

Chapter 11

Activity Design for Students With Visual Disabilities Through an Auditive Notification and Voice Response Interface

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ABSTRACT

This chapter introduces the conceptualization of an educational task tailored for students who have visual impairments, utilizing audio notification and a voice-responsive interface. The design process employed the activity-centered design (ACD) methodology, which centers around the users and their specific requirements and context. This iterative approach facilitated the creation of a prototype device called “The Surfer Pad,” specifically engineered to aid individuals with visual disabilities in navigating audio-based activities such as audio instructions, audiobooks, and thought-provoking queries. However, further investigation is necessary for future endeavors, including 1) conducting evaluations of The Surfer Pad with people with visual disabilities, and 2) assessing the listening comprehension skills of individuals with visual impairments while fostering critical thinking and the analysis of audio content.

INTRODUCTION

Blindness and visual impairment significantly impact a student’s ability to access academic material and participate fully in classroom activities. Studies suggest that students with visual disabilities face

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numerous challenges in classroom settings, including but not limited to inadequate assistive technology, uninformed instructors, and lack of accessibility in educational materials and textbooks. Students with visual impairments require specialized equipment, assistive technologies, and certain strategies to promote learning and academic success. Moreover, students with visual disabilities experience social isolation and negative attitudes from their peers, which can significantly impact their academic performance and overall well-being (Amin et al., 2021).

Students with visual disabilities often experience difficulties accessing educational materials and participating in classroom activities that are visual in nature (Scruggs et al., 2007). The visual impairment may range from partial to severe and could potentially impact the student's ability to read printed material on a page or monitor, recognize faces, or understand spatial relationships between objects. Students with visual disabilities may require additional time to complete tasks or may require alternative methods to complete activities not originally designed for students with visual impairments. They may also miss vital information conveyed through nonverbal cues.

Lack of training and resources for teachers may also present a challenge for meeting the needs of students with visual disabilities in classrooms (Mwakyjeja, 2013). Teachers may not have adequate knowledge for identifying or addressing the learning needs of students with visual impairments. Teachers may also struggle with developing learning materials or teaching methods with little to no experience in doing so. Additionally, teachers may interpret the meaning of disability differently, thus, creating confusion among students who may receive conflicting treatment. Students with visual disabilities may also experience limited involvement with their peers because of their differences (Sacks et al., 1992).

INCLUSIVE EDUCATION AND THE NEED FOR ASSISTIVE TECHNOLOGIES

Inclusive education for students with visual disabilities promotes social inclusion and equal opportunities (Asamoah et al., 2018). It provides students with special needs the chance to learn under the same conditions as their peers. Inclusive education facilitates diverse learning styles and increases social interactions among students with and without disabilities. When schools provide equal opportunities, it improves the prospects of students with visual impairments, encouraging them to reach their full potential.

Assistive technologies can provide critical support for students with visual impairments in inclusive education settings (Mulloy et al., 2014). These technologies increase accessibility and participation at school and help students to learn more effectively. Some examples of assistive technologies include screen readers, Braille displays, magnification and text-to-speech software, and accessible textbooks. Assistive technologies promote autonomy, increase productivity, and improve self-esteem for students with visual disabilities, facilitating their inclusion into the classroom.

Inclusive education and assistive technologies also enhance the performance and academic achievement of students with visual disabilities (Erdem, 2017). Assistive technologies can overcome the challenges experienced by students with visual disabilities in the classroom, enabling them to access information, enhance their learning skills, and participate actively in the learning process. Moreover, inclusive education increases self-esteem and social interaction, building confidence in students, which ultimately impacts their academic achievement.

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