

DIGITAL BOOK INNOVATION: OPTIMAL SUPPORT FOR VISUALLY IMPAIRED ASSISTANTS IN LEARNING

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Abstract

This study aims to develop a digital book as a tool for visually impaired assistants in assisting the visually impaired in inclusive education institutions. Involving 25 visually impaired assistants, the study used a mixed approach through questionnaires, in-depth interviews, observations, and thematic analysis. The results of the questionnaire showed that most of the visually impaired assistants found the digital books helpful, with 85% reporting ease of use and 90% stating that the accessibility features were useful for the visually impaired assistants. In addition, 88% of assistants saw an increase in mentor involvement in assisting the visually impaired. In-depth interviews revealed that the digital book accelerated the process of understanding blind materials for visually impaired assistants. Field observations supported these findings, showing an increase in the participation and skills of the visually impaired assistants. The thematic analysis highlighted ease of access, independence of learning, increased engagement, and the important role of visually impaired assistants. This research concludes that digital books are an effective tool in supporting inclusive education, with important implications for improving training and technological infrastructure for education policy. Digital book innovation offers a significant step towards a more inclusive environment for the visually impaired, supporting their social integration and full participation in daily activities.

Keywords: Digital book, Innovation, Learning, Support, Visually impaired assistants.

1. Introduction

Digital books are growing for facilitating education [1-7]. Digital books make information accessible [8] and mentor special needs caregivers [9], especially visually impaired assistants. For this fight, visually impaired assistants are essential. They help the visually impaired walk, climb stairs, etc. Many visually impaired struggle. Visually impaired struggle with resources and accessibility [10]. Thus, visually impaired assistants may struggle to help the visually impaired. They may struggle with visually impaired assistants' daily tasks. visually impaired assistants learn with digital books [11]. Readable digital content helps visually impaired assistants. For visually impaired assistants, digital books promote accessibility, engagement, and learning [12, 13].

Visually impaired people needs special treatments [14-17]. Visually impaired assistants use digital books to learn independently. Screen readers, larger font, and audio make online books appealing. Technology improves learning. These accessibility features let them read and comprehend. Visually Impaired Assistants learn better with digital captions [18].

Changes to backdrop, typeface, and audio create digital books. Managing their study environment and feeling independent might help kids succeed academically. They learn quickly and bravely. E-books inspire kids to learn. More research is needed on digital books and visually Impaired Assistants' learning independence. We know nothing about how successfully digital books enable visually Impaired Assistants to study and apply learning materials independently. Research is needed on how visually Impaired Assistants might learn from digital literature. Quality and assistive technologies should be studied in digital books.

This study aims to develop a digital book as a tool for visually impaired assistants in assisting the visually impaired in inclusive education institutions. The novelties of this study are (i) there is interactive and easy to understand by the blind companion, (ii) there are animated videos that are easy to learn, and (iii) easy to carry anywhere and use anytime.

2. Literature Review

Digital technology lets you preserve, carry, and read books using "small" equipment much smaller than the book [19]. Digital books have these advantages: (i) Electronic books are easy to use and save. Digital books are easily stored and utilized across devices. (ii) No storage is needed for digital books. (iii) Online or offline use makes digital books versatile. (iv) One-time production expenditures deliver digital books worldwide. (v) Digital books save the environment from paper manufacture. (vi) Digital books contain a variety of technologies and multimedia capabilities, making them rich in knowledge and features that make studying more fun. (vii) Anyone utilize digital books anytime and anywhere. Thus, use is easy and aids learning.

Visual impairment is usually damage to the part of the eye that connects the eye to the brain, resulting in damage to the nerves that connect the eye to the brain [20]. This condition is because of high pressure in the eye, resulting in significant visual impairment. Therefore, the visually impaired need assistance to lead a good social life. Table 1 shows categories of the visually impaired.

Table 1. Categorization of visually impaired.

Category	Description
Low Vision	Has a mild visual impairment
Partially Sighted	partial loss of vision
Totally Blind	Totally lost vision

Visually impaired struggle socially, especially on the road. Passing through a hole, narrow road, moving handrails, climbing stairs, reversing direction, opening a door, chair sitting, driving. These endanger their lives. Visually impaired assistants must also learn how to guide the blind to ensure safety while walking. Visually impaired assistants only have textbooks, which feel hefty and easy to carry. This inspired the developer to create a portable, useful book.

3. Method

Mixed techniques Research used qualitative and quantitative methodologies. This method assessed digital books, blind aides, and their views. This study examined visually impaired assistants in inclusive schools in five major Indonesian cities that utilized digital books. Intentional sample of 25 visually impaired assistants. Data was collected in many methods. First, visually impaired assistants were given a questionnaire to quantify digital book usability, accessibility, and learning impact. Visually impaired assistants were thoroughly interviewed to acquire qualitative data on digital book use and difficulties. Visually impaired assistants were observed using digital books in classes. To augment data, document analysis examines digital book reports for visually impaired assistants' education. Instructional support, user happiness, and digital book comfort are measured by Likert scales. To document learning outcomes, interactions, and digital book use, we devised observation and interview criteria. Survey quantitative data was analysed using descriptive and inferential statistics for patterns and relationships. Thematic analysis showed repeated themes and patterns in qualitative interview and observation data.

4. Results and Discussion

It featured 25 visually impaired assistants from inclusive education institutes. The equal gender ratio of visually impaired assistants ensured bias-free findings and a more thorough picture of their experiences. Most visually impaired assistants in this study were trained. Visually impaired assistants teach visually impaired children. These examples show the popularity of digital books and visually impaired assistants' challenges and solutions. The study uses experienced visually impaired assistants to investigate inclusive education digital book options. Research shows visually impaired assistants learning from digital books. Most visually impaired assistants found digital books beneficial and easy to use. The digital books were easy for 85% of visually impaired assistants, earning 4.5 out of 5. Over 90% of visually impaired assistants emphasized screen readers, expanded text, and audio in digital books. With an average satisfaction score of 4.7 out of 5, these components help visually impaired assistants understand. visually impaired assistants study easily with digital books.

Seeing visually impaired assistants said digital books boosted visually impaired assistants' attention and knowledge beyond simplicity and accessibility. Digital novels encourage visually impaired assistants [21], improving comprehension.

Visually impaired assistants learn from digital literature. Training and inclusive schools improve visually impaired assistants' learning with digital books. Detailed interactions with visually impaired assistants demonstrated digital books improve instruction. Visually impaired assistants said digital books speed up instruction by making knowledge accessible. Visually impaired assistants may focus on visually challenged kids because digital books are easy to navigate. Audio, large print, and screen readers improve vision. Visually impaired assistants claimed digital books improved accessibility and visually impaired assistants helpers learn faster. Visually impaired assistants claimed digital books boost learning confidence and independence. They enjoyed the text and audio speed customization. They build confidence and independence by controlling their learning. Digital books help blind people learn. using support, visually impaired assistants succeed in inclusive education using digital books [22]. Developers utilize flowcharts to control digital book content. The digital book flowchart is in Fig. 1.

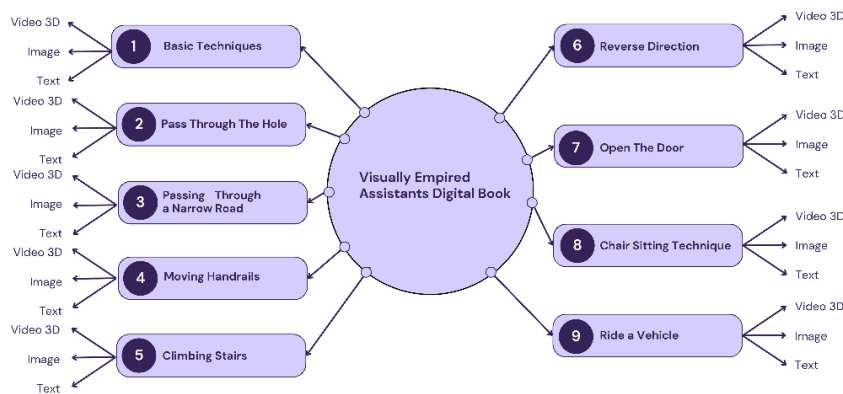


Fig. 1. Flowchart digital book.

Digital books increased visually impaired assistants' lesson involvement; observations indicated. Digital books please visually impaired assistants [23]. Digital books aid visually impaired assistants [24]. Visually impaired assistants comprehend digital literature. Digital books help visually impaired assistants learn and follow directions. Visually impaired assistants use digital literature in inclusive classrooms. Each piece of visually impaired assistants' digital literature has features. The basic, interactive 3D video, image, and text make the subject easy to learn. Basic Techniques, Passing Through a Hole, Narrow Road, Moving Handrails, Climbing Stairs, Reverse Direction, Open the Door, Chair Sitting Technique, and Ride a Vehicle are covered in this digital book. Figures 2 and 3 show the digital book display with 3D video and visual and text display.

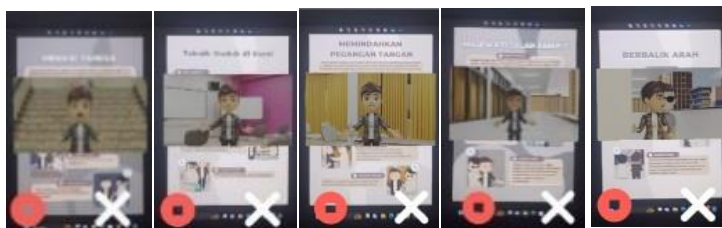


Fig. 2. 3D video digital book.



Fig. 3. Visual and text digital book.

Many topics emerged from visually impaired assistants' digital book use interviews and observations. Accessibility first. Digital books aid the visually impaired. Independence was goal two. Digital books enable visually impaired assistants to learn alone. Control learning with audio and text speed. Interactive and relevant digital books increase this. Digital books helped visually impaired assistants in this study's fourth focus. visually impaired assistants read e-books. Our thematic study suggests visually impaired assistants learn from digital books. Access, learning, engagement, and sighted companionship improve with this technology. The benefits of our digital book include boosting students' motivation to learn the blind buddy approach. Some traits help children learn quickly and properly. The features include 3D movies, enticing visuals, and concise sentences. According to the findings, digital books help visually impaired assistants learn.

The majority of visually impaired assistants surveyed stressed digital book usability and accessibility. They found digital books straightforward to use, helping visually impaired assistants learn. Audio also aids comprehension by giving an auditory alternative. The visually impaired assistants believed these elements helped them understand and assist better. Visually impaired assistants learn better with digital books simplicity of use and accessibility. In inclusive education, digital books make learning easier and more practical [25].

Digital books for visually impaired assistants boost learning confidence and independence [26]. Accessing and understanding things independently gives the visually impaired assistant a sense of accomplishment and freedom. Before digital

books, many people had trouble reading and explaining knowledge. Personalized information processing technology facilitates independent task completion and concept comprehension. visually impaired assistants gain confidence and independence. Digital books train visually impaired assistants to be independent. Therefore, digital books make education more inclusive [27].

Digital books in inclusive schools show how technology helps visually impaired assistants learn to assist the visually impaired appropriately. Digital books improve the teaching of visually impaired assistants [28]. This efficiency allows the caregiver to focus on the needs of the student rather than on manual explanations. Interactive digital books enhance learning [29]. Making learning more enjoyable with screen readers and zoomable text helps the visually impaired assistants. Digital books visually impaired assistants with new technologies and technical and pedagogical issues. Digital books help visually impaired assistants to assist better.

This research affects inclusive education, especially with digital texts. Visually impaired assistants learn and socialize better with digital literature. Inclusion schools use digital books to help visually impaired assistants learn. Technology helps them produce more interactive and accessible instructional resources, making learning more engaging and successful for all students. This maximizes instructional technology benefits for all pupils. New digital books encourage equal education. This technology aids student learning and integration. Digital books make education inclusive for all [30]. Finally, this study adds new information regarding special needs education, giving ideas for improving how the teaching and learning process, as reported elsewhere [31-39].

5. Conclusion

The study found that digital books helped the visually impaired assistants to understand and access the content. Screen readers, magnifiable text, and audio formats help visually impaired assistants to absorb educational content. Digital books increase the independence and interest in learning of the visually impaired assistants. Digital books help visually impaired assistants work better. Visually impaired assistants said that digital books make teaching more efficient and interactive, allowing them to focus on other areas of learning. These findings affect inclusive education significantly. This technology allows visually impaired assistants to fully engage in the classroom. The study found that digital books assisted visually impaired assistants in learning.

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