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Research Article:

Disaster Risk Reduction Education for Students with Diverse Needs

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ABSTRACT

Disaster risk reduction education plays an important role in increasing disaster awareness and preparedness. To instill awareness and a culture of disaster preparedness, disaster education needs to be taught from an early age, as part of the efforts to promote mental health education and inclusive education for students with diverse needs. The purpose of this study is to analyse the integration strategy of disaster risk reduction education into the primary school curriculum for students with diverse needs. This research used a qualitative study approach. This study was conducted in the Special Region of Yogyakarta Province. Data were obtained through three focus group discussion (FGD) sessions with primary School Teachers and Disaster Stakeholders. The data were analysed by transcribing, extracting important statements, formulating meaning and grouping into themes. The results showed that disaster risk reduction education in primary schools is integrated through intracurricular, co-curricular and extracurricular activities. The government needs to develop standard guidelines for the integration of DRR education into the curriculum so that it can be harmonised in its implementation in primary schools for students with diverse needs. Disaster risk reduction education in schools requires the cooperation of various stakeholders, both internal and external parties, for the benefits for inclusive education for students with diverse needs.

Keywords: Disaster, risk, disaster risk reduction, disaster education, diverse needs

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INTRODUCTION

Climate change and extreme weather have made many countries around the world more vulnerable to disasters. Disaster events can be caused by natural or human factors. These disasters can cause significant impacts on people, the economy and the environment (Shi, 2019). According to TheUnited Nations Office for Disaster Risk Reduction (UNDRR), a disaster is defined as a serious disruption of the functioning of a community or society of any scale due to a hazardous event interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: losses and impacts on people, materials, the economy and the environment (UNDRR, 2017). The definition and interpretation of disasters continue to evolve. There has been a paradigm shift in viewing disasters from viewing them as purely physical events to understanding them as complex social phenomena influenced by human actions and social processes (Perry, 2024).

The incidence of disasters in the world is increasing every year. Disasters, ranging from earthquakes and storms to floods and droughts kill an estimated 40,000 to 50,000 people per year. This is the average figure over the past few decades (Ritchie & Rosado, 2024). The world's hottest year on record was 2020, surpassing 2016 despite the absence of a strong El Niño effect. The year was dominated by climate-related disasters. These disasters were largely responsible for 389 recorded events, resulting in 15,080 deaths, 98.4 million people affected, and economic losses of at least USD171.3 billion (CRED & UNDRR, 2021). In addition, in early 2020, the world was confronted with the COVID-19 Pandemic, which is an extraordinary global disaster. As of 27 October 2022, there were more than 625 million cases of the disease and 6.5 million people have been confirmed dead (World Health Organization, 2022).

The impacts of disasters differ on individuals and communities, depending on their knowledge, experience and capacity. Children, the elderly, the disabled, racial/ethnic minorities, individuals with low income and drug abusers are among the vulnerable groups (Benevolenza & DeRigne, 2019; Khorram-Manesh et al., 2017; Ngcamu & Mantzaris, 2021; Rubin et al., 2020). These groups often lack adequate coping resources during natural disasters, such as money to evacuate or prepare. They are also at high risk of poor health outcomes. Disasters significantly impact children in different ways, especially children with diverse needs who may require additional support to process traumatic experiences (Freeman et al., 2015). Disasters have various impacts on children. Firstly, disasters can affect children's physical health. Disaster exposure is correlated with increased rates of acute illness, poor nutritional status, and decreased immunisation coverage (Biswas et al., 2015; Datar et al., 2013; Yamamoto, 2005). In particular, children with disabilities, neurodivergent learners and those with pre-existing mental health conditions may face heightened challenges in coping with disasters, making it essential for disaster risk reduction education to incorporate mental health support tailored to diverse needs.

Further, disasters can affect children's mental health. The main psychological outcomes associated with exposure to traumatic events during childhood include general psychological distress, post-traumatic stress symptoms, depression, anxiety and suicidal thoughts (Adebäck et al., 2018; Mondal et al., 2013; Okafor et al., 2019; Stafford et al., 2019). Children with diverse needs, such as those with disabilities, neurodivergent conditions or pre-existing mental health challenges, may experience heightened distress due to sensory overload, communication barriers or difficulty understanding and processing traumatic events. Besides that, disasters can disrupt educational processes in children, such as loss of learning hours, high rates of absenteeism and low academic achievement (Gibbs et al., 2019; Kousky, 2016; Mudavanhu, 2015). For children with disabilities and diverse needs, these disruptions can be more severe, as they may rely on structured routines, specialised support services and individualised learning plans that may not be readily available during emergencies.

Despite these challenges, children are not just vulnerable recipients of aid; they are also capable and resilient social actors, capable of understanding and responding to disasters. Children, including those with diverse needs, need to be involved in disaster risk reduction and resilience-building efforts, advocating for their active participation and not viewing them as passive victims (Chipo, 2016; Lopez et al., 2012; Martin, 2010; Pfefferbaum et al., 2018). In addition, children can also be effective communicators and agents of change (Mitchell et al., 2008). Children's participation in disaster risk reduction activities has a positive impact on their mental health and resilience, fostering confidence, empowerment and a sense of responsibility (Krishna et al., 2022). Embedding disaster risk reduction within an inclusive education framework ensures that all children, regardless of their abilities, have equitable access to preparedness training, psychological support and active roles in community resilience efforts. By promoting inclusive participation, schools can create disaster education programmes that accommodate diverse learning needs, foster collaboration and build a culture of shared responsibility in disaster preparedness and response.

Research has shown that good disaster mitigation and preparedness can save lives, reduce injuries and prevent damage to property and infrastructure (Raphael, 2008). Disaster education is one of the key approaches in the effort to reduce the negative impacts of disasters (Keith, 2013). Disaster education plays an important role in increasing disaster awareness and preparedness (Nipa et al., 2020). According to the Hyogo Framework for Action 2005–2015 (UNDRR, 2015), the goal of disaster education is to build a culture of safety and resilience to disasters. Disaster mitigation education can increase community awareness in preparing for potential disasters (Kim & Kim, 2022). Although disaster education efforts have been ongoing for a long time, the level of community preparedness is still low. This indicates that disaster education fails to motivate people to take preparedness actions. To improve its effectiveness, disaster education must adopt an inclusive approach that ensures accessibility for students with diverse needs, including those with disabilities, neurodivergent conditions and learning difficulties. By integrating differentiated teaching methods, assistive technologies and alternative communication strategies, disaster education can become more equitable and responsive to the varied learning needs of all students.

Children are a psychologically vulnerable group who often experience disruptions or delays in their educational progress as a result of disasters. Therefore, for more than a decade, various disaster management organisations and agencies have targeted to improve disaster protection and education for children (Sharpe & Kelman, 2011). Sendai Framework for Disaster Risk Reduction The United Nations Office for Disaster Risk Reduction (UNISDR), 2015) states that children and youth can be "agents of change" in transforming and improving community safety. Disaster education programmes for children aim to increase their resilience to disasters, improve safety knowledge and promote disaster preparedness (Yeon et al., 2020). For children with diverse needs, inclusive disaster education is essential to ensure they receive tailored support, such as sensory-friendly emergency drills, adapted learning materials and mental health resources suited to their unique challenges. Embedding disaster education within an inclusive education framework not only empowers all children to take active roles in preparedness but also ensures that no student is left behind in disaster response and recovery efforts.

Indonesia is one of the most disaster-prone countries in the world. This is due to Indonesia's geological condition which is located between three active plates in the world; the Indo-Australian, Eurasian and Pacific plates. The activity of these plates causes the formation of a series of volcanoes and in this region there are many active faults so that frequent earthquakes occur (Badan Nasional Penanggulangan Bencana, 2023). Indonesia has experienced a significant increase in the number and impact of disasters over the past few decades. Between 1900 and 2017, Indonesia has experienced 489 disasters, resulting in nearly 242,000 deaths and impacting 30.7 million people, with total losses reaching USD30 billion. Geophysical disasters accounted for more than 95% of deaths, while hydrological, meteorological and climatological disasters are more frequent, affecting more people and causing more damage (Djalante, 2018). In an effort to be prepared for disasters in the education sector, the Government of Indonesia has issued a Comprehensive School Safety Framework (CSSF) policy to realise resilience and protection of children (GADRRRES, 2022). One of the pillars in the CSSF is disaster risk reduction education. The strategy in disaster risk reduction education in schools is to integrate DRR into the curriculum. The purpose of this study is to explore the integration of disaster risk reduction education into the curriculum and learning activities in primary schools for students with diverse needs.

METHOD

A qualitative study was conducted to analyse the integration of disaster risk reduction education into the curriculum. Focus group discussions (FGDs) were conducted to collect data.

Study Area

Special Region of Yogyakarta (DIY) is a provincial region that has privileges in the administration of government affairs within the framework of the Unitary State of the Republic of Indonesia (Pemerintah Pusat Indonesia, 2012). In the implementation of these privileges, the DIY government prepares special regional regulations (Perdais) that will accommodate various affairs/aspects in the region. The DIY region has diverse landscapes, including volcanic, structural, karst, fluvial and eolian landscapes. Figure 1 shows that disaster risk in DIY Province is in the medium risk category. Volcanic landscapes can be found with the activity of Mount Merapi. In 2023, based on records by BNPB, some of the prominent types of disasters in DIY are extreme weather and forest and land fires. Other types of disasters recorded are landslides, floods, droughts, earthquakes. For earthquakes, DIY is an area traversed by the very active Opak fault. Based on the Disaster Risk Index (IRBI) 2023, Yogyakarta Special Region has a medium risk index with a score of 108.15. (score < 13 = low, score 13–144 = medium, score >144 high).

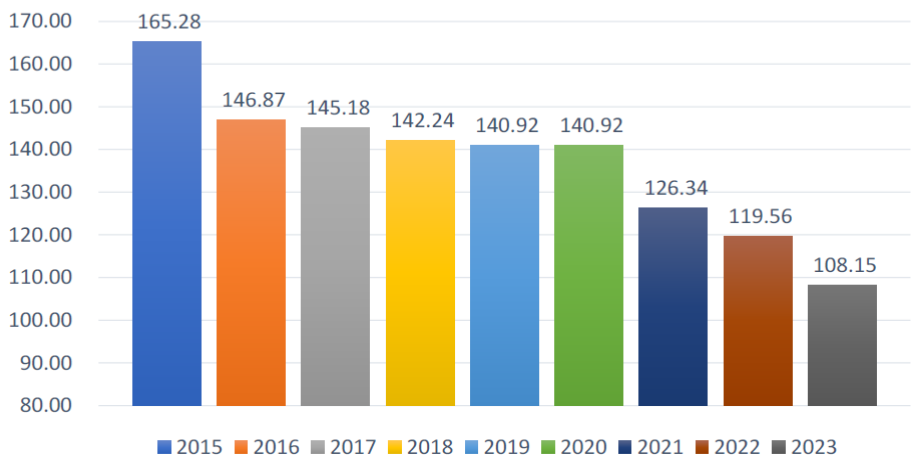

Figure 1. Risk Index Graph of DIY Province from 2015–2023

Sampling and Recruitment

The informants in this study were selected using purposive sampling technique. The informants in this study were primary School Teachers representing primary schools in five districts/cities in Yogyakarta Province. The selected schools represent government-owned schools and private schools. The informant criteria for teachers were that they had worked as teachers for at least 5 years, willing to attend at a predetermined time, and willing to participate in FGDs. In addition, informants in this study were disaster management stakeholders, including: Regional Disaster Management Agency, Meteorology Climatology

and Geophysics Agency, Muhammadiyah Disaster Management Centre, and Joint Secretariat of Comprehensive Safety School Frameworks. The criteria for informants from disaster management stakeholders are personnel who have duties related to mitigation and preparedness efforts, have worked for at least 5 years, willing to attend at a predetermined time and willing to participate in FGDs. There were 24 informants who participated in this study. Each FGD session was recommended to consist of 6-12 participants (Seal et al., 1998). Evidence showed that three FGD groups were sufficient to identify relevant themes in the data set (Guest et al., 2017). informant characteristics are presented in Table 1.

Table 1. Key informant profiles

Code	Gender	Age	Occupation	Institution
School Teacher 1	Male	46	School's teacher	Primary School Yogyakarta City
School Teacher 2	Female	35	School's teacher	Primary School Yogyakarta City
School Teacher 3	Female	39	School's teacher	Primary School Yogyakarta City
School Teacher 4	Female	50	School's teacher	Primary School Yogyakarta City
School Teacher 5	Female	29	School's teacher	Primary School Sleman Regency
School Teacher 6	Male	41	School's teacher	Primary School Sleman Regency
School Teacher 7	Male	44	School's teacher	Primary School Sleman Regency
School Teacher 8	Female	38	School's teacher	Primary School Bantul Regency
School Teacher 9	Female	46	School's teacher	Primary School Bantul Regency
School Teacher 10	Male	35	School's teacher	Primary School Bantul Regency
School Teacher 11	Female	36	School's teacher	Primary School Kulon Progo Regency
School Teacher 12	Female	41	School's teacher	Primary School Kulon Progo Regency
School Teacher 13	Male	40	School's teacher	Primary School Kulon Progo Regency
School Teacher 14	Male	41	School's teacher	Primary School Gunung Kidul Regency

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Code	Gender	Age	Occupation	Institution
School Teacher 15	Female	40	School's teacher	Primary School Gunung Kidul Regency
School Teacher 16	Male	40	School's teacher	Primary School Gunung Kidul Regency
Disaster Stakeholder 1	Male	50	Head Division	Regional Authority for Disaster Management (Yogyakarta Province)
Disaster Stakeholder 2	Female	45	Head Division	Regional Authority for Disaster Management (Bantul Regency)
Disaster Stakeholder 3	Male	39	Head Office	Meteorology Climatology and Geophysics Agency
Disaster Stakeholder 4	Male	44	Head Section	Meteorology Climatology and Geophysics Agency
Disaster Stakeholder 5	Male	45	Secretary	Muhammadiyah Disaster Management Center
Disaster Stakeholder 6	Female	50	Head Division	Muhammadiyah Disaster Management Center
Disaster Stakeholder 7	Female	40	Head Office	Joint Secretariat of Comprehensive Safety School Frameworks
Disaster Stakeholder 8	Female	38	Secretary	Joint Secretariat of Comprehensive Safety School Frameworks

Study Procedures

At the beginning of each FGD session, participants were asked to complete consent forms and were informed about the study objectives. FGDs were recorded using an audio recorder. FDG activities were moderated by one research member using FGD guidelines. Participants were asked to discuss their experiences, opinions and inputs on disaster education content and the integration of disaster risk reduction education into the curriculum. Twenty-four participants engaged in this study which was conducted in three sessions with eight participants per session (two sessions for the teacher group and one session for the disaster management stakeholder group). Discussions were conducted through the Google Meet online platform, following predetermined times in the afternoon and evening, which had been mutually agreed by all participants. Each FGD session had a duration of about 1.5 hours to 2 hours. The questions given in the FGD were:

1. What are the strategies for disaster risk reduction education in schools?
2. What disaster materials and topics are taught in class?

3. How are disaster learning methods implemented in the classroom?
4. Who is involved in disaster risk reduction education?
5. What are the challenges in disaster risk reduction education in schools for students with diverse needs?

Data Analysis

Audio recordings of the FGDs were transcribed. Then the transcripts of the FDG results were reviewed and analysed. The data were analysed using Collaizi's approach (Kr, 2021). There were four steps in analysing phenomenological data. The first step was to obtain an overview of the transcripts by reading the transcripts many times so that they could be clearly understood. The second step was to extract important statements from the transcripts that form the overall meaning of the experience. The third step was to formulate the meaning of these important statements. After obtaining the formulated meaning of the important statements, the researcher then organised them into themes.

RESULTS AND DISCUSSION

Strategies for Disaster Risk Reduction Education in Primary Schools

There are various strategies that can be used in disaster risk reduction education in primary schools. From the results of the discussion, two strategies for disaster risk reduction education in schools were obtained, namely the integration model and the collaboration model. The integration model is done by integrating DRR education into the school curriculum, while the collaboration model is done through collaboration with various stakeholders, both internal and external parties. The findings indicate that schools primarily implement a disaster risk reduction education model through integration into existing curricula and activities.

Disaster risk reduction education can be integrated through intracurricular, co-curricular and extracurricular activities for students with diverse needs.

> The strategy that can be done in disaster risk reduction education in schools is to integrate disaster materials and topics through intracurricular activities, for example inserting disaster topics into subjects (School Teacher 2)

Figure 2 shows a model for integrating disaster risk reduction into school curriculum through intracurricular, cocurricular and extracurricular activities.

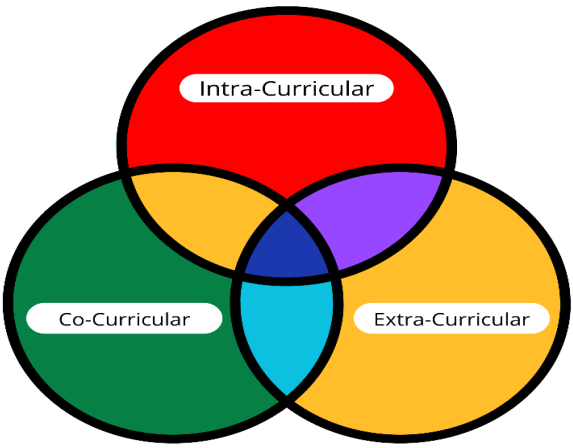

Figure 2. DRR Strategy in Primary School

Disaster risk reduction education can also be integrated through co-curricular activities at school. Co-curricular activities are activities carried out to explore and understand the material that has been obtained through intracurricular activities.

> Disaster risk reduction education can also be integrated through co-curricular activities at school. For example, disaster preparedness material can be given during the introduction to the school environment (MPLS). Then disaster risk reduction education can also be implemented through classmeeting activities such as disaster competitions between classes. In addition, disaster preparedness materials can also be disseminated through communication, information and education (IEC) media such as films, songs, posters, etc. (Disaster Stakeholder 1)

In addition, disaster risk reduction education can also be integrated into extracurricular activities in schools. Extracurricular activities are activities carried out by students outside the standard curriculum learning hours.

> Disaster risk reduction education can be integrated through extracurricular activities, such as scouting activities. The development of an attitude and culture of preparedness can be integrated in scouting activities. For example, during ceremonies and scout camps, material on disaster preparedness can be included. (School Teacher 9)

The findings highlight that disaster risk reduction (DRR) education in primary schools can be effectively implemented through the integration model, where DRR content is embedded into intracurricular, co-curricular and extracurricular activities. This approach ensures that disaster preparedness is not taught in isolation but becomes an integral part of students' learning experiences. Teachers play a crucial role in integrating DRR topics into subjects, co-curricular activities such as school orientation and disaster competitions and extracurricular programs like scouting. This inclusive approach ensures that all students, regardless of their abilities, develop the necessary skills to respond effectively to disasters.

DRR Education Content and Topics in Subjects Taught in the Classes

Disaster Risk reduction education aims to create content, processes and learning opportunities for children so that they have sufficient knowledge and skills in dealing with various disaster risks. Disaster risk reduction education can be integrated into subjects in primary schools such as religious and ethical education, citizenship education, physical education, Indonesian language, mathematics, natural and social sciences, and English. Table 2 shows the integration of disaster risk reduction topics into school subjects.

Table 2. Integration of DRR into subjects

Disaster content	Integration into subjects	Excerpts
Mental health promotion in disaster	Citizenship Education, Indonesian Language, Physical Education	Mental health education can be taught through Indonesian language lessons such as reading about managing stress during disasters. (Disaster Stakeholder 7)
Natural disasters in religious perspective	Religious and Ethical Education	In our school, disaster education is included in Islamic religious studies by explaining how to understand disasters from the perspective of religion. (Disaster Stakeholder 2)
Climate change, earthquakes, tsunamis, floods, volcanic eruptions, strong winds, human and natural interactions	Natural and Social Sciences	Natural and social science lessons teach about protecting the environment and rivers to prevent flooding. In elementary school, they are also taught about various local winds such as the *Bahorok* wind. (School Teacher 3)

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Disaster content	Integration into subjects	Excerpts
Mutual aid, co-operation, and compassion in disaster situations	Citizenship Education	In the subject of Citizenship Education, the topic of gotong royong can be explained in the context of disasters, that we need to work together and care to help people affected by disasters. (School Teacher 1)
Read and write about disaster topics	Bahasa Indonesia	Children are taught to read with disaster topics and content. This can improve children's reading skills as well as their knowledge of disaster mitigation. (School Teacher 8)
Context of disaster in mathematics	Maths	In maths lessons, addition problems are given in the context of disasters, for example calculating the number of refugees consisting of adults, children and toddlers. (School Teacher 2)
Reading and writing English with disaster topics	English	In English reading skills, reading with disaster topics is given. Likewise in writing, children are asked to make essays with disaster themes. (School Teacher 14)

Disaster risk reduction education in Yogyakarta still emphasises on cognitive aspects. To address this, firstly, the scope and content of disaster themes and topics need to be expanded in primary schools as the focus is more on transferring knowledge about disaster prevention and less on developing practice skills for effective disaster preparedness such as disaster drill. This does not suggest that one aspect is above the other, but suggests that students, including those with diverse needs, should be adequately prepared, not only how to prevent disasters, but also how to respond to, manage and recover from disasters. Practice drills have several advantages over purely cognitive aspects when it comes to preparing children for emergencies. Drills provide hands-on experience, which can lead to more effective evacuation during real disaster scenarios by reducing evacuation times. They also help children internalise procedures through repetition, making it more likely that they will remember and follow these procedures under stress (Adebäck et al., 2018). By incorporating inclusive strategies, schools can ensure that all students, regardless of their abilities, develop practical disaster preparedness skills and feel confident in responding to emergencies.

Mental Health Education in Disaster

Children's mental health can be significantly and permanently impacted by disasters. Children who witness natural catastrophes are susceptible to a number of mental health conditions, such as anxiety, depression and post-traumatic stress disorder (PTSD). Thus, mental health education needs to be integrated in school subjects so that children can manage their emotions and feelings during a disaster. Mental health education in primary schools can be integrated into various subjects such as citizenship education, Indonesian language education and physical education.

> Children can be taught about caring for themselves and others and how to manage emotions and stress during disasters, empathy, helping each other and supporting mental health during disasters. (School Teacher 11)

> Mental health education can be integrated into Indonesian language lessons, where children are asked to express their feelings related to disasters and read about managing stress and emotions during disasters. (School Teacher 6)

> Children can be taught relaxation and exercise techniques to reduce anxiety and stress during physical education subject. (School Teacher 3)

Mental health education in the context of disasters raises awareness about the psychological impacts of such events and prepares students, including those with diverse needs, to handle them more effectively. It helps build resilience among students by equipping them with coping strategies to manage stress and anxiety related to disasters (Reilly et al., 2018).

DRR Learning Methods

In disaster risk reduction education, various methods are needed. From the results of the discussion, it was found that there are various kinds of learning methods implemented in disaster risk reduction education in elementary schools such as interactive learning with brainstorming, surrogate experiential learning such as role play and drama, field trips to disaster-prone areas, learning outside the classroom through the internet and media and disaster simulations. Table 3 shows the learning methods used in disaster risk reduction education in elementary schools.

Table 3. Learning Methods in DRR Education

Teaching methods	Description	Excerpts
Interactive	Interactive learning is learning that requires student participation. This participation can be through class and small group discussions as well as through exploration of the interactive learning materials provided in class.	Disaster material is taught through discussion and brainstorming, it can also be done by inviting speakers from the Regional Disaster Management Agency. (School Teacher 13)
Surrogate Experiential	Learning experiences in the form of imitation to represent real conditions	Disaster learning can be taught through role plays and dramas or even by using technology such as virtual reality. (School Teacher 15)
Field Experiential	It is a learning opportunity that takes place outside the classroom, which gives children direct exposure to the field of study.	Disaster learning will be more fun for children when they are invited to field trips, for example a visit to the Merapi mountain national park. (School Teacher 2)
Inquiry	Inquiry-based learning is a learning process that engages students by making real-world connections through exploration. It is an approach to learning that encourages students to engage in problem-solving and experiential learning.	Children get information outside the classroom, for example by exploring TV, social media and the internet. (School Teacher 7)
Action	Action learning is an experiential learning method in which participants learn by doing and then reflecting on what they have done.	In addition to cognitive aspects, children also need to be equipped with motor skills. This can be done through disaster drills and simulations, such as taking shelter under a table during an earthquake, and evacuation drills. School Teacher 10)

The learning methods for disaster risk reduction education include interactive teaching methods such as mini-lectures, discussions, exercises, games, interactive presentations and practical activities like simulations and competitions. Additionally, participatory methods and experiential learning techniques are emphasised, including brainstorming and other participatory pedagogical approaches. These methods aim to engage students actively and

foster a deeper understanding of DRR concepts (Selby & Kagawa, 2012). For students with diverse needs, it is essential to adapt these methods to ensure accessibility and meaningful participation. This may include using visual aids and simplified language for students with cognitive challenges, tactile learning materials for visually impaired students and alternative communication methods such as sign language for those with hearing impairments. By incorporating inclusive strategies, disaster education can cater to different learning styles and abilities, ensuring that all students, regardless of their needs, can develop the necessary skills and knowledge for disaster preparedness.

Stakeholder Support in DRR Education

Disaster risk reduction education in schools requires collaboration and support from various parties. Internal school parties; students, teachers, parents, and school committee and external parties such as the education office, regional disaster management agency, meteorological sentenceology and geophysics agency, fire department, search and rescue team.

> Disaster risk reduction education does not only involve schools, but also needs to involve various parties including parents, because children spend more time at home than at school. In addition, disaster risk reduction education needs to involve Disaster Stakeholders such as disaster management agencies, and meteorological, climatological and geophysical agencies (Disaster Stakeholder 2)

Table 4 shows the parties involved in supporting disaster risk education in elementary schools.

Table 4. Stakeholder support in DRR Education

Internal parties	External parties
Student	Education Office
Teacher	Regional Disaster Management Agency
Parents	Meteorology Climatology and Geophysics Agency
School Committee	Fire Department
	Search and Rescue Team
	Indonesian Red Cross

DRR involves a wide range of stakeholders to ensure comprehensive and effective implementation. Key participants include educators and schools, non-governmental organisations (NGOs), community institutions, families and children and youth. In an inclusive education framework, it is essential that DRR strategies address the diverse needs of all students, including those with disabilities and learning difficulties. Schools and educators must implement accessible DRR education through differentiated instruction,

assistive technologies and personalised support strategies to ensure that students with diverse needs can actively participate in disaster preparedness efforts. Children and youth, as active participants, can contribute to DRR efforts through involvement in school and community activities, enhancing their own resilience and that of their communities. Collaboration among stakeholders must prioritise inclusivity by ensuring that DRR materials, training and emergency response plans are designed to accommodate diverse learning abilities, mobility challenges and communication needs. These stakeholders must work together to create a cohesive and effective DRR strategy that is inclusive, sustainable and equitable for all students (Amri et al., 2022).

Challenges of DRR Education

The first challenge in implementing disaster risk reduction education in schools is related to the human resources aspect. Teachers as educators have limited knowledge about disaster science so that the disaster content and topics given in the subjects are also still limited. Furthermore, schools also find it difficult to integrate disaster risk reduction education into learning activities because the government has not issued such guidelines.

> Our teachers have limited knowledge of disaster science, so the content and themes of disaster are also still limited. (School Teacher 10)

> Disaster risk reduction education still focuses on improving the cognitive aspects, while the psychomotor aspects and disaster skills are still lacking. (School Teacher 4)

> There are no guidelines for the integration of disaster risk reduction into the school curriculum, this is still a major challenge. (Disaster Stakeholder 3)

> Lack of training for teachers on mental health education in disaster situations. (School Teacher 8)

The challenges in implementing disaster risk reduction education in schools primarily stem from limitations in human resources, teacher training, and the absence of clear guidelines for curriculum integration. Many teachers have limited knowledge of disaster science, leading to a focus on cognitive aspects rather than practical disaster response skills. Additionally, the lack of structured training on mental health education in disaster situations further hampers efforts to build psychological resilience among students. The absence of government-issued guidelines for integrating DRR education into learning activities makes it difficult for schools to implement consistent and effective disaster preparedness programmes for all students.

From an inclusive education perspective, these challenges disproportionately affect students with diverse needs, including those with disabilities and learning difficulties, as they may require differentiated teaching strategies, accessible learning materials and

specialised support during emergencies. Without adequate training, teachers may struggle to provide disaster risk reduction education that is inclusive, adaptive and responsive to the unique challenges faced by students with disabilities. To address these gaps, professional development programmes must equip educators with both disaster knowledge and inclusive pedagogical strategies to ensure that disaster risk reduction education is accessible and effective for all students. A comprehensive and inclusive disaster risk reduction framework, supported by clear governmental policies, would enable schools to build disaster-resilient communities where every student, regardless of their abilities, is prepared to respond safely and effectively to emergencies.

CONCLUSION

Disaster risk reduction education is very important to be taught in schools because it can equip students with the knowledge and skills to reduce the impact of natural hazards by reducing the number of casualties, limiting the amount of damage and reducing disruption to economic, social and cultural activities. The results of this study show that disaster mitigation strategies are carried out by integrating disaster risk reduction education into the curriculum. Disaster education content provided in primary schools needs to be expanded not only to improve cognitive aspects but also psychomotor aspects. In addition, it is important to integrate mental health education in disaster situations into the school curriculum. For the sustainability of mental health education in schools, guidelines and training for teachers need to be developed. For students with diverse needs, disaster risk reduction education should be designed with accessibility in mind, using differentiated instruction, assistive technologies, and alternative communication methods to ensure their full participation. The government needs to sit together to develop guidelines for the integration of disaster risk reduction education into the primary school curriculum. The implementation of disaster risk reduction education in schools requires the collaboration of various parties from both internal and external parties.

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