Chapter 1
The Impact of AI on Higher Education Trends and Educational Horizons

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ABSTRACT

In the 21st century, artificial intelligence (AI) is rapidly transforming all areas of life, including education, where it has the potential to trigger a fourth revolution. This review uses a bibliometric analysis, guided by the PRISMA framework, to examine the use of AI in higher education. The study analyzed 1,520 articles from the Scopus database, narrowing it down to 373 relevant papers. The results reveal a significant increase in publications since 2020, highlighting global interest in AI's role in higher education. The research shows the multidisciplinary nature of AI, with contributions from various countries, institutions, and authors, with Chan, C.K.Y. being the most prolific author. AI's growing presence in education signals its importance for global educational reform, underscoring the need for continued

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research and international collaboration to enhance educational resources and student learning. The study recommends further technological development and knowledge expansion to maximize AI's potential in education.

1. INTRODUCTION

In the 21st century, artificial intelligence (AI) develops rapidly and penetrates every area of our lives. The integration of AI and higher education is changing the way that teachers and students collaborate in the classroom, prompting the development of human-AI synergy in classroom instruction (Crompton & Burke, 2023; Wang et al., 2024). According to Chen et al. (2020), teaching and learning in higher education needs cognitive abilities, learning, adaptability, and decision-making capabilities, which are consistent with the characteristics of AI. By ways of personalized learning, teaching support, management optimization, real-time evaluation and feedback, transcultural combination, and collaborative learning, AI adapts to the different needs of higher education(Chen et al., 2020; Popenici & Kerr, 2017; Tapalova & Zhiyenbayeva, 2022). Many studies have proven the effectiveness of AI in higher education. For example, AI helps educators develop and introduce personalized methods to acquire new knowledge and establish abilities (Tapalova & Zhiyenbayeva, 2022), improve teaching efficiency(Allen et al., 2021) and plays an important role in building personalized learning systems for students(Zhai et al., 2021).

However, the integration of AI and higher education faces technological educational and social challenges. For instance, the ethical problem of data collection use, and dissemination(Pedro et al., 2019), the assessment of AI technology in education(Zawacki-Richter et al., 2019), educators' skills acquisition in AI education(Chatterjee & Bhattacharjee, 2020), ethical issues when design and implement AI(Akgun & Greenhow, 2022). Nevertheless, the current education reform provides many opportunities for the development of AI applications in higher education (Zhai et al., 2021).

Given these challenges and opportunities, the researchers use bibliometric analysis to map the AI-driven collaborative teaching paradigm and identify emerging technologies that support human-AI synergy in the classroom. This analysis determines top countries, top researchers, top journals, and development trends in the academic field. This study aims to clarify the future agenda to improve teaching and learning approaches in higher education, which helps to understand the core theme of this volume: creative approaches to human-AI synergy in classroom instruction. Furthermore, bibliometric analysis has been widely used in the education area. For example, Abuhassna (2024) used a systematic literature review and bibliometric analysis to