Chapter 12
Artificial Intelligence in Social Sciences: Transforming Education and Research

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ABSTRACT

Artificial intelligence (AI) is significantly transforming social science education and research by enabling efficient analysis of large datasets, identifying trends, and providing insights from complex social issues. AI is particularly useful in fields like sociology, economics, political science, and psychology, where large-scale data analysis is crucial. In education, AI is transforming teaching methods by utilizing digital platforms and virtual assistants to adapt learning processes to different learners' preferences. It is also crucial in curriculum design, providing adaptive learning systems and facilitating the creation of novel instructional techniques. However, the adoption of AI technology faces challenges, including resistance from educators and ethical concerns like privacy infringement and discrimination. Case studies of successful AI use in academic and research institutes demonstrate their effectiveness in improving research productivity, facilitating educational activities, and making learning more interactive.

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INTRODUCTION

The term Artificial Intelligence (AI) describes a major technological revolution. It is defined broadly as a machine's attempt to imitate human cognitive functions such as learning and problem-solving. Precisely, AI systems can accomplish the tasks of learning, reasoning, and self-correction using advanced algorithms and computational models (Hedayet & Haseen, 2024). The significance of AI in social sciences becomes clear because it provides sophisticated tools and approaches for analyzing and interpreting social phenomena that are often very complicated to understand (Bail, 2024). Similarly, AI-enabled social science research that goes beyond traditional methods, like sentiment analysis, predictive modeling, and behavioral analytics, allows for the exploration of massive datasets and the identification of relevant relationships that would have previously been ignored (Bircan & Salah, 2022; Oliński et al., 2024).

The use of AI in different industries like healthcare, finance, and transport has ignited a debate about its impact on various fields, especially the social sciences (Aldoseri et al., 2023). This cross-connection exists because of AI's sequential impact on workflow efficiency, multi-faceted decision-making capabilities, and innovation in problem-solving techniques. At the same time, the computational social sciences, which deal with how social phenomena can be understood through quantitative techniques, highlight the need to merge social inquiry with AI technologies (Bircan & Salah, 2022; Taheri, 2023). The ability of AI to challenge fundamental beliefs about several approaches raises skepticism and forces a re-evaluation of traditional structures. It makes the possibility of the dissolution of methodological boundaries scientific, which can foster new approaches to achieving comprehensive solutions to complex problems.

Modern AI tools radically shape teaching and learning practices in social sciences, revolutionizing research and education. As the adoption of AI tools to personalize lessons and increase student participation grows (Aliyu, 2024; Zawacki-Richter et al., 2019), educational institutions are making more efforts to integrate AI into their curricula. These tools enable educators to develop tailored learning strategies that meet unique student needs and prepare learners for a highly technological world. Studies suggest that AI competency is becoming increasingly critical to student success in a future labor market dominated by technological needs (LaVelle et al., 2023). At the same time, in research, AI technology makes it possible to process extensive data quickly, allowing for new approaches like agent-based modeling and qualitative improvements to new social theories (Bail, 2024; Morley et al., 2020).

Combining AI and social sciences poses important ethical and governance issues that must be addressed. Morley et al. state that researchers have recognized the frameworks surrounding bias, data privacy, and the ethical implications of AI