

# Role Play-Based Emergency Drill: A Contextual Learning Model to Improve Early Childhood Preparedness in Facing Natural Disasters

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**Abstract.** This study aims to examine the effectiveness of the role-play-based emergency drill model as a contextual learning approach in improving early childhood disaster preparedness. The study was conducted at RA Tamrinusyibyan, an early childhood education unit located in an earthquake-prone area. The research method used was descriptive qualitative, with data collection techniques through observation, interviews, and documentation. The results of the study indicated that disaster simulation activities carried out through role-playing were able to improve children's understanding of danger signs and evacuation procedures and form responsive and empathetic behavior in emergency situations. Children showed high enthusiasm, were able to follow instructions well, and began to apply the concept of preparedness in everyday life. Teachers play an important role as facilitators who package activities in a fun and educational atmosphere. These findings indicate that this model supports thematic and holistic learning and forms strong characters in children from an early age. The role-play-based emergency drill model is recommended for implementation in early childhood education units, especially in disaster-prone areas, as an effort to provide effective and child-friendly risk mitigation education.

**Keywords:** emergency drill; role play; contextual learning; disaster preparedness; early childhood

## INTRODUCTION

Indonesia is highly vulnerable to natural disasters, ranked as the second most disaster-prone country in the World Risk Report 2023. This vulnerability is due to Indonesia's location at the intersection of three major tectonic plates (Eurasia, Indo-Australia, and the Pacific) and its position along the Pacific Ring of Fire, which is volcanically active (Hermon, 2014). In 2024, natural disasters in Indonesia caused significant damage, including 489 deaths, 58 missing, over 11,500 injuries, and more than 6 million displaced people. Additionally, 60,000 houses were damaged, and 954 public facilities, including schools and healthcare services, were affected. Flooding is a particularly widespread disaster in the country, which is categorized as both an actual and potential disaster. Actual disasters are sudden and localized events, typically resulting in fewer fatalities than global disasters, but still causing severe impact.

Children, particularly those aged 0-6, are the most vulnerable in such emergencies. At this stage of development, they lack the cognitive and physical abilities to recognize and respond appropriately to danger. Trauma from emergencies can lead to long-term mental health issues, such as depression and anxiety, and can

hinder social and academic development (DeVoe et al., 2011). Despite this, children are often treated as passive victims in disaster management, even though they can be taught to actively participate in preparedness and self-rescue efforts. It is therefore critical to integrate disaster preparedness into early childhood education.

One promising approach to disaster education is contextual learning, which involves creating situations that allow children to learn through direct experience. This can be achieved through simulations or emergency drills that provide realistic experiences without causing trauma. Regular emergency drills, such as evacuation simulations, help children understand their roles in emergencies (Noumeur et al., 2025). To support this, the role-play-based emergency drill model offers a suitable method for young children. In this approach, children act out disaster scenarios like earthquakes or floods in a safe, fun, and structured environment. This helps children learn safety procedures, develop emotional responses, and practice social skills, listening, and reflecting on their experiences. By actively participating, children are more likely to retain and apply their preparedness skills when real disasters occur.

However, disaster preparedness education in Early Childhood Education (PAUD) institutions is still limited, largely due to teachers' lack of

training and understanding of disaster-related topics. Many teachers assume that such topics are too difficult for young children (Desilia et al., 2023), leading to the exclusion of disaster education from the curriculum. Research highlights the importance of starting disaster education early to build awareness and knowledge (Desilia et al., 2023). The introduction of the Independent Curriculum in Indonesia provides an opportunity to integrate disaster education in a more engaging way. This curriculum offers flexibility in teaching methods, enabling the use of real-life experience-based learning to increase teacher participation in disaster preparedness education (Khusni et al., 2022).

The role-play-based emergency drill model addresses the need for disaster preparedness education tailored to young children. This model not only teaches children about disaster types and self-rescue but also helps them practice decision-making, cooperation, and emotional regulation in simulated emergency situations. Furthermore, this approach benefits teachers and parents by fostering a culture of disaster awareness and community involvement. Teachers gain effective teaching methods, while parents can participate in emergency drills as part of community-based learning.

Theoretically, this model is rooted in constructivist learning theory, which emphasizes knowledge construction through interaction with the environment (González et al., 2019). It also aligns with the "learning through play" approach, which supports children's cognitive, emotional, and social development. Role-playing connects the real world with the imaginary, helping children explore and discover, with the guidance of skilled educators, making the learning process more effective (Wahyuni et al., 2024).

This study aims to explore how the role-play-based emergency drill model can enhance early childhood disaster preparedness. It will examine the conceptual aspects, implementation, and impact of this model on children's cognitive, emotional, and physical development. The results are expected to contribute to more effective disaster education practices in PAUD institutions and strengthen Indonesia's disaster-adaptive education system.

## METHODS

This study uses a descriptive qualitative approach with a case study design to explore the implementation of a role-play-based emergency

drill model in improving early childhood disaster preparedness. The approach allows for an in-depth understanding of the subjective experiences of participants, including children, teachers, and school staff, in disaster simulation activities.

The subjects of this study were children in group B at RA Tamrinusyibyan Banjarnegara, along with their class teachers and principals. The location was purposively selected because it is situated in a disaster-prone area, particularly landslides, and employs a contextual approach to teaching. This setting provides valuable insights into how the environment affects children's disaster preparedness.

Data sources include primary data from observations and interviews at RA Tamrinusyibyan Banjarnegara, and secondary data from curriculum documents, learning guidelines, and information from the local Regional Disaster Management Agency (BPBD). Data collection techniques included participant observation, in-depth interviews with teachers and principals, and documentation review (e.g., RPPH and teacher diaries).

Data analysis was conducted using interactive qualitative analysis, which involved data reduction, narrative presentation, thematic tables, and triangulation for validation. Triangulation, including source and technique triangulation, ensured data reliability and increased confidence in the findings (Nugroho et al., 2023). Member checks with teachers and principals were also employed to confirm the accuracy of data interpretation.

The study aims to provide a comprehensive understanding of the effectiveness of the role-play-based emergency drill model in improving disaster preparedness among young children at RA Tamrinusyibyan Banjarnegara (Sabardila et al., 2021).

## RESULTS AND DISCUSSION

The implementation of the role-play-based emergency drill learning model at RA Tamrinusyibyan Banjarnegara shows interesting dynamics and has great potential to be used as good practice in the context of disaster preparedness education for early childhood. Based on the results of observations conducted during several visits to the institution, it was found that disaster simulation activities have been well integrated into thematic learning, especially with the themes "My Environment" and "Natural Events." This activity is not carried out as a

separate one but as part of a learning process that is integrated with the play approach that is characteristic of early childhood education.

The activity begins with an introduction to the concept of disaster through a storytelling method using hand puppets and pictures. The teacher tells a simple story about an earthquake that hit a village, complete with characters that children know. This story not only builds an initial understanding of what a disaster is but also begins to introduce responses that can be taken when one occurs. Before the simulation, kids are invited to imagine and engage with the story. After the storytelling activity, the teacher begins to direct the children to carry out an evacuation simulation. The scenario used is an earthquake, considering that the Banjarnegara area is classified as earthquake-prone. Children were given a sound signal (siren) as a trigger for reaction, then directed to do the “duck, cover, and hold” movement under the table. Next, they were directed to leave the room in an orderly manner towards a gathering point in a designated open field.

In the simulation, children not only played the role of evacuation participants but were also given certain roles such as “rescue officers,” “leaders of the line,” or “friends who need help.” These roles were given in turns in each simulation session so that all children had different role-playing experiences. This strategy has been proven to be able to foster various important skills in children, such as empathy, communication, responsibility, and cooperation. Observations showed that when a child played the role of a victim and pretended not to be able to walk, other friends quickly “helped” and helped him out of the classroom. In interactions like this, children learn to understand crisis situations in a real context that is relevant to their social lives.

The results of the observation were also found that teachers have a central role in directing and managing activities. They are not only facilitators but also actors who build a fun but serious learning atmosphere. Research indicates that teachers not only act as facilitators in the learning process but also as actors who create an attractive and conducive learning environment. Teachers can help children understand abstract concepts more concretely and clearly by using clear and expressive language, along with visual aids like evacuation route posters and miniature buildings. This is very much in line with Piaget's cognitive development theory, which emphasizes that early childhood is in the pre-operational stage, where

they understand the world through images, concrete objects, and direct experiences (Fajriyah, 2021).

The use of visual aids in teaching not only facilitates understanding but also makes the learning process more enjoyable. Associative image media, for example, shows significant results in number recognition in children aged 4-5 years (Rambe & Konadi, 2022). Thus, this method strengthens the argument that a role-play-based approach which supports exploration and creativity is very suitable for the characteristics and learning needs of children at an early age (Wulandari et al., 2022).

The results of interviews with teachers and the principal of RA Tamrinusyibyan Banjarnegara showed that emergency drill activities based on role-playing have been carried out routinely, with a minimum frequency of once a semester. The teachers stated that the purpose of this activity is not only to introduce children to the concept of disaster but also to build children's preparedness from an early age so that they can deal with real situations without panicking. Previous studies have shown that disaster-related education and training improve individual preparedness, along with adequate mastery of information and experience (Dewi et al., 2024).

The principal also emphasized that these activities can be bridged with child learning and protection efforts as a single program unit. In this context, the training provided by the Banjarnegara BPBD and the socialization of the disaster-safe education unit policy from the Ministry of Education and Culture are important factors in the systematization of activities. This is in line with the findings that state that disaster education and training can improve disaster management capacity, as evidenced by various studies on individual experiences and their preparedness for disasters (Zhai & Lee, 2023).

Role-playing activities in emergency drills not only increase knowledge about disaster hazards but also encourage positive attitudes and awareness of the importance of preparedness (Jannah et al., 2021). Active involvement through simulations and game-based drills provides more effective hands-on experience in building competency in dealing with disaster situations (Kang et al., 2023). A study shows that simulations improve team collaboration and effectiveness in disaster management, which can also be used as a model for implementation in educational settings such as at RA Tamrinusyibyan.

In the interview, it was also revealed that after several emergency drills, children's behavior showed significant changes. Children became more sensitive to the environment, began to recognize the sound of sirens or danger signs, and some even began to imitate evacuation activities in their free play. The teacher also said that children began to ask their parents about evacuation routes at home, what to bring in case of an earthquake, and how to save themselves. This shows the transfer of learning from school to the family environment, which is an important indicator of the success of the contextual learning approach.

Education with a contextual approach, such as that implemented through emergency drills, has been shown to be effective in increasing safety awareness. The low level of safety awareness policies in educational institutions contributes to the lack of knowledge and appropriate attitudes among students. By holding regular drills, educational institutions can increase children's understanding and awareness of the actions to be taken in emergency situations. This approach is in line with the findings of (Susanto et al., 2024), which showed that training conducted in schools in disaster-prone areas was very helpful in strengthening children's habits and preparedness for disasters.

Furthermore, findings in the field show that role-playing models in the context of disaster simulations not only have an impact on children's cognitive aspects but are also profound in shaping affective and socio-emotional aspects. Children learn to stay calm when faced with pressure, learn to trust the teacher's instructions, and learn to be responsible for their friends. On several occasions, teachers reported that children were actually more prepared and did not panic compared to adults when a small earthquake occurred around the school area. This result strengthens the study of the theory of child resilience developed by Susanto et al. (2024) that with the right environmental support, children can build resilience in dealing with stress and pressure from an early age. Research by (Goldstein & Lerner, 2018) shows that pretend play activities can improve emotional control in children, which contributes to the development of resilience.

Teachers report that children are more prepared and less panicked than adults when faced with emergency situations such as small earthquakes. This reflects the importance of the learning experience provided by role play. Children who engage in disaster simulation activities tend to

have better stress coping skills, along with healthy environmental support. Research by (Zhu et al., 2023) shows that children's resilience plays a crucial role in emotional regulation and mental health, strengthening the statement that role-play and simulation experiences can improve emotional regulation and problem-solving when dealing with stressful situations (Zhu et al., 2023).

Research by Wirahandayani et al., (2023) emphasizes that the use of role-playing methods can significantly improve the socio-emotional development of preschool children. This activity provides children with valuable experiences that strengthen their social interactions and communication skills (Wirahandayani et al., 2023). This study marks the importance of using role-playing in education as a tool to develop resilience and positive socio-emotional aspects in children. Thus, the application of role-playing in learning supports the development of children's emotional resilience. This conclusion is in line with the concept of resilience developed by (Masten, 2018), which shows that with adequate environmental support, children can learn to deal with stress from an early age. The integration of disaster simulations into the educational curriculum offers long-term benefits for children's emotional development.

Further analysis of the data obtained shows that this approach is also in line with the principles of early childhood education, which are holistic, integrative, and based on real experiences. According to NAEYC (National Association for the Education of Young Children), effective early childhood learning is active, social, and based on concrete experiences that are meaningful to children (Brown et al., 2017). Role-playing as a medium for disaster simulation fulfills these three aspects: children are actively involved physically and emotionally, activities are carried out in meaningful social interactions, and the context is directly related to children's real lives that they can directly relate to their experiences (Karisa et al., 2023).

Disaster simulations using role-playing can increase children's involvement in understanding risks and appropriate actions in emergency situations. Research shows that children's involvement in disaster simulations can improve their understanding of disaster preparedness better than children who are not involved (Karisa et al., 2023). In addition, the strategies used in this experiential learning are also in line with the objectives of the Merdeka Curriculum, which seeks to form strong characters and critical

reasoning skills among its students (Freeman et al., 2015).

Furthermore, this method aligns with the educational principles of the Pancasila Student Profile, which prioritizes the development of cooperation among children, a crucial aspect of modern-day learning in Indonesia. In this context, it is always important for educators to integrate a curriculum that focuses not only on academic aspects but also on children's emotional and social development (French-Lee & Dooley, 2015). The application of an experiential learning model not only increases their knowledge but also allows children to develop empathy and social skills that are important in everyday interactions (Balikci & Bayrakdar, 2025). Therefore, a holistic and integrative educational approach, such as role-playing in disaster simulations, is essential to support the development of early childhood learning. This methodology is in line with the educational principles set by NAEYC and the character goals in the Merdeka Curriculum, which support the development of critical thinking and cooperation skills among children.

This study also emphasizes that the role of teachers is crucial in the success of this activity. Teachers who understand the importance of disaster preparedness education will be better able to integrate the material into thematic learning naturally. They will also be more creative in creating role-playing scenarios that do not cause trauma or fear but instead become fun, safe, and intriguing learning experiences so that they can create positive learning experiences. (Virgiani et al., 2022) emphasized that teachers who are able to manage simulations with a play approach can build positive disaster understanding among children.

However, the implementation of this activity is certainly not without challenges. The teacher said that not all children were initially able to follow instructions well. Some children have difficulty understanding the meaning of symbols such as evacuation signs or danger alarms. There are also children who are too engrossed in the game and consider the simulation a mere drama. Therefore, teachers need to carry out repeated practice, simplify the language, and involve children in post-simulation reflection to ensure that the learning messages are truly absorbed. In addition, limited teaching aids and human resources are also obstacles in implementing more complex simulations such as floods or fires. Each person expressed that support from the local government and BPBD is essential, both in the form of training

and the provision of aid and technical assistance. Research by (Tyas et al., 2020) shows that good program management by schools, including support from external agencies, plays a major role in the successful implementation of disaster preparedness programs in schools.

With the above considerations, it can be concluded that teacher training, active student involvement, and government support are key factors that will increase the effectiveness of disaster preparedness education programs. Given the importance of disaster knowledge among children, concrete steps need to be taken to strengthen their preparedness in the future (Hidayat, 2023).

In general, the study's results suggest that the role-playing-based emergency drill model is an effective contextual learning approach for enhancing early childhood preparedness for natural disasters. Children not only learn to recognize disasters and how to save themselves but also build attitudes of empathy, responsibility, and social concern. This activity strengthens the synergy between learning, protection, and character development in children within an integrative framework. In addition, this model can be replicated in various other PAUD units with adaptations according to the local context, thus becoming an important strategy in building a disaster-aware culture from an early age in Indonesia.

## CONCLUSION

The role-play-based emergency drill model is an effective approach to improving early childhood disaster preparedness. This model helps children understand disaster signals and evacuation procedures while developing empathy, responsibility, and social cooperation. By integrating disaster simulations into thematic learning, children actively engage in safety practices, building essential skills for real-life emergencies. Teachers play a pivotal role in facilitating these activities, creating a positive and engaging learning environment. Through regular drills, children not only grasp the concept of disaster preparedness but also apply it in their everyday interactions. This approach aligns with the holistic development principles of early childhood education, strengthening cognitive, emotional, and social skills. It fosters a disaster-aware culture from an early age, making it a valuable strategy for early childhood education, especially in disaster-prone areas. The model is

recommended for broader implementation in early childhood institutions to promote preparedness and resilience in young learners.

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