Implementation of Interactive E-Books in Fostering Personal Safety in Early Childhood Education

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Sections Info	ABSTRACT
	Objective: The purpose of this study is to determine the implementation and response to the use of interactive E-Books in early childhood self-safety learning. Personal safety education plays a crucial role in shaping children's attitudes and behaviors, enabling them to maintain their own safety and that of others. However, most PAUD institutions still do not have a structured concept of personal safety learning, so effective and interesting learning media for children are needed. *Method:* This study used a qualitative method with a case study approach. Data were collected through observations, interviews, and documentation involving early childhood educators and experts in learning activities using Interactive E-Books in Fostering Personal Safety in Early Childhood Education. *Results:* The results of the study show that this E-Book has a positive effect on increasing children's understanding of the concept of personal safety. Children show high enthusiasm, actively participate, and can understand safe actions in risky situations such as fires, earthquakes, or meeting strangers. Teachers consider that this media is interesting, communicative, and in accordance with the characteristics of children because it presents concrete, interactive, and fun learning. *Novelty:* This research strengthens the application of Bandura's Social Learning theory and Mayer's Multimedia Learning theory in the context of digital-based early childhood education. The integration of visual, audio, and character elements as behavioral models not only results in theoretical contributions regarding the effectiveness of interactive media but also makes practical contributions to the development of learning that is in accordance with the child's developmental needs. This innovation is in line with the Sustainable Development Goals (SDGs) points 3, 4, and 16, especially in supporting children's health and safety, providing quality education, and strengthening a safe and character-oriented learning environment.

INTRODUCTION

Early childhood is a period of high vulnerability to various potential hazards, both from the surrounding environment and from emergencies such as natural disasters. The lack of understanding of personal safety at this age is often a factor that causes children to be unable to protect themselves in dangerous situations (Basri et al., 2024; Justicia et al., 2024). Early childhood personal safety education plays an important role in instilling children's attitudes, knowledge, and skills to recognize and avoid risky situations from an early age (Von Beesten & Bresges, 2024; Yu et al., 2024). Data from CNN Indonesia in 2022 showed an increase in child abduction cases from 15 in 2021 to 35 in 2022 (Kementrian Pemberdayaan Perempuan dan Perlindungan Anak, 2022). Meanwhile, from the beginning of 2023 to February, 14 cases of kidnapping were recorded. Furthermore, according to the Indonesian News Agency, from 2025 to early 2025, 422 news stories were found regarding child abduction and sexual abuse of children (Antara Kantor Berita Indonesia, 2025). In addition to kidnapping, children are often victims of natural disasters. Furthermore, according to data from the National Disaster Management Agency, there were 3, 318 natural disaster events in 2022, resulting in 563

deaths, including children. Some of the most frequent natural disasters that threaten safety include floods, earthquakes, fires, and landslides (Jayanti & Dewi, 2022).

Personal safety education in early childhood is a preventive effort that aims to shape children's attitudes, knowledge, and skills in dealing with potential dangers in their environment (Fatimah Warosari, 2024; Rusady et al., 2025). Personal safety education in early childhood is a preventive effort that aims to shape children's attitudes, knowledge, and skills in dealing with potential dangers in their environment (Alwasedi et al., 2025; Dharmayanti, 2023; Yusuf & Yuliantina, 2025). Limited learning resources, less attractive learning approaches, and a lack of implementation guidelines are the main challenges in implementing personal safety education. In the digital era, the use of technology-based learning media an alternative solution that is considered to improve the quality of learning (Widayati, 2018).

This further strengthens the need for implementing systematic personal safety education in PAUD services. One approach that is considered effective is through the use of digital-based learning media, such as interactive e-books that can present personal safety materials more attractively and are easily understood by early childhood. E-book media has the advantage of presenting materials in an integrated visual, auditory, and kinesthetic manner, as well as providing a fun and interactive space for early childhood learning (Aditya et al., 2024; Justicia et al., 2023). In addition, these media allow for the active involvement of teachers and parents in the learning process, which contributes to creating a safe learning environment and supports child protection (Ayu Wulandari et al., 2024; Fahmi, 2021; Verina, 2024). Personal safety principles, such as learning hazards, hazard maps, how to avoid hazards, and not creating hazards, can be conveyed in a fun way through an e-book (Widayati, 2018). E-books are digital teaching material innovations that are designed in an interactive and interesting way to support personal safety programs. This media is packed with materials that are planned and designed to achieve learning objectives effectively and efficiently. The success of the personal safety program is highly dependent on the effective use of media in accordance with early childhood development standards (Chiner et al., 2025; Nafiqoh & Nurcahyani, 2025; Nurmalasari et al., 2025). The creation of E-Books is done through various platforms such as Canva, Animaker, Capcut, BookCreator, or Flipsnack which allow for the preparation of materials dynamically and interactively (Ramadhana et al., 2025). E-books provide high interactivity through visual, audio, and kinesthetic elements that increase child engagement. A systematic presentation of the material helps in understanding the concept of safety and preventive measures. Its digital nature allows for flexible access and continuous updates, while its fun approach promotes retention and the application of personal safety principles (Cope & Phillips, 2025).

Previous research conducted by Dwi Wahyuningsih and Dea Komalasari (2025) shows that there is learning that emphasizes the effectiveness of technology-based media in shaping children's positive behavior, especially in the context of thematic learning. Furthermore, (Mauludiyah et al., 2023) stated that the use of interactive digital media in early childhood learning can increase children's understanding of preventive materials, such as disaster mitigation knowledge, through digital storybooks. Furthermore, the research conducted by (Justicia et al., 2023) said that the existence of Smart Book media can be used as a medium for introducing early childhood self-safety can be used as a medium for learning, strengthening, and understanding of teachers related to the importance of children's self-safety in PAUD services. However, most previous research

has focused on the cognitive aspects of children without emphasizing the integration of digital media and overall applicable personal safety values. In contrast to previous research, this study presents an innovation in the form of an interactive e-book that not only conveys personal safety information but also builds synergy between children, teachers, and parents in instilling a safety culture from an early age, as well as a variety of interaction games that can increase children's interest and enthusiasm in learning and getting to know their safety.

Thus, this research contributes to the development of contextual learning media and strengthens the synergy between teachers, children, and parents in creating a culture of self-safety from an early age. In contrast to previous research that tended to focus on improving children's cognitive aspects without emphasizing the integration of personal safety values, this study presents an empirical contribution through the development and implementation of an interactive e-book that combines educational, digital, and personal safety aspects holistically. This approach reinforces the relevance of using digital media as learning advice that is not only informative but also transformative in shaping safety-conscious behavior in early childhood. Empirically, this study presents a real contribution through the development and implementation of e-books as interactive educational media that are proven to increase awareness and self-safety behavior in early childhood. This approach emphasizes the effectiveness of using digital media as a means of learning that is applicable, fun, and relevant to children's needs and interests. Theoretically, this study enriches the study of multimedia-based learning and social learning theory by combining the cognitive, affective, and character values of personal safety in the context of 21st-century education.

This research makes an empirical contribution to strengthening the use of e-books as an applicable personal safety education strategy in early childhood education services. This is in line with the principles of sustainable development outlined in the Sustainable Development Goals (SDGs). This research supports the achievement of Goal 3 (Good Health and Well-being) through promotive and preventive efforts for child safety; Goal 4 (Quality Education) in providing inclusive and quality education from an early age; and Goal 16 (Peace, Justice, and Strong Institutions) in the context of protecting children's rights and building a safe learning environment. participatory and fair.

THEORETICAL FRAMEWORK
The theoretical foundation of this research is condensed to highlight only the principles that directly frame the design and use of interactive e-books in early childhood self-safety education. Although the literature provides a variety of perspectives on development and learning, this study focuses on three main theoretical frameworks that are most relevant to the way children process, understand, and apply safety information in digital media: Dual Coding Theory, Multimedia Learning Theory, and social learning principles. These three theories provide a strong conceptual basis for explaining how e-books support children's understanding through text-visual integration, multimedia, and behavioral modeling.
1. The principle of social learning (Bandura) is used to explain how children imitate the behavior of the "GAGA" character as a positive model. By observing the actions shown in the story, children learn to recognize safe behaviors and repeat them in their everyday lives. The application of this theory is not explained in detail because journal readers are assumed to understand the basic concepts of observational learning

(Tullah, 2020). In the context of this study, the character "GAGA" acts as a positive behavior model that shows safe and empathetic actions. Children pay attention to, retain, and reproduce these behaviors, which are then reinforced by the intrinsic motivation of a pleasant learning experience and positive encouragement from the teacher.

2. Dual Coding Theory (Paivio) is used because E-Books combine verbal information (narrative and text) with visual representations. This principle explains that the presentation of information through two cognitive channels strengthens understanding and retention, so that the message of self-safety is easier for children to internalize. Secure visualization of actions, combined with simple narratives, allows information to be processed more effectively than using only one modality (Nachiappan, 2024). This principle is applied in the e-book through a combination of voice narration, simple text, and color illustrations. Children not only read or listen but also visualize correct behavior in dangerous situations, making it easier to internalize the message of self-safety.

3. The Cognitive Theory of Multimedia Learning (Mayer) is the main framework in the design of E-Books, because this medium utilizes a combination of images, text, and audio that must be managed according to the cognitive capacity of early childhood. Principles such as coherence, modality, and contiguity are applied to ensure that verbal and visual elements complement each other without creating an excessive cognitive load. Thus, the delivery of personal safety material becomes more directed, systematic, and easy to understand (Mayer, 2024). The application of the principles of coherence, modality, and contiguity ensures that the text, images, and sounds are presented in harmony and not excessively. Verbal and visual integration helps children process information through two cognitive channels simultaneously without overloading their memory capacity, thereby improving learning comprehension and retention.

RESEARCH METHOD

This study uses a qualitative method with a case study approach. This approach was chosen because it allows researchers to explore the implementation of the use of e-books in early childhood self-safety education programs in early childhood education services in depth. This method emphasizes understanding the process, experience, and response of children and educators during the use of learning media. The research was conducted over four weeks. In the first week, an initial observation was conducted to identify the child's attitude and behavior before using the media. The second and third weeks were the implementation stages of E-Book media, which were used 1 time a week to observe children's direct involvement in digital-based learning activities combined with direct learning about personal safety for children. In the fourth week, follow-up observations were made on the change in children's attitudes after the use of media, and in-depth interviews with teachers were conducted to reinforce the observation results. The research subjects consisted of 20 children in group B (aged 5–6 years) and four teachers in one of the PAUD institutions in Purwakarta Regency. The research was conducted following ethical principles, including consent from the school and parents, voluntary participation, and confidentiality of participants' identities. The selection of children aged 5–6 years was based on Piaget's preoperational stage, in which the child begins to understand symbolic representations, distinguish dangerous situations, and respond to

visual and verbal stimuli provided through digital media. With these developmental characteristics, children at this age are considered appropriate for evaluating the effectiveness of interactive e-books in learning personal safety. In addition to the main participants, the study also involved two expert informants (one material expert and one media expert) to strengthen the validity of the findings related to the implementation of the e-book, as well as provide triangulation of perspectives between children, teachers, and experts.

The data collection technique is carried out through three main techniques, namely: observation is carried out to observe children's behavior, involvement, and interaction during learning using e-books by paying attention to their expressions, attention, and ability to understand personal safety messages. Furthermore, interviews were conducted with teachers and experts to explore their views on the use of e-books and the relevance of media to the needs of early childhood. In addition, documentation techniques in the form of photos, videos, children's works, and field notes are used to strengthen the data and add visual evidence to the learning process.

The data analysis process was carried out by following the stages from Miles and Huberman, namely: data reduction, data presentation, and conclusion drawing (Qomaruddin & Sa'diyah, 2024). At the data reduction stage, information from observations, interviews, and documentation is categorized into five main themes: (1) Learning Process Using E-Books, focusing on the suitability of learning flows with the use of media; (2) Children's Interaction with the Media, including the child's involvement, attention, and participation while using the E-Book; (3) Children's Responses to Personal Safety Materials, describing the child's cognitive and emotional reactions to the content of the material; (4) Children's Understanding of Personal Safety Problem Solving, assessing the child's ability to identify safe steps in simple situations; and (5) The Role of Educators in Facilitating the Use of Media, observing the form of scaffolding, guidance, and teacher interaction. The data were then presented in a descriptive narrative that connected the findings with the theoretical foundation, and conclusions were drawn through a triangulation process between sources (children, teachers, and experts). The presentation of data and the results of the analysis are presented in a descriptive narrative that combines empirical findings with theoretical foundations. The conclusion was drawn, and the interpretation results were compared between data sources (children, teachers, and experts) to ensure the consistency of the findings. This process is carried out reflexively to understand the extent to which the implementation of the e-book contributes to the improvement of children's understanding of self-safety holistically, including cognitive, affective, and psychomotor aspects.

To ensure data validity, the research applied triangulation of sources and techniques. Source triangulation was carried out by comparing observations with interviews from various parties, while technical triangulation was carried out by combining observation, interview, and documentation data. This approach reinforced the objectivity and validity of the findings and ensured that the results of the research represented the real experiences of all participants.
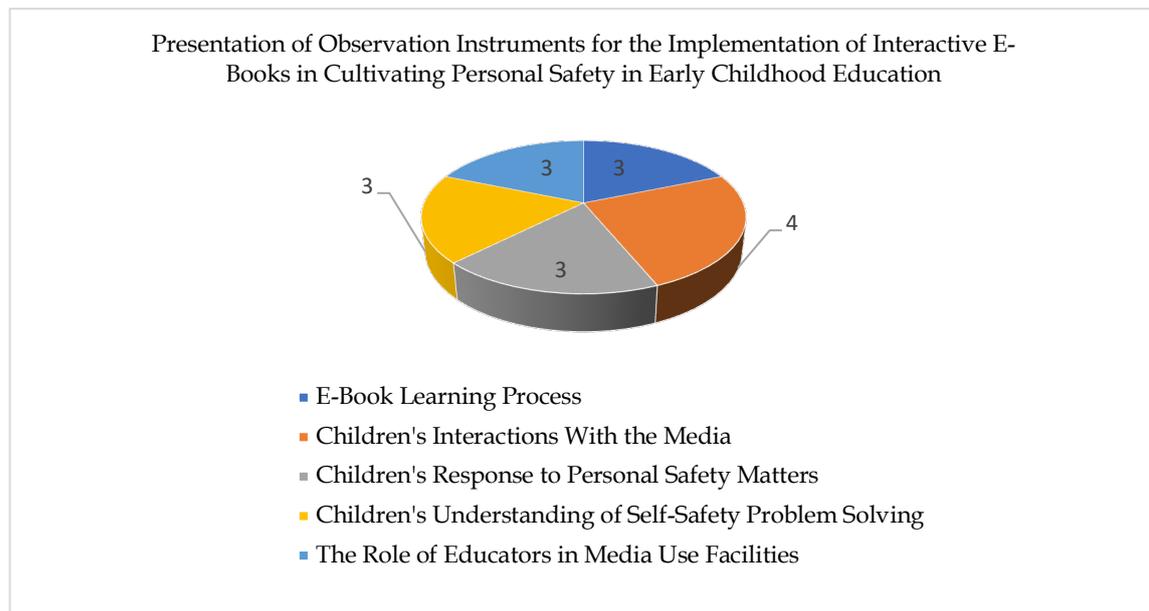
RESULTS AND DISCUSSION

Results

This study uses a qualitative approach with data analysis based on the Miles and Huberman model, which consists of three stages: data reduction, data presentation, and conclusion. Data were obtained through observation, interviews, and documentation during the implementation process of E-Book media on 20 children aged 5–6 years in one of the kindergartens in Purwakarta. This study aimed to determine the process of media application and children's responses to its use. At the data reduction stage, the researcher selected relevant information from the learning activities. Observations show that children show high enthusiasm while using e-books. They focus on paying attention to illustrations, listening to narratives, and responding to questions given by teachers. A spontaneous response arises when the character of GAGA exemplifies a self-defensive measure. For example, when the earthquake simulation and the GAGA character ask, "What to do in case of an earthquake?", the children immediately answer with enthusiasm: "We take shelter and find a safe place!" These findings indicate that an initial understanding of measures to deal with emergencies is beginning to develop. At the data presentation stage, interviews with teachers showed that e-books were considered effective and relevant for early childhood. The teacher stated that before the use of media, the concept of personal safety was abstract for children. However, through visual illustrations, interactive narratives, and GAGA characters, children find it easier to understand the meaning of dangerous situations and preventive measures. Teachers also consider that this media encourages children to think reflectively, dare to ask questions, and imitate the positive behaviors displayed by characters in stories. Furthermore, at the conclusion stage, it was found that the implementation of the e-book had a positive impact on increasing children's understanding and awareness of personal safety. Children are not only able to identify potential dangers but also begin to express preventive measures, such as sheltering in a safe place or seeking help from teachers. This shows that interactive digital learning can improve children's cognitive, affective, and preventive behaviors.

Overall, the results of the study confirm that e-books are feasible for implementation in early childhood education. This media not only provides a fun and informative learning experience but also helps to form an awareness of self-safety from an early age through contextual narratives and visual approaches. From the data analysis process, three main themes were obtained: (1) the creation and development of E-Book media, (2) the implementation of the use of E-Books, and (3) the subjects' response to the media. These findings are in line with the research of Justicia (2023) and Dwi Wahyuningsih and Dea Komalasari (2025), who showed that interactive digital media can increase children's awareness and positive behavior. However, this study makes a new empirical contribution by presenting a behavioral model using GAGA characters as a positive moral example for early childhood self-safety education.

Table 1. Observation Results in the Field

Nu.	Aspects Observed	Indicator	4	3	2	1
1.	The learning process uses E-Books.	Teachers use media according to the learning flow.	-	√	-	-
2.	Children's interaction with the media.	Children are interested, focused, and engaged in activities with E- Books.	√	-	-	-

Nu.	Aspects Observed	Indicator	4	3	2	1
3.	Child's response to personal safety material.	Child's response to personal safety material.	-	√	-	-
4.	Children's understanding of problem-solving with personal safety materials.	Children are able to apply solutions that have been applied to E-Book media.	-	√	-	-
5.	The role of Educators in media use facilities.	Teachers provide direction and assistance when children use E-Books.	-	√	-	-

Presentation of Observation Instruments for the Implementation of Interactive E-Books in Cultivating Personal Safety in Early Childhood Education

- E-Book Learning Process
- Children's Interactions With the Media
- Children's Response to Personal Safety Matters
- Children's Understanding of Self-Safety Problem Solving
- The Role of Educators in Media Use Facilities

Figure 1. Presentation of the Interactive E-Book in Fostering Personal Safety in Early Childhood Education Cycle

Discussion

A. E-Book Media Creation Process

The E-Book development process involved validation by subject matter and media experts to ensure its feasibility for use in early childhood education. This Interactive E-Book was developed based on the need for interesting learning media while being able to support the cognitive, social-emotional, and character development of children in an integrated manner. Learning self-safety is an important part of early childhood character education, in line with Permendikbud No. 146 of 2014, which emphasizes the holistic development of religious, moral, social-emotional, and cognitive values (*Permendikbud_tahun2014_nomor146*, n.d.). Children aged 5-6 years are in the pre-operational stage according to Jean Piaget, where the ability to think symbolically and imaginatively has already begun to develop, but they still need concrete stimulation to understand more complex concepts (Utami, 2025). Therefore, visual and narrative-based learning media, such as e-books, are an effective solution to help children understand risky situations in a real and meaningful way.

The findings of this study strengthen the theory of Social Learning put forward by Albert Bandura, who explains that the learning process of children occurs through observation and imitation (observational learning or modelling). Bandura emphasized that children learn by paying attention to the behavior of the model in their environment, storing information about the behavior, and then imitating it in a similar context,

especially when the behavior has positive consequences. This process includes four main stages: attention, retention, reproduction, and motivation (Tullah, 2020).

In the context of learning using interactive e-books to foster personal safety in early childhood education, this theory is evident in children's behavior during and after learning activities. The "GAGA" character in the E-Book media serves as a model of positive behavior that demonstrates safe, responsive, and empathetic actions in a variety of dangerous situations. Through observation of the character's actions, children pay attention to each step displayed (attention) and remember the safety messages conveyed (retention). Furthermore, they mimic behaviors observed in play activities and real situations (reproduction), such as being careful when walking on slippery stairs, asking teachers for help, or reminding friends to stay away from dangerous objects (Yanuardianto and Elga, 2019).

Children's motivation to imitate the behavior of GAGA characters is also strengthened by interactive and attractive media design. Bright colors, expressive illustrations, and communicative voice narration foster a high sense of emotional involvement among children. This is in line with the concept of vicarious reinforcement in Bandura's theory, where children are encouraged to imitate positive behavior because they see the model getting good results or consequences (Yanuardianto and Elga, 2019). In addition, teachers also play an important role as reinforcers who provide social reinforcement, such as praise and appreciation, when children show safe behavior during learning activities. Thus, the results of this study show that e-book-based learning not only improves children's cognitive understanding of the concept of self-safety but also shapes behaviors and habits through observational mechanisms, as explained by Bandura. This confirms that the use of digital media with a strong educational character can be an effective strategy for instilling the values of safe behavior and social responsibility in early childhood.

In addition to the role of character as a behavioral model, the findings of this study are also consistent with Paivio's Dual Coding Theory, which asserts that learning takes place through verbal and visual systems. The presentation of information that integrates the two allows cognitive processes to work in parallel, thereby improving students' understanding and retention (Mayer, 2024). In the context of this study, the Interactive E-Book in Fostering Personal Safety in Early Childhood Education uses the principle of dual coding through the presentation of illustrated stories with simple narratives that are adapted to early childhood language skills. Brightly colored illustrations, clear character expressions, and short narrative texts serve to strengthen the message of self-safety so that children can concretely understand the meaning of dangerous situations. For example, in the section about the fire, the visual combination of fire and the narrative of "moving away from the heat source" helps the child connect words with images, simultaneously strengthening visual and conceptual memories.

Thus, the results of this study support Paivio's theory that learning that combines visual and verbal elements not only improves memory but also enriches children's conceptual understanding and emotional involvement in learning activities. This was briefly but clearly conveyed by the Media Expert who stated:

"Yes, for digital media, the learning that has been made is good and narrative. Both in terms of design visualization and the narrative provided, it provides a good mix for early childhood learning". This quote reinforces the interpretation that the main strength of the

e-book lies in the synergy between visual design and contextual storylines, which is able to facilitate Dual Processing in early childhood learning, as explained by Paivio.

E-The book also adopts an integrated thematic learning approach, where each part of the story is connected to the child's real-life theme, such as "at home", "at school", and "in the neighborhood". This emphasizes that learning in early childhood must be designed according to a child's developmental stages, interests, abilities, and life context. This means that an effective learning process is not only delivering material, but also considering how children think, interact, and understand the world around them according to their age characteristics (Rukiah & Malik, 2024). In addition, this e-book provides space for children to actively participate and explore, for example, by answering questions from teachers, imitating the actions of GAGA characters, or retelling their experiences. Teachers also play the role of facilitators who adjust teaching strategies to children's needs and responses, not just as material presenters (Mccarver, 2025). This is also supported by educators at one of the early childhood education services in Purwakarta, where researchers conducted research on the implementation of this e-book, who stated:

"GAGA media is very good, children are very enthusiastic when researchers do learning with this e-book media, the material is also very in-depth, and it happens that our school has used Deep Learning. The GAGA E-Book can be one of the learning media whose content is already in-depth". This statement serves as empirical evidence supporting the finding that the use of e-books can increase children's cognitive and emotional involvement in learning activities.

Figure 2. Interactive E-Book Cover in Fostering Personal Safety in Early Childhood Education, **Figure 3.** Expert Validation of Media and Subject Matter Experts

B. Implementation of the Use of E-Books

Based on the results of research on the implementation of the use of e-books, it can be seen that this media has a positive influence on improving the understanding and attitude of early childhood self-safety. This can be seen from the change in children's behavior, who become more careful, able to recognize dangerous situations, and can remind their friends to keep safe. This is also supported by educators at one of the early childhood education services in Purwakarta, where researchers researched the implementation of this e-book, which states:

"After I observed, when children know about security and safety, they show positive actions in their attitudes. Both in maintaining the safety of himself and his friends. Children also remind their friends when things are dangerous, or they are more careful when playing. Because our school area has many stairs, like yesterday, the child wanted to play in the lower area, and it happened that before it rained, the stairs became slippery. The child has begun to understand that someone had fallen, and after using personal safety learning media, children are now more careful and start to avoid slippery or dangerous places. In addition, yesterday, it was also taught related to dangerous objects or related to disaster mitigation, now that children have begun to understand what to do when a natural disaster occurs. Some children have also begun to obey the rules, although initially, they did not understand the rules, especially those related to personal safety. Children follow the rules well, and children are more protective of themselves from danger, and also take care of their friends." This quote reinforces the finding that e-books play an effective role in internalizing oneself through concrete learning, which is in accordance with the characteristics of early childhood.

These results show that interactive digital media, such as e-books, are effectively used as a means of thematic learning in early childhood education, especially in introducing the concept of personal safety. According to Piaget, children aged 5–6 years are in the preoperational stage, where their way of thinking is still intuitive and highly dependent on experiences that can be seen, heard, or felt directly (Ahsanul Huda Susanto et al., 2024). Therefore, they are not yet able to understand abstract concepts in depth, so effective learning must be presented through a concrete and contextual approach (Suryana et al., 2022). In this study, children assimilated their experiences of danger into more concrete concepts through the medium of e-books, as well as making accommodations when they found new ways to respond to dangerous situations. Thus, this interactive e-book has proven to be an effective medium in helping children understand the concept of self-safety because it can present a learning experience that is visual, contextual, and in harmony with the way children think at their developmental stage.

This Interactive E-Book also emphasizes that learning occurs through social interaction and guidance from more competent adults or peers, which is when children are helped to move from actual abilities to potential abilities that can be achieved through such support (Kurniati, 2025). In this context, learning becomes effective when teachers or media provide appropriate support to help children gradually understand the material. And this is also strengthened by educators at one of the early childhood education services in Purwakarta which is where researchers conduct research on the implementation of this E-Book, which states:

"Children can already express one or two words of action and provide solutions given from the questions in the e-book. So this media is very good for children, where children respond very well, children are also able to distinguish between safe and unsafe, and can provide behavior or attitudes to these situations with the results of learning this media." Thus, E-Book-based learning has been proven to facilitate and strengthen children's social engagement and reflective thinking skills. The use of this interactive e-book not only increases conceptual understanding of personal safety but also develops critical thinking skills, language skills, and a sense of social empathy for children through meaningful collaboration and communication.

From the aspect of learning media, the teacher said that the visual appearance and design of the e-book were very interesting for children. The use of bright colors, expressive character illustrations, and interactive features can attract children's attention and maintain their focus during the learning process. This supports the idea that good learning media must be able to generate interest in learning and facilitate children's understanding. And this is also strengthened by educators at one of the early childhood education services in Purwakarta, which is where researchers research the implementation of this E-Book, which states:

"The content and design are suitable for children because they look very attractive. The display is presented in the form of pictures that stimulate children's imagination and games that can stimulate children's development. In addition, the design is suitable for children, and the color and image of the character are very interesting. Related to the child's social development, the child can feel, then related to his cognition, helping to trigger thoughts from the questions given, so that the child can think and answer the questions given. Furthermore, the moral value is seen from the attitude of children after learning using this E-Book media, children can remind each other and other positive values." This observation indicates that visually appealing media can increase motivation to learn and help children understand simple cause- and effect-relationships. In addition to having an impact on behavior and morals, the implementation of this e-book also stimulates the cognitive aspects of children. By answering questions, guessing situations, and mentioning safe actions, children are trained to think logically and understand simple cause-and-effect relationships (Nurdiyanto et al., 2023).

Thus, it can be concluded that the use of interactive digital media in this e-book makes a significant contribution to early childhood self-safety learning. This media is not only visually appealing but also effective in instilling safety values, building moral awareness, and developing children's cognitive and social abilities. Although there are shortcomings in the technical aspect, overall, this e-book has fulfilled the function of a learning medium that is educational, interactive, and relevant to the needs of early childhood development in the digital era.

C. Subjects' Responses in the Use of Interactive E-Books in Fostering Personal Safety in Early Childhood Education

The results of using Interactive E-Books showed a very positive response from children and teachers. Children appear enthusiastic, actively follow stories, and can relate the material to real experiences, such as actions during fires, earthquakes, meeting strangers, or finding dangerous objects. These findings show that these media not only attract attention but also help children build a concrete and applicable understanding of personal safety issues.

Meanwhile, the teacher responded that e-book media helps create a learning atmosphere that is more interactive, interesting, and relevant to children's lives. This media is considered effective because it can transform personal safety material that was originally abstract into concrete and easy-to-understand material for children. These findings are in line with Mayer's multimedia learning theory, which explains that the combination of text, images, and audio can improve children's understanding and retention of the material learned (Teguh Handoyo et al., 2024). From the perspective of Paivio's Dual Coding theory, the results of the study show that the combination of text, images, and sounds in e-books strengthens children's understanding through the

processing of verbal and nonverbal dual information. This combination helps children process information through two cognitive channels, verbal and visual, so that learning messages are easier to remember. In addition, the use of simple characters and storylines also supports Bandura's Social Learning theory, where children learn through the process of observation and imitation of the behavior of characters who are considered positive (Nurdiyanto et al., 2023).

From the results of interviews and observations, it was also found that the advantages and disadvantages of this E-Book media were identified. The main advantage lies in the suitability of the material and the appearance of the media with the characteristics of early childhood education. The language used is simple, communicative, and easy for children to comprehend. Visual illustrations are also made in bright and expressive colors to attract attention and stimulate children's imagination. The teacher considers that the content of the material is relevant to the purpose of learning personal safety in the context of PAUD and can be used as supporting media in the themes "Myself," "My Environment," or "My Needs." This was briefly but clearly conveyed by educators at one of the early childhood education services in Purwakarta, where researchers researched the implementation of this e-book, which stated:

"The advantages of media and materials are very suitable, starting from the language of delivery of media illustrations that are easy for children to understand." This quote corroborates the analysis that interactive digital media facilitate concrete, experiential learning.

However, there are several shortcomings that need to be considered for further media development. Some teachers and children said that the articulation of the voice of the "GAGA" character sounded unclear and monotonous, thus reducing the level of emotional involvement of children when listening to the narrative. In addition, the number of animated videos shown was limited. These aspects are important inputs for developing media with better audio quality and more dynamic and expressive animation variations. This was briefly but clearly conveyed by educators at one of the early childhood education services in Purwakarta, where researchers researched the implementation of this E-Book, which stated:

"But there are shortcomings related to the sound that is not clear in terms of the articulation of the "GAGA" sound and too monotonous regarding the delivery in the media, the animation video is not much." The feedback emphasizes the need to improve the quality of audio and visual aspects in the development of the next e-book. The refinement of these two components is important not only to improve the child's learning experience but also to ensure that interactive media truly meet the pedagogical, technical, and accessibility standards required in digital-based early childhood learning. Thus, the input becomes a strategic basis for developing a more effective, immersive, and optimal version of the e-book.

Based on the positive responses from children and teachers, this interactive e-book has significant potential for wider implementation in personal safety learning in early childhood education. Interactive digital media have been shown to increase children's cognitive, affective, and social-emotional engagement, so that they not only understand the content, but also show improvements in responsiveness, empathy, and awareness of self-safety. Pedagogically, these results affirm the central role of teachers as facilitators who direct the learning process, clarify concepts, and connect the material with children's real experiences. With adequate training and mentoring, teachers can optimize the use of

social media to instill character values, such as responsibility, discipline, and concern for themselves and others (Tullah, 2020).

This study has important implications for educational and policy practices. Practically, PAUD teachers can use this e-book as a thematic learning medium, such as Diriku and Lingkungan ku, to instill safe habits. This medium also strengthens communication between children, teachers, and parents in building a safe culture at home and school. In terms of policy, the results of this study support the integration of personal safety education into the national PAUD curriculum, in line with the Child-Friendly Schools program from the Ministry of PPPA. This interactive e-book can be a model of technology-based educational media that supports the achievement of the SDGs, especially in points 3, 4, and 16. SDGs 3 (Good Health and Well-Being), the implementation of e-books contributes to building early childhood awareness of the importance of maintaining safety and personal health. Through interactive and contextual learning activities, children are trained to recognize the risks of hazards around them, understand basic first-aid steps, and develop preventive behaviors against safety threats. This supports the achievement of SDGs 3 by instilling healthy and safe living habits from an early age as part of children's physical and mental well-being. SDGs 4 (Quality Education), this research is in line with SDGs 4, which emphasizes inclusive, equitable, and quality education. SDGs 16 (Peace, Justice, and Strong Institutions) from the aspect of character and moral values, the use of e-books instills the principles of responsibility, empathy, discipline, and social awareness in early childhood. Children learn to respect themselves and others, understand safe boundaries, and have the courage to ask for help when faced with dangerous situations. These values are the foundation for the formation of individuals who behave justly, respect social norms, and create a safe and peaceful environment. Institutionally, this research also strengthens the role of PAUD institutions as educational institutions committed to building character and a culture of child safety, in line with the principle of strong institutions in SDGs 16. Thus, the results of this study make a real contribute to strengthening early childhood education practices based on safety and character values while supporting the sustainable achievement of the SDGs. This e-book is not only an innovation in the field of learning but also a strategic step towards an education system that is oriented towards the safety, welfare, and character development of future generations.

Figure 4. Watching Stories Interactive E-Book in Fostering Personal Safety in Early Childhood Education

Figure 5. E-Book Use Activities With Children's

Figure 6. Children's Enthusiasm in Playing and Learning with Interactive E-Book in Fostering Personal Safety in Early Childhood Education

Figure 7. Socialisation of The Use of Interactive E-Books in Fostering Personal Safety in Early Childhood Education

CONCLUSION

Fundamental Finding: The study's findings confirm that interactive e-books are effective in improving the understanding and awareness of early childhood self-safety through fun and responsive learning. This effectiveness is reinforced by integrating key principles from learning theory, including social modeling, concrete experiences, and verbal–visual combinations that support the process of internalizing the concept of safety. **Limitation:** This study has several limitations, namely, the sample was limited to one PAUD institution, so the results cannot be generalized, and the technical aspects of the media, especially audio quality and visual variation, still need to be improved. In addition, studies have not reviewed the long-term impact of e-book use on children's self-safety behaviors outside the classroom. For further research, it is recommended to involve a more diverse sample, develop media with higher interactivity, such as mini-games or AR

technology, and conduct longitudinal studies to see changes in children's behavior sustainably. **Practical Implications:** The findings of this study have practical implications for improving the quality of learning in early childhood education. Teachers can use this e-book as an interactive and contextual learning tool to instill personal safety values from an early age. Early childhood education institutions can use the results of this study as a reference for integrating personal safety literacy programs into technology-based curricula that are more adaptive to children's needs. In addition, the results of this study provide input for the development of digital media to improve the audio, visual, and media interactivity aspects so that children's learning experiences become more interesting, communicative, and meaningful. **Future Research :** Further research is suggested to involve more early childhood institutions and a more diverse sample of children so that the results can be compared between different learning environments. In addition, the development of e-book media can be done by adding interactive features such as mini games, virtual simulations, or augmented reality (AR) elements to make learning more interesting and in accordance with the development of children's educational technology. Future researchers can also expand the focus of the study to aspects of the long-term impact of media on the formation of children's character and safety behavior, as well as examine the effectiveness of similar digital media on other learning themes such as health, environment, or social-emotional literacy.

ACKNOWLEDGEMENTS

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