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The Concept of Disaster Education and the Roles of Educational Personnel, Parents, Partners, and Community in Early Childhood Education

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Abstract

Indonesia faces high disaster risk due to its geological and geographical conditions, which disproportionately affect vulnerable groups, including young children. This situation highlights the urgency of integrating disaster education into Early Childhood Education to build awareness, preparedness, and resilience from an early age. This research aims to examine the concept and implementation of disaster education in Early Childhood Education and to analyze the roles of education personnel, parents, partners and the community in its implementation. Employing a qualitative case study approach, the research was conducted in six ECE institutions in Pangkalpinang City and Bangka Regency, Bangka Belitung Islands Province. Data were collected through in-depth interviews, participatory observation, and document analysis involving 24 informants, including teachers, parents, partner representatives, and community leaders and using the interactive model of Miles, Huberman, and Saldaña. The findings identify two empirically grounded implementation models: comprehensive (holistic) and partial integration, shaped by institutional readiness, educator capacity, and local disaster risk contexts. The research also reveals a collaborative ecosystem in which teachers function as core implementers, school leaders as coordinators, parents as learning reinforcers, and partners and community as technical supporters. These findings demonstrate that disaster education in Early Childhood Education is practiced in adaptive and context-specific forms. This research contributes an ecosystem-based, multi-stakeholder framework to strengthen sustainable disaster preparedness and long-term resilience from early childhood.

Keywords: *disaster education, disaster risk reduction, early childhood education, multi-stakeholder collaboration*

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Introduction

Indonesia is one of the countries with the highest disaster vulnerability in the world. Its location at the intersection of the Indo-Australian, Eurasian, Pacific and Philippine tectonic plates make Indonesia highly susceptible to earthquakes, volcanic eruptions and tsunamis (Sidik, 2025). Furthermore, around 70% of Indonesia's territory is ocean, which increases the risk of tsunamis caused by tectonic and volcanic activity in the sea (Setiawan et al., 2023). The geographical conditions in the tropical region with high rainfall also increase the potential for hydrometeorological disasters such as floods, landslides, tornadoes and droughts.

Disaster phenomena in Indonesia are diverse and broadly categorized into natural and non-natural disasters. This study specifically focuses on disasters caused by natural phenomena. Geologically and geographically, Indonesia is located within the "Pacific Ring of Fire" and traversed by two major mountain systems, namely the Circum-Pacific and Circum-Mediterranean ranges, which host numerous active volcanoes capable of generating volcanic earthquakes. From a geographical perspective, Indonesia lies at the crossroads of the Asian and Australian continents and between the Indian and Pacific Oceans, extending across the tropical zone (Yulianto et al., 2021). These natural characteristics render Indonesia highly prone to various types of

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natural disasters, as reflected in the national disaster risk distribution illustrated in the Indonesia Disaster Risk Index Map (BNPB, 2024).

A series of major disasters over the past two decades including the 2004 Aceh tsunami, the 2006 Yogyakarta earthquake, the 2006 Pangandaran tsunami, the 2009 Padang earthquake, to the 2018 Lombok and Palu-Donggala earthquakes, show that Indonesians live in an area with a very high risk of disasters. In the 2018 Lombok earthquake, for example, 471 people were recorded as dead, 23,098 houses were destroyed, and 169 educational institutions suffered severe damage, causing more than 31,000 students to lose access to education (Rahmanda & Yanuar, 2024). Meanwhile, the earthquake, tsunami and liquefaction in Palu-Donggala caused more than 2,256 fatalities and forced hundreds of thousands of residents to evacuate (Amiruddin & Lumbaa, 2024). These impacts show that disasters not only damage infrastructure but also hinder the continuity of education and cause trauma, especially for young children.

Indonesia is frequently described as a "disaster laboratory" due to the diversity and frequency of natural and non-natural disasters occurring annually (Rahma & Kahfi, 2022). As an archipelagic country with thousands of islands and extensive ethnic, religious, cultural, and linguistic diversity, Indonesia faces spatial vulnerability and uneven local capacity in disaster preparedness and mitigation, rendering disaster management highly complex (Ayuningtyas et al., 2021). Nevertheless, Indonesia's success in various disaster management efforts has made it a role model for other developing countries.

Amid these geographical and social realities, disaster education has become a fundamental need for all levels of society. In addressing this condition, education plays a strategic role in fostering disaster awareness from an early age. Education not only serves to transfer academic knowledge but also functions as a means of shaping attitudes and behaviors that are responsive to natural risks. According to UNESCO, as stated by Tahmidaten & Krismanto (2019), disaster education is an important component of Education for Sustainable Development (ESD), which is education that fosters awareness of the importance of maintaining the sustainability of life on Earth.

Early Childhood Education not only plays a role in children's academic and character development, but is also an important vehicle for instilling disaster literacy knowledge about risk, mitigation, preparedness, and disaster response from an early age, so that children can understand and behave adaptively in response to complex natural hazards such as earthquakes, floods, or fires (Humaedi et al., 2025). Research Ningrum et al., (2025) shows that integrating disaster education materials into the Early Childhood Education curriculum through contextual learning and interactive media such as educational games, videos, and simulations not only strengthens children's preparedness but also enhances their overall ecoliteracy about environmental hazards and builds individual and collective resilience.

The disaster mitigation curriculum implemented in early childhood education has shown an increase in children's competence in basic preparedness, while other studies highlight that disaster mitigation learning in early childhood education institutions needs to cover the pre-disaster phase until the time of the disaster in order to build an integrated response (Talango et al., 2025). In terms of policy, strengthening disaster education in educational units, including early childhood education, is supported through the Disaster-Safe Educational Unit Program regulated in Regulation of the Minister of Education and Culture Number 33 of 2019, which emphasizes improving the capabilities of educational resources in reducing disaster risk and ensuring the safety of students and educators in every phase of a disaster.

At the global level, education for sustainable development as mandated in SDGs Target 4.7 requires that all learners acquire knowledge and skills that support sustainable development, including an understanding of disaster risks and environmental adaptation, so that early childhood education with integrated disaster education contributes directly to the achievement of these targets and supports the formation of resilient citizens who are ecologically literate and responsible for safety and the environment in the future.

To support this, the Ministry of Education and Culture of the Republic of Indonesia encourages early childhood education units to diversify and integrate the curriculum so that elements of disaster education can be incorporated comprehensively, gradually and in accordance with the stages of child development (Hasbi et al., 2020). Bronfenbrenner's ecological systems theory (1979) emphasizes that child development is influenced

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by the interaction of multiple environmental systems including family, school, community and supporting institutions, hence the implementation of disaster education requires active involvement from educational personnel, parents, institutional partners and the community surrounding the early childhood education unit (Dharma, 2023).

Despite the increasing attention to disaster education in early childhood settings, existing studies largely concentrate on curriculum content, instructional media, or children's learning outcomes, often from a single-actor perspective, particularly that of teachers or educational institutions. Limited research has examined disaster education as a systemic, multi-stakeholder process that integrates the roles of families, institutional partners, and community within early childhood education ecosystems. Consequently, the novelty of this study lies in its integrative and ecosystem-based approach to disaster education in early childhood education units. This article contributes by conceptualizing disaster education as a collaborative multi-stakeholder framework, analyzing the distinct yet interconnected roles of education personnel, parents, partners, and community, and elucidating how such collaboration strengthens early childhood disaster ecoliteracy as a foundation for long-term resilience and national disaster risk reduction efforts.

Unlike prior studies that primarily focus on curriculum content or teacher-centered disaster education initiatives, this study advances the field by conceptualizing disaster education in Early Childhood Education as an ecosystem-based, multi-stakeholder practice. By empirically mapping the differentiated yet interconnected roles of educators, parents, institutional partners, and community actors across diverse disaster risk contexts, this research fills a critical gap in early childhood disaster education literature, particularly in disaster-prone developing countries.

Methodology

This research uses a descriptive qualitative approach because it aims to gain an in-depth understanding of the implementation of disaster education and the role of early childhood education personnel, parents, partners, and the community in Early Childhood Education. The qualitative approach is considered suitable for revealing processes, meanings, patterns of relationships, and social contexts that cannot be explained quantitatively. This approach aligns with Creswell (2020) viewpoint, which emphasizes that qualitative research is used to explore an in-depth understanding of experiences or social practices in a comprehensive and naturalistic manner.

The research design used is a case study, as the study focuses on an in-depth examination of disaster education implementation practices in a specific early childhood education unit. A case study allows the researcher to comprehensively understand the phenomenon within a real context, including how collaboration among various parties occurs. Case studies are particularly suitable for investigating complex phenomena related to implementation processes and interactions among actors within a system (Yin, 2020).

The research subjects include education personnel, parents of students, partner institutions such as the Regional Disaster Management Agency, the education department, professional organizations, as well as community members or local leaders. Purposive sampling techniques were used to select informants based on specific criteria, including their experience, active involvement in disaster risk reduction programs, and willingness to provide in-depth information. A total of 24 informants participated in this research, consisting of 8 early childhood educators, 8 parents of students, 4 representatives from partner institutions, and 4 community leaders from Pangkalpinang City and Bangka Regency, Bangka Belitung Islands Province. This approach is in line with (Palinkas et al., 2015) who emphasize that purposive sampling is effective in qualitative research because it allows for the selection of informants who have a deep understanding of the phenomenon being studied.

Tabel 1. Profile of Research Informants

No	*Informant Category*	*Code*	*Number*	*Role in Disaster Education*
1	Early Childhood Educators	E1–E8	8	Curriculum integration & classroom practice
2	Parents	P1–P8	8	Home-based disaster preparedness
3	Partner Institutions (e.g., BPBD)	I1–I4	4	Policy & technical support

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4	Community Leaders	C1–C4	4	Community engagement & local wisdom
Total			**24**	

The research was conducted in six early childhood education institutions, consisting of three institutions in Pangkalpinang City and three institutions in Bangka Regency, all of which have integrated Disaster Risk Reduction (DRR) elements into their curriculum and teaching and learning activities. This research was conducted over a period of three months, providing sufficient time for in-depth data collection through interviews, observations, and documentation. The selection of research locations was based on considerations of accessibility, institutional readiness, and program relevance, in accordance with Neuman (2019) statement that the qualitative research environment should facilitate natural and context-rich data exploration. The selection of research sites also reflects (Neuman, 2019) view that qualitative inquiry requires context-rich environments that allow naturalistic observation of social practices and institutional dynamics.

Table 2. Research Sites and Institutional Characteristics

No	*Institution Code*	*Region*	*Type of Institution*	*DRR Integration Form*
1	PAUD A	Pangkalpinang City	Public	Curriculum & routine drills
2	PAUD B	Pangkalpinang City	Private	Learning activities & simulations
3	PAUD C	Pangkalpinang City	Community-based	Parent involvement programs
4	PAUD D	Bangka Regency	Public	SOP & partner collaboration
5	PAUD E	Bangka Regency	Private	Disaster-themed learning
6	PAUD F	Bangka Regency	Community-based	Local wisdom integration

Data were collected using three main techniques, namely in-depth interviews, participatory observation, and document studies. Interviews were used to explore the perspectives, experiences, and empowerment practices of stakeholders. Observations were conducted to understand real situations, interactions, and disaster preparedness learning activities for early childhood. Meanwhile, documentation was used to obtain data from school-level curriculum, weekly learning implementation plan, daily learning implementation plan, disaster standard operating procedures and activity archives. This combination of techniques aligns with Flick (2019) guidelines, which state that variation in data collection techniques enhances the depth and completeness of qualitative findings.

Data analysis was conducted using the Miles et al. (2020) model, which includes three main steps: data reduction, data display, and conclusion drawing. The analysis process was carried out continuously from data collection to the final verification stage. This model was chosen because it can systematically and flexibly depict the dynamics of qualitative data, and it allows researchers to identify meaningful patterns in the empowerment process of various parties.

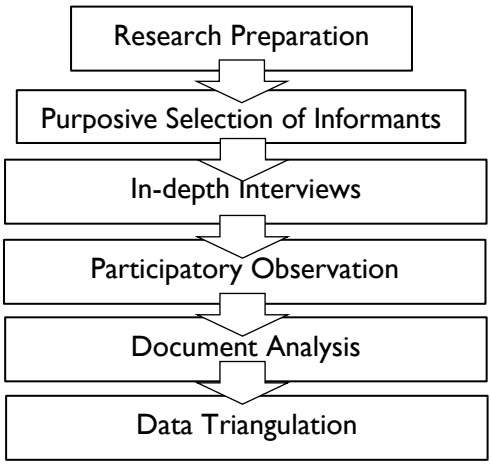

Figure 1. Data Collection Process in the Case Study

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The validity of the data was tested through source triangulation, method triangulation, member checks, and audit trails. Triangulation was conducted by comparing data from education personnel informants, parents, partners, and the community; while method triangulation was performed by testing the consistency of findings from interviews, observations, and documentation. This technique aligns with the guidelines of Lincoln & Guba (2020) which emphasize the importance of trustworthiness in qualitative research through process and interpretation validity.

The research was conducted in accordance with research ethics principles, such as providing information and obtaining consent from informants, maintaining the confidentiality of identities, and ensuring that all data are used solely for academic purposes. These ethical guidelines refer to the standards of educational research ethics emphasized by the (AERA, 2020), which underscore the importance of respecting the privacy and dignity of research participants.

Results and Discussion

The Concept of Disaster Education in Early Childhood Education

Research by Yani et al. (2024) confirms that disaster education needs to be an integral part of the education process, especially at the Early Childhood Education level, in order to foster a culture of risk awareness from an early age. In the context of Early Childhood Education, disaster education is defined as a planned process to instill basic knowledge, attitudes and skills about disasters through a playful, contextual approach that is appropriate for the child's stage of development. Mujiburrahman et al. (2020) state that disaster education for young children must be designed using exploratory and enjoyable methods so as not to cause fear, but rather to build confidence and preparedness in facing emergency situations. Thus, disaster education is not merely additional material, but an integral part of the Early Childhood Education Curriculum and the implementation of national standards for Early Childhood Education.

The main objective of disaster education in early childhood education is to strengthen the character of Pancasila students, namely to be independent, critical thinkers, creative, cooperative, faithful, noble, and globally diverse. Septikasari et al. (2022) show that the routine and contextual integration of disaster education can improve children's cognitive and social-emotional development, as well as their problem-solving skills. Therefore, disaster education needs to be implemented through various activities such as role-playing, simple discussions, evacuation simulations, and project-based learning.

The integration of disaster education in early childhood education can be done through four areas. First, integration into the Education Unit Level Curriculum (KTSP), covering the institution's vision and mission, learning objectives, and educational calendar. Second, integration into learning planning (Semester Program, RPPM, RPPH). Third, integration into methods, activities, media, and learning resources such as thematic games, disaster teaching aids, visual media, and the STEAM approach. Fourth, integration in child development assessment through observation, portfolios, and documentation. Rahma (2018) emphasizes that a Disaster Risk Reduction (DRR)-based curriculum through formal education, especially in early childhood education, will be effective if it is implemented comprehensively and involves all components of the institution.

In practice, disaster education in early childhood education can be implemented holistically or partially. The holistic model integrates all components of the curriculum and is particularly suitable for early childhood education units located in disaster-prone areas. Conversely, the partial model allows Early Childhood Education units to implement disaster education gradually according to the readiness of resources and the commitment of the institution. Lilianti et al. (2023) emphasize that flexibility in the implementation model is very important so that disaster education can be applied adaptively by various types of Early Childhood Education.

Based on in-depth interviews, participatory observations, and document analysis conducted in early childhood education units in Pangkalpinang City and Bangka Regency, the findings indicate that disaster education has been implemented in different forms depending on institutional readiness, educator capacity, and local disaster risk contexts. The results show that disaster education practices identified in the field are not uniform,

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but can be categorized into two empirically grounded implementation models: comprehensive (holistic) implementation and partial implementation.

Comprehensive (Holistic) Implementation; field data reveal that several early childhood education units located in disaster-prone areas have integrated disaster education comprehensively into institutional and learning practices. Interviews with education personnel and document analysis of institutional curricula indicate that disaster education is embedded in the vision and mission statements, annual programs, semester plans, lesson plans, and daily learning activities. Observations further show that disaster themes are consistently incorporated into learning centers, storytelling, simulation activities, and routine safety drills. Educators in these institutions reported strong institutional commitment and support from partner institutions such as the Regional Disaster Management Agency, which provided technical guidance and learning materials. This holistic model reflects a high level of readiness and is typically adopted by institutions positioning themselves as disaster-safe or model schools.

Partial Implementation; in contrast, other early childhood education units were found to implement disaster education partially. Interview data indicate that disaster-related content is incorporated selectively into certain learning activities, such as thematic lessons, learning media, or extracurricular simulations, without being formally integrated into institutional policy documents. Observations show that disaster education activities are conducted occasionally, often in response to external programs or specific events. Educators in these institutions expressed constraints related to limited training, time allocation, and learning resources, leading them to adopt a gradual implementation strategy. This partial model reflects an adaptive approach for institutions at the early stage of integrating disaster education.

These findings demonstrate that disaster education in early childhood education is not merely a normative or conceptual ideal but is empirically practiced in diverse forms shaped by local contexts, institutional capacity, and stakeholder support. The identification of comprehensive and partial implementation models provides a grounded understanding of how disaster education is operationalized in early childhood education settings and serves as a basis for further discussion on strengthening sustainable and scalable disaster education practices.

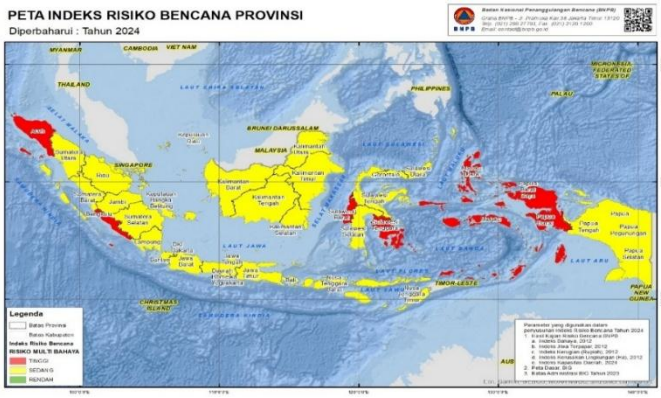

Figure 2. Indonesia Disaster Risk Index Map and Research Context (BNPB, 2024)

To contextualize the empirical findings, Figure 2 presents the Indonesia Disaster Risk Index and the study's research context. The positioning of Pangkalpinang City and Bangka Regency within moderate-to-high risk areas reinforces the relevance of examining variations in institutional readiness, stakeholder engagement, and implementation strategies across the two sites. This context supports the comparative interpretation presented in Table 2.

Table 2. Disaster Education Implementation in Early Childhood Education by Research Site

Aspect	***Pangkalpinang City***	***Bangka Regency***
Disaster Risk Context	Urban coastal area, flood and fire prone	Semi-urban and rural areas, flood and land-fire prone

DOI: https://doi.org/10.64850/jecep.v1i2.142

Curriculum Integration	Disaster education integrated into vision, mission, curriculum documents, and lesson plans	Disaster education integrated into selected lesson plans and thematic activities
Learning Activities	Routine disaster simulations, storytelling, disaster-themed learning centers, and safety drills	Occasional thematic lessons, storytelling, and limited simulations
Educator Readiness	High; educators have received disaster education training and technical guidance	Moderate; limited training and reliance on self-initiated learning
Institutional Commitment	Strong and formalized through institutional policies and programs	Gradual and informal, dependent on leadership initiative
Partner Involvement	Active and sustained collaboration with BPBD, education offices, and professional organizations	Event-based collaboration, mainly during disaster awareness campaigns
Implementation Model	Comprehensive (Holistic) Implementation	Partial Implementation

Multi-Stakeholders Roles in the Implementation of Disaster Education in Early Childhood Education

The implementation of disaster education in Early Childhood Education requires the involvement of multiple stakeholders to ensure that learning processes are effective, high-quality, and oriented toward the protection and safety of children. Field data from interviews, observations, and document analysis indicate that disaster education in ECE units is not implemented by educators alone but is shaped through the interaction of educational personnel, parents or families, institutional partners, and the surrounding community. The involvement of these stakeholders reflects a shared sense of responsibility and ownership in strengthening disaster preparedness from an early age.

Empirical findings show that each stakeholder performs distinct yet interconnected roles that collectively form a disaster education ecosystem. Teachers play a central role as planners and implementers of disaster-related learning activities, including the preparation of disaster learning implementation plans, the integration of disaster themes into daily learning, and the facilitation of simulations and storytelling activities. Principals or heads of in Early Childhood Education function as institutional leaders who coordinate stakeholder involvement and establish collaboration with external partners. Supervisors or inspectors contribute through monitoring, evaluation, and professional guidance to ensure the quality and sustainability of program implementation. Parents reinforce disaster education at home, participate in school-based activities, and support learning continuity, while partners and community actors provide technical expertise, training, learning media, and contextual support based on local disaster risks.

Table 3. Stakeholder Roles in the Implementation of Disaster Education in Early Childhood Education

Stakeholder	***Empirical Roles Identified***	***Description of Roles***
Teachers	Planning and implementation	Designing disaster learning plans, integrating disaster themes, conducting simulations, and assessing children's preparedness
ECE Principals	Coordination and leadership	Managing collaboration, facilitating stakeholder engagement, and ensuring program continuity
Supervisors	Monitoring and evaluation	Providing guidance, supervision, and quality assurance
Parents/Families	Learning reinforcement	Supporting learning at home and participating in school activities
Partners	Technical and material support	Providing training, expertise, media, and logistical assistance
Community	Contextual support	Sharing local knowledge, supporting simulations, and strengthening social acceptance

Source: Processed by the researcher, 2025

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Figure 3 illustrates the distribution of stakeholder roles in disaster education implementation in in Early Childhood Education. The figure is derived from processed field data collected during the research and depicts teachers as the core implementers supported by principals as coordinators, with parents, partners, and community actors contributing reinforcing and enabling roles. This visualization clarifies that stakeholder involvement is not hierarchical but complementary, with each actor strengthening different dimensions of disaster education practice.

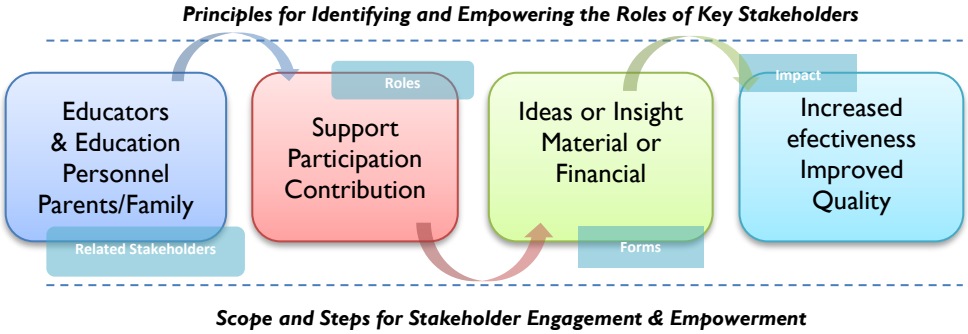

Figure 3. Illustrates the Distribution of Stakeholder Roles in Disaster Education Implementation in in Early Childhood Education

This The empirical patterns identified in this study align with Suryani et al. (2019), who emphasize that multi-stakeholder collaboration constitutes the core of successful Disaster Risk Reduction (DRR) programs because disasters are inherently cross-sectoral and cross-role issues. The findings also support the whole community approach in contemporary disaster risk management, where preparedness is understood as a collective effort rather than an institutional responsibility alone.

Conceptually, stakeholder roles in disaster education can be understood as the capacity and readiness of each actor to contribute ideas, labor, material resources, or financial support. The field findings demonstrate that these contributions are not symbolic but directly influence the effectiveness and quality of disaster education implementation. Consistent with Mulia & Kurniati (2023), parental and community involvement was found to strengthen children's character development, basic literacy, and thinking skills in alignment with the national curriculum and the Pancasila Student Profile.

Moreover, stakeholder engagement was observed across all stages of disaster education implementation, from identifying learning needs and planning activities to implementing learning, assessing outcomes, and continuously strengthening programs. This flexible and inclusive engagement enables Early Childhood Education to optimize both internal and external resources. To ensure effectiveness, stakeholder collaboration in the field adhered to key principles, particularly prioritizing the best interests of the child, strengthening program quality, empowering local potential, ensuring fair role distribution, and fostering effective coordination and mutual cooperation.

Overall, the integrated involvement of educational personnel, parents, partners and community actors forms a robust disaster education ecosystem in Early Childhood Education. The empirical evidence demonstrates that such collaboration not only enhances children's preparedness from an early age but also provides a sustainable foundation for cultivating a long-term culture of disaster awareness and resilience.

Roles of Educational Personnel, Parents, Partners and Community in the Implementation of Disaster Education in Early Childhood Education

The implementation of disaster education in Early Childhood Education involves multiple stakeholders who play distinct yet interconnected roles in ensuring that disaster preparedness values are effectively introduced to children from an early age (Pohan et al., 2024). Disaster education is inherently interdisciplinary and cross-sectoral, requiring coordination between educational institutions, families, government agencies, and the wider community. This multi-actor involvement reflects the whole community approach in disaster risk management, which emphasizes shared responsibility in building resilience (Rahma, 2018).

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Role of Educational Personnel in Disaster Education in Early Childhood Education

Educational Personnel is a key actor who acts as the main designer, implementer, and evaluator in the integration of disaster education in early childhood education. Therefore, empowering Educational Personnel is a strategic step to ensure the creation of learning that is relevant, contextual, and appropriate to the child's developmental stage. Emphasis on teacher competence is very important because teachers are the ones who are closest to and interact most frequently with students in their daily activities (Hasbi et al., 2020).

Teachers as implementers of disaster-based learning; teachers function as the main implementers of disaster education in daily learning activities. They integrate disaster themes into learning plans, select age-appropriate methods and media, and design play-based activities that introduce basic concepts of risk, safety, and preparedness. As the educational actors who interact most frequently with children, teachers have a strategic role in ensuring that disaster education is delivered in a manner that is non-threatening, engaging, and meaningful (Hasbi et al., 2020).

Strengthening the role of Early Childhood Education heads; Early Childhood Education heads are the driving force that ensures the entire institutional system supports the implementation of disaster education. They play a role in building partnerships with BPBD, health centers, professional organizations, and other institutions, as well as facilitating disaster training for teachers and parents. In addition, Early Childhood Education heads are responsible for creating a safe and disaster-friendly learning environment. Visionary leadership has been proven to have a significant influence on the quality of Early Childhood Education services, including in the implementation of preparedness-based programs (Pandiangan, 2019).

Optimizing the role of inspectors/supervisors; Early Childhood Education inspectors or supervisors play an important role in ensuring the quality of disaster education implementation through intensive coaching, academic supervision, and periodic evaluations. They can provide assistance related to the disaster curriculum, help monitor programs, and identify the need to improve teacher competencies. This ongoing assistance contributes to strengthening the institutional capacity of Early Childhood Education to systematically implement Disaster Risk Reduction (DRR) Programs (Lestari, 2022).

Role of Parents in Disaster Education in Early Childhood Education

Parents play a complementary role in reinforcing disaster education beyond the school environment. As children's primary caregivers, parents contribute to the continuity of learning by supporting preparedness values and practices at home (Matsopoulos & Luthar, 2020). Parents are involved through participation in school programs, discussions related to disaster risks in the local context, and joint activities such as evacuation simulations and preparedness campaigns. Their involvement helps align messages received at school with daily practices in the family environment, which is essential for strengthening children's understanding and behavior related to disaster preparedness (Benveniste, 2023).

Parental involvement in program development; Parents can be involved in the development of disaster-based Education Unit Level Curriculum and in discussion forums on the development of lesson plans related to local risks. This involvement provides space for families to convey their views, experiences, and children's needs related to preparedness. Parental participation in educational program planning increases the relevance of learning and strengthens the learning environment at home.

Participation in appreciation and socialization activities; Parent role can be achieved through appreciation activities, such as exhibitions, art performances, or parent classes on disaster mitigation. In addition, parents can be involved in conducting evacuation drills with their children in the school environment. These kinds of activities not only increase parents' awareness of disaster risks, but also reinforce preparedness behaviors in everyday family life.

Role of Partners and Community in Disaster Education in Early Childhood Education

Partners and community are external resources that can strengthen the capacity of early childhood education institutions in implementing disaster education. Their involvement provides technical support, information, and facilities that institutions may not have independently. This collaborative approach is in line

DOI: https://doi.org/10.64850/jecep.v1i2.142

with the principles of disaster risk management, which emphasizes the role of multiple parties in building resilience (Mason et al., 2025).

Professional organizations and community leaders; Professional organizations such as IGTKI, HIMPAUDI, and APPAUDI can be empowered to provide training, workshops, and disaster education modules for teachers. Community leaders can act as inspirers and facilitators in educational activities for children and parents. The presence of local leaders makes disaster messages easier to accept and more relevant to the cultural context of the community.

Cooperation with government/regional agencies; Agencies such as BPBD, health centers, PMI, and fire departments have important technical capacities in disaster education. They can provide counseling, assist in the preparation of disaster SOPs, facilitate disaster simulations, and provide simple educational tools, such as evacuation routes and risk maps. The involvement of government agencies has been proven to increase institutional capacity in disaster risk management (Amrullah, 2023).

The role of the business and industrial world (DUDI); The business world can contribute through Corporate Social Responsibility (CSR) programs in the form of providing educational tools for disaster education, funding support for school activities, or conducting inspirational classes. The involvement of DUDI strengthens the sustainability of DRR programs because Early Childhood Education institutions have access to additional strategic resources.

Role of educational personnel, parents, partners and community is a key pillar in implementing disaster education in early childhood education. Educational personnel play a very important role because its role and impact are significant to the success of disaster education in early childhood education. Empowerment that can be optimized includes making teachers the spearhead, giving Early Childhood Education managers or heads more flexibility in their leadership, and providing inspectors or supervisors with more flexible access to guidance, more frequent monitoring, and more comprehensive monitoring and evaluation. Furthermore, parents can be involved in various ways, for example, by being used as resource persons when preparing the *KTSP* and *RPP*, and being empowered during the end-of-year performances related to the results and achievements of disaster education. Meanwhile, partners and community can be used as resource persons to improve the competence of administrators and educators, as resource persons for student activities in inspirational classes, as donors in supporting the development of disaster education, and so on.

Discussion

The primary contribution of this study lies in its identification of two empirically grounded disaster education implementation models, comprehensive and partial, within Early Childhood Education settings. Rather than treating disaster education as a uniform or prescriptive intervention, the findings demonstrate that implementation is shaped by institutional readiness, leadership capacity, educator competence, and local disaster risk characteristics. This reinforces Rahma (2018) argument that Disaster Risk Reduction (DRR) education must be context-sensitive and adaptable, particularly in early childhood settings where institutional resources and environmental risks vary significantly.

The comprehensive (holistic) implementation model reflects a mature institutional response to disaster risk, characterized by the integration of disaster education across curriculum documents, learning plans, daily classroom practices, and routine safety procedures. From a theoretical perspective, this model aligns with systems-oriented approaches to education, in which organizational coherence and leadership commitment play a central role in sustaining innovation (Lilianti et al., 2023). The presence of strong leadership and formalized institutional policies suggests that disaster education becomes embedded not merely as a learning topic, but as part of the institutional culture and identity.

Conversely, the partial implementation model highlights a gradual and adaptive pathway through which Early Childhood Education institutions begin to integrate disaster education despite constraints such as limited training, time, or external support. Importantly, this model should not be interpreted as a deficiency, but rather as a developmental stage of institutional adaptation. Talango et al. (2025) similarly emphasize that disaster education initiatives in early childhood contexts often evolve incrementally, reflecting pragmatic decision-making

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in response to capacity limitations. This finding contributes to the literature by reframing partial implementation as a legitimate and contextually rational strategy rather than a failure of policy enactment.

A key theoretical insight of this study is that disaster education in Early Childhood Education functions as an ecosystem-based practice, rather than a teacher-centered or curriculum-driven intervention alone. The differentiated roles of teachers, principals, parents, partners, and community actors reflect the interconnected systems described in Bronfenbrenner's ecological systems theory (Dharma, 2023). Teachers operate within the microsystem as daily implementers of learning, while principals and supervisors influence the mesosystem by coordinating institutional processes and partnerships that shape implementation quality.

The study further highlights parental involvement as a critical mediating factor in sustaining disaster education beyond formal schooling. Parents' engagement in preparedness activities, simulations, and learning reinforcement at home extends disaster education into the family environment, strengthening behavioral consistency and meaning-making for children. This finding supports Matsopoulos & Luthar (2020) assertion that parents are often underrecognized contributors to resilience-building processes, as well as Mulia & Kurniati (2023) evidence that parental participation enhances both cognitive and socio-emotional development in early childhood. Parental involvement observed in this study aligns with (Benveniste, 2023) argument that parents function as children's first educators, particularly in reinforcing values and behavioral consistency beyond formal schooling environments.

The involvement of institutional partners and community actors emerges as another defining feature of effective disaster education ecosystems. Access to technical expertise, localized risk knowledge, and material resources provided by agencies such as BPBD and community organizations significantly enhances institutional capacity. From a disaster management perspective, this finding corroborates Amrullah (2023) conclusion that cross-sector collaboration is a prerequisite for inclusive and effective disaster risk management, particularly in regions with high vulnerability and uneven institutional capacity. This finding is consistent with (Mason et al., 2025) who emphasize that high-quality collaborative partnerships in early childhood settings strengthen program sustainability and institutional capacity through shared responsibility and resource integration.

At a broader conceptual level, the findings of this study align with the whole community approach to disaster risk reduction, which positions preparedness as a collective responsibility rather than an institutional obligation alone (Suryani et al., 2019). By embedding disaster education within a multi-stakeholder framework, Early Childhood Education institutions contribute to the formation of a shared preparedness culture that transcends classroom boundaries. This perspective shifts disaster education from a pedagogical activity to a societal resilience-building mechanism that begins in early childhood.

Taken together, the discussion demonstrates that disaster education in Early Childhood Education is most effective when conceptualized as a dynamic, ecosystem-based process that balances structured integration with contextual flexibility. The empirical distinction between comprehensive and partial implementation models provides a nuanced understanding of how disaster education is operationalized in practice, while the theoretical framing offers insight into why such variations occur. These findings extend existing disaster education and early childhood education literature by offering an empirically grounded, multi-stakeholder model that informs policy development, institutional practice, and future research aimed at strengthening sustainable and scalable disaster preparedness from the earliest stages of education.

Conclusion

This research confirms that disaster education in Early Childhood Education constitutes a fundamental and strategic approach to strengthening disaster awareness, preparedness, and resilience in Indonesia, a country characterized by high disaster vulnerability. The findings demonstrate that disaster education can be effectively implemented through systematic yet flexible integration into curricula, learning plans, teaching methods, media, and assessment, using either comprehensive (holistic) or partial implementation models tailored to institutional readiness and local risk contexts. Empirical evidence from multi-site case studies in Pangkalpinang City and Bangka Regency indicates that disaster education is not a uniform practice but an adaptive process shaped by educator capacity, institutional commitment, and stakeholder support. Holistic implementation is typically

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adopted by institutions with strong leadership and partner engagement, while partial implementation reflects a gradual and context-sensitive strategy for institutions with limited resources.

Furthermore, this research highlights that the effectiveness and sustainability of disaster education in Early Childhood Education are highly dependent on multi-stakeholder collaboration. Education personnel serve as the primary drivers of learning, school leaders ensure institutional coordination and continuity, parents reinforce preparedness values at home, and partners and community actors enhance program capacity through technical expertise, resources, and contextual knowledge. The synergy among these actors forms a resilient disaster education ecosystem that strengthens children's disaster ecoliteracy, character development, and basic preparedness skills from an early age. Overall, this study contributes an integrative, ecosystem-based perspective on disaster education in Early Childhood Education, offering empirical insights that can inform policy development, institutional practice, and future research aimed at building sustainable disaster preparedness and national resilience starting from the earliest stages of education.

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