for earthquake disaster mitigation.

1.1. Earthquakes

Earthquakes are vibrations propagating to the earth's surface caused by faults and instability in the soil layer. Another definition by Hendro is that an earthquake is a shock on the earth's surface due to shifts in the earth's plates, volcanic activity, and debris from hills that cause rocks to fall together. (Murtianto, 2016).

Based on its characteristics, earthquakes are divided into three characteristics, namely collapse earthquakes, which are earthquakes from the collapse of the ceiling in the earth, such as tunnels in caves or mining. This type of earthquake has a vibration frequency that is not too large; Volcanic earthquakes are earthquakes caused by the release of magma from the earth's bowels into the upper hole, often referred to as the Kapunda hole. Before the volcano eviscerates, there is a vibration caused by magma activity, so residents around the volcano will feel the vibration. This type of earthquake has a vibration frequency that is small enough so that it does not have a significant impact on the population. It is volcanic eruptions that significantly impact the community; Tectonic earthquakes are earthquakes that occur because of the meeting between the oceanic

plate and the continental plate that occurs so strongly that it releases so much energy from the collision. (Sungkawa, 2016).

The magnitude and magnitude of an earthquake are influenced by factors of damage to the earth's surface, seismic wave modulation, topography, rock composition, water and soil conditions, and other factors (Fan et al., 2019). Some of the sociological factors mentioned by Nur Hidayat and Eko in their research (Hidayat & Santoso, 1997), such as population density, the time of the earthquake, and the community's preparedness, are determinants of the number of victims due to earthquakes.

The losses caused by the earthquake impacted various sectors, such as the loss of materials from the collapse of buildings, agriculture, and livestock, and not a few casualties (Subagia, 2015). The human body will be shaken and experience impact from various sides of the contact that hits it when the speed of the earthquake is tremendous (Husein S, 2016).

1.2. Literacy

Information literacy, according to Setio in his research (Marlyono et al., 2016), is a person's skill in understanding a vital information need, identifying and recognizing a problem, assessing information carefully, linking and designing the information into existing knowledge, concluding and communicating it clearly and straightforwardly so that there are no errors in the information conveyed.

Limited knowledge about earthquake disasters is still minimal, where most information is obtained from print and electronic media. This limited knowledge resulted in a lack of responses on how to save yourself when an earthquake occurs spontaneously. This limitation of knowledge is not only experienced by adults but the educated experience it. Students also dominated the earthquake victims because they would spend most of their time away from the reach of their parents, whether playing or at school. Therefore, it is essential to know the literacy profile of students in understanding earthquake disaster mitigation (Labudasari & R, 2020). Disaster

literacy has four sub-indicators, including aspects of the process, concept, context, and attitude that become the reference in describing the ability of disaster literacy. (Atmojo et al., 2018).

Based on the explanation above, the purpose of this study is to review and describe how much understanding of disaster literacy skills is for the student at Kuningan, West Java. Thus, students know mitigation efforts must be made when parents are out of reach before, during, or after an earthquake.

2. METHODS

The method used in this research is pre-experimental by using one shoot test design. This data was collected using a test instrument using a literacy instrument consisting of four aspects: process, concept, context, and attitude (Rochman et al., 2017). The research was applied to students of class XI MAN at Kuningan for the academic year 2021/2022 by filling out a questionnaire. The research data obtained are in the form of answers from respondents, which are then analyzed using an assessment rubric with an assessment range between 0-4, as shown in Table 1 (Zakwandi et al., 2018)

Table 1. Assessment Rubric

Score	Criteria
0	No Answer
1	Answer but wrong
2	Very minimal answer
3	The answer is correct but incomplete
4	Correct and complete

3. RESULTS AND DISCUSSION

3.1 Profile of Scientific Literacy Ability

The profile of students' literacy skills on earthquake disasters and their mitigation efforts in Kuningan is shown in Table 2.

Table 2. Literacy Ability Profile

Score	Category	Amount	percentage (%)
8-10	Low	8	26,7
11-12	Medium	15	50
13-16	High	7	23,3

Based on the data in Table 2, the scientific literacy ability about mitigation of the largest earthquake disaster is in the score range of 11-12, with as much as 50% of the total 30 respondents.

Meanwhile, the lowest scientific literacy skills on earthquake disaster mitigation were mainly in the 13-16 range, as much as 23.3% of the total 30 respondents. Based on this review, this shows that the literacy ability of students towards earthquake disasters and their mitigation still shows moderate ability. This is because it is seen that in the 11-12 grade range, students can only answer questions related to an average score of 2-3. Visually, the student's ability is shown in Figure 1.

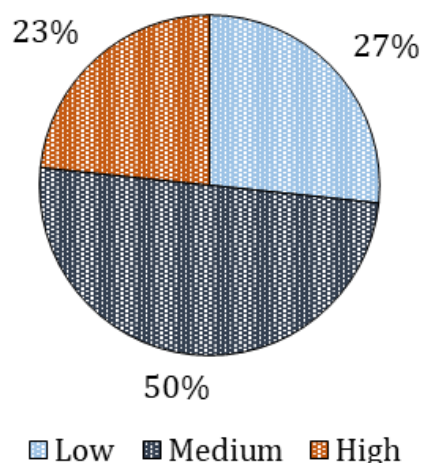


Figure 1. Graph of Science Literacy Ability Profile

3.2 Literacy Profile by Aspect

The profile of the scientific literacy ability of students in Kuningan in every aspect of scientific literacy that has been tested in the questionnaire distributed and carried out by the respondents is shown in Table 3 and Figure 2.

Table 3. Distribution of students' scientific literacy abilities based on aspects

Aspect	score	Average	Percentage
Process (P1)	90	3	75%
Concept (P2)	86	2,87	72%
Context (P3)	89	2,97	74%
Attitude (P4)	77	2,57	64%

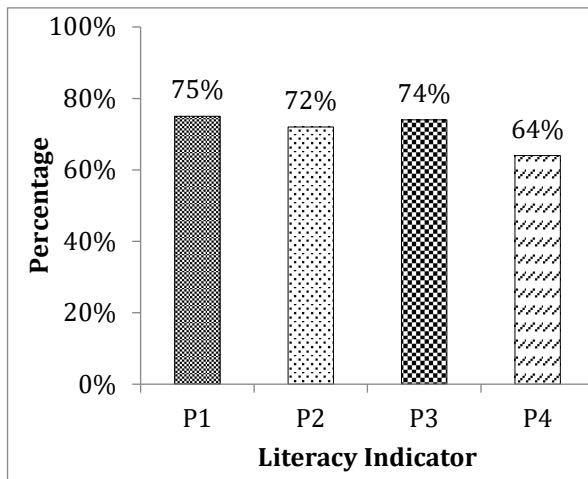


Figure 2. Distribution of students' abilities based on literacy aspects

Based on Figure 2, it can be concluded that the scientific literacy of students about mitigation against earthquakes is highest in the process aspect, namely about the process of occurrence and causes of earthquakes, especially in the Kuningan area of West Java, by 75% and scientific literacy of students about mitigation of earthquake disasters. The lowest is in the attitude aspect, which is about a positive attitude that must be done before or when an earthquake occurs, especially in the Kuningan area, West Java, by 64%.

3.3 Profile of Literacy Ability Based on Values

Based on the data shown in Table 3, the process aspect has a high percentage of other aspects, which is 75%, and the attitude aspect has the lowest percentage of other aspects, which is 64%. This is because the average answers obtained from the questionnaire answers get an average score of 1-2 due to students' limited knowledge or literacy skills towards earthquake disaster mitigation efforts.

This result follows the research conducted by Muhyiatul Fadilah (Fadilah et al., 2020) that the level of mastery of the procedural and epistemic knowledge domains in IPA students of FMIPA UNP is in the deficient category, with scores of 38.18 and 19.12. The knowledge that is sufficiently mastered by students in the scope of procedural knowledge is the determination of variables. On the other hand, students still

experience problems with knowledge of graphing and graph interpretation. In epistemic knowledge, knowledge of making analysis and inference is more mastered by students. The low level of procedural and epistemic knowledge is related to several factors. These factors indicate several attributes or characteristics of procedural and epistemic knowledge for scientific literacy skills in disaster contexts: content novelty, contextuality, dimension of inquiry, scientific explanation, and data visualization.

This research is expected to have a good impact on making people aware of the need for knowledge literacy about natural phenomena around us, especially earthquakes.

4. CONCLUSION

The profile of the scientific literacy ability of students in class XI IPA 2 at MAN 1 Kuningan to the earthquake disaster and its mitigation in Kuningan district, in general, is still in the medium category. Overall, the profile of the scientific literacy ability of students in Kuningan against earthquakes and their mitigation for the four aspects tested is in the poor category. If sorted by aspect, the lowest score percentage is attitudes, concepts, contexts, and processes. Students' low scientific literacy ability in the attitude aspect is caused by the unfamiliarity or *habits* of students toward earthquake mitigation knowledge. This condition can be used as an initial reference for teachers or other researchers to develop learning media or learning models that will be applied to students to improve scientific literacy skills associated with natural events or phenomena and teaching materials related to earthquake disasters and their mitigation.

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