Chapter 2
Enhancing Quality of Life for Students With Disabilities Through Accessible Smart Technologies in Higher Education

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ABSTRACT

The integration of smart technologies in higher education has the potential to significantly enhance the quality of life for students with disabilities by fostering greater accessibility, independence, and inclusion. This chapter explores how emerging digital tools such as assistive software, artificial intelligence, adaptive learning systems, and smart campus infrastructure can address the unique challenges faced by students with disabilities. The chapter highlights how institutions can implement these technologies to create an inclusive learning environment by examining case studies, best practices, and policy frameworks. Furthermore, it discusses the barriers to technology adoption, including financial constraints, lack of awareness, and infrastructural limitations, while proposing strategies for overcoming these chal-

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lenges. This chapter underscores the transformative role of smart technologies in ensuring equitable educational opportunities and improving the overall well-being of students with disabilities in higher education.

INTRODUCTION

The advancement of smart technologies has revolutionised the landscape of higher education, offering unprecedented opportunities for students with diverse disabilities (Almufareh et al., 2024). In this context, disability encompasses not only sensory disabilities such as vision and hearing loss, and physical impairments, but also extends to neurodivergence (e.g., ADHD, autism, dyslexia), mental health conditions, chronic illnesses, speech and communication disorders, and invisible disabilities that may not be immediately apparent. Recognising this diversity is essential for creating truly inclusive academic environments. Smart technologies, including artificial intelligence (AI), adaptive learning systems, assistive software, and smart campus infrastructure, play a pivotal role in bridging accessibility gaps while fostering independence and social inclusion across this broad spectrum of needs. These tools facilitate academic success and greater engagement, enabling students to confidently navigate educational environments. For instance, AI-driven assistive tools such as text-to-speech software and real-time captioning support students with visual or hearing impairments, while adaptive learning systems personalise educational experiences to accommodate students with learning disabilities or cognitive challenges (Taylor et al., 2021). Similarly, mental health supporting applications, communication aids, and smart campus technologies enhance accessibility for students with less visible or complex conditions. The potential of these innovations to inspire independence, equity, and inclusion in higher education is significant and transformative. Embracing such a broad understanding of disability, this chapter underscores the importance of designing smart technologies that serve all students, ensuring accessibility is embedded as a foundation of equity in higher education.

Despite the transformative potential of smart technologies, challenges persist in their widespread adoption and effective implementation (Javed et al., 2022). Financial constraints, inadequate institutional support, lack of awareness, and infrastructural limitations often hinder students with disabilities from fully benefiting from these innovations. The high cost of implementing and maintaining advanced smart technologies in educational settings can be a significant barrier, especially in institutions with limited funding. Additionally, Monaco et al. (2024) mention that while higher education institutions recognise the importance of digital accessibility, the lack of consistent and comprehensive policies for adopting these technologies presents another obstacle. There is an urgent need for more extensive training and