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A Web Learning Model Integrated with Case Study for College Student Self-Awareness

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Abstract

The low level of disaster self-awareness among college students served as the driving force for this research, which involved developing a web learning model integrated with a case study that has been deemed valid by experts. This study aimed to identify the web learning model that was integrated into a case study on college students' disaster self-awareness. This study used a nonequivalent control group design in a quasi-experimental setting. This study examined 120 college students in total. According to the research findings from the independent sample t-test calculation, the sig value 0 .000 was lower than 0.05. These findings demonstrated that there was a difference between college students who studied using the web-learning model integrated case study and those who studied using conventional learning models in terms of average disaster self-awareness. The average disaster self-awareness score of college students who used the web-learning learning model integrated case study was greater than that of students who studied conventionally which supported this conclusion. This result showed that raising college students' self-awareness of disasters using a web-learning model integrated with a case study was successful. The research's implications may serve as a guide for improving university students' awareness of disasters.

Keywords: *Case Study; Disaster; Model; Self-Awareness; Web Learning.*

Introduction

The web learning model integrated with case studies may raise disaster self-awareness for the following reasons. These elements could serve as empirical The process of comprehending the risks, preparation, and preparedness of people in facing disasters is known as disaster self-awareness (Tsai, Chang, Shiau, and, Wang, 2020). This self-awareness encompasses the process of comprehending how risks, hazards, and the steps required to lessen the effects of disasters that strike individuals in their personal and communal contexts. People must be aware of every potential risk associated with a disaster and equip themselves with emergency supplies, quick response plans, and numerous training programs connected to disaster management (Oktaria, Windah, Nurhaida, et al., 2023). The community context, such as knowledge of local resources or the community emergency response plan procedure, is also related to disaster self-awareness. Disaster self-awareness is linked to self-understanding as well as the adaptation process, environmental monitoring, psychological preparedness, and personal involvement in dealing with disaster (Rosas, Garay, and, Hidalgo, 2020). This will make people more resilient and capable of adapting both during and after disasters. Thus, Indonesians must learn to be self-aware of disasters.

Indonesia is in an area vulnerable to earthquakes, landslides, floods, tsunamis, and volcanic eruptions (Shoji, Takafuji, and Harada, 2019). One of the Indonesian provinces that is vulnerable to natural disasters is Aceh. The 2004 earthquake and tsunami, which caused enormous damage and even took lives, is one of Aceh's most notable disaster histories (Syamsidik, Oktari, Nugroho, et al., 2021). Aceh's geology and geography, which make the province disaster-prone, are to blame for the disaster's occurrence. The residents of Aceh, especially the university students there, need to be more prepared for disasters for this reason. In community

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development, students are a strategically important population. To be prepared to deal with future disasters in their area, higher education students must possess knowledge and skills linked to disaster self-awareness.

Students who are self-aware of disasters will be more equipped to recognize different types of hazards from disasters, become more prepared on a personal and communal level, and take proactive steps to manage the effects of a disaster (Takayama, Craig, Cooper, and Stokar, 2022). Students who are self-aware of disasters are better equipped to participate in or carry out practical actions during emergencies (Paradkar, Zhang, Yuan, and Mostavi, 2022). Furthermore, students who possess this catastrophe self-awareness are better equipped to implement disaster mitigation strategies and become change agents that strengthen community resilience to disasters (Yildirim, Keshavarzi, and Aman, 2021). Consequently, measures must be taken to raise Aceh University students' self-awareness about disasters to strengthen community resilience throughout the region.

However, it was discovered that students' comprehension of disasters is inadequate based on the literature analysis that the researchers carried out (Dasci Sonmez & Gokmenoglu, 2023; Hatori, Moriwaki, and Shingu, 2023; Parlak, Kaya, Duru, and Örsal 2023). This demonstrates that pupils' self-awareness of disasters is still poor. These conclusions are further supported by the findings of researcher observations during the flood in Aceh Tamiang Regency in 2023, which revealed that many flood victims, many of them were students, felt calm and appeared unconcerned when the water rose and the situation became tense. The kids lacked empathy and appropriate emotional responses, even amid the more visible floods. This instance also suggests a lack of emotional awareness of the dangers and degree of vulnerability encountered. Furthermore, based on observations made at the time of the flood, the volunteer team had started urging locals to leave right away. However, it was seen that many students who were affected did not take the urgency seriously. They believe that because they can swim, they can save themselves. This issue demonstrates that students are still unable to determine how much they need assistance or how much they can offer. It is clear from these two observations that students' catastrophe self-awareness is still quite low.

The researchers used questions on disasters to gauge students' level of disaster self-awareness at one of the universities in Aceh Province, Indonesia, to verify their findings. Based on these findings, pupils' average disaster self-awareness ability score is 40.23. These findings indicate that university students have a poor level of disaster self-awareness. As a result, efforts are required to strengthen this ability for disaster self-awareness.

According to the researchers' analysis, the reason why students in higher education have a poor level of disaster self-awareness is because the disaster learning process is not aligned with the characteristics of students in the 4.0 era. Most learning in the 4.0 era is done through technological tools. The primary means of living processes, including the process of learning, in the era of 4.0 are the information and communication technology system. Learning is necessary to implement a digitization process considering this information and communication technology system's development (Sousa and Rocha, 2019). Furthermore, learning about disasters needs to align with the characteristics of disaster learning. Learning that requires an actual context process is known as disaster learning (Händel et al., 2020). Students need to be able to see actual disaster problems during disaster learning. A case study is one of the suitable learning methods. A case study is an extensive study of an event, situation, or phenomenon in a real-life context (Arora, Kumar, and Panigrahi, 2020; Bell and Warren, 2023). This process of learning is connected to the analytical process of comprehending and solving problems. So that case study learning is appropriately applied in the disaster learning process.

Therefore, researchers have created a web-learning model integrated with a case study to raise disaster self-awareness to match the characteristics of learning in the era of 4.0. The web-learning model is integrated with case-study a method of learning that applies case studies to an online learning environment. Students employ online learning materials like forums, digital modules, learning videos, and other digital resources when utilizing this learning model. Through case studies, students can gain a deeper grasp of disaster-related problem situations in this learning process. Through case analysis, students will integrate information from the virtual world.

Research related to the development of this model is only limited to the feasibility test of the model. Experts declared that it is feasible to employ the web-learning model integrated with a case study. Therefore, further research is required to determine how well higher education students' ability for disaster self-awareness is impacted by the web-learning learning model integrated with a case study.

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This research is not the same as the earlier research. A study looked at how Edu games might help raise early childhood learners' awareness of disaster mitigation. According to the study's findings, the Edu game is a legitimate, useful, and efficient way to raise young children's understanding of disaster mitigation (Sari, Dayurni, and Nur, 2023). The impact of natural disaster reporting in the Indonesian Daily Portico on public awareness is the subject of research done by Istiqomah (2019). The study's findings indicated that the public's knowledge of disasters was raised by the coverage of natural disasters on the Indonesian daily portico. The construction of an interactive CD learning model to raise early childhood disaster self-awareness is the subject of research by Ningtyas & Risina . According to the study's findings, an interactive CD learning model has been created that is reliable, useful, and efficient for raising young children's self-awareness (Ningtyas and Risina, 2019). It is evident from these prior studies that research has started to be conducted on ways to raise catastrophe awareness, although the studies are now restricted to the creation of educational games, interactive learning models, and news articles in the media. Using an integrated case study web learning model to raise catastrophe self-awareness has not been attempted. Therefore, more research is required to determine how the suggested web learning model integrated with the case study affects higher education students' disaster self-awareness. Thus, the goal of this research is to ascertain how higher education students are affected by the web learning model integrated with the case study.

Literature Review

Case-Study based Web Learning

The web-learning learning model integrated with the case study is an online learning approach that combines elements of web-learning or e-learning with the case study method. In this context, web learning refers to using online platforms or systems to deliver learning material. At the same time, a case study is a learning approach that involves an in-depth analysis of real-world cases or situations. In this model, learning materials are presented via an online platform, allowing flexible and interactive access for participants. Meanwhile, the case study approach provides practical and applicable context for the concepts or theories being taught. Participants can apply the knowledge they gain from web learning in analyzing and solving problems that arise in the given case studies.

A web-learning learning model integrated with case studies can be designed to increase students' self-awareness of disasters. Through web learning, students can flexibly access information about disasters, safety protocols, and mitigation measures (Santoso & Wijayanto, 2021; Yeung, 2003). Real-world disaster study cases can be integrated as part of learning, providing practical context, and allowing students to apply their knowledge in natural disaster situations (Azad, 2022; Valdanha Neto and Jacobi, 2022). By involving students in an in-depth analysis of disaster cases, this model aims to develop a better understanding of disaster risk and the actions that can be taken to reduce its impact. Through active involvement in case studies, students can improve critical thinking, problem-solving and decision-making skills related to disasters. In addition, web learning allows for online discussions, collaboration between students, and access to the latest online resources, all of which can support the formation of a comprehensive understanding of disaster management. Thus, this model can help students increase their self-awareness of disasters and readiness to deal with emergencies.

Disaster Self-Awareness

Disaster Self-Awareness refers to an individual's understanding and awareness of potential disaster risks, knowledge of actions to be taken during a disaster, and personal readiness to face emergencies (Nurjanah, Herlina and Erikanto, 2023). Disaster self-awareness includes understanding the types of disasters that may occur in an area, knowing how to identify warning signs, and having knowledge of evacuation procedures and safety measures (McLennan, Marques and Every, 2020). Individuals with good disaster self-awareness are usually better able to recognize risks in advance, take preventive action, and respond quickly when a disaster occurs. Disaster self-awareness also involves understanding personal needs and preparation, including preparing emergency plans, establishing a stock of necessities, and having practical skills and knowledge to act effectively in disaster situations. Disaster education and preparedness training programs

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often aim to increase self-awareness among communities to manage disaster risks better and protect themselves and their communities.

There are three indicators of disaster self-awareness, namely Emotional Self-Awareness, Accurate Self-Awareness, and Self-Confidence, which can be explained as follows (Thaintheerasombat and Chookhampaeng, 2022):

1. Emotional Self-Awareness.

   This indicator refers to a person's ability to recognize and understand feelings and emotions. Individuals with high emotional self-awareness can identify and manage their feelings effectively, including in stressful or emergency situations, such as when a disaster occurs.

2. Accurate Self-Awareness

   This indicator refers to a person's ability to properly understand themselves, including strengths, weaknesses, and limitations. Individuals with accurate self-awareness can recognize their level of preparedness in facing disasters, assess their skills and knowledge, and identify areas that need improvement.

3. Self-Confidence

   This indicator includes a person's confidence level to face challenges and overcome difficulties, including disaster situations. Individuals with good self-confidence may be more likely to take appropriate and effective action during a crisis because they are confident in their abilities and knowledge.

Increasing the level of disaster self-awareness through developing the aspects above is hoped that individuals will be better prepared and able to manage themselves and provide better support in dealing with disaster situations.

Methods

Research Design

This study used a nonequivalent control group design and was a quasi-experiment. The research design can be seen in the table below.

Table 1. Research design

Group	Pre-Test	Treatment	Post-Test
Eksperiment	O1	X	O2
Control	O3		O4

Annotation

- X: The use of web-learning learning model integrated with case study
- O1: Pre-test (Understanding disaster self-awareness before using the web-learning learning model integrated with case study)
- O2: Post-test (Understanding disaster self-awareness after using the web learning model integrated with case study

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- O3: Pre-test (Understanding disaster self-awareness before using conventional model)
- O4: Post-test (Understanding disaster self-awareness after using the conventional model)

Research Procedure

The first step in this research process was to identify the participants in the control and experimental groups of students. All students in the control and experimental groups received identical materials for this study, which included sub-studies on earthquakes, tsunamis, and floods, as well as the notion of disaster mitigation. Students in the control group would get standard instruction on mitigating disasters. Lecturers conducted discussions about disaster mitigation while using the lecture, question, and answer format. During the experimental class, lecturers used the previously constructed website to offer instructional videos and materials. To improve their grasp of disaster mitigation, students were required to watch instructional videos and study digital teaching materials. The lecturer also provided case studies on the website for the students to solve. The case study was to be solved cooperatively by the students. A video was used to present the case study's findings, and the written report was posted on the website. Every pupil was instructed to provide feedback on the reports of their peers.

Sample and Data Collection

120 students from Samudra University participated in this study, 80 of them were female and 40 of them were male. By meeting the requirements of being third-semester students who have suffered a catastrophe, these 120 students were chosen via the purposive sampling technique. There were two groups of students: 60 in the control class (who learned through conventional methods) and 60 in the experimental class (who learned through a web-based learning model integrated with a case study).

A questionnaire with 100 statements was used to gauge higher education students' ability for disaster self-awareness. Emotional self-awareness, accurate self-awareness, and self-confidence were the three disaster self-awareness indicators that went into creating the test. Three experts in disaster management verified the questions' content and deemed them to be feasible. Construct validation was done by testing the instrument on 30 additional students after it was determined to be feasible. This exam was made up of reliability and validity tests. The product-moment correlation formula was utilized to conduct the construct validity test. The questions were deemed valid and potentially useful based on the outcomes of the content validity test. Each question's calculated r-value in the construct validity test was higher than the r-table value, proving the questions' validity. Furthermore, a test for question reliability was conducted, and the results showed a very high degree of question reliability—0.927.

Analyzing of Data

This study's data analysis method included paired sample t-tests, independent t-tests, homogeneity tests, normality tests, and descriptive statistical tests, all of which were performed with the aid of the SPSS 26 application.

Results and Discussion

Results

After each class completed an action and a questionnaire, data analysis was carried out. To make data processing easier, data tabulation is done as shown in table 2 below:

Table 2. Data tabulation of control class and experimental class

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test Eksperiment	60	58	65	60.37	3.362
Post-Test Eksperiment	60	81	95	88.20	5.393
Pre-Test Control	60	59	69	60.37	3.382

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Post-Test Control	60	63	83	63.39	4.943
Valid N (listwise)	60				

The baseline data for the four tested classes were displayed in the table 2 above. The following step would include processing this data. To find out if the collected data had a normal distribution, the normality test was performed. The following were the normality test results:

Table 3. Normality test

	Class	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Disaster self-awareness	Pre-test Experiment	.223	60	.483	.849	60	.483
	Post-test Experiment	.438	60	.593	.239	60	.434
	Pre-test Control	.239	60	.392	.850	60	.504
	Post-test Control	.294	60	.429	.760	60	.605

a. Lilliefors Significance Correction

From Table 3, it could be seen that each class had a sig value > 0.05. This showed that each class's distribution was normal. The paired sample t-test was the next test carried out. This test aimed to evaluate the average difference between the two paired samples. The purpose was to determine whether students' ability for disaster self-awareness was impacted by the web-learning model integrated with a case study in higher education. The paired sample t-test findings are as follows:

Table 4. Paired sample t-test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Test Eksperiment - Post-Test Eksperiment	-15.303	9.382	1.329	-20.392	-19.392	-10.303	59	.000
Pair 2	Pre-Test Control - Post-Test Control	-3.323	2.382	.323	-2.332	-2.302	-6.302	59	.230

Table 4 for pair 1 revealed that the average pre-test and post-test in the experimental class differed in terms of students' disaster self-awareness, with the significant value (2 failed) being less than 0.05. In contrast, pair 2 demonstrated that the significant value (2 failed) was larger than 0.05, meaning that there was no difference in the control class before and after the test related to students' disaster self-awareness. Additionally, it is evident from the average difference column that pair 1 had an average difference of 15.303, but pair 2 had an average difference of only 3.323. This showed that, in comparison to conventional learning, the implementation of the web-learning integrated case study learning model had a substantial impact. Next, the pair 1 results were subjected to the effect size measurement, yielding the following results:

Table 5. Results of effect size

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.830[a]	.738	.712	.3022

Predictors: (Constant), X

Table 5 showed that the coefficient of determination was 0.830. This showed that the web-learning model integrated with a case study may account for around 83.00% of the disaster self-awareness of college students, with other unexamined factors influencing the remaining 17.00%. The homogeneity test was the next. The purpose of this homogeneity test was to ascertain how homogeneous the post-test results for the experimental and control classes were. The homogeneity test yielded the following findings.

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Table 6. Results of Homogeneity Test

		Levene Statistic	df1	df2	Sig.
Disaster self-awareness	Based on Mean	.203	1	118	.129
	Based on Median	.030	1	118	.392
	Based on Median and with adjusted df	.040	1	57.393	.129
	Based on trimmed mean	.039	1	118	.832

Table 6 showed that the significance value based on the mean was 0.129, higher than 0.05. This demonstrated homogeneous variances in both data. Then, the independent sample t-test was performed. The purpose was to compare university students who studied using the web-learning integrated case study model to those who studied using the conventional learning model, to see if there was a difference in disaster self-awareness. The test results are displayed in the table below:

Table 7. Independent t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Disaster Self-Awareness	Equal variances assumed	.194	.749	10.392	118	.000	21.393	1.944	18.303	25.393
	Equal variances not assumed			10.392	59.302	.000	21.393	1.944	17.493	25.393

Table 7 suggested that the two-tailed significance value was less than 0.05. This suggested that students who studied using the web-learning integrated case study model and those who studied using the conventional learning model had different average levels of disaster self-awareness. Please see the following data in order concerning the significance of disaster self-awareness:

Table 8. Results of post-test data comparison between the control class and experimental class

	Class	N	Mean	Std. Deviation	Std. Error Mean
Disaster Self-Awareness	Post-test Experiment	60	88.20	5.393	1.393
	Post-test Control	60	63.39	4.943	.449

Table 8 demonstrated that college students in the experimental class had an average level of disaster self-awareness that was higher than that of the control class. This proved that raising students' awareness of disasters using a web-learning model integrated with a case study was successful.

Discussion

This study found that college students' self-awareness of disasters increased because of the web-learning model integrated with the case study. Research by Rusilowati et al. in 2012 that looked at the creation of a disaster mitigation learning model with a science, environment, technology, and society vision (Rusilowati

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et al., 2012) provided support for the findings of this study. The study's findings indicated that students in elementary through high school might have a better grasp of catastrophe-related topics due to the disaster mitigation learning model, which included science, environment, technology, and society systems. This increase occurred because of the model's integration of science, environmental systems, technology, and society, making it simple for students to comprehend the process of catastrophe mitigation. In 2016, Pralisaputro et al. conducted additional research on the topic of natural catastrophe mitigation and adaptation for high school students. They developed STES-based booklet media (Pralisaputri, Soegiyanto, and Muryani, 2016). The development outcomes showed that student learning outcomes on the topic of natural disaster mitigation and adaptation were significantly enhanced by the STES-based booklet media. The STES-based booklet media presented material that combined the concepts of science, environment, technology, and society so that students could easily understand material related to disaster mitigation. This increased student learning outcomes on the subject matter of natural disaster mitigation and adaptation for high school students in elementary school. In an additional investigation carried out in 2016, Mantasia & Hendra looked at the creation of a virtual disaster learning model to help junior high schools mitigate the effects of and prepare for natural disasters. According to the study's findings, junior high school students' comprehension of the processes involved in natural disaster mitigation and adaptation can be enhanced by creating a virtual disaster learning environment (Mantasia and Hendra, 2016).

Research on mitigating the effects of disasters has started to emerge from the findings of these earlier investigations. According to an earlier study, attempts to increase knowledge of the processes involved in disaster adaptation and mitigation using various innovative learning models and other new learning media are still relevant to disaster mitigation studies. Studies on disaster mitigation, however, focused on more than just understanding mitigation; people also needed to be prepared for other aspects of facing catastrophes, one of which being disaster self-awareness. This is why this study differs from earlier studies and yields new insights: it discovered that college students' disaster self-awareness may be enhanced using an integrated case study web-learning model.

The capacity of people or communities to recognize and assess possible hazards to their safety and to make necessary preparations is known as disaster self-awareness. This skill is essential for creating communities that are resilient and ready to respond to emergencies. The web-learning integrated case-study learning model was found to raise university students' disaster self-awareness. Several factors contributed to college students' greater disaster self-awareness. Students were able to obtain up-to-date knowledge regarding disasters due to the web-based learning model that was integrated with case studies. To obtain the most recent knowledge about disasters, the web-learning model integrated case study might make the most of technology and other online learning resources. Students could obtain current reports, data, and information on disasters from multiple reliable sources by optimizing their internet access (Early and Hernandez, 2021; Imran, Ofli, Caragea, anda Torralba, 2020; Kankanamge, Yigitcanlar, Goonetilleke, and Kamruzzaman, 2020). Students were able to comprehend disasters in real time due to this process.

Furthermore, the usage of web-learning platforms made it possible to display knowledge engagingly and interactively. Using a variety of multimedia, including animations, simulations, photos, films, and graphics, can help students learn about disasters in a dynamic way (Cheikhrouhou, Koubaa, and Zarrad, 2020; Kopacz, Banerski and Biele, 2022; Laurensia, Abdurrahman, and Dewi, 2022.). Interactive case studies could be given. With an emphasis on disaster self-awareness, this interactive presentation may enable students to learn more about the disaster process. Additionally, providing various engaging and interactive materials may boost students' interest in and participation in the learning process (Aladsani, 2022; Hew, Huang and Jia, 2022; Zainuddin, Shujahat, Haruna and Chu, 2020). In addition to passively receiving information, students could participate actively in conversations, assignments, and Q&A sessions with numerous disaster-related forums. This procedure succeeded in establishing an active and engaging learning environment.

Due to its capacity to provide a learning process that was pertinent and contextual to disasters, the web-learning integrated case-study learning model proved efficient in raising university students' self-awareness of disasters. Students in higher education could become attached to real-world conditions and events by using actual crisis scenarios in case studies. The effects of the disaster were real and visible to the students.

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Students were helped to make the learning process meaningful by this contextualization process using disaster scenarios (Almutairi, Ali, and Ghuloum, 2021; Derot, Sugiura, Kim, and Kouketsu, 2024; Wu, 2021).

Students were able to directly comprehend and experience the effects of the disaster through this case study on disasters. In addition to emphasizing theory, the case study also included practical experience (Derot, Sugiura, Kim, and Kouketsu, 2024; Zhao, Dai, and, Chen 2023). Through case studies, university students were able to offer input on actual disaster scenarios and develop an extensive understanding of the potential effects and vulnerabilities of disasters. Students' empathy for victims of disasters and their understanding of potential future challenges may grow because of being immersed in disaster scenarios (Gable et al., 2021; Lu and Yuan, 2021). Students would become more self-aware of disasters because of this approach, which connected abstract ideas to actual crisis scenarios. The ability of this web-learning integrated case-study approach to stay relevant to current events was another factor in its success. Past disaster events might be examined and evaluated by students, who could then use them as a dynamic and pertinent teaching tool (Kitagawa, 2021; Tomczyk and Walker, 2021).

The fact that the web learning model with case studies allowed students to develop a greater sense of awareness and empathy for the vulnerability of the risks and impacts of disasters they faced is another reason why it was successful in raising university students' disaster self-awareness. Students engaged in direct emotional involvement with actual disaster scenarios in addition to their theoretical studies of disasters. Students would be able to experience empathy through case studies they did on disaster situations, which would help them to comprehend the significance of disaster self-awareness. Growing empathy would be a solid foundation for growing self-awareness of disasters (Quinn, Grant, Sampene and, Zelenski, 2020; Sorbet and Graybeal, 2021). Students would be more likely to comprehend the importance of emergency response and preparation as well as the experiences of disaster victims. Students would be more conscious of the risks of disasters they will encounter and comprehend the steps they should take to mitigate those risks (Shah et al., 2020; Thorup-Binger and Charania, 2019). Using case studies of disasters also helped raise awareness of how vulnerable communities are. Students could name various elements, such as social, economic, and environmental ones, that may increase the probability and impact of disasters (Hoffmann and Blecha, 2020; Rahman et al., 2021). As a result, their perception of disaster was not restricted to a singular incident but rather saw it as a crucial component of the complex social system and surrounding environment.

The web learning model integrated with case studies may raise disaster self-awareness for the following reasons. These elements could serve as empirical justifications for educators and researchers to employ the web-learning model combined with case studies to raise students' disaster self-awareness in higher education.

Conclusions

According to the results, the significant value (sig) of the independent sample t-test analysis is 0.000, which is less than the significance level of 0.05. This result suggests that the group of college students utilizing the web learning integrated with the case study model and the group using the conventional learning model had different average disaster self-awareness. Furthermore, students using the web-learning integrated with the case study model have a greater mean value of disaster self-awareness than students using the conventional learning approach. These findings offer compelling evidence for the efficacy of using the web-learning integrated with the case study model to enhance university students' knowledge of disaster self-awareness.

Authors' contributions

All the authors collaborated in the elaboration of the data collection instrument and process. Tengku Muhammad Sahudra worked mainly in the Introduction and Literature Review. Ary Kiswanto Kenedi worked mainly in the methodology, results, discussion, and conclusions. Asnawi worked mainly in the scale selection. Dini Ramadhani and Hamimah, edited, and revised the whole paper in English language.

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