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THE ROLE OF ANIMATION IN ENHANCING INTERACTIVE LEARNING FOR EARLY CHILDHOOD

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Abstract
This study aims to explore the role of animation in improving interactive learning in early childhood. In today's digital era, animation is one of the effective media in delivering learning materials in a fun and easy-to-understand way for children. The method used in this study is a qualitative approach with literature studies and participatory observations in several early childhood education institutions. The results of the study indicate that the use of animation in the learning process can improve children's attention, memory, and involvement in learning activities. In addition, interactive animation is also able to stimulate children's cognitive, language, and social development more effectively than conventional methods. The conclusion of this study suggests that the integration of animation in the early childhood learning curriculum can be the right strategy to create a more interesting and meaningful learning experience. And the impact of animation technology on cognitive development, literacy, engagement, and motivation in early childhood. Furthermore, animation-based learning environments have been shown to be effective in developing critical thinking skills, problem-solving abilities, and social skills through collaborative activities. This reinforces the view that the judicious use of animation can bridge digital learning with children's life experiences. Animation has been shown to be a valuable educational tool in modern learning, helping to deepen understanding, improve memory retention, and encourage active participation in the learning process.
Keywords: Animation, Learning Media, Interactive Learning.

INTRODUCTION

In recent years, the development of information and communication technology (ICT) has had a significant impact on various fields, including education. This shift is also evident in early childhood education (ECE), where technology is increasingly being used to complement traditional teaching methods. One innovation that has garnered attention is the use of animation as an educational medium. As a dynamic visual tool, animation has the advantage of capturing children's attention, making it an effective means to enhance active participation in learning. Studies indicate that animation can improve children's learning experiences, foster an interest in learning, and support cognitive

development, which is crucial for their future growth (Abdel-Salam et al., 2022; Adair, 2023).

At present, animation technology has become a crucial component of modern learning methods, particularly in early childhood education. Animation not only makes learning enjoyable but also enhances the way children engage with educational content. Against this backdrop, the aim of this study is to further explore how animation technology and interactive learning environments can support children's cognitive development, as well as enhance their motivation and engagement (Adair, 2023). Additionally, this research will investigate how animation technology can foster engagement, motivation, cognitive development, and literacy in children. Through a data-driven approach and in-depth analysis, this study is expected to provide a more comprehensive understanding of the application of animation in early childhood education (Abdel-Salam et al., 2022). Early childhood learning requires an approach that is in accordance with their developmental characteristics, namely they like to play, are visual, and have a limited attention span. However, in practice, the learning methods used are often conventional and less able to encourage active involvement of children. Along with the development of technology, animation has become one of the potential learning media for use in early childhood education. Animation can present material in an interesting, interactive, and fun way, so that it can increase children's motivation and learning involvement. However, the use of animation in early childhood learning has not been fully optimal, both in terms of content and strategies for its use in the classroom. Therefore, this study was conducted to explore the role of animation in improving interactive learning in early childhood, as well as the extent to which this media can support an effective and enjoyable learning process.

With the continuous advancement of educational technology, animation not only serves as a visual aid but also plays a crucial role as an essential component in enhancing student engagement, motivation, cognitive development, and literacy (Abdel-Salam et al., 2022). The research highlights the role of animation as a tool

that can boost children's enthusiasm and encourage them to be more actively involved in learning activities (Adair, 2023).

A number of studies have indicated that this technology can make the learning process more engaging and stimulating, thereby increasing children's enthusiasm for learning. According to research conducted by Abdel-Salam et al. (2022), the use of 3D animations with moving characters and vibrant visual effects can effectively capture children's attention. This transforms learning into a playful experience, making children more actively engaged without feeling pressured. These findings align with the views of Vallefuoco (2022) and Ronfard et al. (2023), who assert that animation in education can enhance students' attention and motivation. As a result, children become more enthusiastic about participating in lessons and actively engaging in the learning process.

Furthermore, learning environments that incorporate interactive animations have a positive impact on children's cognitive development. Research by Leung, Wu, and Li (2024) reveals that animations can help children grasp complex concepts more easily due to their visually accessible presentation. With the aid of these visuals, children are able to better comprehend the material. Animations also make learning more enjoyable and colorful, which facilitates information retention and enhances memory.

Fan et al. (2021) found that, although animations with high fantasy elements may distract children, they actually help them process information in a different way. The experience of watching animation can enhance their critical thinking skills and engagement in learning. This study affirms that, when used appropriately, animation can be a highly effective tool for promoting children's motivation and learning engagement.

Xu and Warschauer (2020) further emphasized that interactive videos featuring engaging animated characters, such as those in the program "Wonder with Elinor," have the potential to enhance children's active engagement. Children are not merely passive viewers; rather, they are encouraged to think critically and

pose questions related to the content they observe. This process aids in the development of deeper cognitive skills and a better understanding of the lessons presented.

Budiarto et al. (2020) and Barut Tugtekin & Dursun (2022) further emphasize that the use of interactive multimedia, including animations and games, has proven to be effective in making learning more engaging and efficient. With an appropriate format, children are more actively involved and enjoy the learning process. Animation also plays a crucial role in enhancing children's literacy skills. Nuankaew et al. (2024) argue that engagement in animation-based learning aids children in building knowledge through enjoyable and immersive interactions, thereby increasing their motivation to learn. This approach proves effective in developing their literacy abilities. The interactive elements within animations also help children focus on the material, reinforce their understanding, and extend their memory retention.

Das et al. (2023) explain that the use of animation in interactive learning can enhance children's memory retention through visual aids. Visualization in animation makes learning more engaging and motivates children to study more diligently. It also helps them better understand language concepts and expand their vocabulary, which is crucial for literacy development. Younas and Dong (2024) state that animated media can improve children's language skills and comprehension by providing relevant visual contexts.

In this study, a *Systematic Literature Review* (SLR) and the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) framework were employed. The author aims to examine the research trends conducted by scholars worldwide regarding the role of animation in developing interactive learning for early childhood education. The research was selected from data mined from Scopus and other sources. This review is summarized through the following research questions:

RQ 1. How does animation technology affect engagement and motivation in early childhood learning processes?
RQ 2. How can an interactive learning environment created through animation influence cognitive development and literacy in early childhood?.

RESEARCH METHODOLOGY

This study employs the Systematic Literature Review (SLR) method and the PRISMA framework to systematically review relevant literature. The SLR method aims to accurately summarize the data collected (Moher et al., 2009). The author includes articles published within the last 20 years, from 2004 to 2024. To conduct this literature review, the author selectively included several relevant journals, such as Sage Journals, Springer, Elsevier, Taylor and Francis, IOP, IEEE Xplore, Press University, and others.

This study also uses a descriptive qualitative approach, which aims to understand in depth how animation can play a role in improving interactive learning in early childhood. This approach was chosen because it allows researchers to explore the meaning, perceptions, and experiences of students and educators regarding the use of animation in the learning process. The subjects of the study were early childhood (3–6 years) who were involved in the learning process with animation media. PAUD teachers who use animation in the learning process. Parents as additional informants to obtain perceptions about changes in children's behavior when learning with animation. And data analysis in the form of Data reduction: Filtering and compiling raw data from observations and interviews. Data presentation: Organizing data in the form of descriptive narratives, quotes, and thematic tables. Conclusion drawing: Finding patterns and relationships that show the role of animation in improving the interactivity and quality of children's learning.

The keywords used to search for journals and articles in the Scopus database that are relevant to the topic and appropriate are: animation OR "animation art" AND childhood AND learning OR "media learning" AND "interactive learning."

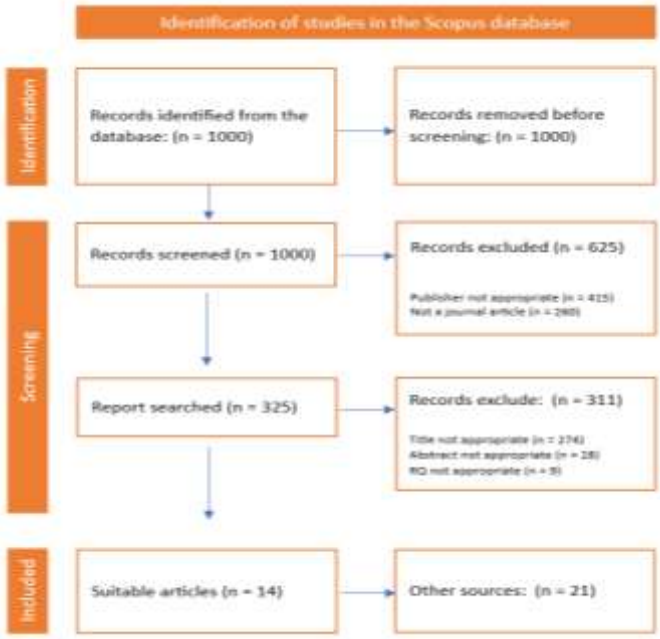

Figure 1. PRISMA Diagram for *Systematic Literature Review* (SLR)

The PRISMA diagram is designed to facilitate authors in transparently reporting the reviews conducted and the findings discovered. According to Matthew J. Page et al. (2021), PRISMA 2020 replaces the 2009 version and includes new reporting guidelines that reflect advancements in the methods for identifying, selecting, assessing, and synthesizing studies. The structure and presentation of items have been modified to facilitate implementation. In the initial stage, researchers conducted a search for articles in the Scopus database to ensure the quality and accuracy of the literature sources used. From this initial search, approximately 1,000 articles were identified based on the relevant keywords, which were then subjected to a strict selection process (Figure 1).

The first selection process was conducted on the article titles, where articles deemed less relevant to the research topic were excluded, leaving 50 articles for the next stage. In the second stage, the abstracts of each article were reviewed, resulting in 22 articles that more closely aligned with the research criteria. In the third stage, a thorough examination was conducted on the full text of the selected articles, yielding 14 articles that were both relevant and met the quality standards for further analysis. These 14 journals were entered into the

research logbook to facilitate the author's work. The logbook was organized into a table consisting of the article titles, abstracts, research objectives, research questions, and key findings from each reviewed journal. Additionally, the researcher included 21 articles from other sources that were considered important for strengthening the research findings. This was done to expand the sources in order to address the previously defined Research Question (Figure 1)**.**

RESULTS AND DISCUSSION

Results

In the results section of the systematic literature review, the author will provide an in-depth answer to the research question. This answer is based on the selection process, evaluation conducted, and the information gathered from various articles. By synthesizing these findings, the author aims to offer a well-supported understanding that aligns with the data supporting the research hypotheses or arguments. The explanation provided will highlight the differences within the reviewed literature.

a. The influence of animation technology on the engagement and motivation of young children in the learning process is a significant area of study.

In addition, the study by Fan et al. (2021) found that although animations with high fantasy elements can distract children, such experiences can alter how children process information, which may influence their learning and still enhance executive functions as well as their ability to engage in learning. Another study by Xu and Warschauer (2020) revealed that interactive videos, such as "Wonder with Elinor," which use emotional appeal with favored animated characters, are able to enhance children’s active engagement and foster deeper thinking, rather than merely watching videos passively. This approach allows children the opportunity to think critically and learn the ideas presented. The incorporation of pauses and conversations in the content also promotes greater attention throughout the learning process, both positive and negative. Cognitive engagement enables children to react to the content more effectively, which helps them understand better what is being taught.

Animation increases children’s engagement because the process of animation requires attention and interaction. Through animation, children can visualize concepts that require a concrete or specific example, such as using geometric shapes to represent objects. This can boost their motivation during the learning

process, as they feel involved in the content creation (Leung, Wu, & Li, 2024). According to Nuankaew et al. (2024), animation technology has also become a popular and engaging medium for children, designed in a creative and intuitive way.

According to Dalacosta et al. (2009), animation also aids children in better remembering and understanding information in greater depth. Visual representations linked to everyday situations enable them to more easily associate new material with the knowledge they already possess, thereby increasing their curiosity and motivation to learn (Adair, J. K., 2023). This approach, supported by Martzoukou (2020), demonstrates that animation is not only effective in capturing attention but also encourages active participation in contextual and collaborative learning. By featuring characters similar to the children themselves, animation fosters greater engagement with scenarios that resonate with their experiences, thereby creating a strong emotional bond. Additionally, animation can simplify complex concepts, making them easier to understand.

According to Triatmaja et al. (2022), games, as an element of animation, provide psychological benefits such as cognitive, emotional, and social development. This enhances children's motivation in the learning process. In the process of computational thinking, children gradually develop a sense of responsibility and independence in learning (Leung et al., 2024). Another perspective from the research by Schubertová et al. (2023) suggests that animation is equally effective, if not more so, than traditional static storybooks in terms of enhancing children's engagement in learning. Children tend to prefer watching narrative cartoons over listening to or reading them because they can absorb more information in a shorter amount of time (Das et al., 2023).

According to Sun, Loh, & Roberts (2019), although they share a similar viewpoint, their opinion differs slightly as they found that children exposed to animation displayed longer total fixation times (in percentage) on repetitive readings compared to their peers in the static group with only audio and static visuals. By utilizing animation (moving images, hotspots, and sound) along with read-aloud texts, these books have the potential to stimulate the reader's auditory, visual, and even kinesthetic senses, thereby aiding in better comprehension and absorption of the story.

Essentially, animation systems utilize various techniques, including AI-driven behaviors, which enable both animation and interaction. Qualitative analysis indicates that the visual outcomes of such systems are intuitively accepted by users and offer advantages over similar solutions. This suggests that AI-based

animation approaches can enhance the quality of children's learning experiences by providing more vibrant and engaging illustrations (Abdel-Salam et al., 2022).

However, animation can also hinder the development of young children if not accompanied by appropriate guidance. Children often struggle to transition from digital media to the real world without supportive interaction (Thornberg & Sundqvist, 2021). As Fan et al. (2021) note, watching an 11-minute animated episode containing fantasy elements can directly disrupt children's executive functioning. This indicates that animations with strong fantasy narratives can distract children and affect their focus during learning. Nevertheless, when accompanied by guidance, animations can help children feel connected and engaged in the learning process through realistic depictions, direction, and emotional involvement, transforming learning into a compelling and memorable experience for them.

Research by Budiarto et al. (2020) and Barut Tugtekin & Dursun (2022) on the use of interactive multimedia, which includes animation and games, as educational media, has demonstrated its ability to increase students' interest and motivation in learning. This makes the learning process more efficient and engaging for them. Presenting content in multimedia formats that align with the characteristics of the material facilitates student engagement in learning activities.

Based on several opinions, it is concluded that animation is used in various learning activities such as: Recognizing letters and numbers through educational animated videos. Recognizing colors, shapes, and animals through animated stories. Singing educational songs in the form of interactive musical animations.

b. An interactive learning environment built through animation can influence the cognitive development and literacy of young children.

Technology has the potential to make a positive impact on children's education by creating a more interactive and engaging learning environment. This not only enhances student participation but also encourages them to learn by applying innovative and captivating teaching methods. Additionally, technology enables the customization of learning activities to meet the individual needs of each student, resulting in variations in learning styles and abilities. Technology-based learning environments, including the use of animation, can promote cognitive development and literacy by providing various activities that support multisensory learning. This allows children to learn through visual and auditory experiences combined with interactive elements, helping to enhance their understanding and communication skills (Anh & Ha, 2020).

Learning through animation encourages children to explore their own interests, while simultaneously strengthening their metacognitive thinking and reasoning abilities. This has a positive impact on their literacy skills as they are trained to think deeply about the content they produce (Leung, Wu, & Li, 2024; Das et al., 2023). Animation-based interactive learning environments help enhance the cognitive development and literacy of young children by reinforcing their understanding and memory of concepts through enjoyable and interactive animations (Nuankaew et al., 2024). Engagement in animation activities enables children to build knowledge through guided interactions, making them more active participants in the learning process. Children are encouraged to create new things freely, thereby increasing their engagement in learning activities (Leung et al., 2024). Animation-based interactive learning environments are capable of recognizing and extracting dialogue, then generating appropriate audio, thereby assisting children in better understanding the narrative (Das et al., 2023).

Animations that incorporate interactive elements within multimedia learning environments help children focus their attention on the material, which is crucial for cognitive development and literacy (Barut Tugtekin & Dursun, 2022). The interaction facilitated by animated media also helps deepen the understanding of language concepts. Additionally, animation offers significant advantages in learning by integrating visually engaging contexts, which not only aid vocabulary memory but also improve overall learning motivation (Younas & Dong, 2024; Uzuegbunam et al., 2017).

According to Nurlaila et al. (2022), animation can also increase children's engagement and motivation during the learning process. It can enhance students' listening abilities and help them maintain attention throughout the learning process, particularly for young children. A fun learning environment with animations, such as Videoscribe, can motivate students to learn by engaging them in a more interactive and stimulating way, thus supporting children's cognitive development.

Undheim's (2022) research emphasizes that animation technology enables children to create their own content, thereby enhancing their motivation and engagement while helping them feel a sense of control over their learning process. In environments that provide space for exploration, animation allows children to perceive themselves as "actors" in their own learning, encouraging more active participation. Technologically driven, interactive learning environments based on animation offer children opportunities to develop literacy skills in ways that are meaningful and directly related to their everyday experiences. According to Marsh, J. (2006), animation also enables children to critically participate in

content creation. They can make decisions about story design, characters, and sound effects, which further enhances their desire to learn.

In the context of language literacy, Mou (2023) demonstrates that the concept of visualizing complex ideas through animation offers significant advantages for the cognitive development of young children. With the aid of dynamic visualization, children find it easier to understand and absorb material, thus enriching their literacy skills. Animation also plays a role in enriching children's critical thinking skills and literacy abilities. Deibl, Zumbach, and Fleischer (2023) highlight that animation in interactive learning supports mental processes by providing external representations that assist in building mental models. This approach helps children solve problems and think critically from an early age.

Moreover, animation supports social development through collaboration. Aronsson and Ågren (2022) demonstrate that it fosters collaborative skills that enhance children's social literacy as they interact with peers through animated games. This interaction encourages children to learn to share, cooperate, and understand each other's emotions, which are crucial for their cognitive and social development.

According to Schubertová et al. (2023) and Aditya et al. (2022), animation enables children to gain a deeper understanding of scientific concepts, such as speciation, through dynamic visual representations. These high-quality representations assist children in comprehending scientific processes, like natural selection, in a simple and engaging manner, thereby enhancing their scientific understanding.

Research by Thornberg and Sundqvist (2021) and Kalvin et al. (2024) further adds that animated learning environments supported by adult interaction help accelerate children's mastery of learning content. With adult guidance, children can easily connect what they see on screen with real-life situations, which is essential for grasping challenging concepts. Children also learn that stories can be conveyed through various media, and the shift from text to animation helps them understand the fundamentals of digital literacy. Animation also teaches children to think critically and creatively (Marsh, J. 2006).

By offering visually and interactively engaging content, this tool can capture students' attention and encourage them to actively participate in learning. This, in turn, can lead to better learning outcomes and a more positive learning experience (Alzubi, 2023). The use of interactive media and animation in the learning process also provides children with opportunities to enhance cognitive skills and literacy through experiences that engage multiple senses. This approach allows children to

absorb information more efficiently, improve their literacy skills, and simultaneously boost critical thinking abilities and comprehension (Kim et al., 2024; Larkins et al., 2023; Liu, 2021).

Following the discussion of animation above, it is important to note that the majority of educators believe that the use of computer technology, including animation, creates a supportive learning environment, characterized by its engaging, interactive, and motivating nature. The use of software that integrates audiovisual elements can increase children's interest and motivation to learn, making them more enthusiastic about the learning process (Alkhawaldeh et al., 2017). Moreover, the application of technologies such as animation has been shown to enhance children's engagement and motivation. Children demonstrate enthusiasm, satisfaction, and excitement when using these tools in the learning process, thereby making activities more appealing and encouraging their participation (Nikolopoulou, 2021).

Children showed increased involvement in the learning process. Based on observations: 85% of children actively responded to teacher questions during the animation show. Children appeared more focused and sat still longer compared to conventional learning methods. Some children even imitated animated characters in role-playing activities. Children sang educational songs more often. Children's interest in reading picture books and watching educational videos increased. Several parents also said that children found it easier to remember simple concepts such as colors, shapes, and letters.

Discussion

This study emphasizes that animation technology plays a crucial role in supporting cognitive development, literacy, engagement, and motivation in early childhood. Overall, animation technology has proven successful in creating an interactive and engaging learning environment for children, making them more enthusiastic about lessons and encouraging active participation in the learning process. The following is a deeper discussion on the impact of animation technology on the aspects of engagement, motivation, cognitive development, and literacy in early childhood:

1. Animation and Early Childhood Engagement

This research reveals that animation can significantly enhance children's engagement. This supports the "interactive visual technology" theory, which posits that visual media such as animation are effective in capturing children's attention. By utilizing moving characters, vibrant colors, and sound effects, animation is able to sustain children's focus during lessons. Previous studies have

also shown that animation can "bring to life" abstract lesson content, making it easier to understand (Leung, Wu, & Li, 2024). These findings align with constructivist theory, which asserts that knowledge is acquired through direct experience. As an interactive medium, animation enables children to gain understanding through active learning experiences. Animation provides an engaging visual stimulus, thus increasing the appeal of the learning material. This supports previous findings by Mayer (2001), who explained that multimodal learning (a combination of audio and visual) can improve comprehension and retention of information, especially in children.

2. Animation as a Driver of Learning Motivation

This study also found that animation has a significant impact on enhancing the learning motivation of young children. Learning environments supported by animation make the learning process more enjoyable, reduce anxiety when encountering new material, and ultimately increase motivation. These findings align with developmental psychology theory, which asserts that enjoyable and pressure-free learning experiences are more effective for children. This also supports the view of Barut Tugtekin and Dursun (2022), who argue that engaging visual elements and interactive experiences can foster stronger emotional connections with the material, thereby igniting children's enthusiasm for learning.

With interactive displays and easy-to-understand narratives, animations encourage children to participate more actively. Learning is no longer one-way, but becomes dialogic between children and teachers, even between children and children. This is in line with the active learning approach, where children not only receive information but are also emotionally and cognitively involved.

3. Interactive Learning Environments and Cognitive Development

This study demonstrates that animation-based learning environments support cognitive development in young children, particularly in areas such as critical thinking, problem-solving, and decision-making. Animation helps children learn to think logically and understand cause-and-effect relationships. These findings support Piaget's cognitive development theory, which emphasizes the importance of logical reasoning in understanding new concepts. Animation-based learning environments also encourage children to think logically and develop problem-solving skills, such as determining appropriate actions within an animation's storyline and understanding the consequences of their decisions. Animation often conveys moral and social messages through relatable characters, thus helping children's social-emotional development. Animated characters can model positive behaviors such as cooperation, empathy, and independence.

4. Literacy Development through Animation Technology

Animation technology plays a significant role in the literacy development of young children. The combination of animation with text and audio helps children recognize and understand new vocabulary in an engaging manner (Younas & Dong, 2024). These findings support early literacy theories that suggest children learn more rapidly when exposed to vocabulary in relevant and meaningful contexts. Animation presents words in everyday situations that are easily comprehensible for children, thereby providing a solid foundation for literacy development.

5. Social and Collaborative Skills in Animation Learning

This research also reveals that animation in collaborative learning activities can support the development of children's social and collaborative skills. As noted by Aronsson and Ågren (2022), learning with animation enhances social skills such as cooperation, negotiation, and idea-sharing. These findings align with Vygotsky's theory of the "Zone of Proximal Development" (ZPD), which asserts that children learn more effectively when collaborating with peers or adults who guide them. Through interactive animation, children learn to communicate, listen, and actively contribute to learning activities.

6. Negative Impacts and the Importance of Guidance in the Use of Animation

Although many benefits are derived from the use of animation, this study also highlights that animation, when used without proper guidance, can lead to negative effects. For example, Fan (2021) found that excessive fantasy elements in animation can disrupt children's focus. Therefore, adult supervision, such as that provided by parents or teachers, is essential to ensure that the use of animation aligns with learning objectives and does not distract children. This guidance is also crucial for explaining the content being learned and maintaining the child's focus.

CONCLUSIONS

Based on the results of a systematic literature review (SLR) using the PRISMA framework, it can be concluded that animation technology has a significant positive impact on early childhood learning processes. The use of 3D animation, rich in visual and interactive elements, has been shown to enhance children's engagement and motivation for learning, as noted by Abdel-Salam et al. (2022) and supported by findings from Vallefuoco (2022) and Ronfard et al.

(2023). Furthermore, animation plays a crucial role in enriching children's learning experiences by helping them understand complex concepts and supporting the development of critical thinking skills as well as literacy abilities, as outlined by Leung, Wu, and Li (2024).

Further findings indicate that interactive videos incorporating animation, as discussed by Xu and Warschauer (2020), can influence how children process information and increase their cognitive engagement. Although fantasy elements in animations can be distracting, as pointed out by Fan et al. (2021), when applied appropriately, these animations can still support the development of children's executive functions. (Thornberg & Sundqvist, 2021; Kalvin et al., 2024). Learning environments that utilize animation contribute to children's cognitive and literacy development by providing an engaging and visually and auditorily stimulating learning experience. The use of animation makes it easier for children to build knowledge interactively, improving both their understanding and memory (Nuankaew et al., 2024).

It can be concluded that animation has a significant role in increasing the effectiveness and interactivity of the early childhood learning process. The main conclusions obtained from this study are as follows: Animation increases children's attention and interest in learning. Bright visual characters, dynamic movements, and simple narratives make animation a very interesting medium for early childhood. This helps children focus more on absorbing learning materials. Animation strengthens children's active involvement in the learning process. Children tend to be more active in responding, singing, imitating movements, and answering questions when learning using animation compared to conventional methods. Animation-based learning supports cognitive and social-emotional development. In addition to helping understand basic concepts (such as letters, numbers, colors, and shapes), animation is also able to convey moral messages and shape characters through stories and figures that are easily identified by children. The role of teachers and parents as companions is very important. The use of animation will be more optimal if accompanied by teachers who are able to

direct learning activities interactively and parents who support the learning process at home. Animation is a tool, not a substitute for real interaction.

Although animation is very effective as a learning medium, it still needs to be balanced with conventional learning activities that involve direct interaction, real exploration, and physical play. Thus, animation has proven to be one of the learning media that can create a fun, interactive, and educational learning atmosphere for early childhood, as long as it is used appropriately and proportionally.

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