Chapter 5
Algorithmic Bias in Generative AI:
Implications for Critical Pedagogy, Inclusivity, and Equity in Education

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ABSTRACT

This chapter examines the implications of algorithmic bias in generative AI for critical pedagogy, inclusion, and equity in education. This chapter explores how generative AI tools, increasingly prevalent in educational settings, can perpetuate cultural, gender, racial, socioeconomic, and accessibility biases due to skewed educational data and design choices. Through a critical pedagogy lens, they highlight the risks of reinforcing systemic inequalities and marginalizing diverse learners, drawing on real-world examples and theoretical frameworks from scholars such as Freire and Noble. The chapter suggests actionable strategies for reducing bias and aligning AI with educational justice, such as diversifying data sources, encouraging inclusive development teams, ensuring transparency, and implementing ongoing audits. The chapter concludes with a call for educators, policymakers, and technologists to collaboratively reimagine AI as an equitable learning tool, as well as directions for future research.

DOI: 10.4018/979-8-3373-1195-1.ch005

INTRODUCTION

Imagine a classroom in which the teacher is not a human being. A classroom in which the teacher is a complex disaggregation that can create lesson plans, obtain different resources, and even provide personalized feedback. One might assume that this is science fiction, but it is not. It is the rapidly emerging reality of productive artificial intelligence (AI) in education. Generative AI tools such as ChatGPT, DALL-E, DeepSeek, Grok, Claude and newer iterations such as the one that inspired this text promise efficiency, productivity, and scalability, transforming the way we teach and learn. However, behind this glamour lies a constructive question: What happens when the practices that shape our educational spaces carry biases that alter and sometimes exacerbate the inequalities on which they are built? This chapter examines the phenomenon of algorithmic bias in generative AI and explores whether this has implications for critical pedagogy, inclusion, and educational equity. This discussion is important not only for technological developments or educators but for anyone who cares about what kind of society we are building for future generations.

The Role of Generative AI in Education

Generative AI refers to systems that can produce materials such as writing, graphics, music, and more using patterns learned from large data sets. These tools are becoming increasingly common in education. Generative AI is used by teachers to create lesson plans, by students to help with homework, and by institutions to create adaptive learning platforms. UNESCO's 2023 report emphasized that AI-driven tools are reshaping the delivery of education worldwide, with applications ranging from language training to virtual simulations (UNESCO, 2023). The attraction of this is clear: generative AI can personalize learning at scale and fill gaps where human resources fall short; however, as personalized learning is often idealized with past technologies, this potential should be critically evaluated to avoid overhyped expectations that fail to deliver meaningful, evidence-based advances (Bozkurt et al., 2024).

But this isn't just about convenience. The integration of AI into education reflects a broader shift toward digital ecosystems that promise to democratize knowledge. For underserved communities, where access to quality education has long been limited by geography or funding, AI offers a tantalizing possibility: a tutor that never sleeps, a library that fits in your pocket. Yet, as we embrace these tools, we must ask who this technology really serves? The answer, as we'll see, depends heavily on how these systems are designed and what biases they carry.