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Braille *Flashcard* Media as a Learning Innovation for Early Reading among Children with Visual Impairment

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Abstract

The process of learning early Braille reading for children with visual impairments often encounters obstacles due to a lack of flexible instructional methods, barriers in tactile reading techniques, and limited fine motor readiness. Furthermore, the scarce availability of interactive teaching aids and the use of monotonous media in the classroom risk inducing boredom and diminishing students' learning interest. This study aims to examine in depth the implementation of Braille flashcard media as an instructional innovation for early reading among children with visual impairments. The research method employed is a literature review (*library research*) using a qualitative descriptive approach. Secondary data were obtained through documentation techniques by searching, identifying, and selecting relevant scientific references. Data analysis was conducted using content analysis (*content analysis*), which involved the stages of data reduction, data presentation, and conclusion drawing. The findings indicate that Braille flashcard media is an effective innovation for supporting basic reading skills, including recognizing letters, reading syllables, and understanding simple words. The process of consistently and repeatedly tracing Braille dot patterns enhances students' finger sensitivity, retention, and fine motor coordination. Moreover, the implementation of flashcards combined with educational games has proven to positively impact students' motivation, learning interest, and active participation, thereby mitigating boredom during the instructional process.

Keywords: Braille Flashcards Early Reading; Visual Impairment; Instructional Innovation

1. Introduction

Every individual, without exception, including those with visual impairments, has the right to receive equal education as emphasized in the principles of inclusive education (UNESCO, 2020). In the educational process, children with visual impairments require services and learning media that align with their characteristics and needs so that they can participate optimally in learning activities. This is in line with the findings of (Amin et al., 2024), who stated that assistive technology plays a significant role in enhancing the academic engagement of students with visual impairments, empowering them to participate actively, and accommodating the individual needs of each learner. One of the fundamental skills that is important to develop in children with visual impairments is early reading ability. (Loh et al., 2023) emphasized that education plays a critical role in determining the quality of life and socio-economic future of children with visual impairments, making early intervention to improve literacy skills crucial for improving their educational outcomes. Through this process, children are guided to recognize letter symbols, convert them into sounds, and gradually and systematically understand their meaning. This ability becomes the main

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foundation for children in understanding various information and supporting learning success at the next level.

In practice, learning to read Braille still faces various obstacles due to the limited flexibility of instructional methods. (Kana & Hagos, 2024) showed that one of the main obstacles in mastering Braille letters is the tactile reading technique, in which reading speed and fluency are influenced by the dexterity of the child's fingertips. In addition, (Loh et al., 2023) found that children with visual impairments generally have slower reading speeds compared to their sighted peers. This condition is worsened by differences in fine motor ability among children with visual impairments, which can complicate the process of feeling and understanding Braille symbols optimally. This ability becomes the main foundation for children in understanding various information and supporting learning success at the next level (Swenson, 2016).

The use of engaging media that suits learners' needs can create a more active and enjoyable learning atmosphere. In line with this, (Lee & Hock, 2023) emphasized that teachers need modules and systematic approaches for pre-Braille skills The development of pre-Braille instruction should also prioritize meaningful literacy experiences and individualized tactile exploration (Wormsley, 2016) to develop tactile awareness and perception, such as finger sensitivity and touch discrimination, before children enter the early Braille literacy stage. However, in practice, the process of early reading instruction is often confronted with the limited availability of interactive teaching aids. The use of monotonous and less varied media in the classroom risks triggering boredom among children with visual impairments. (Astuti et al., 2026) emphasized that the absence of engaging and interactive learning experiences can cause students to lose interest and feel bored during the learning process. Therefore, media that involve tactile stimulation are needed so that children can more easily recognize the symbols being learned.

One medium that can be used is the *Braille flashcard*. Flashcard media is essentially an instructional innovation capable of integrating visual elements, motor stimulation, and educational games, thereby helping students identify and understand symbols or objects directly and enjoyably (Astuti et al., 2026). The use of *Braille flashcard* media is considered an effective innovation in early reading instruction for children with visual impairments. This card-based medium is a low-cost and interactive alternative solution, enabling children to explore letters and words independently through play-based learning methods (Bintari, 2023). In addition to being practical to use, *Braille flashcards* can be adapted to the needs and abilities of learners, making instruction more flexible. The presence of this tactile learning aid is also in line with evidence-based pedagogical principles, which show that tactile stimulation for beginning readers is highly effective in building focus, increasing engagement, and strengthening information retention (Croake et al., 2024).

Responding to the importance of optimizing adaptive learning media, this article aims to examine in depth the implementation of *Braille flashcard* media as an instructional innovation for early reading among children with visual impairments. This study is expected to provide a practical and theoretical alternative solution for educators in addressing the problems of learning boredom and tactile motor barriers among students. By integrating tactile sensory stimulation through play-based learning methods, the implementation of *Braille flashcards* is projected not only to restore the independence and literacy interest of

children with visual impairments, but also to foster a more interactive and enjoyable inclusive education ecosystem.

2. Method

This study applies the literature review (*library research*) method with a qualitative descriptive approach. The qualitative descriptive approach is used to examine and describe various information related to the use of Braille *Flashcard* media as an instructional innovation for early reading among children with visual impairments. The literature review method was conducted by examining various relevant sources, such as books, scientific articles, journals, and previous research results. (Fadli, 2021) explained that a literature study is a data collection method carried out by searching, understanding, and constructing information from various sources related to the research topic.

The data used in this study are secondary data obtained from various literature sources related to Braille learning media, early reading ability, the characteristics of children with visual impairments, and instructional innovation. Data collection was carried out using documentation techniques through the process of searching, identifying, and selecting relevant scientific references, both from national journals, international journals, and other scientific sources that support the research.

The data analysis technique used in this study is content analysis (*content analysis*), which was carried out through the stages of data reduction, data presentation, and conclusion drawing. The data reduction stage was carried out by selecting and focusing data in accordance with the research focus, after which the data were presented narratively to facilitate the interpretation process. Subsequently, conclusions were drawn based on the themes and patterns found across various literature sources, resulting in a deeper understanding of the phenomenon under study (Nurahma & Hendriani, 2021).

3. Results and Discussion

3.1 Result

The results show that children with visual impairments rely on the sense of touch as their primary source for receiving information. In the early stages of reading, children with visual impairments not only need to recognize Braille letter symbols, but must also be able to distinguish dot patterns, train finger sensitivity, improve fine motor coordination, and accurately associate Braille symbols with language sounds. Therefore, the use of learning tools that suit the learning style of children with visual impairments is an important element in supporting the success of the early reading learning process.

The research results show that *Braille Flashcard* media is an effective instructional innovation for introducing Braille letters to children with visual impairments. This medium allows students to learn through the activities of touching, recognizing, and remembering Braille dot patterns repeatedly, thereby providing a more concrete and engaging learning experience compared to traditional methods that only use Braille books.

In addition to introducing letters, analysis of previous research discussed in this study shows that Braille Flashcards can also gradually improve the basic reading ability of children

with visual impairments. This improvement is reflected in students' ability to recognize Braille letters more quickly, read simple syllables, and understand word combinations more accurately. Several studies also state that repeated use of Braille Flashcards can strengthen students' memory of Braille dot patterns, making reading more fluent. The use of practical and flexible media allows students to practice reading both independently and with teacher guidance, in a more interactive learning atmosphere.

Based on the analysis of various references, the application of Braille Flashcards in basic reading instruction is generally carried out through several learning stages. The first stage is introducing Braille letters gradually, so that students can understand the difference in dot patterns for each letter. Next, students are given practice reading syllables and simple words using flashcards arranged according to their learning ability level. Several studies also explain that teachers can develop the use of Braille Flashcards through educational play activities, such as matching letter cards, arranging words, finding letter pairs, or word-guessing games. These activities aim to increase students' active participation and create a more enjoyable and less monotonous learning atmosphere.

3.2 Discussion

This finding is consistent with the theory that students with visual impairments acquire literacy most effectively through systematic tactile experiences and explicit instruction adapted to their sensory characteristics (Holbrook & Koenig, 2010). Based on the results of the literature review conducted, the use of Braille Flashcard media shows a fairly significant role in supporting early reading instruction for children with visual impairments. This medium is considered capable of adapting the learning process to the learning characteristics of children with visual impairments, who rely more on the sense of touch to receive information. Learning to read Braille not only requires the ability to recognize letter symbols, but also requires finger sensitivity, fine motor coordination, and the ability to accurately distinguish Braille dot patterns. Therefore, the use of tactile-based learning media such as Braille Flashcards is highly relevant to help students understand the concept of reading more concretely. The results of the study show that Braille Flashcards can help improve the basic reading ability of children with visual impairments, ranging from recognizing letters and reading syllables to reading simple words. The repeated use of Braille cards provides tactile stimulation that can strengthen students' memory of Braille dot patterns. This condition supports the theory put forward by Croake et al. (2024), that tactile sensory stimulation for beginning readers with visual impairments can increase focus, engagement, and information retention during the learning process. In addition to affecting reading ability, the use of Braille Flashcards can also increase students' motivation and active participation in learning. Learning activities combined with educational games such as matching cards, arranging words, and letter-guessing games create a more interactive and enjoyable learning atmosphere. Engaging instruction can reduce the boredom that often arises when students only use Braille books in a monotonous way. This finding is in line with the opinion of Astuti et al. (2026), who stated that interactive learning experiences can increase the learning interest of children with visual impairments. In its implementation, Braille Flashcards also provide flexibility for teachers in adapting learning materials to students' ability levels. Teachers can introduce Braille letters gradually, starting from single letters, syllables, to simple words. This gradual approach is important because the fine motor

ability and tactile sensitivity of each child with visual impairment varies. Thus, the use of Braille Flashcards not only helps the process of introducing Braille symbols, but also trains students' motor coordination and finger sensitivity. The development of tactile skills is also an important component of learning for students with visual impairments, as these skills support their ability to access information and develop greater independence in learning (American Printing House for the Blind, 2022).Nevertheless, the effectiveness of using Braille Flashcards is still influenced by several supporting factors, such as student readiness, the intensity of reading practice, and teacher creativity in managing instruction. Teachers play an important role in creating a consistent, enjoyable learning atmosphere and providing continuous reinforcement so that students' reading ability can develop optimally.

4. Conclusion

Based on the results of the literature review conducted, it can be concluded that Braille Flashcard media is an effective instructional innovation for supporting early reading ability in children with visual impairments. The use of this medium can help students recognize Braille letters, read syllables, and understand simple words through a direct and repeated tactile stimulation process. The learning process, which involves the activity of consistently touching Braille dot patterns, helps improve students' finger sensitivity, fine motor coordination, and memory of Braille symbol shapes, so that reading ability develops more progressively.

In addition to improving basic reading ability, the use of Braille Flashcards also has a positive impact on students' motivation, learning interest, and active participation during the learning process. Instruction packaged through educational play activities such as matching cards, arranging letters, and word-guessing games can create a more enjoyable, interactive, and less monotonous learning atmosphere. This condition shows that the use of varied media suited to the characteristics of children with visual impairments can help increase student engagement in learning activities.

Braille Flashcards also have the advantage of being practical, flexible, and easy to use both at school and at home. Teachers can adapt the use of the medium according to the ability level and needs of each student, making instruction more adaptive and individualized. Thus, this medium not only functions as a tool for introducing Braille letters, but also as a means to train tactile motor skills and build the learning independence of students with visual impairments.

Nevertheless, the success of using Braille Flashcards is still influenced by several supporting factors, such as student readiness, consistency of reading practice, learning environment support, and teacher creativity in managing instruction. Therefore, the implementation of appropriate, interactive, and sustainable instructional strategies is needed so that the benefits of using the medium can be obtained optimally. Overall, Braille Flashcards can be an effective alternative solution to overcome the obstacles of early reading instruction for children with visual impairments while supporting the creation of more inclusive, adaptive, and meaningful education for all learners.

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