Journal of Science and Education (JSE)
Vol 5, Issue 1, September 2024, Pages 264-273
ISSN: 2745-5351 (Media Online)
DOI: https://doi.org/10.58905/jse.v5i1.424

Needs Analysis of Digital Media-based Disaster Mitigation Education for Gen Z

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Abstract. This research aims to analyze the needs of Gen Z in integrating digital media into disaster mitigation education. This research method uses a qualitative approach with a case study. The participants in this study were 16 people in Pramuka Island, Kepulauan Seribu. The selection of these participants was carried out using purposive sampling technique. In-depth interviews, observation and documentation are data collection techniques conducted by researchers. The results of this study indicate that gen Z has digital literacy competencies only limited to internet searching, and hypertextual navigation. Meanwhile, content evaluation and knowledge assembly cannot be done effectively by Gen Z due to knowledge constraints and poor internet signal. In general, Gen Z understands information related to natural disasters and the impact of natural disasters. The results of this study conclude that gen Z needs digital media that can contain information as a tool to introduce disaster mitigation education. However, the digital media can not only be accessed through the internet online, but can also be used offline. Thus, digital media-based disaster mitigation guides need to be developed in future research.

Keywords: learning media; mobile learning; microlearning; vocational high school

1 Introduction

The use of technology has increased in various aspects of life[1]. Likewise with the easy access to information obtained through technological advances. Technological advances provide various offers that make it easier for users. Gen Z as the previous generation, namely the millennial generation, is identical to the use of digital technology[2]. Thus, Gen Z is known as the digital generation that has never been separated from the development of digital media [3]. Therefore, the use of digital media among Gen Z is not something new. This is because Gen Z accesses information such as news and entertainment through digital media. Some academics consider digital media to be closely related to various types of platforms such as content-based websites, social media, user granted content websites, marketplaces, crowd-sourcing to cloud computing[4][5].

The development of the world of digital technology also has an impact on electronic-based government systems. Various countries have implemented electronic-based

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government systems[6][7]. The use of e-government offers solutions to improve the efficiency and effectiveness of public administration. One of them is the application development carried out by the Meteorology, Climatology and Geophysics Agency (BMKG). BMKG is a government agency that has duties in the fields of meteorology, climatology, air quality and geophysics. According to Sahrial and Muslim[8], the application developed by BMKG is one of the digital media that can help the public to get information related to earthquake information, location and earthquake strength. Thus, this application can minimise the number of victims affected by the earthquake. In addition, the BMKG application also provides information related to weather early warnings and warnings related to active volcanoes. Therefore, this application is an alternative for Gen Z to get information related to disasters.

Previous research explains that Indonesia is located in the ring of fire [9]. The geographical location of the region causes Indonesia to be one of the countries prone to earthquakes[10]. Earthquakes are natural disasters that cannot be predicted when they will occur. Therefore, information related to disasters is currently carried out through digital media. However, gen Z still experiences obstacles related to digital media literacy skills. According to Ilomaki et al. [11] there are three digital competencies that must be possessed, namely the skills to use digital technology in different settings, understanding the phenomenon of digital technology from the perspective of individuals and society, and the motivation to participate responsibly in the digital world. Thus, the use of digital media will not be effective if the digital media literacy skills of gen Z are optimal. According to Dewi et al.[12], gen Z needs assistance in culture, ethics and digital security. These three things are done to minimise the impact of individual inability to counteract hoax information. Therefore, digital media that can improve the digital literacy of gen Z is needed.

Digital literacy is the ability possessed by individuals as digital media users to access information, manage, integrate, evaluate, analyse and create media expression to realise social development [13]. Thus, this digital literacy ability is not only limited to the use of digital tools[14]. Digital media has become a part of gen Z's life. Therefore, digital media can have the potential as a source of information for Gen Z to be able to help convey potential disasters as part of the early warning system[15]. Early warning system is also related to disaster mitigation. Mitigation is an effort to reduce the risk of disaster, both through physical development and awareness and improvement of the ability to face the threat of disaster[16]. Some previous studies assess that digital media still focuses on efforts after a disaster [17][18]. Moreover, the application provided by BMKG is only limited to information related to disasters. For this reason, disaster education and mitigation requires broadcasting media that is tailored to the needs of gen Z. Thus, it is necessary to analyse the needs of disaster mitigation digital media. Given that not all areas occupied by gen Z have the ease of finding internet signals while accessing information.

Broadcasting media can foster a disaster awareness culture. This disaster awareness culture can be done through programmes compiled in digital media. According to Gilster in Ummah and Kurniawan[19], there are four core competencies of digital literacy, namely internet searching, hypertextual navigation, content evaluation, and knowledge assembly. In general, gen Z can search for information via the internet. However, hypertextual navigation, also known as dynamic reading skills and understanding of hypertext and its devices, requires more in-depth identification. This is due to the

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increasing number of hoaxes. In addition, Gen Z's ability in content evaluation is also needed to identify the completeness and correctness of information. Thus, they can organise the information by evaluating the facts in a structured manner.

On the other hand, the development of digital media-based broadcasting media is also inseparable from the main foundation in building disaster communication. According to Haddow and Haddow[20], there are four main foundations in building disaster communication including audience focus, leader commitment, situational awareness, and media partnership. Therefore, disaster mitigation digital media is not only limited to providing tools but also has a focus on building a disaster awareness culture. Thus, this research aims to analyse the need for disaster mitigation digital media to improve digital literacy of gen Z.

2 Method

Generally, qualitative research is used to analyse phenomena and events both individually and in groups[21]. Thus, this qualitative research method was conducted as a process to analyse and understand more deeply the needs of disaster mitigation digital media for gen Z. The case study approach became part of the qualitative research conducted by the researcher. The case study approach is part of the qualitative research conducted by researchers. According to Patton [21], a case study is research on the specificity and complexity of a single case and seeks to understand the case through a particular context, situation and time. Research related to disaster conducted by academics is very diverse. Aziz[22] showed that disaster communication has a role and benefits to disaster mitigation. This is because there are still some people who have a rendang level of knowledge related to disasters[23]. Therefore, this case study approach is a step for researchers to investigate and understand the understanding of disaster mitigation of gen Z, the need for disaster mitigation digital media for gen Z and the digital media literacy skills of gen Z.

Indonesia has more than 17 thousand islands. One of these islands is the Thousand Islands. Thousand Islands is an island located in the capital city of DKI Jakarta Province [24]. According to Ramdani et al. [25], an area that has an intensity often affected by earthquakes is the southern coastal area along the Indian Ocean where this area is passed by the Indo-Australian tectonic plate. Therefore, this research was conducted at the coastal location of Pramuka Island, Kepulauan Seribu. Pramuka Island is one of the most populated islands. The participants in this study were 16 people from the community on Pramuka Island. The selection of these participants was carried out using purposive sampling technique. In line with the purpose of this research towards gen Z, the selection of these participants was carried out through several criteria as follows: 1) a native of Pramuka Island; 2) aged 15 to 25 years; 3) has social media; 4) understands digital media; and 5) in accordance with the needs of the research.

Data collection techniques carried out by researchers through in-depth interviews, observation and documentation. In-depth interviews were conducted by researchers using guidelines. The interview guidelines were based on Gilster's four core competencies of digital literacy and Haddow and Haddow's four key building blocks of disaster communication. Thus, the interviews were semi-structured. The interview process was conducted for 95 minutes from each participant. Before conducting the interviews, the

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researcher asked permission from the participants to record the interview process through a voice recorder. The researcher also wrote notes on the notes of important things conveyed by the participants. After conducting the interview, the researcher directly observed the information seeking process carried out by the participants. Data collection through documentation was also conducted by researchers to analyse sources in the form of research journals related to digital media, disaster mitigation, digital literacy, and thousand islands.

After researchers collected data, data analysis was carried out to present descriptive results related to the research objectives. In the data analysis process, researchers used the steps taken by Miles and Huberman[26]. In the first stage, researchers conducted data reduction. Data reduction was carried out to provide a clear picture related to the research objectives and make it easier for researchers to collect data. Thus, researchers look for themes and patterns that suit the needs of the research and cross out those that are not needed. In the second stage, researchers presented the data in the form of categories. To maintain the research code of ethics, the names of participants were disguised in presenting the data. The results of this data presentation helped researchers to understand the needs of disaster mitigation digital media in gen Z. In the third stage, the researcher drew conclusions and conducted verification. Verification is done through triangulation as a data validity test. Therefore, researchers used source triangulation and technique triangulation as steps to obtain valid data.

3 Results and Discussions

3.1 Results

Based on the research findings, Gen Z digital literacy competence has various characteristics. The participants of this study have the following characteristics.

Table 1. Participant Characteristics.

Characteristics	N	Percentage
Gender		
Man	6	37.5%
Women	10	62.5%
Aged		
15 – 18 y.o.	2	12.5%
19 – 22 y.o	9	56.25%
23 – 25 y.o.	5	31.25%
Education Background		
Senior High School	2	12.5%
Bachelor Degree	14	87.5%
Frequently Used Social Media		
Instagram	10	62.5%
TikTok	6	37.5%

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Intensity of Using Social Media		
2 – 3 hours	2	12.5%
4 – 5 hours	6	37.5%
5 – 6 hours	2	12.5%
More than 6 hours	6	37.5%

Table 1 provides an overview of the characteristics of participants who fall under the Gen Z criteria. Of the 16 participants, two of them have a high school education background. Generally, social media that are often used by participants are Instagram and TikTok. Instagram through its photo and video sharing platform provides benefits to its users in communicating to the public. The intensity of social media use is generally carried out by participants 4 to 5 hours and more than 6 hours. Hepilita and Gantas[27] explain that the ideal duration of doing online activities is around 4 hours and 17 minutes. Because, more than this duration, gadgets are considered capable of disrupting brain performance. This impaired performance can also have an impact on participants' competence in using digital media.

Table 2. Participant Interview Results.

No	Questions	Answers
1	OP	'To find accurate information, it is necessary to use various social media such as Google and Social Media (April, 2024).
2	OA	'I choose reliable sources, such as academic websites, scientific journals and official websites of relevant organisations. I also pay attention to the date of publication to ensure that the information is up-to-date and relevant. After that, I read critically, compare information from several sources, and record or save the most relevant information for later use.' (April, 2024)
3	OC	'I look for links or references that support the information presented, and see where the information comes from.' (April, 2024)
4	OB	Information is usually picked up by news channels such as BMKG, news, and info Jakarta. Content is usually uploaded by individual accounts such as the content creator (April, 2024).

The results of Table 2 show that participants generally seek information through Google and social media (Instagram, TikTok and YouTube). In addition, participants endeavoured to pay attention to the publication date to confirm the information obtained. After that, the information was compared with some other information to adjust the data needs. Out of 16 participants, only four participants analysed information using search algorithms, pattern recognition and content analysis to understand and present information efficiently and accurately. This condition shows that digital literacy competence at the stage of evaluating information content and compiling knowledge requires improvement. Based on the main foundation in building disaster communication, there is an audience focus. The foundation is what information is needed by the audience, in this case, gen Z. Of the 16 people, 10 of them or around 63 per cent were looking for information related to natural disasters. The natural disasters sought were earthquakes (8 people), tsunamis (7 people), and floods (1 person). This is because

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participants indicated that natural disasters that often occur are earthquakes, sea water floods and tornadoes. In addition, 31 per cent of participants sought information related to how to deal with natural disasters. Unfortunately, only 6 per cent of participants searched related to disaster mitigation. Meanwhile, the main foundation in building effective disaster communication requires a form of information that has a level of probability of disaster occurrence. In addition, participants also stated that they had received hoaxes related to natural disasters. Hoax news is not only obtained through social media but also direct messages through Whatsapp groups. According to Rahmawati et al. [28] the impact of the spread of hoaxes can affect economic activity in Indonesia.

> 'When analysing the truth of hoax news information, the obstacles I get are limited sources of information, sorting information and unsupportive internet signals' (OD, April 2024).

However, this sorting of information cannot be done by gen Z due to unsupportive internet signals. This is due to the lack of accessibility and availability of internet networks in Kepulauan Seribu (Ismail & Sari, 2019). Based on the research findings, it shows that the digital literacy skills of gen Z in the islands still need improvement. Increasing digital literacy skills is not only limited to information retrieval but also the development of disaster mitigation digital media needed.

> 'Because the internet network is often problematic, so the digital media needed can also be used offline. Apart from Instagram social media, I also enjoy listening to podcasts because they can be listened to offline through downloading. However, podcasts related to disaster mitigation are still few and do not discuss thoroughly.' (OA, April 2024)
>
> 'In addition to digital media, guidelines related to digital literacy competencies and disaster mitigation are also needed. Because, we as gen Z also need guidance to be able to conduct campaigns related to natural disasters through digital media. The guidelines should be easy to understand by gen Z and creative' (OB, April 2024).

The interview results show that gen Z in the Thousand Islands needs digital recording media such as Podcasts. In addition, there is a need for guidelines related to disaster mitigation and digital literacy competencies that must be possessed by gen Z.

3.2 Discussions

The need for disaster mitigation digital media must be based on digital literacy competence and the main foundation in building disaster communication. This research shows that generally gen Z only searches for information related to natural disasters that occur. Earthquakes and tidal floods are sentences that are often expressed. This condition cannot be denied because the threat of extreme waves and abrasion in the coastal area of Pramuka Island is considered high[29]. Therefore, the results of this study are in line with Sidi et al. [30]where Pramuka Island, located in the Thousand Islands, is vulnerable to natural disasters such as tornadoes, tsunamis and tidal floods. The vulnerability of the Pramuka island area, fosters the curiosity of gen Z related to natural disasters. With regard to information search, Gen Z in the Thousand Islands region is used to using Instagram, YouTube and TikTok. According to Rejeb et al. [31] the use of Instagram as a source of information for gen Z is because it is a well-known social networking site for information sharing and communication. Thus, many gen Z use this social

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media. However, the limited digital literacy skills of gen Z make them easily caught in hoax news. In other words, these findings show that the digital media used cannot guarantee that gen Z is able to evaluate information content and construct knowledge.

Based on the research findings, it shows that gen Z in the Pramuka island area, Kepulauan Seribu needs digital media that not only explains disaster mitigation but also improves their digital literacy competencies. OA and OB considered that internet network difficulties made them need guidance and media that could be used offline and online. So, when the internet signal is problematic, they can still use or listen to these information sources. Generally, previous research has focused on the development of natural disaster mitigation applications.

In preparing disaster mitigation guidelines, it is not only limited to explaining related to general knowledge of disaster mitigation. This is because previous research has used many of these products. Disaster guidelines must be adjusted to the main foundation in building disaster communication. According to Haddow and Haddow, there are four main foundations, namely audience focus. With regard to the research findings, the information needed by gen Z in the thousand islands related to natural disasters is the possibility of natural disasters, the handling that must be done and the impact of natural disasters. These three things are interrelated to build a communication mechanism that ensures information is delivered precisely and accurately. For this reason, in building audience focus, gen Z is directed to use digital media in the form of text, photos, videos and digital audio. Thus, access to this information is obtained through social media and podcasts. Currently, social media does not only provide personal accounts but various online news start to use social media in disseminating information. Likewise, digital audio such as podcasts are starting to be used by gen Z.

The next stage is leader commitment. The foundation of leader commitment relates to leaders who play a role in emergency response, have a commitment to communication and are actively involved in the communication process. Therefore, the role of community leaders and community organisations such as youth organisations can collaborate to conduct programs related to disaster mitigation and campaigns through digital media. Thus, the guidelines compiled not only lead to the information aspect but can also have an impact on other gen Z. For this reason, the foundation of situational awareness is important for Gen Z in collecting, analysing and disseminating controlled information related to disasters. This situational awareness foundation must be supported by digital literacy competencies. Digital literacy competencies are divided into four as follows.

Internet searching is the ability of gen z in finding information through the internet and using search engines. Furthermore, hypertextual navigation where gen Z uses digital literacy is required to understand the direction guide in the web browser. Thus, gen Z has knowledge of hypertext and hyperlinks and how they work, understands the difference between reading textbooks with e-books or browsing through the internet, understands the characteristics of web pages. After that, gen Z has the ability of content evaluation. Content evaluation is the ability to think critically and provide judgement on what is found on the internet. Therefore, gen Z is able to distinguish the appearance from the information content, analyse the background of the information obtained, and analyse the information. The final competency of digital literacy is knowledge assembly or compiling knowledge obtained through digital media, building a collection of information and evaluating facts and opinions properly. Gen z has the ability to create

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a personal newsfeed and use all types of media to prove the truth of information. In the final stage, this disaster mitigation guide is inseparable from the media partnership used to convey the right information to gen Z regarding disaster mitigation. In simple terms, the media can be managed by gen Z in the form of direct socialisation. The disaster mitigation guide can be described as follows.

Fig. 1. Digital Media-based Disaster Mitigation Guide

The results of this study are in line with Ilomaki et al. [11] that increasing digital literacy for gen Z requires different arrangements and encouragement or motivation to participate responsibly in the digital world. This is because gen Z is not only limited to knowing disaster mitigation but also can disseminate the information obtained. This research has implications for gen Z and the local government in the Thousand Islands region to be able to design and build disaster mitigation digital media with guidelines based on disaster communication and digital literacy.

4 Conclusion

The results of this study conclude that gen Z needs digital media that can contain information related to disaster mitigation. However, the digital media can not only be accessed via the internet online, but can also be used offline. Thus, a digital media-based disaster mitigation guide needs to be developed in future research. The guide can be the basis for gen Z to understand natural disasters and improve their digital literacy in accessing information. Therefore, this disaster mitigation guide has a gradual disaster communication foundation. This research has limitations in research methods, number of participants and location. Future research can survey the needs of disaster mitigation digital media with a quantitative approach. In addition, the number of participants who participated in this study was adjusted to the needs of the survey. And the location studied can be added. Future research also requires the development of digital media that can be based on this research.

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