Chapter 3
AI and the Ethics of Student Data Privacy

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ABSTRACT

As artificial intelligence (AI) becomes increasingly integrated into education, concerns about student data privacy and ethical AI use are growing. AI-driven learning platforms and predictive analytics rely on vast amounts of student data to personalize education, but this raises ethical challenges related to data security, informed consent, algorithmic bias, and potential misuse. This chapter explores the implications of AI on student data privacy, examining current legal frameworks such as FERPA and GDPR, best practices for ensuring transparency and accountability, and strategies for equitable and secure AI implementation in education. By addressing these concerns, institutions and policymakers can create AI-driven learning environments that protect student privacy while maximizing innovation and educational benefits.

INTRODUCTION

The fallout from the digitization of education is an enormous volume of data. The use of artificial intelligence (AI) in education exacerbates the production of data. 'Big data' in education, as in other domains, is touted as having significant potential benefits. The collection and analysis of big data is facilitated by machine learning and other algorithms developed in the field of AI. In education, the integration of AI technologies into classrooms has spawned a growing movement towards personalized education. It seems that the vision of providing highly student-centered, individualized

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education, tailored to the needs of individual students in mass education systems, is a real possibility. Embedded in the excitement about the possibilities enabled by AI and big data is a significant (and well-justified) concern.

With the increasing reliance on AI-based educational technologies, institutions must carefully navigate the social, ethical and legal challenges associated with student data collection, storage, and use. AI-powered learning management systems, predictive analytics, and automated assessments generate massive datasets that contain sensitive personal information, including academic performance, behavioral patterns, and even biometric data in some cases. Without proper safeguards, this data can be susceptible to breaches, unauthorized access, or misuse by third parties. Moreover, AI algorithms, if not properly designed and monitored, can perpetuate biases, inaccuracies, and privacy violations, further complicating the ethical landscape of AI in education (Baker & Hawn, 2021) (Idowu, Koshiyama, & Treleaven, 2024).

The aim of the present chapter is to add voice to the necessity of addressing the ethical and legal challenges associated with the collection, analysis and use of student data in an increasingly AI rich education system.

THE COLLECTION AND USE OF STUDENT DATA

Artificial intelligence (AI) is revolutionizing education by enabling new methods of instruction, assessment, and student engagement. AI-driven technologies are transforming traditional learning environments, making education more personalized, efficient, and data-driven (Peng, Ma, & Spector, 2019) (Rahiman & Kodikal, 2024).

AI applications in education are designed to improve learning outcomes by leveraging vast amounts of student data to create personalized learning experiences. Personalized learning platforms use AI algorithms to analyze students' strengths, weaknesses, and learning preferences, tailoring instructional content to their specific needs. AI-powered tutoring systems, such as Carnegie Learning's MATHia (https://www.carnegielearning.com/solutions/math/mathia/) and IBM Watson Tutor, provide real-time feedback and individualized lesson plans, ensuring that students receive targeted support in areas where they struggle (Georgia Tech, 2016). These technologies enable a more student-centered approach to education, enhancing engagement and retention by delivering content at the right difficulty level for each learner.

In addition to personalized learning, adaptive assessments have gained traction in AI-powered education (Khine, 2024). Traditional standardized tests often fail to capture students' true abilities, as they do not account for individual learning progress and contextual factors. AI-driven adaptive assessments adjust in real time based on student responses, ensuring that each question matches their skill level. This method provides a more accurate measurement of student proficiency, reducing