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Trend analysis of the development of Indonesian local disaster: A bibliometric study

Aminkun Imam Rafii
University of Islam Malang, Malang, Indonesia
aminkun_rafii@unisma.ac.id

ABSTRACT

This study aims to analyze trends in the development of disaster education studies in Indonesia by considering the literature and its implementation. Bibliometric and network analysis is carried out based on the visualization of research trends in disaster education in Indonesia. Based on 35 articles analyzed, the result shows that disaster education has received increasing attention from researchers in recent years. Then, research mainly focused on simulation-based disaster education and limited training. However, this trend in disaster education research has overgrown since mid-2016 and will peak in 2022. This study also involves geographic mapping of disaster education research in several regions of Indonesia. The findings show that Central Java is the main focus of the study. However, the research also involves other areas in Indonesia vulnerable to disasters, such as Aceh, South Sumatra, North Sumatra, Jakarta, East Java, Sulawesi, and Jayapura. This study also found that disaster education literature's dominant discussion trend is "Local Wisdom-Based Disaster Education." This research underscores the importance of innovation in disaster education through local wisdom and various tools. The results of this study also show that journals with SINTA 3 and SINTA 5 indexes have more publications related to disaster education.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis tren perkembangan kajian pendidikan bencana di Indonesia dengan mempertimbangkan literatur dan implementasinya. Analisis bibliometrik dan jaringan dilakukan berdasarkan visualisasi tren penelitian pendidikan bencana di Indonesia. Berdasarkan 35 artikel yang dianalisis, hasilnya menunjukkan bahwa pendidikan kebencanaan semakin mendapat perhatian para peneliti dalam beberapa tahun terakhir. Kemudian, penelitian terutama difokuskan pada pendidikan kebencanaan berbasis simulasi dan pelatihan terbatas. Namun tren penelitian pendidikan bencana ini telah berkembang sejak pertengahan tahun 2016 dan akan mencapai puncaknya pada tahun 2022. Kajian ini juga melibatkan pemetaan geografis penelitian pendidikan bencana di beberapa wilayah di Indonesia. Temuan menunjukkan bahwa Jawa Tengah menjadi fokus utama penelitian. Namun penelitian tersebut juga melibatkan daerah lain di Indonesia yang rawan bencana, seperti Aceh, Sumatera Selatan, Sumatera Utara, Jakarta, Jawa Timur, Sulawesi, dan Jayapura. Penelitian ini juga menemukan bahwa tren pembahasan literatur pendidikan kebencanaan yang dominan adalah "Pendidikan Kebencanaan Berbasis Kearifan Lokal". Penelitian ini menggarisbawahi pentingnya inovasi dalam pendidikan kebencanaan melalui kearifan lokal dan berbagai alatnya. Hasil penelitian ini juga menunjukkan bahwa jurnal dengan indeks SINTA 3 dan SINTA 5 memiliki publikasi terkait pendidikan kebencanaan lebih banyak.

Kata Kunci: *Analisis bibliometric; analisis jaringan; mitigasi bencana; pendidikan kebencanaan; tren bencana lokal.*

INTRODUCTION

In recent years, the increase in the frequency of disasters in Indonesia has caused much loss of life and property for the people and victims affected. The government continues to carry out disaster prevention and mitigation processes to place this preparedness into an education unit program or disaster education (Zhang & Wang, 2022). Disaster education is essential to study, especially considering that Indonesia is a country that is vulnerable to various types of natural disasters, both natural, such as earthquakes, tsunamis, volcanic eruptions, floods, and non-natural ones, such as forest fires, industrial accidents, and social conflicts (Widiadi, 2022). Nevertheless, unfortunately, disaster mitigation efforts through disaster education have not been carried out optimally in Indonesia.
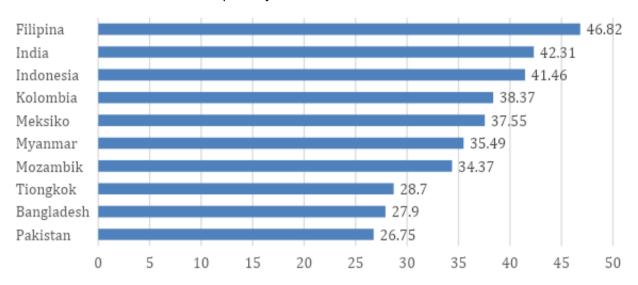

Figure 1. Global Risk Index for Disaster Prone Conditions in 2022
Source: Data processed, 2023

Based on **Figure 1**, Indonesia is the world's third most vulnerable country to disasters after the Philippines and India. Indonesia's Global Risk Index score is in the range of 41.46 points in 2022. The magnitude of the global risk index score can be seen from the number of cases and the number of natural disaster events that have occurred in Indonesia in the past year, like the eruption of Mount Semeru and the earthquake in Cianjur that occurred last November 2022. The World Resources Institute (WRI) Indonesia score consists of five areas. First, the scope of exposure *(exposure)* disaster with a score of 39.89 points or in the very high category. Second, in the scope of vulnerability (*vulnerability),* Indonesia scored 43.10 points or in the high category. This scope considers the number of refugees, asylum seekers, and people affected by natural disasters in the last five years. Third, in the scope of vulnerability (*susceptibility*), Indonesia scored 33.48 points or is in the high category. Fourth, in the scope of the lack of disaster management capacity, Indonesia scored 50.67 or is in the very high category. Fifth, the area related to the lack of adaptive capacity to disasters, in this scope, Indonesia received a score of 47.19 points or is in the moderate category.

In the concept of disaster education, different countries and regions have different categories of types of treatment. Disaster education began in the 1990s in the United States as a form of disaster risk reduction and social participation led by the local government as stipulated in legislation (Wang, 2018). In addition, disaster education emerged in the cases of Japan and China in 2008, when the two countries proposed incorporating knowledge about disaster prevention into the national education system (Shi, 2020). The study underlined the importance of schools as the leading implementation agency so that the establishment of disaster education in Japan and China began in 2008. The same year, disaster mitigation

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encouraged countries like Indonesia to place disaster education into the general education syllabus (Zhang & Wang, 2022).

Disaster education aims to help increase student preparedness in dealing with disasters (Dwi et al, 2021). In disaster education, regional knowledge is essential in increasing preparedness due to differences in regional characteristics in a disaster between one region and another, requiring different handling (Mustofa & Handini, 2020). So disaster education in Indonesia is considered a strategic tool to introduce disaster potential and its risks. In addition, disaster education is considered capable of helping the community instill attitudes and character prepared for disasters in a particular area.

Furthermore, disaster education in Indonesia faces several challenges that must be overcome. First, there is a need for more public awareness and understanding of the importance of disaster education. Many people still need to prepare for disasters and have sufficient knowledge about what to do when a disaster occurs. Second, there are limited resources and infrastructure for disaster education in Indonesia. Many schools and educational institutions still need to be equipped with adequate facilities and curricula to teach disaster education to students. Third, coordination could have been more optimal between the government, educational institutions, and the community in implementing disaster education. Better cooperation is needed between all related parties to achieve the goals of effective disaster education (Ayuningtyas et al., 2021).

On the other hand, disaster education has been proven to minimize the impact of severe disasters on society. Tanaka and Zhang confirmed that respondents with disaster education had more preparedness to deal with earthquake disasters in America than those without, but this increase was insignificant. Even so, at least disaster education can increase public and student awareness of the potential for existing disasters so that people can better understand the signs of disaster and the impact of disasters on individuals, families, and communities. On the other hand, the Indonesian government has realized the importance of developing disaster education. The Indonesian government has developed a disaster education curriculum based on local wisdom. The distribution of the implementation of disaster education has been implemented to reduce the impact of the earthquake in the Palu area (Evie et al., 2022), empowerment-based disaster education in Tulungagung Regency (Khusna & Samudra, 2022), disaster education in early childhood (Retnaningsih & Rosa, 2023; Rahayu & Salam, 2022; Amir et al., 2022; Dwi et al., 2021), at both junior and senior high school student levels (Nurfalaq et al., 2023; Sudrajad & Napitupulu, 2022). Furthermore, disaster education efforts are contained through training, printed and digital books, simulations, educational curricula, educational subjects, models, and learning media related to disasters.

Based on the explanation above, this study aims to analyze trends in the development of disaster education studies in Indonesia by considering the literature and its implementation. Disaster education in Indonesia must continue to be developed and improved so that people can be better prepared to face disasters and reduce the risk of disaster victims. Thus, it is necessary to conduct a study to see the trend of disaster education in Indonesia. In this paper, we conduct bibliometric and network analysis in research in disaster education in Indonesia. We limit literacy only to the Garuda Portal and Google Scholar databases. Apart from discussing development trends, the geospatial distribution of disaster education in Indonesia and this research also provides essential references for the development of broad and in-depth disaster education in the future.

LITERATURE REVIEW

Disaster mitigation education

Natural dynamics significantly impact human life, both beneficial and detrimental, which is then known as a disaster. To minimize risks or losses to humans, knowledge, understanding, preparedness, and skills are needed to prevent, detect, and anticipate various types of disasters better known as disaster mitigation. Mitigation includes disaster protection activities and actions, in the form of rescue, rehabilitation and relocation. Based on Peraturan Menteri dalam Negeri nomor 33 Tahun 2006 is "*upaya yang bertujuan untuk mengurangi dampak bencana, baik bencana alam, bencana akibat ulah manusia, maupun kombinasi keduanya terhadap suatu negara atau masyarakat.*" Disaster mitigation is a form of attitude towards disasters, both during disaster prevention, when a disaster occurs, and after a disaster. This needs to be carried out through both formal and non-formal education. The purpose is to build a system that combines technology engineering with legal, administrative, economic, managerial, and educational aspects to secure development and social stability (Rofiah et al., 2021). In order to reduce the risk of natural disasters, an essential thing in disaster mitigation efforts is knowledge and understanding of natural disasters and preparedness for natural disasters.

Local disasters in Indonesia

Indonesia's geographical conditions and location make the potential for natural disasters relatively large. Indonesia is an archipelagic country located at the confluence of four tectonic plates, namely the Asian continental plate, the Australian continental plate, the Indian Ocean plate and the Pacific Ocean plate. In the southern and eastern parts of Indonesia there is a volcanic belt (volcanic arc) that extends from the islands of Sumatra, Java, Nusa Tenggara, to Sulawesi. Meanwhile, on the sides there are old volcanic mountains and lowlands, some of which are dominated by swamps. So Indonesia is very vulnerable to natural disasters such as volcanic eruptions, earthquakes, tsunamis, floods and landslides. Based on its territorial location, Indonesia is a country with high hazard potential or a country that has the potential for danger. Apart from that, Indonesia is located in a tropical climate area which has two seasons, namely dry and rainy. The tropical climate means that our country has high rainfall and air temperatures. It turns out that this can cause detrimental threats, such as hydrometeorological disasters. This hydrometeorological disaster is a disaster caused by hydrological and meteorological parameters, such as river water volume, rainfall, humidity, temperature and wind. For example, floods, landslides, hail, tornadoes, droughts, etc. (Arfani, 2022).

METHODS

This study uses a bibliometric approach and network analysis to complete the information that will be presented. This study used Vosviewer and Gephi as visualization tools for the analysis. Bibliometrics allows statistical methods to carry out simple statistical analysis on the characteristics of selected documents to visualize and describe the data's characteristics that support disaster education studies (Zhou et al., 2021). Then use VosViewer version 1.6.9, developed by *The University of Leiden,* as a bibliometric tool used in this study. Furthermore, Vosviewer helps extract essential terms from a scientific document to be used as a collection of networks visualized with visual effects. Meanwhile, Gephi, in this study, is used for interactive visualization and detection of various networks and systems that are more complex (Zhang & Wang, 2022). Then the 35 relevant articles obtained are exported into two formats: (1) exported as (.csv) format and directly imported into the project created by VosViewer, then keyword settings are carried out that support and are in line with this research. (2) export format to plain text (.txt),

then import data to *software* Gephi for in-depth analysis and mapping of geospatial distribution regarding disaster education in Indonesia.

In order to understand accurately related development trends and the geospatial distribution of disaster education in Indonesia, this research retrieves relevant documents related to "disaster education in Indonesia" based on the Garuda Portal database and Google Scholar. A total of 238 relevant articles were collected from 2010 to 2023. The year 2010 was used because it was based on the search results of the first study that discussed disaster education from 2010 to 2023 on articles on implementing disaster education in various regions in Indonesia. The exclusion criteria used were non-academic articles (news reports, conferences, opinion articles, and journal catalogs without authors other than in Indonesian) which were deleted. There are 35 articles retained as a sample used to analyze trends in the development of disaster education and analyze the dynamics of disaster education research.

RESULTS AND DISCUSSION

Development of Disaster Education Literature

Identifying trends in the development of disaster education publications in Indonesia begins by looking at the extent to which the number of published studies on disaster mitigation in the education or disaster education sector has grown from 2010 to the following year. Specifically, the data presented is in the form of publication trends with *filtration* manually from the findings of 35 articles discussing disaster education in Indonesia. A graph of publication trends can be seen in **Figure 2** below.
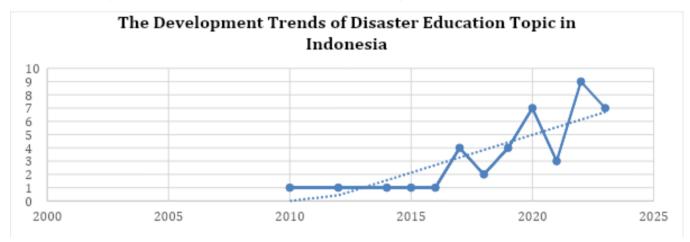

Figure 2. The Development Trends of "Disaster Education" Topic in Indonesia
Source: Data processed by researchers, 2023

The data in **Figure 2** shows that publications on the topic "disaster education" in Indonesia have increased from year to year, and the initiatives of researchers from academic and non-academic circles began to emphasize the importance of disaster education in 2010. Most of the research from 2010 to 2016 focused on simulation-based disaster education and limited training. Publications related to disaster education were quite limited from the beginning of 2010 to 2016. However, the findings increased along with mid-2016 and sharply in 2022, making that year the most productive. Starting from studies that discuss the development of disaster training and simulation to factors that influence the development of the concept of "disaster education." In order to complete the required data, this paper also adds the trend distribution of "disaster education" in several partially distributed regions in Indonesia in **Figure 3**.
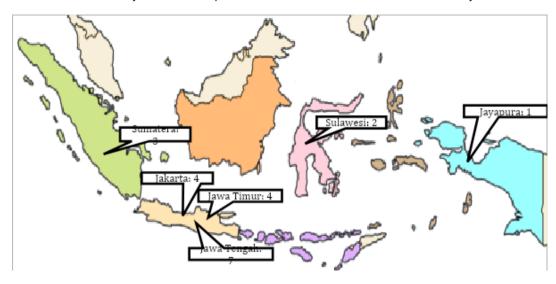
Figure 3. Geospatial distribution of disaster education publications in Indonesia
Source: Data processed by researchers, 2023

Based on the data presented in **Figure 3**, the distribution of disaster education shows that the focus of the areas that are used as projections/cases of disaster education is mainly on the island of Java, namely Central Java, with a higher partial level; this is due to the high disaster-prone conditions in Central Java. Compared to several other similar areas (Ningtyas & Risina, 2019; Septikasari & Ayriza, 2018; Hadiyati & Hafida, 2018; Permana & Hartanto, 2019). In addition, **Figure 4** also shows that apart from Central Java, research is also developing by elaborating disaster cases and conditions in several other areas, namely, Aceh, South Sumatra, North Sumatra, Jakarta (Central & East), East Java, Sulawesi (Manado and Palu), Jayapura and the rest take the location distribution nationally. This distribution shows that areas vulnerable to disasters, as shown in **Figure 3**, require good disaster education to minimize disaster risk. Then, to deepen the analysis, author mapping was carried out based on the article's subject to determine the development of disaster education. It can also be used to show which side is most in demand by researchers who conduct research in the field of disaster education.

Figure 4. Author Mapping Based on the Subject Area "Disaster Education"
Source: Data processed by researchers, 2023

Yani (2010)
Ningtyas & Risina (2019)
Sari et al (2020)
Putranto (2019)
Permana & Hartanto (2019)
Triwidada & Dirhansyah (2017)
Rosdiansyah et al (2022)
Mustofa & Handini (2020)
Dwi et al (2021)

Septikasari & Ayriza (2018)
Syaifullah & Wibowo (2017)
Nasution (2020)
Sahab & Soegiono (2021)

Isnaeni et al (2014)
Masruroh et al (2017)
Widiadi (2022)
Sudrajat & Napitulu (2022)

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Based on the visualization of the data presented in Figure 4, the development of discussion trends related to disaster education is dominated by the context of "Disaster Education based on local wisdom." This trend shows the side that is most in demand by researchers in studying disaster issues; the local wisdom base here shows innovative efforts from researchers to develop disaster education contexts, for example, in developing training, outreach, and disaster simulation (Putranto, 2019; Evie et al. al, 2022; Khusna & Samudra, 2022), then this local wisdom base is followed by the use of tools to increase the effectiveness of disaster education in Indonesia. For example, the innovation through CD media (Ningtyas & Risina, 2019), Monopoly, Pocket Books (Rosdiansyah et al., 2022), and the use of prototype models (Fortuna et al., 2023). Meanwhile, Hardiyati and Hafida began to study and question the urgency of disaster education for students. However, this context is the least desirable because the urgency of disaster education has been proven through several subsequent studies and empirical evidence of the effectiveness of its application in neighboring countries such as the United States, Japan, and China (Wang, 2018; Zhang & Wang, 2022; Shi, 2020).

Most Cited Document

Furthermore, this section presents the documents that were published the most and those that were published together with journal sources that other researchers most widely cited. Visual data processing in this study was carried out using the assistance *software* VosViewer. This step is done to see the relationship between the articles found. The researcher uses a coupling bibliography to determine the contemporary conceptual structure at this stage.
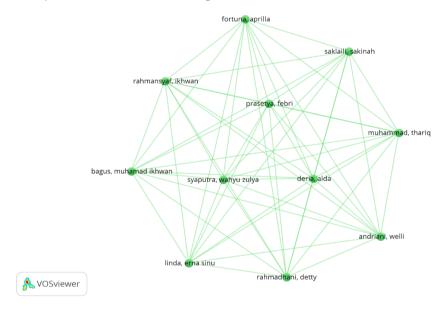

Figure 5. Visualization of Relationships Between Articles
Source: Data processed by researchers, 2023

Based on **Figure 5** above, there is a link between documents that have an attachment because they quote each other between one article and another. The following is also attached data of the most cited authors in **Table 1** below.

Table 1. The Top 10 Most Cite Documents

Author/Year	Title	Journal	Citation
Honesty & The Boy (2012)	Disaster Education in Schools in Indonesia Based on Several Viewpoints of Scientific Disciplines	Momentum Journal	62

Author/Year	Title	Journal	Citation
Kurniati & Suwito (2017)	The Effect of Disaster Knowledge on Preparedness in Facing Disasters in Students of the Geography Education Study Program, Kanjuruhan University, Malang	Journal of Education and Geography	60
Septikasari & Ayriza (2018)	Strategy for Integrating Disaster Education in Optimizing Community Resilience in Facing Mount Merapi Eruption	Journal of National Resilience	50
Tahmidaten & Krismanto (2019)	Implementation of Disaster Education in Indonesia (A Literature Study on Problems and Their Solutions)	Lectura: Journal of Education	35
Hadiyati & Hafida (2018)	The Urgency of Disaster Education for Students as an Effort to Realize a Disaster Resilient Generation	Journal of Education and Social Sciences	34
Syaifulloh & Wibowo (2017)	The Educational Values of Syair Gulung as a Community-Based Disaster Education Effort for Malay Communities in Ketapang District, West Kalimantan	Journal of Educational Reflections	11
So (2010)	Development of a Center for Training and Simulation of Natural Disaster Events for National Disaster Education	Journal of Geography (GEA)	9
Sari et al (2020)	Dissemination of Flood Disaster Mitigation Through Disaster Education Based on Local Wisdom	Independent Society Journal	8
Aji & Hermanto (2019)	Mythology as Disaster Education in Understanding the Eruption of Mount Merapi	Journal of Educational Reflections	7
Mustofa & Handini (2020)	Disaster Education Based on Local Wisdom in Strengthening the Character of Disaster Preparedness	GEODIKA: Journal of Geography Studies and Education	5

Source: Data processed by researchers, 2023

Table 1 shows that the research conducted by Honesti and Djali is the most dominant publication. The implementation of disaster education that is applied in schools is clear evidence that its application provides benefits for increasing student preparedness. This is evidenced by the large number of citations in this article, namely 62 citations cited by other researchers. Apart from this article, the second most cited citation is an article that examines the effect of disaster knowledge on disaster preparedness. The article published by Kurniati and Suwito provides empirical support for the importance of disaster education for individuals in increasing awareness and preparedness for disaster risks. The following details the trends in Figure 7 related to disaster education in Indonesia based on the frequency of publications uploaded by journal publishers. This is to find out the potential acceptance of journals related to disaster education which are most often at the indexing level (SINTA 1, 2, 3, 4, 5 or still need to be accredited by SINTA).
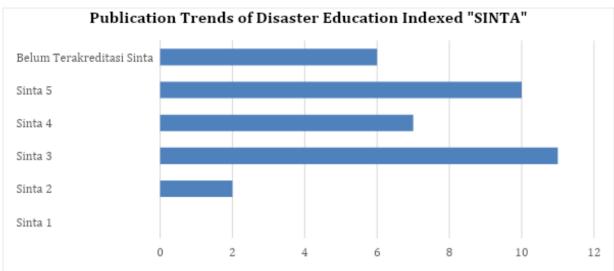
Figure 6. Publication Trends of Disaster Education Indexed "SINTA"
Source: Data processed by researchers, 2023

Based on the list of the ten most cited articles in **Table 1** and **Figure 6**, the interest in writing about the development of disaster education in Indonesia is quite varied; this also includes the variety of published articles. Furthermore, **Figure 7** implies that journals with the SINTA 3 index are the most published; this is, of course, also the level of strictness in the journal, so this finding also confirms that other than the SINTA 3 journal, researchers tend to find it easier to publish articles on SINTA 5 index. The exciting thing is that in this finding, there are no articles contained in SINTA 1; this might happen considering the level of strictness of SINTA 1; the majority must use languages other than Indonesian as well. Scopus has indexed part of SINTA 1, reducing the ease of acceptance of articles in the journal.

In addition to deepening the analysis in this section, visualization data from *the software Gephi* is based on 35 relevant article findings. Gephi is used to see the keywords that appear most often in Indonesia's disaster education development. A total of 325 keywords were found from 35 articles. The researcher took 108 keywords with the most occurrences, which were then processed and filtered to find other relevant keywords, then sorted by strength *link* formed. When reviewing the development of disaster education in Indonesia, specific problems are clearly stated through the keywords that appear on the word network. The early years of the emergence of the need for training and simulations to increase disaster preparedness are symbolized by blue; this cluster describes disaster issues/discussions of trends in the latest research topics; the shift in disaster training and simulation efforts into disaster education efforts is increasingly leaning towards purple relevant to the development of the latest topics related to disaster education.

Research prior to 2016 brought up the keyword "disaster," followed by increasing disaster preparedness and Kelurahan Tangguh. Others are province, Riau, region, earthquake, coast, tsunami, hazard, urban village, nature, mitigation, curriculum, outreach, city, response, and potential. These keywords emerged due to an interesting analysis that initiated awareness of the emergence of disaster education. Simulation and training are considered the beginning of an initiative based on the principles of a disaster-resilient Kelurahan and a disaster-resilient city. In addition, the keyword coastal, vulnerable, emerged from several studies evaluating the occurrence of a tsunami so that coastal communities could increase their preparedness (Sari et al., 2022).
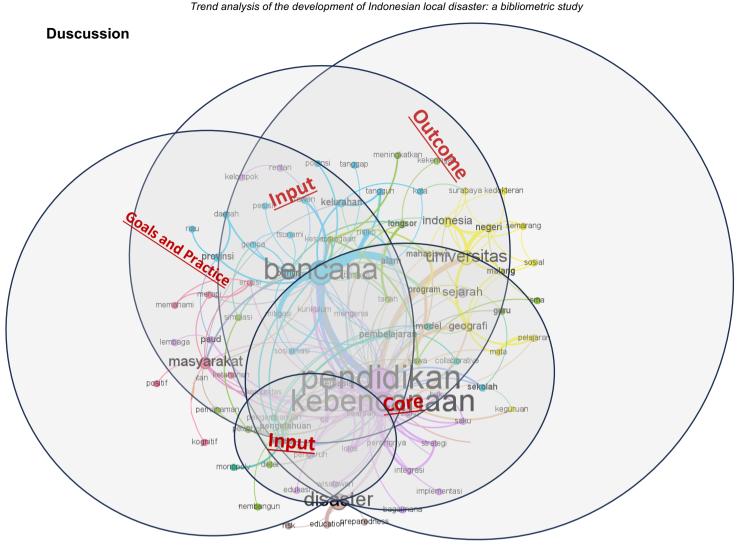
Duscussion

Figure 7. Visualization of keyword networks on the topic of disaster education in Indonesia based on clusters
Source: Data processed by researchers, 2023

The clustering in **Figure 7** shows five different colors representing the 5 clusters of top keyword clusters. The researcher then identified the main group themes by looking at groups of keywords that were similar or similar to what the previous researchers did. The university cluster represented by Yellow discusses the implementation of disaster education, as shown in Figure 4. First, the initial theme refers to anxiety over disaster conditions that have hit several regions in Indonesia, a study conducted by Rosdiansyah et al. (2022) showed that the existence of a disaster education pocketbook shows a validity percentage of 88% in increasing preparedness for disaster conditions in the future. In addition, research development leads to red and green clusters, which indicates a trend of developing essential components in disaster education through synergy between actors. In this case, the synergy is represented by the keywords community, government, and school. If this synergy can run well, it can support the achievement of increased community, student, and individual preparedness.

This synergy follows the topic related to disaster education based on local wisdom in Figure 4, which illustrates the relevance of the development of educational techniques originating from the innovations of researchers and local communities. Ningtyas and Risina (2019) concluded that using disaster education CD media could increase children's self-awareness against disasters. This subject area also explains how local wisdom can be integrated into disaster education to deal with disasters that are specific to an area. As is the case in the study reviewed by Permana and Hartanto (2019) there is an educational meaning implied in the mythology of "supernatural creatures" of Mount Merapi; people's belief in this mythology forms the basis of local community preparedness to avoid the area of Mount Merapi at certain times. This

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local wisdom proves that disaster management efforts strengthen the synergy between society, culture, and the environment in disaster education.

Meanwhile, the trend of implementing disaster education gradually involves all levels of education. These findings confirm that the trend of implementing disaster education was first carried out in 2012 in several MI schools or elementary schools (Tahmiden & Krismanto, 2019; Fahrizal & Zaini, 2022). Gradually Nurfadilah et al. (2021) reviewed that the implementation of disaster education was extended to the early childhood education (PAUD) stage up to the high school and university levels. The earlier a student understands how to act when a disaster occurs, the greater his level of safety. With disaster education, individuals can learn how to recognize the signs of a disaster (Eka et al., 2020), know evacuation procedures, and learn how to act when a disaster occurs (Kurniawan & Darsono, 2020). This will increase students' awareness and preparedness in dealing with disasters and can reduce the negative impacts that may occur.

However, on the other hand, family responses and support play an essential role in supporting disaster education for both students and adults. A study conducted by Rahayu & Salam (2022) highlights a need for more understanding from parents and teachers regarding disaster education. They found that the pattern of disaster education taught by parents and teachers was only based on parents' experiences. The development of disaster education continues to expand its scope not only to students but also parents or the wider community, and this is as in a study conducted by Septikasari & Ayriza (2018); Nasution (2020); Sahab & Soegiono (2021); Widyasari & Setyaningsih (2020); Dinata & Anggraini (2020); and Sari et al (2022). In the study of Sari & Ayriza (2018), disaster education that students receive at school can be integrated by *sharing knowledge* with families so that the resilience of local communities in dealing with disasters will be maximized. However, on the other hand, the development of disaster education also provides insight into the extent of the role of the family in helping students understand the importance of disasters and preparedness in dealing with them.

CONCLUSION

The development of disaster education literature in Indonesia has experienced a significant increase in the last few years. Publications on disaster education began to receive attention from academic and non-academic researchers in 2010. At first, most of the research focused on simulation-based disaster education and limited training. However, this research is growing and covering a wider geographical area. However, the number of publications has increased sharply since mid-2016 and will reach its peak in 2022. The distribution of research on disaster education shows that Java, especially Central Java, is the region's main focus in projections and cases of disaster education. This is reasonable, given the region's high level of disaster vulnerability. However, the research also involved other areas in Indonesia vulnerable to disasters, such as Aceh, South Sumatra, North Sumatra, Jakarta, East Java, Sulawesi, and Jayapura, as well as several other regions nationally. The dominant discussion trend in disaster education literature is "Disaster Education Based on Local Wisdom." This shows that many researchers are interested in developing innovations in disaster education by utilizing local wisdom and various tools to increase the effectiveness of this education. Although several studies have tried to question the urgency of disaster education, this has been refuted by empirical evidence of its effectiveness in several regions and other countries. The results of the most cited document citations show that the research conducted by Honesti & Djali and Kurniati & Suwito is the most dominant. These articles discuss the implementation of disaster education in schools and the influence of disaster knowledge on disaster preparedness.

This study provides evidence that disaster education has significant benefits for increasing individual preparedness in dealing with disasters. Although interest in writing about disaster education varies quite a bit, research tends to be more easily published in journals with SINTA 3 and SINTA 5 indexes. This

shows the level of rigor in these journals. Overall, the development of disaster education literature in Indonesia has experienced a positive increase. Researcher interest in this topic is increasing, focusing on approaches based on local wisdom and the use of tools to increase the effectiveness of disaster education. However, there is still room for broader research, closer collaboration, and a deeper understanding of the implementation of disaster education. As a suggestion for further research, it is necessary to conduct more in-depth and comprehensive research on the effectiveness of disaster education based on local wisdom and the use of various tools. In addition, it is also necessary to conduct broader research covering areas that have yet to be widely studied in the context of disaster education. In addition, it is crucial to broaden the research focus, such as examining the urgency and benefits of disaster education for various community groups, including children, youth, and adults. In this research, both qualitative and quantitative approaches can be used to gain a comprehensive understanding.

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