Chapter 4
Assistive Technology for Blindness and Visual Impairments:
Supporting Teachers in K–12 Classrooms

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ABSTRACT

This chapter will provide K-12 educators in regular and special education programs with an overview of the various assistive technology (AT) devices and services that can be used for students who are blind or have visual impairments. This chapter will include introductory information about blindness and visual impairments, including the causes, characteristics, types, prevalence, identification, assessment, and educational placement alternatives. The authors will introduce the student, environment, task, and tools (SETT) framework to identify a struggling student's learning needs and match those needs with the most appropriate assistive technology options. The chapter will cover the implementation of specific low-tech to high-tech AT devices, such as covered overlays, magnifying aids, vibrating pocket watches, large print backlit keyboards, electronic magnifiers, braille display devices, special optic glasses, and voice typing applications. Finally, this chapter will provide support organizations and resources for K-12 educators teaching in inclusive educational environments.

INTRODUCTION

According to the Center for Disease Control (2022), approximately three percent of children younger than 18 are blind or visually impaired. Visual impairments represent less than 1.0 percent of all students ranging from 6 to 21 years of age having a classification in special education. However, this prevalence is not representative of the total percentage of students with visual impairments because many students with visual impairments often have other "primary" conditions, thereby being reported in another Individual with Disabilities Education Act (IDEA) disability category (Heward, 2013).

The legal definition of blindness includes assessment of visual acuity and field of vision. Visual acuity is considered the clarity or sharpness of a student's vision. Field of vision, also known as peripheral vision, is the entire area a student is able to view when his or her eyes are fixated in one position. A student who is legally blind has visual acuity 20/200 or less in the better eye with corrective lenses or has a narrow field of vision no greater than 20 degrees. According to the definition of low vision, also known as partially sighted, a student who has low vision has visual acuity between 20/70 and 20/200 in the better eye with corrective lenses (Hallahan, Kauffman, & Pullen, 2018).

BACKGROUND

Adapting the educational environment to accommodate a student with a visual impairment requires an awareness of the student's level of functional vision (Project Deal, 2022). Every student with visual impairments has a different level of functional vision. Functional vision can be classified into three categories: low vision, functional blindness, and total blindness. Low vision is when a student uses their vision as the primary sensory channel for learning. Functionally blind is when a student has limited vision for functional tasks, but uses tactile and auditory channels for learning. Totally blind is when a student does not use any vision, but uses tactile and auditory channels to meet the demands of the environment and daily life. In addition to these three categories, it is important for teachers to know and understand the arrival of the visual impairment itself. For example, a visual impairment that is congenital in nature occurs before, during, or immediately following birth. In this instance, a student's visual impairment is present before established visual memory. An adventitious visual impairment happens after having normal vision. In this case, visual memory may remain during the lifespan of the student.

It is estimated that visual cues account for up to 80 percent of what a student learns in school (Project Ideal, 2022). Students with visual impairments have a limited

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