TARBIYA: Journal of Education in Muslim Society, 11(1), 2024, 81-92
DOI: http://doi.org/10.15408/tjems.v11i1.40444
Website: http://journal.uinjkt.ac.id/index.php/tarbiya
p-ISSN: 2356-1416, e-ISSN: 2442-9848

UNIVERSITY STUDENTS' AWARENESS AND PREPAREDNESS FOR NATURAL DISASTERS: A STUDY ON PREVENTING LANDSLIDES, EARTHQUAKES, AND VOLCANIC ERUPTIONS IN INDONESIA

Fujikawa Yoshinori[1], Tuswadi[2,*], Hayashi Takehiro[3], Isozaki Tetsuo[4], Niken Subekti[5]
[1,5] Semarang State University, Indonesia
[2] SMP Negeri 1 Banjarnegara & Indonesia Academy of Young Sciences, Indonesia
[3,4] Hiroshima University, Japan
E-mail: tus5800@yahoo.com

Received: 24th November 2023; Revised: 15th May 2024; Accepted: 28th June 2024

Abstract

This study seeks to understand the disaster-prevention consciousness focused on landslide, earthquake, and volcanic eruption among 22 students pursuing a major in Geography in the Social Science Faculty, Semarang State University (UNNES), Indonesia. It analyzed the students' consciousness through short comments toward questions "What can we do?", which focused on preventing, defending, reducing, and mitigating the impacts of the three kinds of natural disasters. The average number of the description was 5.7, and the median was 5. More than half of the students mentioned points related to "before disaster and usual life," "after disaster and restoration," "hardware/structural," and "software/non-structural." All the answers described ideas with reasons. But only four students described ideas based on educational viewpoints, indicating students' lack of scientific viewpoints in elaborating their ideas about disaster prevention. This finding calls for improving students' consciousness regarding disaster prevention through education.

Keywords: consciousness; youth, university students; natural disasters; prevention

Abstrak

Penelitian ini bertujuan untuk memahami kesadaran pencegahan bencana yang difokuskan pada tanah longsor, gempa bumi, dan letusan gunung berapi di antara 22 mahasiswa yang mengambil jurusan Geografi di Fakultas Ilmu Sosial, Universitas Negeri Semarang (UNNES), Indonesia. Kesadaran mahasiswa dianalisis melalui komentar singkat terhadap pertanyaan "Apa yang bisa kita lakukan?", yang difokuskan pada pencegahan, pertahanan, pengurangan, dan mitigasi dampak dari tiga jenis bencana alam tersebut. Rata-rata jumlah deskripsi adalah 5,7, dan median adalah 5. Lebih dari setengah mahasiswa menyebutkan poin-poin yang terkait dengan "sebelum bencana dan kehidupan biasa," "setelah bencana dan pemulihan," "perangkat keras/struktural," dan "perangkat lunak/non-struktural." Semua jawaban menggambarkan ide-ide dengan alasan yang mendasarinya. Namun, hanya empat mahasiswa yang menguraikan ide-ide berdasarkan sudut pandang pendidikan, yang menunjukkan kurangnya sudut pandang ilmiah dalam mengelaborasi ide-ide mereka tentang pencegahan bencana. Temuan ini menunjukkan perlunya peningkatan kesadaran mahasiswa mengenai pencegahan bencana melalui pendidikan.

Kata kunci: *kesadaran; pemuda, mahasiswa; bencana alam; pencegahan*

How to Cite: Yoshinori, F, Tuswadi, Takehiro, H, Tetsuo, I., & Subekti, N. (2024). "University Students' Awareness and Preparedness for Natural Disasters: A Study on Preventing Landslides, Earthquakes, and Volcanic Eruptions in Indonesia. *TARBIYA: Journal of Education in Muslim Society, 11*(1), 81-92. doi:10.15408/tjems.v11i1.40444.

*Corresponding author

Introduction

In many countries of the world, people have been exposed to a variety of disasters in the time period of the past to the present (Ozkazanc and Yuksela, 2015). Disasters like floods, earthquakes, fires, typhoons and the like pose a serious threat to people (Matunhay, 2018). Disasters have become major global problems and threats to sustainable development. Its effects are varied, as well as loss of life, injury, illness, and destruction. Property and other asset disasters can also lead to social and economic disruption, loss of infrastructure and other services, and environmental destruction (Twigg, 2015).

Indonesia is geographically and geologically a disaster-prone region, such as earthquakes, landslide, tsunamis, floods, and volcanic eruptions (State Ministry for National Development Planning. National Action Plan for Disaster Risk Reduction, 2010). The country is in the Pacific ring of fire where the region has a lot of tectonic activity. Indonesia is also located on the Eurasian plate, the Pacific, plate along with the Indo-Australian plate which are three active tectonic plates that cause the occurrence of collision zones that then form volcanoes (Verstappen, 2010). Indonesian society's disaster preparedness is still weak despite the fact that the country is prone to some kinds of natural disasters. It is proven by the large number of victims and victims of property from each disaster (James, 2008; Kusumastuti, Arviansyah, Nurmala, & Wibowo, 2021).

Beside children, youths are often identified as particularly vulnerable to disasters owing to their lack of resources and underlying socio-economic conditions that increase their vulnerability (Fothergill, 2017; Mitchell et al., 2008; UNDRR, 2020). The United Nations, for statistical purposes, defines 'youth', as those persons between the ages of 15 and 24 years, without prejudice to other definitions by Member States.

Looking at this condition, regarding the disaster education for young people, it is important for Indonesia government to give youths disaster education at schools and universities. By getting this, youths will get knowledge and skills about disaster-risk-reduction and they can behave effectively to save themselves and other people in disasters. Youths should have effective knowledge related to disaster prevention and mitigation for facing any emergency time to increase the survival rates. In addition, knowledge of disasters is vital for students because it can help them understand the risks and dangers that might arise if a disaster occurs, and knowledge of disasters can help students understand the importance of emergency response (Pramita et al., 2022; Sayuti et al., 2022). Furthermore, when students know about disasters, they can better prepare for and deal with emergencies and help reduce the risk of injury and loss. Therefore, it is important for students to learn disaster information to act appropriately and safely in an emergency (Ilyasa, Rahmayanti, Muzani, Ichsan, & Suhono, 2020; Kamil, Utaya, & Utomo, 2020).

Level of knowledge of the individual can affect the level of preparedness in dealing with disaster. Disaster knowledge is important basic to prepare individual and should be given as early as possible, because the varieties and characteristics of regions will affect the potential and threat level in the region.

At the same time, youth are incredibly resilient and may be able to contribute ideas and actions during a disaster. By involving youth in disaster planning well in advance of an emergency situation, for example, they will be better equipped to respond appropriately and calmly when confronted with an actual event. We cannot deny that youth have incredible reserves of energy and may bring fresh new ideas to the table that adults have not considered. By including youth in local disaster preparedness planning

DOI: 10.15408/ tjems.v11i1.40444

and recovery efforts, not only can they help share the message about the importance of disaster preparedness, the skills they develop will continue to serve the community long into their adult years.

Youths can participate in various preparedness activities including hazard and threat identification, drills, evacuation planning, home adjustments, search and rescue training, and risk communication; in response efforts such as risk communication, evacuation, and search and rescue; and in recovery efforts such as helping to care for others, gathering and distributing resources, peer counselling, planning and reconstruction projects, and assisting with child care and household responsibilities (Peek, 2008). To have such kind of knowledge and skills in disaster, youths first should have consciousness about disasters prevention as part of disaster preparedness which is an important factor that plays a major role in diminishing the causalities in case of any disasters (Rohith et al., 745-753).

It evidenced that disaster awareness translates into disaster preparedness. The relationship between awareness and disaster preparedness has been extensively researched in several previous studies (Hargono, 2023). Consciousness about disasters can be the first thing coming in somebody's mind when they deal with disasters. Some experts refer consciousness to a motivation to recognize the problem occurring at the time of disaster and solve it. Such psychological activities are generally called "disaster-prevention consciousness." As disaster-prevention consciousness urges disaster-prevention behaviour; the importance of improving disaster-prevention consciousness has been pointed out by various institutions and researchers (Yamori, 2011).

In Ozeki et al. (2017), disaster-prevention consciousness is defined as "the degree of recognizing the fact that one can be affected by a disaster and the necessity for informational, physical, and social preparation and the level of protecting lives and properties of oneself and people around one as well as local cultures and communities." Our present study adopted this definition.

Campuses like other public facilities have significant potential for disaster exposure. Many activities occur in campus, ranging from academic to student activities. Campuses are not only facilities used by their students but also places visited by the public. All activities will be disrupted or even halted when the campus is hit by a disaster, especially if the campus lacks adequate disaster response efforts. To assess campus preparedness for disasters, attention needs to be paid to several aspects such as awareness of the importance of disaster preparedness, individual knowledge about disasters, disaster-related information systems, and adequate campus facilities. As such, as highlighted by Matunhay (2022) in as much as higher education institutions (HEIs) are expected to effectively respond to the current and dynamic construction of labor markets, they are likewise expected to build an environment with continuous updates of knowledge and education in order to contribute to disaster management. Apparently, the increased independence that comes with being in college also comes with more responsibility, especially when it comes to emergency preparedness (Dynes, 2019).

It is concerning that research on disaster prevention awareness among university students remains scarce. Given the critical importance of such awareness, our study seeks to explore the extent of university students' understanding and consciousness regarding natural disaster prevention. The goal is to identify effective strategies to enhance this awareness, ultimately helping to cultivate a resilient and prepared generation capable of facing natural disasters in the future.

DOI: 10.15408/ tjems.v11i1.40444

As Ozeki (2017) pointed out, measuring disaster prevention awareness is just as essential as the efforts made to improve it. Such measurement helps to pinpoint areas that require further development and informs the strategies needed to strengthen disaster prevention awareness among students.

To achieve the research objectives, we formulated several key questions. First, how many aspects can students identify when discussing natural disasters such as landslides, earthquakes, and volcanic eruptions? Second, what specific factors do students consider, and how many do they identify in relation to the phases of "before disaster/normal life" and "after disaster/restoration"? Third, what "hardware/structural" and "software/non-structural" elements do students consider in disaster prevention and mitigation, and how comprehensive is their consideration? Lastly, what scientific reasoning do students use when explaining issues related to natural disasters?.

These questions are designed to provide a deeper understanding of how students perceive and respond to the threat of natural disasters, as well as how they conceptualize strategies for prevention and mitigation. The findings of this study are expected to offer valuable insights into improving disaster prevention awareness among university students, thereby contributing to the development of more resilient communities capable of withstanding the impacts of natural disasters.

Method

Design of the Study

This type of research is descriptive research with a qualitative approach. Descriptive statistical analysis is an analysis that describes or gives an overview of the object under study through sample or population data as it is, without conducting analysis and making generally accepted conclusions (Sugiyono, 2019).

This study cited part of the theory model composing the disaster-prevention consciousness proposed by Ozeki et al (2017). The “disaster-prevention consciousness” as a psychological aspect which is separated from the actions and knowledge of individuals (Fig. 1). In this model, the psychological aspect is completely separated from demographic factors, experience, and knowledge. Not only the actions of individuals but also the concept of mutual assistance, which has been regarded as important recently, is integrated and the concepts of interaction among persons, relationship with residential areas, and panoramic perspectives in relation to the total image of disaster are added.

Students’ responses in this research were categorized. For example, if one student said “Plant many trees on slopes and avoid building homes near slopes,” these were counted as “two matters”. The first matter is “Plant many trees on slopes” and the second matter is “avoid building homes near slopes”.

Students’ responses were categorized into “hardware” and “software.” In this study, “hardware” is the structural or physical system and refers to infrastructure, such as machinery and equipment. “Software” is a comparative term for “hardware” and refers to a non-structural system, such as a social, cultural, or educational approach. For example, “Avoid building in places with high slopes” is “hardware,” while “We must relax and not panic” is “software.”

DOI: 10.15408/ tjems.v11i1.40444

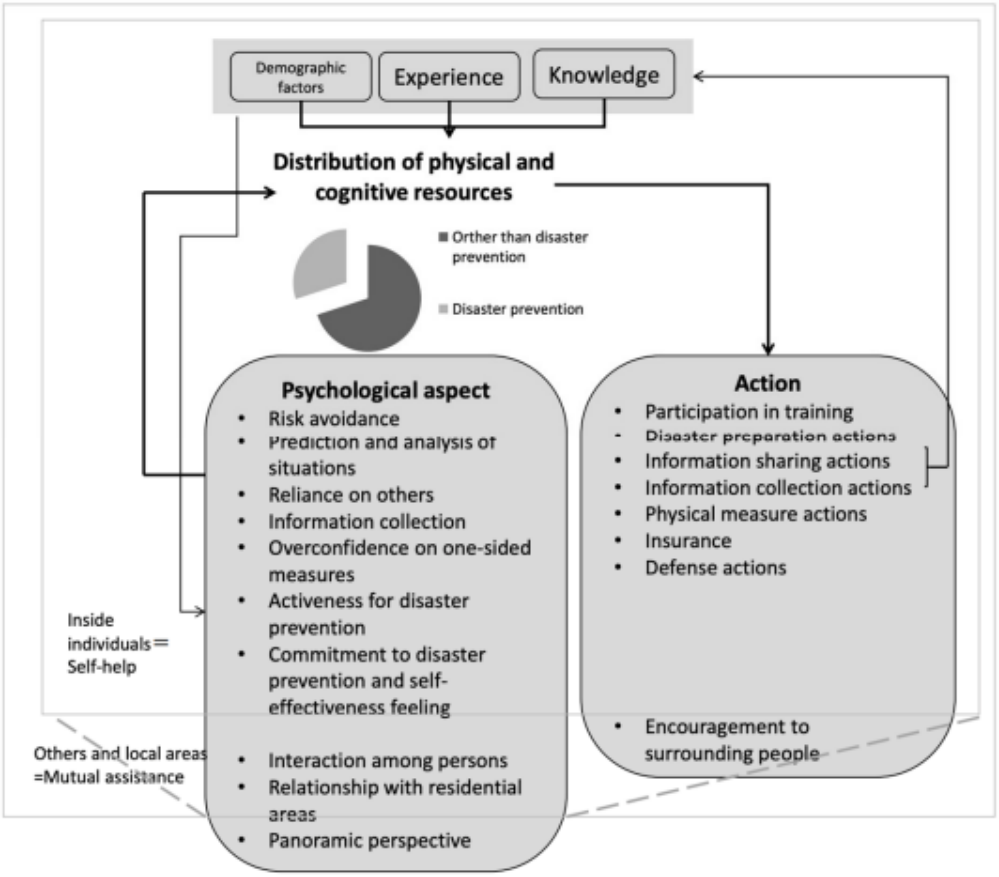

Figure 1. The theory model of Ozeki et al. (2017)

Furthermore, it was checked if the students' responses were accompanied by reasons based on the mechanism of each natural disaster. For example, "Plant trees on slopes" does not contain a reason that is based on natural disaster mechanisms. By contrast, "Plant trees so that the soil is strong" or "Planting a plantation to keep the soil strong" are responses that contained reasoning grounded in natural disaster mechanisms. Finally, whether the students described their opinions based on the educational viewpoint was analysed. Keywords like "learn" and "study" were counted in their descriptions.

Question Items

The students were asked three questions (in English) about natural disasters prevention. The topics for the short report were "What can we do?" for preventing, defending, mitigating, and reducing each disaster. We took three most common natural disasters in Indonesia namely landslide, earthquake, and volcanic eruption. The questionnaire has been tested for validity and reliability by being carefully checked by the Indonesian author and being tried out to make sure that the students understood the meaning of the questions so that they could answer according to the objective of this research. 1) Regarding landslide, do you think "what can we do?" (*Untuk Longsor, menurut Anda "apa yang bisa kita lakukan?"*); 2) Regarding earthquake, do you think "what can we do?" (*Untuk Gempa Bumi, menurut Anda "apa yang bisa kita lakukan?");* 3) Regarding volcanic eruption, do you think "what can we do?" (*Untuk Letusan Gurung Berapi, menurut Anda "apa yang bisa kita lakukan?").*

DOI: 10.15408/ tjems.v11i1.40444

Survey Subjects and Survey Method

A total of purposely selected 22 students pursuing a major in Geography in the Social Science Faculty, Semarang State University (UNNES), Indonesia participated in this research. There were 14 students in the 3rd semester and 8 students in the 5th semester (aged 18-20 years old as they were categorized as youths). These students took the Disaster Education Class with one of the authors in UNNES.

Students in the 3rd-semester had received basic knowledge, such as natural processes in the geosphere and their relationship with human beings. They had information about various kinds of natural disasters, such as landslides, earthquakes, tsunamis, floods, and droughts, through their geomorphology, geology, and hydro-meteorology subjects. The 5th-semester students had advanced knowledge, such as disaster mitigation, applied geomorphology, and land and water conservation. Hence, they had basic knowledge of disaster mitigation.

After graduation, several students wanted to become high school teachers or experts and workers based on their knowledge and skills in geography-related natural disaster education. Furthermore, several students wanted to study Geography in their Master's course in Indonesia or abroad.

One of the researchers conducted four lessons about natural disasters prevention from September–October 2018. The first lesson was an introduction to disaster education. In this lesson, the author checked the general information knowledge regarding crisis management, risk management, and emergency management. The concepts of natural phenomena, natural hazards, and natural disasters were also introduced based on several cases. For example, if a cliff collapses where people live, it would be a natural disaster. However, if people do not live there, it would be a natural phenomenon or a natural hazard, depending on the situation.

The second lesson was about landslides, whereby students' knowledge about landslides, mud/debris flow, and floods was tested with basic mechanisms. The third lesson was about earthquakes where students' knowledge regarding earthquakes, tsunamis, and land liquefaction was checked with basic mechanisms.

The fourth lesson was about volcanic eruption, texting students' knowledge about volcanic eruption, lava flow, and pyroclastic flow with basic mechanisms. In the second, third, and fourth lessons, students examined natural phenomena, natural hazards, or natural disasters based on several natural disaster cases. The lessons further introduced the Japanese system of "Three kinds of protection" during disasters – self-protection, cooperative help, and public support. Through classes, the students thought about "What can we do?" for understanding their consciousness about disaster prevention.

The students were instructed to write three short reports about landslides, earthquakes, and volcanic eruptions prevention in English in 30 minutes. All of the 22 students submitted their reports.

DOI: 10.15408/ tjems.v11i1.40444

Results and Discussion

Results

The total number of described matters

Every student described what was in their mind about landslides, earthquakes, and volcanic eruptions. The total number of the described matters was presented in Figure 2. The average was 5.7 and the median was 5.

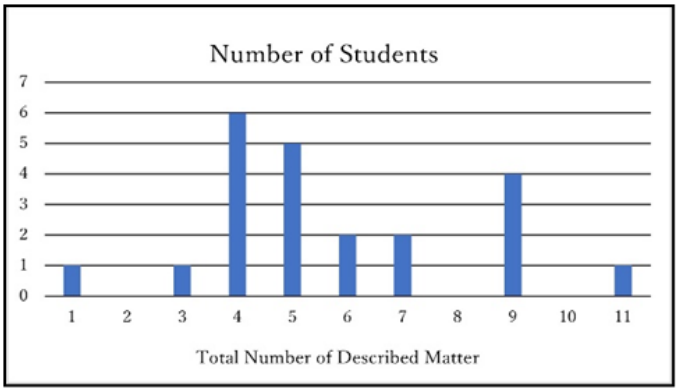

Figure 2: The total number of described matters (average = 5.7; median = 5; N = 22)

Before Disaster/Usual Life and After Disaster/Restoration: Total number of answers

With 22 students (N = 22) providing answers in two categories, the total number of answers was 44. A total of 24 answers mentioned "before disaster/usual life" and 27 answers mentioned "after disaster/restoration" (Table 1).

Category	Total answers
Before disaster and usual life	24/44
After disaster and restoration	27/44

Table 1. "Before disaster/usual life" and "after disaster/restoration" (the total number of answers)

Hardware/Structural and Software/Non-Structural): Total Number of Answers

Similar to the previous section, there were 44 answers. A total of 22 answers mentioned "hardware/structural" and 29 answers mentioned "software/non-structural" (Table 2).

Categories	Total number of answers
Hardware/Structural	22/44
Software/Non-structural	29/44

Table 2. "Hardware/structural" and "software/non-structural" (the total number of answers)

Table 3 presents the division based on all four categories. Of 44 answers, 24 answers belonged to "before disaster/usual life," with 16 mentioning "hardware/structural" and 8 mentioning "software/non-structural." In the remaining 27 answers belonging to "after disaster/restoration," 6 mentioned "hardware/structural" and 21 mentioned "software/non-structural." Simultaneously, of the 22 answers belonging to "hardware/structural," 16 mentioned "before disaster/usual life" and 6 mentioned "after

DOI: 10.15408/ tjems.v11i1.40444

disaster/restoration." Of the remaining 29 answers belonging to "software/non-structural," 8 mentioned "before disaster/usual life" and 21 mentioned "after disaster/restoration."

Categories	Hardware/ Structural	Software/ Non-structural	Total number of answers
Before disaster/usual life	16	8	24
After disaster/restoration	6	21	27
Total number of answers	22	29	44 (N = 22)

Table 3. "Before disaster/usual life," "after disaster/restoration," "hardware/structural," and "software/non-structural" (the total number of answers)

Reasons Based on Mechanism

As mentioned above, the students had basic knowledge and information on geography, including the mechanism of natural disasters. Whether students justified their opinions on disasters with proper reasoning was analysed.

There were 11 students whose opinions included reasons. Selected examples of students' answers were presented below:

"Plant trees, so that the soil is strong."—**preventing landslide.**

"Planting the plantation to keep the soil strong."—**preventing landslide.**

"We should avoid the volcanic eruption area quickly because the pyroclastic flow comes very fast."—preventing volcanic eruption.

"We have to save ourselves, such as by moving about 8 km away from the erupting mountain because that is a safe zone."—**preventing volcanic eruption.**

"Don't panic. We can find a safer and higher place. If we are at a lower place, it will be dangerous to be exposed to the ruins."—**preventing landslide.**

Educational viewpoint

The study analysed whether the students had described their opinions from an educational viewpoint. The keywords were, for example, "learn" and "study."

Only four students stated their answers from an educational viewpoint. The described matters were as follows:

"To prevent, we can learn mitigation; disaster management."—**preventing all the three natural disasters.**

"To reduce victims, we can provide counselling to the community."—**preventing all the three natural disasters.**

"Start to learn about disaster education."—**preventing all the three natural disasters.**

"We must know about the danger zone, define an evacuation area, and study hard for mitigation before or later."—**preventing all the three natural disasters.**

DOI: 10.15408/ tjems.v11i1.40444

Discussion

Analysing how students perceive about disaster prevention or "students' consciousness about disaster prevention" can be used as the base for making more effective disaster education implementation at university level. Students' perceptions may vary owing to their diverse backgrounds. For example, some students come from schools that have implemented disaster education; thus, they already have ideas and insights about disaster prevention. Others, by contrast, have limited disaster knowledge prevention as they come from schools with minimal experience of disaster teaching and learning. Family background may also influence their opinions; those belonging to well-educated families may have broader knowledge about disaster prevention compared with students from marginalized or poorer families. Our present study revealed the students' consciousness of natural disaster prevention focused on landslide, earthquake, and volcanic eruption.

The more the students mentioned the matters related to disaster prevention, it is hoped the better their consciousness about disasters will be. The students who only mentioned only one to three matters may have low consciousness.

A total of 24 answers mentioned "before disaster/usual life," 27 mentioned "after disaster/restoration," 22 mentioned "hardware/structural," and 29 mentioned "software/non-structural." Each category was half or more than 44 (the total number of answers). Hence, it can be deduced that the students were thinking in a balanced manner. Most of them understood two ways of facing natural disasters: prevention and mitigation. Prevention refers to actions before the disasters occur while mitigation is the actions when or after the disasters happen.

The students were also aware of the structural and non-structural ways and actions in disaster anticipation side by side. For example, understanding the building vulnerability is essential to moving towards structural measures for disaster-risk-reduction (Prevention Web — UNDRR, 2020). These measures usually adopt engineering techniques and technologies to improve the resistance and resilience against the hazard. At the same time, other non-structural measures involving preparation and evacuation planning, as well as public risk-awareness programs, could significantly support disaster-risk-reduction and disaster-risk-management (Bernardini, D'Orazio, and Quagliarini, 2016; Kaveh, Javadi, and Moghanni, 2020; Lu et al. 2019; Yao et al., 2021).

Only a total of 11 students justified their thinking with reasons. Hence, not many students can express their reasons even though this is a crucial skill when they aim to become teachers or experts, or pursue post-graduate studies in geography. In the future, instead of talking about memorized words and phrases, as professionals, the students would be required to explain to students/people and encourage their understanding/thinking. For example, as high school teachers, when their students would make a landslide inventory map, they would have to explain the importance of the map in terms of the evacuation routes. Only when their students understand the meaning and significance of certain actions does their awareness of natural disasters increase. Understanding such kind of situation, university faculties must review the curriculum content to be more comprehensive and effective. In this regard, university curricula should demand the critical thinking of the students based on the scientific methods. The curriculum should not only focus on the students' memorization skills but it should also heighten their skills in analysing and determining effective ways for their safety and future.

DOI: 10.15408/ tjems.v11i1.40444

Only four students stated their answers based on an educational viewpoint; but it was good that what they had explained comprised things about all the three kinds of natural disasters. Assuming that several of the students would become teachers or experts, they need to develop this skill to be able to explain disaster prevention and mitigation with scientific reasons to their students and peers. Therefore, promoting reasoning skills based on educational viewpoint through scientific activities is important to conduct by university to make the students being more rational and logical in thinking and behaving during the event of disasters.

Conclusion

University students were hoped to have good or high consciousness about natural disasters and prevention as they live in a disasters-prone country or area. This consciousness includes recognizing the fact that they can be affected by a disaster and the necessity for informational, physical, and social preparation and the level of protecting lives and properties of themselves and people around theme as well as local cultures and communities.

Our present study proved that the 22 students had relatively good consciousness about landslides, earthquakes, and volcanic eruptions prevention. They developed an understanding regarding certain aspects related to "before disaster" and "after disaster," and the "hardware" and "software" components of disaster prevention and mitigation. Moreover, some students were able to think and express their reasons when describing issues related to natural disaster prevention and mitigation. Although a minority, some students were able to critically explore their ideas about disaster prevention with educational viewpoints. For future anticipation, student mastery on basic knowledge on disaster prevention may be systematically increased by giving them educational programs with better materials and methods.

References

Bernardini, G., M. D'Orazio, and E. Quagliarini. 2016. Towards a 'Behavioural Design' approach for seismic risk reduction strategies of buildings and their environment. Safety Science 86 (July):273–94. doi:https://doi.org/10.1016/j.ssci.2016.03.010.

Dynes, R. R. (2019). The Accident at Three Mile Island: The Contribution of the Social Sciences to the Evaluation of Emergency Preparedness and Response. Journal of Planning Literature.

Federal Emergency Management Agency. (2015). National strategy for youth preparedness education. Empowering, educating and building resilience. US Department of Homeland Security. https: http://www.fema.gov/media-library/assets/documents/96107.

Fothergill, A. (2017). Children, youth, and disaster. Oxford research encyclopaedia of natural hazard science. https://doi.org/10.1093/acrefore/9780199389407.013.23

Hargono A, Artanti KD, Astutik E, Widodo PP, Trisnawati AN, Wardani DK, Lioni E. Relationship between disaster awareness and disaster preparedness: online survey of the community in Indonesia. J Public Health Afr. 2023 Oct 1;14(9):2376. doi: 10.4081/jphia.2023.2376. PMID: 37927360; PMCID: PMC10621481.

DOI: 10.15408/ tjems.v11i1.40444

Ilyasa, F., Rahmayanti, H., Muzani, M., Ichsan, I. Z., & Suhono, S. (2020). Environmental education for prevent disaster: A survey of students knowledge in beginning new normal of COVID-19. International Journal on Advanced Science, Education, and Religion, 3(2), 1–8.

James, E. (2008). Getting ahead of the next disaster: Recent preparedness efforts in Indonesia. Development in Practice, 18(3), 424–42

Kamil, P. A., Utaya, S., & Utomo, D. H. (2020). Improving disaster knowledge within high school students through geographic literacy. International Journal of Disaster Risk Reduction, 43, 101411.

Kusumastuti, R. D., Arviansyah, A., Nurmala, N., & Wibowo, S. S. (2021). Knowledge management and natural disaster preparedness: A systematic literature review and a case study of East Lombok, Indonesia. International Journal of Disaster Risk Reduction, 58, 102223.

K. Yamori (2011) "Chapter 10: Regional Community and Disaster Prevention," M. Karasawa and Y. Muramoto (Eds.), "Perspectives on Contemporary Social Psychology, Vol.3: Social and Individual Dynamics," pp. 187-207, Seishin Shobo, Ltd., 2011 (in Japanese).

Matunhay, L. M. (2018). Disaster Management: Towards Building Community Resilience. International Journal of Sceintific Research and Management.

Mitchell, T., Haynes, K., Hall, N., Choong, W., & Oven, K. (2008). The roles of children and youth in communicating disaster risk. Children, Youth and Environments, 18(1), 254–279. https://doi.org/10.1353/cye.2008.0036.

M. Ozeki, K. Shimazaki, and T. Yi, (2017) "Exploring Elements of Disaster-Prevention Consciousness: Based on Interviews with Anti-Disaster Professionals," J. Disaster Res., Vol.12, No.3, pp. 631-638.

Ozkazanc, S., and Yuksela, U. D. (2015). Evaluation of disaster awareness and sensitivity level of higher education students. Procedia - Social and Behavioral Sciences, 745-753.

Peek, Lori (2008). "Children and Disasters: Understanding Vulnerability, Developing Capacities, and Promoting Resilience – An Introduction." Children, Youth and Environments 18(1): 1-29.

Pramita, G., Saniati, S., Assuja, M. A., Kharisma, M. P., Hasbi, F. A., Daiyah, C. F., & Tambunan, S. P. (2022). Pelatihan sekolah tangguh bencana di SMK Negeri 1 Bandar Lampung. Journal of Social Sciences and Technology for Community Service (JSSTCS), 3(2), 264–271.

Rohith, V. R., Kolathayar, S., Priyatham, K., and Kumar, V. K. (745-753). Disaster Preparedness Index: A Valid and Reliable Tool to Comprehend Disaster Preparedness in India. Urbanization Challenges in Emerging Economies, 2015.

Sayuti, M., Hasibuan, A., Baidhawi, B., Siregar, W. V., Mariyudi, M., Puspasari, C., … Al Farizi, R. (2022). Pelatihan simulasi tanggap darurat kebakaran di SMA Lhokseumawe dan Aceh Utara. Jurnal Solusi Masyarakat Dikara, 2(3), 172–175.

State Ministry for National Development Planning. National Action Plan for Disaster Risk Reduction 2010-2012. 2010. [Google Scholar]

Sugiyono (2019). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alphabet.

DOI: 10.15408/ tjems.v11i1.40444

Twigg, J. (2015). Disaster Risk Reduction. Good practice review 9. http://bvpad.indeci.gob.pe/doc/pdf/esp/doc2601/doc2601-contenido.pdf

UNDRR. (2020). Words into action: Engaging children and youth in disaster risk reduction and resilience. United States Department of Health and Human Services, & Office of the Assistant Secretary for Preparedness and Response. (2017). NPRSB-NACCD joint youth leadership report. Washington, DC: Author. Retrieved from https://www. phe.gov/Preparedness/legal/boards/nprsb/meetings/ Documents/joint-youth-ldrshp-rpt.pdf

Verstappen HT: Indonesian landforms and plate tectonics. J Geol Indones 5: 197-207, 2010. [Google Scholar].

DOI: 10.15408/ tjems.v11i1.40444