

Chapter 11

Navigating the Ethical Frontier: Emerging Dilemmas at the Intersection of Special Education and Artificial Intelligence

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ABSTRACT

Artificial intelligence (AI) is transforming special education by enabling personalized learning pathways and innovative assistive technologies. However, its growing use raises critical ethical concerns, including algorithmic bias, data privacy, and fairness. Biased algorithms can lead to misdiagnoses or inappropriate learning recommendations, while the collection of sensitive student data increases privacy risks. Many educators also lack the training to critically assess AI-generated outputs. Ensuring inclusive and transparent AI design is essential to providing equal opportunities and avoiding the reinforcement of educational disparities. Policymakers, developers, and educators must collaborate to establish clear, enforceable guidelines that protect student rights and promote ethical AI use. This chapter explores the expanding role of AI technologies in special education by advocating for a balanced approach that supports innovation while prioritizing ethical responsibility and inclusion.

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INTRODUCTION

Advancements in science and technology have significantly influenced special education (SE), improving educational processes for researchers, specialists, and teachers (Hamutoglu et al., 2022; Inci & Köse, 2023). Artificial intelligence (AI) applications are among these advancements, supporting individualized education, communication, and independent living skills for individuals with special needs (Tsouktakou et al., 2024).

AI, defined as the ability of machines to analyze data, learn, and make decisions, has become an essential tool in education (Morandín-Ahuerma, 2022; Saxena et al., 2023). In SE, AI facilitates personalized learning, assessment, and communication (Holman et al., 2024; Scott et al., 2024). AI-based assessment systems analyze students' cognitive, linguistic, and social skills, assisting teachers in developing Individualized Education Programs (IEPs) (Rakap, 2024). These systems help teachers allocate more time for direct instruction while providing instant feedback to students (Goldman, 2024). Additionally, AI-powered augmentative and alternative communication (AAC) tools enhance interaction for individuals with speech impairments (Zhumazhan et al., 2024).

Despite its advantages, AI integration in SE raises ethical, pedagogical, and systemic concerns (Ersoy, 2025; Martínez-Requejo et al., 2025; Taneja et al., 2025). Since AI systems rely on large datasets, biased training data can lead to misdiagnoses, disproportionately affecting marginalized students. For example, an AI-based autism diagnostic system in the U.S. showed discrepancies in diagnosing Black students compared to White students due to biased datasets (Marino et al., 2023). Similarly, AI systems assessing neurological differences like dyslexia and ADHD may generate false positives or negatives, misguiding educators and families. Another major concern is the reduction of teacher-student interactions. AI-driven tools, while enhancing instruction, cannot replace the emotional and social guidance provided by educators. A study in Japan found that students in AI-assisted classrooms experienced a decline in social development and relationships with teachers (Walugembe et al., 2024). Students with special needs require human-centered support, and an over-reliance on AI may weaken the effectiveness of educational processes.

AI applications in SE also pose risks regarding data privacy. AI continuously analyzes students' cognitive and emotional data, and unauthorized sharing of this information raises significant ethical concerns (Howorth et al., 2024). In some countries, AI-based monitoring systems track student behavior without consent, with this data being shared with commercial entities. Protecting sensitive student information is crucial within legal and ethical frameworks.

Another issue is the accessibility of AI-assisted educational tools. Due to their high costs and technical requirements, these tools may not be equally available to all students. Schools in low-income or rural areas face challenges in adopting AI technologies, potentially exacerbating educational inequalities (Holmes et al., 2018). A study in Europe found that AI-supported tools were predominantly used by private schools and well-funded public institutions, further widening the gap in educational opportunities (Marino et al., 2023; Rakap, 2024).

Ensuring AI supports equity rather than reinforcing disparities is crucial. SE must prioritize applications that enhance well-being, promote independence, and improve quality of life (Alkan, 2024). AI should serve as a supportive tool rather than a substitute for educators. While AI facilitates efficiency in education, its risks, limitations, and potential for misguidance must be carefully considered. AI systems collect and analyze large-scale educational data to improve learning. However, this data-driven approach raises concerns about privacy violations and algorithmic bias. AI-generated assessments may exclude

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