


# Chapter 12

## Teaching Reading and Literacy Using Artificial Intelligence to Students With Intellectual Disability

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### **ABSTRACT**

*Reading and literacy are essential for academic success, social inclusion, and lifelong learning. However, students with intellectual disabilities (ID) often face significant challenges in developing these skills due to cognitive, linguistic, and memory difficulties. Advances in artificial intelligence (AI) offer promising solutions by providing personalized, adaptive, and evidence-based approaches to literacy instruction. This chapter reviews current research on literacy development for students with ID, highlighting effective interventions, instructional strategies, and the role of AI in fostering reading and writing skills. It explores how AI technologies, such as intelligent tutoring systems and gamified learning platforms, can address the unique needs of students with ID, enhancing motivation, engagement, and academic outcomes. By analyzing the capabilities and limitations of AI in inclusive education, this chapter contributes to the discourse on equity, innovation, and the future of literacy instruction for students with ID.*

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## INTELLECTUAL DISABILITY AND LITERACY CHALLENGES

Intellectual disabilities (ID) are neurodevelopmental disorders characterized by limitations in intellectual functioning, such as reasoning, problem-solving, and adaptive behavior. These limitations significantly affect communication, social interaction, and academic achievement (Schalock et al., 2021). The American Association on Intellectual and Developmental Disabilities (AAIDD) highlights that intellectual disability involves adaptive behavior challenges in addition to cognitive difficulties. Importantly, both cognitive abilities and adaptive behavior can improve with appropriate support and interventions.

The degree to which individuals with ID can function effectively is largely influenced by the level and quality of support they receive from their environment. The AAIDD defines support as the strategies, services, and resources required to help individuals with ID engage in everyday activities and reach their full potential (Thompson et al., 2009). This support can vary in intensity, ranging from occasional assistance to continuous, high-intensity intervention, depending on the specific needs of the individual (Switzky, 2006). Research suggests that high-quality, individualized educational programs and interventions play a pivotal role in fostering cognitive, social, and functional development (Hallahan et al., 2022).

Individuals with ID experience significant memory difficulties (Levorato et al., 2011), along with widespread challenges in both language comprehension and expression. The specific nature of these difficulties largely depends on the etiology of their condition (Abbeduto et al., 2006). Current research (Burack et al., 2020; Giaouri & Alevriadou, 2021; Hallahan et al., 2022; Hodapp & Fidler, 2016) indicates that individuals with ID face considerable learning difficulties due to delayed cognitive development, difficulties in generalizing and transferring knowledge, an inability to engage in reversible thinking, and challenges in information processing. They also exhibit limitations in short-term and working memory (van der Molen et al., 2007), selective attention, and the use of cognitive strategies (Tsakiridou & Alevriadou, 2017; Zagaria et al., 2021).

Children with ID struggle with identifying task demands and retaining necessary information. Their reliance on inflexible and ineffective processing strategies often leads to higher failure rates in problem-solving tasks (Alevriadou & Giaouri, 2011; Giaouri et al., 2010; Giaouri et al., 2021; Wehmeyer, 2001). Moreover, they face significant difficulties in applying cognitive and metacognitive strategies, although cognitive limitations vary among individuals (Dermitzaki et al., 2008; Ferretti, 2019). As they encounter repeated experiences of failure and frustration, children with ID often develop a strong sense of learned helplessness, which intensifies with age (Weisz, 1999; Alevriadou & Giaouri, 2009).

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