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Unveiling the Role of Smart Pinwheel Media in Supporting Alphabet Recognition Among 4-5-Year Olds

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Abstract

This study aims to analyze the use of smart pinwheel media in helping children aged 4–5 years recognize alphabet letters. The research was conducted at RA Al-Ikhsan, Banda Aceh, with samples selected using purposive sampling techniques. The research method employed was qualitative, with interviews conducted with teachers as the primary data source. Data were analyzed descriptively in a narrative form. The findings show that smart pinwheel media is effective in increasing children's interest and enthusiasm in learning alphabet letters. Additionally, the media supports children's development in letter recognition, particularly in pronunciation and the ability to associate letters with words that begin with those letters. However, several challenges were identified, including a lack of interest among some children and technical difficulties in using the media. Therefore, support from schools and training for teachers are crucial to optimizing the use of this media.

Keywords: *Smart Pinwheel Media, Alphabet Letters, Early Childhood Education, Interactive Learning.*

Abstrak

Penelitian ini bertujuan untuk menganalisis penggunaan media smart pinwheel dalam membantu anak usia 4–5 tahun mengenal huruf abjad. Penelitian dilaksanakan di RA Al-Ikhsan, Banda Aceh, dengan sampel yang dipilih menggunakan teknik purposive sampling. Metode penelitian yang digunakan adalah kualitatif, dengan wawancara kepada guru sebagai sumber data utama. Analisis data dilakukan secara deskriptif dalam bentuk narasi. Hasil penelitian menunjukkan bahwa media smart pinwheel efektif dalam meningkatkan minat dan antusiasme anak untuk mengenal huruf abjad. Selain itu, media ini juga mendukung perkembangan anak dalam pengenalan huruf, khususnya dalam pelafalan dan kemampuan mengasosiasikan huruf dengan kata-kata yang dimulai dengan huruf tersebut. Namun, beberapa tantangan yang dihadapi meliputi kurangnya minat pada sebagian anak dan kesulitan teknis dalam penggunaan media. Oleh karena itu, dukungan dari pihak sekolah serta pelatihan bagi guru menjadi hal yang sangat penting untuk mengoptimalkan penggunaan media ini.

Kata Kunci: Media Kincir Pintar, Pengenalan Huruf Abjad, Pendidikan Anak Usia Dini, Pembelajaran Interaktif

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INTRODUCTION

Early childhood education serves as a critical foundation for shaping children's character, skills, and potential (Nadlir et al., 2024; Saleha et al., 2022; Warmansyah et al., 2022). During the golden age period, between 4–5 years, children demonstrate remarkable abilities to absorb and process information from their environment. One essential skill that should be nurtured at this stage is early literacy, particularly recognizing alphabet letters (Amri et al., 2021; Fitriah Hayati et al., 2020). Santrock (2008) highlights that early literacy acts as a fundamental prerequisite for success in mastering reading and writing skills in later educational stages.

The introduction of alphabet recognition at a young age is critical because it acts as the entryway to future literacy development. Piasta & Wagner (2010) found that early knowledge of alphabet letters is a robust predictor of subsequent reading skill. The process of learning to recognize letters assists youngsters in developing phonemic awareness, which is necessary for grasping the link between sounds and letters (Setiowati & Warmansyah, 2023; Simmons, 2021). Early mastery of these abilities improves children's ability to decipher words and builds the foundation for fluent reading (Durand et al., 2013). Delaying letter introduction might result in gaps in literacy development, potentially impacting children's academic progress in later years.

Furthermore, the importance of alphabet recognition in early life is linked to its role in supporting children's cognitive development (Hewi, 2020; Nadlir et al., 2024; Oktaviana et al., 2021; Wahyuni et al., 2023). According to Whitehurst & Lonigan (1998), early exposure to reading tasks, such as letter recognition, promotes the development of memory, attention, and problem-solving abilities. As children become older, their cognitive capacities become more closely tied to their ability to comprehend and integrate complicated information. Introducing letter recognition in a disciplined yet entertaining approach ensures that children are not only ready to read and write, but also have the core cognitive tools they need for lifetime learning.

Despite the importance of early literacy, challenges persist in its implementation. Ismawati et al., (2024) states that unvaried and monotonous approaches often hinder students' active participation, resulting in boredom and a lack of interest in learning. Conventional teaching methods, such as rote memorization and lectures, dominate many early childhood education institutions. These approaches are less engaging for children, leading to low motivation and slower mastery of alphabet recognition skills (Firdaus, 2019; Fitriah Hayati et al., 2020; Hewi, 2020; Rahayuningsih et al., 2016; Ritonga et al., 2022). Consequently, there is a need for innovative learning methods that can create an enjoyable and interactive learning atmosphere.

Research by Zati, (2018) emphasizes the importance of providing a rich and stimulating literacy environment for young children. A well-designed literacy program that incorporates engaging activities can significantly enhance children's early reading and writing skills. Active participation in playful and meaningful learning experiences has been shown to foster children's cognitive and linguistic development, laying a

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stronger foundation for future academic success. This reinforces the idea that educators must adopt dynamic and child-centered teaching strategies to optimize literacy development.

Furthermore, Vygotsky's sociocultural theory highlights the importance of interaction in the learning process, particularly for young children. According to Vygotsky (2021), children learn best through social interactions and scaffolded guidance provided by teachers or peers. This approach aligns with modern educational methods that integrate interactive media and collaborative activities. By involving children in hands-on, engaging, and contextually relevant activities, educators can better support the acquisition of literacy skills. As such, integrating innovative methods that emphasize interaction and play into literacy instruction becomes imperative for addressing existing challenges and enhancing learning outcomes..

Initial observations conducted on July 24, 2024, at RA Al-Ikhsan, Banda Aceh, revealed that some children still struggled to recognize the alphabet compared to their peers. For example, certain children faced difficulties matching letters or symbols when asked to write their names. Although teachers utilized various teaching methods—such as letter cards, banners, singing, and loose-part activities—the results were still not optimal in capturing the interest of all children. These findings underline the necessity of more effective and engaging learning innovations tailored to children aged 4–5 years.

One promising innovation is the use of smart pinwheel media. As Sari & Simaremare, (2023) explains, the term "windmill" refers to an object that rotates, combining visual and physical elements to create an interactive learning experience. The smart pinwheel integrates games with learning activities, utilizing pictures and colors that children enjoy. This media provides kinesthetic learning opportunities, allowing children to actively engage with the material, thereby enhancing their focus and motivation. Such an approach aligns with findings from Hartono, (2013), who emphasizes that interactive media involving physical and visual activities can accelerate learning, especially in alphabet recognition.

Previous studies have demonstrated the effectiveness of interactive media in fostering early childhood learning. Priyanti & Warmansyah, (2021)noted that game-based methods increased children's motivation and supported cognitive, motor, and social development. Similarly, Safitri et al., (2022) reported that smart pinwheel media, which incorporates colors, movements, and physical interactions, helped improve children's focus and enthusiasm in learning. These studies highlight the potential of visual and interactive tools in introducing basic concepts such as letters, numbers, and colors, while also promoting fine motor and cognitive development.

Although existing research underscores the benefits of smart pinwheel media, most studies focus on general improvements in learning motivation and basic concept acquisition. Limited attention has been given to its specific impact on alphabet recognition in early childhood education and its integration into daily classroom

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activities. Furthermore, there is insufficient exploration of the challenges and practical strategies for optimizing its use.

This study aims to address these gaps by investigating the effectiveness of smart pinwheel media in improving alphabet recognition among children aged 4–5 years at RA Al-Ikhsan, Banda Aceh. By employing a qualitative approach, this research seeks to provide an in-depth understanding of how the media supports children's cognitive, motor, and social development, while identifying challenges and proposing actionable solutions. The novelty of this study lies in its focus on combining visual, kinesthetic, and interactive elements within the context of early literacy, offering practical insights for early childhood education institutions.

METHODS

This study uses a qualitative approach to analyze the use of smart windmill media in introducing letters of the alphabet to children aged 4-5 years at TK RA Al-Ikhsan Banda Aceh. Qualitative research aims to gain a deeper understanding of the phenomena that occur. And to determine the teacher's perception of the effectiveness of the media in the learning process. The population in this study were all teachers who teach children aged 4-5 years at RA Al-Ikhsan Banda Aceh. The sample of this study was taken using a purposive sampling technique, where teachers who were directly involved in the learning process using smart windmill media were selected as informants.

In this case, the research sample was one teacher who was responsible for group A learning which used smart wheel media to introduce the alphabet to children. The selection of teachers as samples was based on their experience in using the media. It was ensured that the teachers who would later become the research samples had direct involvement in the learning activities that were the focus of this research. To collect the required data, this research used an interview technique conducted with teachers. The interviews were conducted using prepared question guidelines. This activity also provided space for teachers to provide more in-depth and flexible answers. Teachers were invited to provide additional information related to the student learning situation in the classroom. This interview was intended to explore teachers' perceptions regarding the use of smart windmill media in learning to recognize the alphabet. And to find out to what extent this media is considered effective in improving children's understanding of the alphabet.

The data collected through interviews were then analyzed using qualitative methods using a thematic analysis approach. Interview transcripts will be grouped into a table according to the questions asked during the interview. Some things that will be asked include teachers' views on smart windmill media, its influence on students, and obstacles experienced when using the media. Then the results of the analysis will be discussed in the form of descriptive narratives. This study applies the source

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triangulation technique, which aims to compare data from teacher interviews with practical observations of classroom learning conducted by researchers.

RESULTS AND DISCUSSION

Results

This study aimed to analyze the implementation of the smart pinwheel media in teaching 4–5-year-old children at RA Al-Ikhsan Banda Aceh. Based on in-depth interviews with teachers, the findings of the study are summarized into several key themes.

Teachers expressed that the smart pinwheel media provided an engaging and interactive learning experience. One teacher stated, "*This media is very helpful. The learning process feels like playing, so the children remain enthusiastic and focused"* (W1). Teachers also noted that the media made it easier to explain letter concepts and encouraged active participation from the children.

The process of using the smart pinwheel media begins with preparing a circular tool designed with letters A-Z and supporting images. A teacher explained, "*We designed this media with consideration for visual and kinesthetic aspects. The children can spin the pinwheel and name the letters that appear"* (W2). In practice, games such as "guess the letter" and "find the letter pair" were used to enhance children's engagement.

Teachers observed a significant improvement in the children's ability to recognize letters. One respondent noted, "The children now find it easier to identify the shapes and sounds of letters. Some even begin associating letters with words, like 'A for Ayah'" (W3).

Initially, children showed curiosity about the media. A teacher remarked, "*The children seemed excited and curious when they first used the pinwheel. This made them more interested in learning"* (W4).

Despite its advantages, teachers faced some challenges, such as a decrease in the children's interest after repeated use and technical issues when the pinwheel became difficult to spin. One teacher shared, "*Sometimes the children get bored after spinning the pinwheel several times, so we have to create game variations*" (W5).

To address these challenges, teachers implemented different game variations and provided positive reinforcement. One teacher explained, "*We added physical activities, like asking the children to spin the pinwheel themselves, to keep them interested*" (W6).

The children's understanding was assessed through observation sheets. According to one teacher, "*We recorded the children's abilities in naming letters, pronouncing sounds, and recognizing simple words*" (W7).

For teachers, this media proved to be an effective tool for facilitating learning. As one teacher stated, *"The pinwheel is very helpful, especially in capturing the children's interest and simplifying the evaluation process"* (W8).

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Teachers expressed hope that this media would continue to be used to improve children's understanding. One teacher commented, *"We hope this media will continue to be utilized with more engaging variations*" (W9).

Support from the school played a crucial role in the successful implementation of the media. A teacher acknowledged, *"The school's support has been invaluable, from providing materials to offering training on how to use the pinwheel"* (W10).

The smart pinwheel media is used in three main stages. First, preparation is done by creating a pinwheel with a circular design, featuring letters A-Z and simple images relevant to each letter, such as "A for Apple." This media is designed to be easily spun by the children. Second, during the letter recognition stage, children take turns spinning the pinwheel, saying the letter displayed, and associating it with simple words. The teacher also uses this activity to introduce the letters in the form of words and sounds. Third, interactive games like "Guess the Letter" or "Find the Matching Letter" are conducted to increase children's engagement and help them remember the letters in a fun way. This activity also involves children in group activities to develop their social skills. The stages of using the smart pinwheel media can be seen in the photos below:

Fig 1. The teacher explains how to use the smart pinwheel media.

Fig 2. The children engage in the activity of recognizing the alphabet letters using the smart pinwheel.

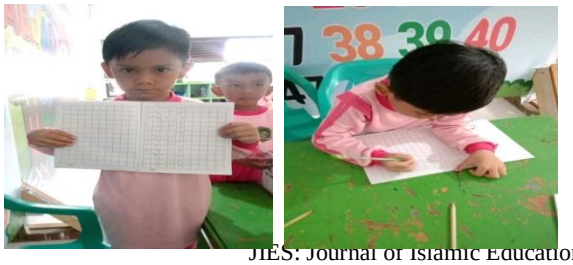

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Fig 3. The children engage in writing activities after learning the letters with the smart pinwheel.

Fig 4. The children sing together while saying the alphabet letters.

Fig 5. The children participate in an activity to demonstrate the shape of the alphabet letters.

Discussion

The findings of this study demonstrate that the use of smart pinwheel media has a significant positive impact on early childhood learning, particularly in the recognition of the alphabet. This aligns with the work of Wandini et al., (2021), who found that interactive learning media can enhance student engagement and material understanding. Smart pinwheel media addresses various aspects of learning, from fostering interest and comprehension to supporting motor and social development, proving to be an effective tool for enhancing the quality of learning at RA Al-Ikhsan Banda Aceh.

The smart pinwheel captivates children's attention with its vibrant design and dynamic spinning motion. These features create an atmosphere where learning feels like play, motivating children to concentrate for longer periods. Teachers at RA Al-Ikhsan Banda Aceh reported that children showed curiosity about using the pinwheel independently, which further motivated them to engage actively in learning. This observation is consistent with the characteristics of early childhood learners, who tend to learn better through activities that involve sensory engagement and movement (Bisma et al., 2023; Kurniawati & Husnayain Madani, 2024; Utami & Warmansyah, 2019).

The interactive nature of the pinwheel, which encourages children to spin it, name the letters, and link them to familiar objects, significantly enhances their understanding of the alphabet. For example, children started associating the letters with

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words they already knew, such as “A for Ayah” or “B for Bola.” This hands-on approach helped reinforce their memory and understanding of the alphabet in a contextualized way. According to the findings of Machdarini & Hidayat, (2023), using media that facilitates contextual learning can increase children’s ability to comprehend symbols, supporting their early literacy development.

Beyond cognitive development, the smart pinwheel media also supports motor and social development. The act of spinning the pinwheel promotes fine motor skills, which are crucial for hand-eye coordination. Furthermore, teachers reported that group activities involving the pinwheel encouraged positive social interactions. Children learned to take turns, cooperate, and communicate with one another, contributing to their overall social development. This aligns with research on social-emotional learning in early childhood, which emphasizes the importance of collaborative activities in building social competence (Ismawati et al., 2024; Nabila & Basri, 2023; Rahayu et al., 2021).

This study demonstrates that the use of smart pinwheel media has a profound impact on increasing children's interest and participation in early reading activities. It helps children understand the alphabet and its connection to words, facilitating their cognitive, motor, and social development. Despite encountering some challenges, such as a decrease in interest after repeated use and limited time for activities, the benefits of this media far outweigh the drawbacks. This finding is supported by Safitri et al., (2022), who highlighted the importance of interactive media in sustaining children's engagement in learning activities.

The study’s findings suggest that smart pinwheel media stimulates children's interest through visual and movement-based approaches. The physical interaction, such as spinning the pinwheel and naming the letters, creates an experience similar to reading a picture book, enhancing children's learning in a more engaging and interactive way (Devitawati, 2017). Children also began associating the letters with objects or words they recognized, such as "A for Ayah" or "B for Bola." This demonstrates their growing understanding of how symbols (letters) are connected to real-world meanings, aligning with the principles of early childhood literacy development.

In addition to enhancing letter recognition, the smart pinwheel media fostered active participation in pre-reading activities. Children were observed eagerly responding to questions, initiating interactions, and sharing their knowledge about letters and words they recognized. These high levels of engagement indicate that the media successfully created an interactive learning environment, one that promoted cognitive development while also encouraging social interaction among peers. This is in line with the findings of Sari & Simaremare, (2023), who emphasized that active participation in learning activities supports the development of early literacy skills.

The research highlights the significant positive effects of using smart pinwheel media in early childhood education. It enhances children's engagement, helps them better understand the alphabet, and supports their motor, cognitive, and social

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development. These findings align with previous research by Piasta & Wagner (2010) who emphasized the value of interactive media in early childhood learning environments. Given these positive outcomes, further exploration and development of such media can make valuable contributions to the field of early childhood education, improving the quality of learning for young children.

CONCLUSION

The study concludes that the use of smart pinwheel media positively impacts alphabet recognition among children aged 4–5 years at RA Al-Ikhsan Banda Aceh. This media effectively captures attention and fosters enthusiasm due to its interactive and engaging nature. Teachers observed that smart pinwheel media simplifies the learning process, making it easier for children to recognize alphabet letters while creating a dynamic and positive classroom environment. However, some challenges were identified, such as a decline in children's interest over time and occasional technical difficulties in utilizing the media. Teachers can address these issues through innovative strategies, such as incorporating interactive games and offering continuous encouragement. Moreover, the smart pinwheel media facilitates the evaluation of children's comprehension of the material being taught. Overall, this study demonstrates that smart pinwheel media serves as an effective and innovative tool for teaching early childhood alphabet recognition, contributing to the advancement of interactive, game-based learning methods.

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