

Chapter 3

The Transformative Role of Assistive Technology in Enhancing Quality of Life for Individuals With Disabilities

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ABSTRACT

This chapter examines the critical role of assistive technology in enhancing the quality of life for individuals with disabilities by providing tools that promote independence and inclusivity. It categorizes assistive technologies into mobility aids, communication devices, cognitive assistance tools, and environmental control systems, highlighting their practical applications in daily life, education, and healthcare. The chapter also discusses the evolution of these technologies, from basic mobility aids to advanced digital solutions, and emphasizes the transformative impact of artificial intelligence

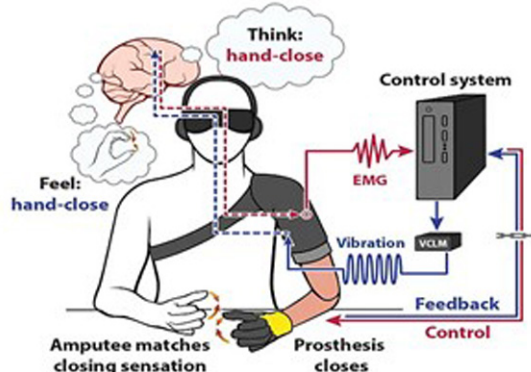
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in improving functionality and user experience. Factors influencing the adoption of assistive technologies, such as cost, accessibility, user preferences, and cultural attitudes, are explored, underscoring the need for ongoing research and innovation to ensure equitable access and support for all users.

INTRODUCTION

Assistive technology encompasses a diverse range of tools and devices specifically designed to aid individuals with disabilities in enhancing their functionality and independence (Bowser et al., 2015). These technologies serve to facilitate participation in everyday activities, educational pursuits, and employment opportunities. By addressing various barriers, assistive technology significantly contributes to improving the quality of life for individuals with disabilities. Mobility aids assist individuals with physical disabilities in achieving safe and independent movement. Examples include manual and powered wheelchairs, which provide essential mobility for those facing walking challenges. Walkers and canes offer stability and support for individuals who can ambulate but require assistance. Prosthetic limbs (see Figure 1) replace missing body parts, enhancing mobility and functionality, while electric scooters are designed for individuals who struggle with walking long distances. Mobility aids are utilized in various settings, including homes, workplaces, and public areas, enabling users to navigate their environments more efficiently.

Figure 1. System of a prosthetic arm and AI sensory receiver



(Marasco et al., 2018)

Communication aids facilitate effective interaction for individuals with speech or language impairments. These include speech-generating devices (SGDs), which produce spoken language based on user input, often utilizing touch screens or eye-

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