AI in Higher Education:
Reshaping Teaching, Learning, and University Governance for the 21st Century

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ABSTRACT

Artificial Intelligence (AI) is increasingly becoming a transformative force in higher education. Integrating AI at various levels within academic institutions can enhance educational outcomes, improve learning experiences, and optimize administrative processes. This especially applies to Generative AI, whose rapid adoption and development created numerous challenges and opportunities in higher education. The article examines how AI is reshaping teaching, learning, and institutional governance in the higher education sector, along with exploring its transformative potential in supporting universities to adapt to 21st-century trends. It also presents real-world case scenarios, theoretical studies, and practical frameworks for educators, administrators, and stakeholders. By examining these areas, the article provides a roadmap on how institutions can adopt a strategic approach to leverage AI efficiently and responsibly while addressing this technology's ethical, social, and practical implications.

INTRODUCTION

Comprehensive technological changes and continuous scientific advancement have profoundly changed every aspect of work and life. From everyday tasks to work routines, technology has become an integral part of our lives and work. As new technological tools and solutions emerged, they were integrated into educational processes and instructional and research frameworks at all levels. From Internet databases to computer-based assessment or web-based learning and learning management systems (LMS), educational technologies have become integral to all levels of education. Higher education institutions are no exception; contemporary teaching practices differ significantly from similar practices thirty years ago. The application of technology in the higher education sector experienced exponential growth, starting with specialized technological applications and steadily becoming an integrated component of teaching,

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learning, and research processes in academic environments (Ashwin et al., 2022; Barret et al., 2024), reaching the levels of hyper-personalized learning (Jayaram, 2024).

While we have been witnessing fast technological development for years now, the recent progress made in the field of artificial intelligence (AI), especially in the area of Generative Artificial intelligence (GenAI), may still be one of the most significant disruptors of processes in higher education (Chiu, 2023; Fleischmann, 2024; Jaboob, 2024). The fundamental change from AI as a specialized tool to AI as a tool efficiently utilized by the general population happened in 2022 when the first generative AI model, ChatGPT, was launched. Since then, artificial intelligence, its impact, and its potential use have become the focus in all areas, including higher education.

Artificial intelligence solutions have the potential to revolutionize higher education at all levels fundamentally. The transformative power of AI can introduce technologically advanced solutions for teaching, learning, and administrative processes, ushering in a new era of education (Chan, 2023), and opening new opportunities for personalized learning (Bose, 2025; Sornavalli et al., 2025), moving even to the level of AI-assisted supervision of doctoral students (Thong et al., 2025). However, the current adoption of AI in higher education institutions varies widely due to differences in perceived risks of its use, infrastructural and accessibility challenges, and overall organizational culture and expectations (Nagy et al., 2024). Additionally, there is a significant concern related to the digital divide. Maphosa and Maphosa (2023) argued that AI-related research output mostly comes from economically advanced countries, while less developed countries are underrepresented. Despite that, AI has the potential to help underdeveloped regions and countries overcome digital inequalities in education and, therefore, could be leveraged (Hussein et al., 2025).

Sanabria-Z et al. (2023) and Singun (2025) argued that to address those challenges, higher education institutions must urgently align their learning goals and preferred learning outcomes with technological capabilities. The potential of AI applications in educational institutions is vast; however, it comes with both opportunities and challenges. While AI can enhance many processes within the higher education institution, from teaching and learning to administrative tasks, it comes with a burden of ethical concerns, such as data privacy, biased data, and breaches of academic integrity in using Generative AI tools to create student assessments (Chaparro-Banegas et al., 2024; Chan, 2023). Similarly, Ahmed et al. (2025) and Williams and Ingleby (2024) discussed AI's capacity to optimize administrative tasks, provide personalized learning solutions, and create dynamic and interactive educational experiences. They argued that introducing AI in the educational processes within universities must be accompanied by fundamental changes in the pedagogical approaches, focusing on ethics, data privacy, and eliminating biases and resistance to change.

At its core, universities should be leaders in science, innovation, and advancement, with an agile approach and fast adoption of innovative solutions. However, after the launch of Chat GPT in 2022, higher education institutions first reacted by forbidding generative AI in classrooms. One-third of the UK Russel Group universities, including Oxford and Cambridge, immediately placed a ban on the use of generative AI tools in classrooms, labeling them as a breach of academic integrity (Chan, 2023). AI checkers, which some companies rushed to introduce, created a number of additional challenges, resulting in ungrounded cheating accusations and student complaints.

The potential benefits of artificial intelligence (AI) integration in higher education are vast. Artificial intelligence (AI) has the potential to become a cornerstone of innovation in higher education and reshape traditional learning environments. AI solutions can support the creation of tailor-made personalized