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MORALITY BEFORE KNOWLEDGE

Enhancing youth preparedness and resilience in earthquake disaster mitigation: Evaluating the impact of disaster education workshops

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ABSTRACT
Bacground: Indonesia, as the world's largest archipelagic country, faces significant natural disaster risks due to its location on the "Ring of Fire." This study examines the knowledge and role of the younger generation in disaster preparedness in Pangalengan, focusing on understanding risks, actions during earthquakes, and information dissemination to enhance community resilience. **Methods:** The research method used is a field survey and workshop activities consisting of distributing oral questions, direct questions and questionnaires distributed before and after the workshop. While for area analysis, it was carried out by interviews and location surveys and the use of Google Maps. This study was conducted at State Senior High School 1 Pangalengan, West Java, with 150 students participating. From 9 schools located around the city of Pangalengan. **Findings:** This paper indicate that the 4-hour disaster mitigation workshop supported by teachers and presenters from Kitakyushu, Japan, effectively enhanced students' earthquake preparedness in Indonesia. The workshop strengthened their understanding of evacuation procedures, safe zones, early warning systems, and the preparation of a disaster emergency kit. Moreover, it fostered a greater sense of responsibility, concern for personal and community safety, mental resilience, and confidence in managing emergency situations. **Conclusion:** Disaster education not only reduces the risk and negative impacts of disasters but also forms a generation that is more aware and responsible for the environment and shared safety. **Novelty/Originality of This Study:** This research contributes to the academic discourse by evaluating the effectiveness of disaster education workshops in enhancing youth preparedness and resilience, with a particular focus on the role of interactive learning in promoting community engagement and fostering a culture of responsibility in disaster-prone regions.

KEYWORDS: community resilience; disaster education; disaster mitigation; youth preparedness.

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1. Introduction

Indonesia, the world's largest archipelagic country, faces significant challenges related to natural disasters due to its unique geographic position at the meeting point of three of the world's major tectonic plates (Anggraini & Yuadi, 2023). As part of the "Ring of Fire," Indonesia is prone to earthquakes, volcanic eruptions, and tsunamis (Rustam et al., 2023). This country is recorded as the second country most frequently hit by earthquakes after China.

Disaster management is a major focus for the government and related organizations, with the National Disaster Management Agency (BNPB) playing a key role in coordinating mitigation and response efforts (Anggraini & Yuadi, 2023). A major challenge is educating and preparing a large population spread across disaster-prone areas (Nepal et al., 2012; Yusuf et al., 2022). Although many Indonesians have basic knowledge about disasters, their preparedness for emergency situations still needs to be improved. Research shows that people in some areas have a good understanding of earthquake disasters, but are still lacking in practical preparedness. Efforts to improve community preparedness continue to be carried out through education and training programs (Aruru et al., 2021; Khaerunnisa et al., 2023; Madona, 2021). However, challenges such as low interest in reading and limited access to information remain obstacles. A comprehensive and sustainable approach is needed, including improving disaster-resistant infrastructure, effective early warning systems, and ongoing education and training for the community.

In recent years, West Java has experienced a series of significant earthquakes, resulting in loss of life and significant damage to infrastructure. The high level of damage is not only caused by geological factors, but is also influenced by the lack of knowledge and preparedness of the community in dealing with earthquake disasters (Bhandari et al., 2021; Hu et al., 2022; Lian et al., 2021). The lack of general understanding about earthquake disaster management and appropriate emergency response measures during an earthquake are crucial factors contributing to the high number of victims (Anggraini & Yuadi, 2023). This is especially evident in the younger generation, who should be at the forefront of future disaster mitigation efforts.

Given the importance of the younger generation in facing future natural disaster challenges, a specialized training program on earthquake management targeted at this age group is necessary. Such training will not only enhance their knowledge and skills in disaster response but also contribute to building a more resilient and disaster-prepared society in the future. Therefore, this research seeks to explore several key issues. First, it examines the level of knowledge that the younger generation has regarding the potential for disasters in the Pangalengan area. Second, it investigates their understanding of the appropriate actions to take when an earthquake occurs. Third, it explores how young individuals perceive their role as part of society, especially in the event of experiencing an earthquake. Lastly, this research aims to understand how the younger generation can become agents of change in disseminating disaster-related knowledge to their families and the wider community.

This study aims to examine the level of knowledge and role of the younger generation in dealing with potential disasters in the Pangalengan area. The main focus is to explain their understanding of disaster risks, actions to take during an earthquake, and their role as part of society in dealing with disasters. In addition, this study aims to equip the younger generation to become agents of change in disseminating knowledge about disasters to families and the wider community.

The benefits of this research include identifying the level of knowledge of the younger generation to design effective educational programs, increasing disaster preparedness, and strengthening the role of the younger generation in disaster management. This research also contributes to the development of disaster management policies, increasing community resilience, and optimizing the potential of the younger generation in disaster mitigation. By increasing understanding and preparedness, this research is expected to

reduce the psychological impact of disasters on the younger generation and create a positive domino effect in increasing overall community preparedness.

2. Methods

2.1 Respondent profile and design of research

The research method used is a field survey and workshop activities consisting of distributing oral questions, direct questions and questionnaires distributed before and after the workshop. While for area analysis, it is done by interview and location survey and use of google map.

This research was conducted at State Senior High School 1 Pangalengan, West Java, with 150 students participating. From 9 schools located around the city of Pangalengan. This training lasted for 4 hours of lessons, guided by 4 teachers and 3 presenters.

2.2 Overview of the research program

The Figure 1 illustrates the research program flow, starting with analyzing potential disaster issues in Pangalengan and discussions with the school community. It continues with planning and conducting a workshop, including distributing pre- and post-questionnaires to students. The results are then analyzed to evaluate students' understanding and compiled into reports and journals.

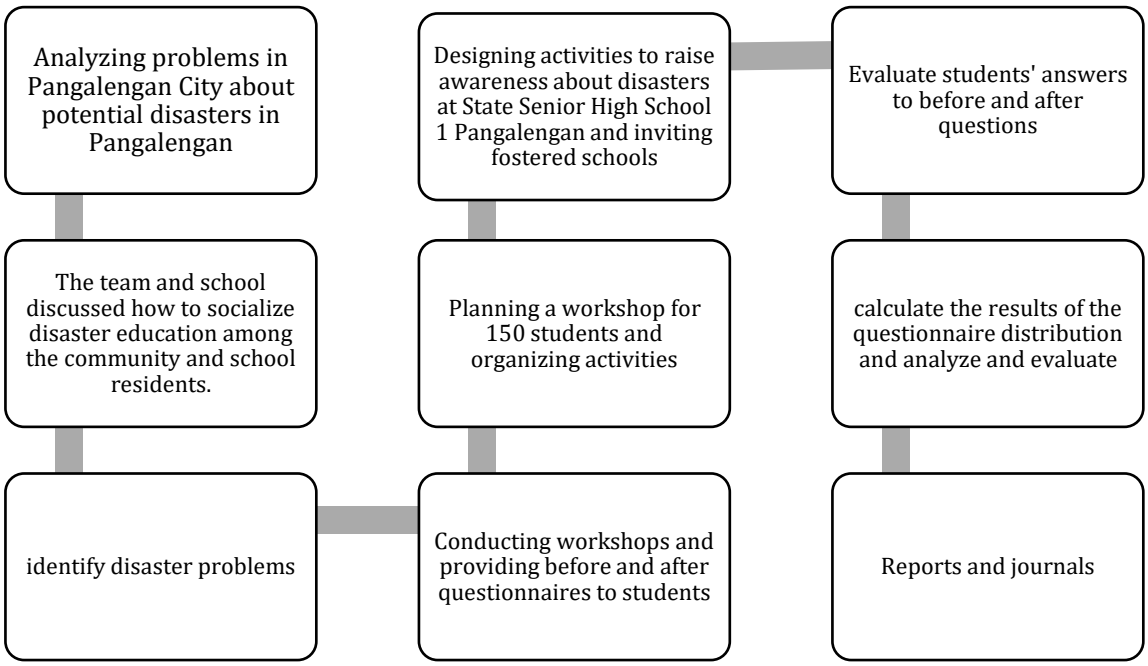

Fig 1. Overview of the research program

3. Results and Discussion

3.1 Characteristics of the research participants

The demographic characteristics of the participants are presented in Table 1. The table shows that this study involved 150 participants who attended the workshop, consisting of 30 junior high school students and 150 senior high school students from the area around Pangalengan city, where the schools are located around the earthquake-affected area. Table

1 lists the schools and the number of students who participated in the disaster mitigation workshop (Table 1).

Table 1. List of schools participating in the workshop

School level	School name	Number of representatives
Senior High School	Junior High School 1 Pangalengan	10 students
	Junior High School 2 Pangalengan	10 students
	Junior High School 4 Pangalengan	10 students
Senior High School	Senior High School 1 Pangalengan	60 students
	State Vocational School 5 Pangalengan	15 students
	MA Islamic Trust	15 students
	Tribakti Vocational School, Pangalengan	10 students
	PGRI 31 High School Pangalengan	10 students
	Danul Falah IT High School	10 students
Total participants		150 students

3.2 Workshop agenda and workshop as training to face disasters

This workshop was held at State Senior High School 1 Pangalengan, with the following activity agenda, as shown in Table 2.

Table 2. One-day activity agenda during the workshop

Workshop Agenda	
Theme :	Disaster Mitigation and Response Education Training
Implementation date	August 27, 2025
Number of participants Place	State Senior High School 1 Pangalengan
Schedule	Workshop participant registration Opening and welcoming remarks Session 1 Questions (Individual) 1. Have you ever experienced a disaster? 2. Have you ever experienced an earthquake disaster? Session 2 Questions (Individual) 1. If an earthquake suddenly occurs, what should we do? 2. If an earthquake occurs, what kind of places should be avoided? 3. In your opinion, what will happen after the earthquake? Listening to presentations from resource persons 1. Explanation of disaster mitigation 2. Explanation of disaster mitigation education in Japan 4. Explanation of our role in society in participating in disaster management Session 3 questions 1. Things to anticipate before an earthquake occurs 2. Actions that must be taken to prepare for the possibility of an earthquake 3. If a disaster occurs, what should we do? Answering the questionnaire after the workshop Discussion group forum closed with closing remarks

During the workshop, there were six questionnaires distributed to participants. Three questionnaires were distributed before the presentation of the material, and two were distributed after the presentation of the material, while for the evaluation, one question was distributed related to the workshop material. From the results of the questions given to udents individually, they produced very diverse answers, from these answers were summarized using cloud bibliometrics and the most frequently appearing part was taken.

3.3 Students' experiences and self-protection measures during and after earthquakes

Before entering the workshop material, about disaster management and mitigation, participants were given questions about whether they had experience dealing with disasters. This question was asked before there was an explanation of the disaster mitigation PPT. Therefore, these questions were designed to obtain responses related to disaster situations. The data showed that 65% of participants had experienced natural disasters, namely earthquakes. while 10% had undergone evacuation to shelters. However, almost 100% of participants reported never having attended training on natural disaster management.

Questions were given to students and answered individually, with the question If an earthquake suddenly occurs, what should we do. The most common answer is Take shelter under the table as much as 27%, the most frequently appearing, then the answer is do not panic/stay calm in second place, amounting to 16%, while avoiding tall buildings amounting to 14%. The rest is protect the head, become an open space and avoid glass in the order after number 3. Shown in Table 3.

Table 3. First steps to save yourself

No	If an earthquake occurs, what should we do?	Frequency
1	Take cover under the table	27%
2	Don't panic/ Stay calm	16%
3	Avoid tall buildings	14%
4	Protect your head	13%
5	Looking for an open field	9%
6	Avoid glass	7%
7	Waiting for the earthquake to subside	6%
8	Protecting your own body	4%
9	Following evacuation directions	3%
10	Gather at the evacuation point	1%

Next is the 2nd question, answered by individuals, namely places to avoid during an earthquake. Fifty two percent (52%) of the words tall buildings are the most frequently occurring words, Buildings with glass windows appear as many as 18%. The beach should be avoided as much as 9%, this answer is answered by few, because students live far from the beach, namely living in the mountainous area. While other answers, amount to less than 8%. Listed in table 4.

Table 4. Places to avoid during an earthquake

No	Places to avoid during an earthquake	Frequency
1	High rise building	52%
2	Building with glass windows	18%
3	Beaches should be avoided	9%
4	Power pole	8%
5	Cliff area because it could be subject to landslides	5%
6	Big tree	4%
7	Area near many buildings	1%
8	Old building	1%
9	Hill	1%
10	A house that is not strong	1%
		100%

In the 3rd question, participants were divided into large groups, with an average of five people. The next question was answered based on the results of the group discussion. And they were allowed to search for information from the internet using the mobile phones they brought. The question asked was, what will happen after the earthquake, the discussion was limited to 5 minutes, and they wrote on paper that had been distributed. Because many participants had experienced an earthquake, they could imagine that cracked buildings

were the most common, this was answered by 35% of the group. While the roads cracked as much as 31%, the victims died as much as 12%. The rest were in 4th place, there was no water. Power outages were in 5th place with 5%. Can be seen in Table 5.

Table 5. Results of group discussions answering the question of what will happen after the earthquake

No	If an earthquake occurs, what will happen?	Frequency
1	Cracked building	35%
2	Cracked road	31%
3	Victim died	12%
4	There is no water	9%
5	Power outage	5%
6	Aftershocks	3%
7	Cracked ground	2%
8	destroyed house	1%
9	Injured victims	1%
10	Broken bridge	1%
Total		100%

3.4 The importance of disaster mitigation and response education

This disaster mitigation education workshop was attended by three speakers from Kitakyuhsu City. A city located in the north of Kyushu Island, Japan. Coming to Pangalengan City to fill the workshop and provide a presentation on disaster mitigation and management. The presentation session was divided into three themes, namely, presentation on disaster mitigation and management, disaster mitigation and management education in japan and our role in society in participating in disaster management.

3.4.1 Disaster mitigation and response

Building a disaster-resilient community, one of which is through disaster education and training. Whether through formal or informal education, of course, the aim is for the community to understand the characteristics of disasters, especially earthquakes, recognize early signs, and know what actions to take when a disaster occurs. Of course, in addition to disaster mitigation knowledge, practical training is also needed to hone the skills to act quickly and appropriately through simulations and exercises. Some important things, is that each individual must be able to understand their respective roles when in a disaster situation. Each member of society can play a role as a "preparedness ambassador" to a professional with special skills. Awareness of this role can increase the sense of responsibility and strengthen social relations.

Another important role is the ability of each individual to help others during a disaster needs to be developed. Mutual cooperation and solidarity are becoming increasingly important in the context of disaster preparedness. Our ability to provide first aid or emotional support can help other disaster victims in critical situations. A holistic approach involving education, training, understanding roles, and developing mutual aid capabilities is essential in responding to earthquake threats. This approach not only increases the chances of individual safety, but also builds collective resilience in communities.

Earthquake preparedness is an ongoing process that needs to be continually evaluated and adjusted as the environment and social dynamics change. With a shared commitment to learning, practicing, and supporting each other, communities can build a strong foundation to face the unexpected challenges of nature.

3.4.2 Disaster mitigation and management education in japan

The Japanese government's disaster management policy reflects a comprehensive and proactive approach (Ghalehteimouri, 2024). Japan often experiences earthquakes,

tsunamis, and other natural disasters. Japan is also a country that has 4 different seasons, each season has a different type of disaster. Like in summer, there will usually be many typhoons and heavy rain, landslides and river floods, in winter, there will usually be many snowstorms and avalanches, while in autumn there are many wind disasters. While earthquakes have nothing to do with the season, but come suddenly. Therefore, Japan includes disaster mitigation education in the school curriculum. From kindergarten to university. They are required to practice facing disasters. The government requires every school to carry out disaster drills at least 3 times a year. This aims to prevent students from panicking when a disaster occurs, to get used to what to do. This disaster drill is integrated into social studies, sports, and life. The government has developed a sophisticated disaster management system, in addition to education, Japan also created an earthquake early warning system via mobile phones (Beam et al., 2021; Fujinawa & Noda, 2013; Kitazawa & Hale, 2021). Strict earthquake-resistant building standards, Provision of emergency equipment (Emergency Kit). And Research and development of disaster management technology (Prastowo & Wahyuningsih, 2020).

The Japanese government also involves the community in building disaster response communities. This is done through, formation of small groups in various neighborhoods (Anggraini & Yuadi, 2023). Raising public awareness through organizations such as Jishubou (Anggraini & Yuadi, 2023). Comprehensive cooperation between the government, related organizations, and the community (Anggraini & Yuadi, 2023).

Disaster education is provided from an early age to create a generation that is ready to face disasters (Lestari et al., 2024). The goal is to improve the individual's ability to assess the situation and make quick decisions when a disaster occurs (Anggraini & Yuadi, 2023).

While the initial policy was centralized, the Japanese government now involves communities in disaster mitigation planning and implementation. Each district has the freedom to adjust programs to suit local needs, such as focusing on tsunamis in coastal areas or landslides in mountainous areas.

Lessons on Disaster Prevention at an Elementary School Present to each other about the hazard maps they have created. Hazard map created by elementary school students. In social studies: Class for making hazard maps Lessons on Disaster Prevention at an Elementary School Consider ways to help those injured in a disaster. In physical education lessons, Learning about disaster prevention in physical education class, Lessons on Disaster Prevention at an Elementary School, Craft lessons: Making clothes using plastic bags. Making slippers with Newspaper. Other efforts for disaster reduction learning in the classroom.

3.4.3 Our role in society in participating in disaster management

In Japan, disaster mitigation and response education is included in the school curriculum, so there are at least 3 exercises in one year. Usually students will be invited to practice forest fires, disasters when there are dangerous people and natural disasters. For the natural disaster section, the theme for the exercise at that time depends on the principal's decision. Which one comes first. In the preparation of policies carried out by the community, which of course is accompanied by the government, it will usually compile what to do in relation to earthquake conditions. Identifying emergency evacuation sites, namely determining evacuation areas during disasters, is very important for several reasons: Saving lives and minimizing risk. Well-defined evacuation areas allow people to save themselves and secure property when there is an early warning or signs of disaster (Anggraini & Yuadi, 2023). Facilitating organized evacuation. Pre-determined gathering points help people gather safely during emergency response situations (Anggraini & Yuadi, 2023). Utilizing local knowledge. Involving local communities in determining evacuation routes and points ensures that the plan is in accordance with local conditions and needs (Anggraini & Yuadi, 2023). Speeding up the evacuation process.

With predetermined evacuation routes and points, the evacuation process can be carried out more quickly and efficiently, especially in emergency situations (Mohadib,

2024). Reduce confusion and panic. Clear evacuation routes and gathering points help reduce confusion and panic during a disaster (Yulianto et al., 2021). Facilitate coordination. Predetermined evacuation areas facilitate coordination between the community, emergency response personnel, and authorities (Mohadib, 2024). By determining evacuation areas in advance, we can increase community preparedness and reduce risks when a disaster occurs (Kinasih et al., 2023; Maulita et al., 2024).

Try disaster prevention training is Disaster response training or disaster response training is very important for several reasons: Increasing awareness and preparedness for disaster risks that may occur in our area (Lestari et al., 2024). Developing important skills such as evacuation, first aid, and emergency communication needed when a disaster occurs (Mohadib, 2024). Helping organize communities to respond to disasters in a coordinated and effective manner (Mohadib, 2024). Improving the ability of individuals and communities to reduce the negative impacts of disasters (Anggraini & Yuadi, 2023). Helping to form trained disaster volunteers to assist in various stages of emergency response (Mohadib, 2024). Improving coordination and collaboration between various parties involved in disaster management (Mohadib, 2024). Providing accurate information on what to do when a disaster occurs, such as evacuation sites and items to bring (Prastowo & Wahyuningsih, 2020). Helping to evaluate and identify aspects that need to be improved in the disaster response system (Yulianto et al., 2021). By participating in disaster response training, we can be better prepared to face emergency situations and protect ourselves and others around us when a disaster occurs.

3.5 Preparedness strategies and post-disaster actions: anticipation, response, and evaluation after the workshop

After the participants listened to the presentation from the resource person, the participants answered questions about what to anticipate before an earthquake occurs, the Group discussed the answers to the questions. So thirty four percent of the answers were earthquake disaster training, then 27% prepared rescue equipment, while 11% of respondents answered determining a place to evacuate, as shown in Table 6.

Table 6. Things to do before an earthquake occurs

No	What to do before an earthquake occurs	Frequency
1	Earthquake disaster drills	34%
2	Preparing rescue equipment	27%
3	Determining a place to evacuate	11%
4	Learning about earthquakes	9%
5	Creating an earthquake volunteer group	7%
6	Making a rescue poster during an earthquake	4%
7	After the workshop, teach the family at home	4%
8	Learning the history of disasters	2%
9	Save money	1%
10	Study the areas that are potentially damaged during an earthquake.	1%

In this section, students discuss questions in groups about what to do to prepare for an earthquake. After getting the material about what to do, participants discuss what to do. The answers are summarized and written in Table 7.

Table 7. Preparations that must be made to face an earthquake disaster

Group	What preparations should be made to face an earthquake disaster?
1	Understand the stages/SOPs for dealing with an earthquake
2	Prepare an emergency bag. It contains food, a first aid kit, emergency clothing, blankets and a flashlight.
3	Understand the risks of earthquakes, get to know the surrounding environment, conduct disaster preparedness exercises/simulations, prepare disaster preparedness bags, learn first aid

4	Prepare evacuation points, determine safe places to take refuge such as fields (together with village officials), then prepare medicines, clothing, first aid, food, flashlights, candles, water, communication equipment.
5	Prepare equipment such as first aid kits, clean water, long-lasting food, such as canned food, blankets or warm clothes to protect against bad weather. Communication tools, important documents and prepare for self-rescue in case of an earthquake.
6	Together with firefighters, prepare the equipment needed in case of an earthquake. Medicines, first aid kits, clothing, food, important documents and some money.
7	First aid bag, sunter, what food, clothes, tubes, water tubes, masks.
8	Create an emergency plan, conduct evacuations, emergency drills, establish emergency contacts.
9	Prepare emergency equipment: emergency kit, important documents, battery radio,.
10	Securing the house such as: checking the house regularly, building structure, securing furniture. Turn off energy sources.
11	Taking education and training such as: learning first aid, understanding types of disasters
12	Follow news developments and find the latest information about disasters. Follow weather developments and other information
13	Look for an evacuation site, make sure the area is safe and no one is hurt.

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The next question is about what to do after a disaster, especially an earthquake that often occurs in Pangalengan city. Group members discuss what to do. The answers are in Table 8.

Table 8. Things to do after a disaster occurs

Group	If a disaster occurs, what should we do?
1	Providing assistance to affected victims
2	Be alert for aftershocks
3	Help officers set up temporary evacuation posts and help prepare necessities while at the evacuation post.
4	Be alert when a disaster occurs and always be prepared if a disaster occurs, don't panic.
5	If a disaster occurs, start looking for a wide area far from residential areas, large buildings and multi-storey houses.
6	Helping others, cleaning up the environment affected by the earthquake,
7	Contacting family members, finding shelter, volunteering and learning from experience
8	Helping to set up tents for refugees, helping to bring clean water.
9	Volunteering at a soup kitchen, helping injured people, volunteering for search and rescue or disaster relief.
10	After a disaster occurs, what we can do is check if anyone is injured, make emergency tents for temporary accommodation and evacuate the damage that has occurred.
11	Recognizing the surrounding environment, such as knowing safe places for evacuation, recognizing disasters that often occur in the surrounding environment
12	Know and understand how to deal with disasters and how to provide first aid, ensure you stay calm, don't panic, check if anyone is injured, stay away from damaged buildings,
13	Avoid other dangers, be alert if there is a gas leak, evacuate and find a safe place, move to an open field, a large field, follow the evacuation, help each other, pay attention to parents and relatives, or those with special needs, be ready to face aftershocks.

After the workshop was completed, participants were asked questions about changes in their knowledge after receiving the workshop. Based on the results of the questionnaire given, it can be concluded that the narrative is that the majority of respondents have direct experience with natural disasters, with 65% stating that they strongly agree that they have experienced disasters such as floods, landslides, or earthquakes. This shows a high level of exposure to disaster risk among respondents. Awareness of the actions to be taken when a disaster occurs is quite high, with 85% of respondents strongly agreeing that they know what to do when a disaster occurs. This shows a good level of preparedness among respondents. The disaster workshop attended by respondents proved effective in increasing their understanding. As many as 75% of respondents stated that they

understood what to do in the event of a disaster after attending the workshop. Furthermore, 84% of respondents admitted that they understood the things that must be prepared for in the event of a disaster.

Disaster workshops have been shown to provide significant benefits to participants, with positive impacts extending to the community at large. Based on the results of the questionnaire, 91% of respondents strongly agreed that they gained a lot of important and useful information from the workshop (Anggraini & Yuadi, 2023). This high percentage indicates that the material presented in the workshop was not only relevant, but also presented in a way that was effective and easy for participants to understand.

One of the key aspects of the workshop was raising awareness of the importance of sharing knowledge about disaster mitigation. A total of 76% of respondents expressed a strong intention to disseminate information about disaster mitigation education to their family and friends (Anggraini & Yuadi, 2023). This reflects a potential multiplier effect, where the knowledge gained from the workshop is not only beneficial to the participants directly, but also has the potential to reach a wider social circle. Most impressively, almost all respondents (98%) strongly agreed that disaster education should be understood by everyone. This extraordinarily high figure indicates a strong collective awareness of the importance of disaster knowledge among the community. This is in line with the principle that disaster preparedness is a shared responsibility involving all levels of society.

Disaster training such as this workshop plays a vital role in improving community preparedness. They help participants develop the skills needed to act effectively during disaster situations, including knowledge of evacuation, first aid, and emergency communications (Anggraini & Yuadi, 2023). In addition, these trainings also contribute to raising awareness of the threat of natural disasters that may occur in their area, enabling participants to recognize early signs of disaster and respond quickly. Furthermore, disaster workshops play a role in building community capacity to respond to disasters in a coordinated manner. This can involve forming groups such as first aid teams or evacuation team (Anggraini & Yuadi, 2023). By understanding the appropriate steps to take during a disaster, emergency response and response can be carried out more efficiently, ensuring that the actions taken by the relevant parties are relevant and effective.

Disaster training also helps in improving the preparedness of individuals, families, and communities. This includes the preparation of emergency equipment, evacuation plans, and knowledge of the steps to take before, during, and after a disaster (Anggraini & Yuadi, 2023). In addition, this training can help in recruiting and training disaster volunteers who can assist in various stages of emergency response, such as evacuation, aid distribution, and psychosocial support. Community awareness of disasters is closely related to their understanding of risks and vulnerabilities. By knowing the risks and vulnerabilities of the area where they live, communities can identify potential threats and develop appropriate mitigation strategies. Disaster-aware communities are able to identify and monitor potential hazards that threaten their area, understand the types of disasters that may occur, and take preventive measures and prepare evacuation plans.

Overall, the results of this questionnaire indicate that the disaster workshop has succeeded in increasing participants' understanding and preparedness for disasters, as well as raising awareness of the importance of disaster education for the wider community. This is an important step in building a resilient community that is ready to face the challenges of disasters in the future.

Table 9. Questionnaire after attending the workshop

Question	SS	S
I have experienced natural disasters, such as floods, landslides, earthquakes	65%	35%
I know what to do when a disaster occurs.	85%	15%
After getting a disaster workshop, I understand what I should do if a disaster occurs.	75%	25%
After getting the workshop, I understand the things I need to prepare for in case of a disaster?	84%	16%

There are many important and useful things that I got after I attended the disaster workshop.	91%	9%
I intend to tell my family and friends about Disaster Mitigation Education.	76%	24%
In my opinion, everyone should understand about Disaster Education.	98%	2%

3.6 Discussion

Disaster education is a crucial aspect in preparing the younger generation to face increasingly complex natural challenges (Nasution et al., 2025). Through structured workshops and training, students can gain invaluable knowledge about disaster preparedness, especially earthquakes that frequently occur in Indonesia. These activities not only provide theoretical information, but also practical experience that can be applied in real situations.

By holding the workshop, students gain a more comprehensive understanding of what to do when an earthquake occurs. They learn about proper evacuation steps, how to take safe shelter, and how to help others around them (Prastowo & Wahyuningsih, 2020). This training also teaches students about their own role in emergency situations, increasing their sense of responsibility and concern for the safety of themselves and others (Hidayat et al., 2023). Effective Evacuation Procedures, students are trained to follow effective evacuation procedures, such as, protecting the head with hands, bags, or other light objects. Taking shelter under a strong table or in the corner of a building column (triangle of life) and staying away from glass and objects that can fall. Then after the earthquake stops, immediately evacuate yourself through the designated route to the gathering point. In addition, the workshop provides practical knowledge about things that need to be prepared when an earthquake occurs. Students learn to put together a disaster preparedness bag, identify safe places at home and school, and understand the early warning system (Mohadab, 2024). They are also taught not to wear high heels or stockings during evacuation, which can hinder rapid movement (Lestari et al., 2024). Disaster education through workshops not only increases physical preparedness, but also builds students' mental resilience. They become more confident and calm in facing disasters, which can ultimately reduce the risk and negative impacts of natural disasters (Yulianto et al., 2021). This calmness and confidence are very important in emergency situations, where panic can cause accidents or errors in decision making (Rahmasari & Giyarsih, 2024).

Disaster simulation is an integral component of preparedness education. Through simulation, students can practice directly what they have learned in theory. This activity helps hone their skills and reflexes in responding to emergency situations. Simulation also helps identify areas that still need improvement in school evacuation plans. Disaster Education as a long-term investment providing disaster preparedness education from an early age is a long-term investment in building a resilient community (Yulianto et al., 2021). Students who have been equipped with this knowledge and skills can not only protect themselves, but can also become agents of change in their communities. They can share their knowledge with family and friends, creating a positive ripple effect in improving disaster preparedness widely (Sahidu et al., 2021).

Integration with school curriculum To maximize its impact, disaster education should be integrated into the school curriculum. This can be done through relevant subjects such as science, geography, or citizenship education. With this approach, students can understand the scientific context behind natural disasters, as well as their social and ethical implications. And the role of technology in Disaster Education, technological developments open up new opportunities in disaster education. The use of mobile applications, virtual reality, or computer simulations can make learning more interactive and interesting for students (Bean et al., 2021). Technology can also be used to disseminate important information quickly and efficiently when a disaster occurs. In addition, multi-sectoral collaboration is needed, namely effective disaster education requires cooperation from various parties, including schools, governments, non-governmental organizations, and communities. This collaboration can ensure that disaster education programs are always

up-to-date and relevant to local conditions. Continuous evaluation and improvement are important to conduct regular evaluations of disaster education programs. This allows for improvements and adjustments based on experience and the latest developments in disaster management. Feedback from students, teachers, and parents should also be considered in this evaluation process. With a comprehensive and sustainable approach to disaster education, we can prepare a young generation that is resilient, responsive, and ready to face the challenges of nature. This investment in education not only benefits individual students, but also contributes to the overall resilience of communities to natural disasters.

4. Conclusions

Natural disasters are phenomena that cannot be predicted with certainty when they will occur. Therefore, community preparedness in facing disasters is the main key to minimizing the negative impacts caused. Disaster mitigation education is present as a solution to improve the understanding and skills of the community, especially the younger generation, in dealing with emergency situations due to natural disasters.

The role of schools as educational institutions is very important in instilling disaster mitigation knowledge and skills in students. Integration of disaster mitigation materials into the learning curriculum is a strategic step to ensure that each student has sufficient provisions in dealing with disasters. The insertion of this material can be done in various subjects such as Geography, Sociology, History, Indonesian, Chemistry, and Biology.

Disaster mitigation education is not only aimed at providing theoretical knowledge, but also at shaping the character of students who are prepared for disasters. This character will be formed through a combination of knowledge and skills that are developed in learning and extracurricular activities. With a good understanding of the types of disasters, signs of disasters, the impacts of disasters, and disaster risk reduction efforts, students will be better prepared to face emergency situations. The implementation of disaster mitigation education can be done through various methods that are tailored to the characteristics and needs of students. Some approaches that can be applied include the use of interactive learning media such as illustrated stories and light simulations. integration of disaster mitigation materials into relevant subjects, implementation of workshops and practical training on disaster preparedness, development of learning-based projects that focus on disaster issues. Utilization of technology in disaster mitigation learning. In addition, the role of students and the community in handling disaster mitigation is that students as an integral part of society have an important role in disaster mitigation efforts. The knowledge and skills acquired in school can be transferred to families and the surrounding community, thus creating a positive domino effect in building awareness of the importance of disaster preparedness. Collaboration between students and the community in preparing for disasters will create a more resilient and responsive environment to emergency situations. Teachers have a crucial role in imparting disaster mitigation knowledge and skills to students. Therefore, increasing teacher capacity through training and professional development in the field of disaster management is very important. Schools also need to develop comprehensive disaster mitigation education management, including planning, organizing, commanding, coordinating, and controlling related programs.

The implementation of disaster mitigation education in the school curriculum certainly faces various challenges. One of them is the need to integrate disaster material without adding to the burden of an already dense curriculum. A solution that can be applied is to adopt an integrated and contextual learning approach, where disaster material is naturally integrated into various subjects.

Disaster mitigation education is a long-term investment in building a resilient and disaster-ready society. Through the integration of disaster materials into the school curriculum, workshops, and practical training, students not only gain theoretical knowledge but also practical skills that can be applied in real situations. With a holistic and integrative approach, disaster mitigation education can improve physical preparedness, build mental

resilience, and foster a sense of responsibility and concern for the safety of themselves and others. This will ultimately contribute to the formation of a generation that is more aware and responsible for the environment and shared safety. The implementation of effective disaster mitigation education requires collaboration between various parties, including the government, educational institutions, community organizations, and families. With this joint effort, it is hoped that a society can be created that is more prepared and resilient in facing various natural challenges, especially in Indonesia which has a fairly high potential for disasters.

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