Chapter 6
Artificial Intelligence: An Educational Advancement for Students With Visual Disabilities

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ABSTRACT

A lot of industries, including education, are fast changing due to artificial intelligence (AI). Artificial Intelligence (AI) is evolving into a potent tool for meeting a variety of educational needs because to its ability to handle enormous volumes of data, recognize patterns, and carry out difficult tasks. One of its most exciting uses is the assistance it gives visually impaired pupils, giving them more chances to study, be involved, and be independent. Traditional teaching strategies and resources can provide serious difficulties for pupils who are visually impaired. A heavy emphasis on visual materials—like textbooks, whiteboards, and computer screens—can make it difficult for students to learn and participate.

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1. INTRODUCTION

1.1. Understanding Visual Disabilities

1.1.1 Definition and Categories of Visual Impairments

Visual Impairment is a general term for all forms of vision issues (Wang, Wang, & Zhang, 2023; Luo & Pundlik, 2022) minor to severe, that impair a person's ability to see clearly. It can range from partial visual loss to total blindness. Blindness is the entire lack of vision (Luo & Pundlik, 2022) or very restricted vision, which is commonly characterized as the inability to perceive light or discern any visual features. A condition in which a person's eyesight is significantly reduced and cannot be rectified with ordinary glasses, contact lenses, or medical therapies (Wang, Wang, & Zhang, 2023).

1.1.2 Categories of Visual Impairments

1. **Blindness:** Total Blindness is complete lack of vision, often known as no light perception. Functional blindness occurs when a person's eyesight (Pundlik, Shivshanker, & Luo, 2023) is substantially damaged, limiting their ability to do daily chores.
2. **Low Vision:** Central vision (Luo & Pundlik, 2022; Nguyen, Weismann, & Trauzettel-Klosinski, 2009) loss causes difficulty seeing objects directly in front of you while peripheral vision stays intact. Common in situations such as macular degeneration. Peripheral Vision Loss is the difficulty seeing objects at the outside borders of your visual field, as in glaucoma or retinitis pigmentosa. Night Blindness (Nguyen, Weismann, & Trauzettel-Klosinski, 2009; Moshtael, Aslam, Underwood, & Dhillon, 2015; Deemer et al., 2018) is the difficulty seeing in low light or darkness, which can impair activities such as driving at night.
3. **Color Vision Deficiency (Color Blindness):** Red-Green Colour Blindness: The most prevalent type, in which discriminating between red and green hues is difficult. Blue-Yellow Colour Blindness is a less common condition characterised by difficulty differentiating blue and yellow hues. Total Colour Blindness is an extremely rare condition in which no colours are perceived at all (Luo & Pundlik, 2022; Moshtael, Aslam, Underwood, & Dhillon, 2015).
4. **Refractive Errors:** Myopia (nearsightedness) causes difficulty seeing distant objects hyperopia (farsightedness) causes difficulty seeing close objects. Astigmatism is a vision distortion caused by an irregularly shaped cornea or lens that affects both near and distance vision. Presbyopia is an age-related condition