Chapter 2
Artificial Intelligence in Education:
Shaping the Future of Curricula

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ABSTRACT

The rapid development of artificial intelligence (AI) technologies are bringing about fundamental transformations in the field of education. This chapter, comprehensively examines the transformative impact of AI on educational curricula. The study begins by presenting an overview of AI in education, then proceeds to analyze in detail the role and contributions of this technology in pedagogical processes. The chapter presents strategies for integrating AI into curricula across different educational levels. New skills and competencies that students and educators need to acquire in the age of AI, such as digital literacy, AI literacy, and critical thinking, are elaborated upon. The study also addresses the challenges and limitations associated with the use of artificial intelligence in education, including ethical concerns, data privacy issues, digital divide, and technological competencies of educators. In conclusion, this chapter highlights the potential of AI to transform curricula while emphasizing the importance of effectively integrating technology and pedagogy.

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1. INTRODUCTION

The rapid development and proliferation of artificial intelligence (AI) technologies are bringing about radical transformations in education systems and all areas of social life. In particular, developments in educational technologies in recent years have caused artificial intelligence to cease to be a mere research topic and become an active component of education training processes (Holmes et al., 2023). This transformation necessitates the reconsideration of curricula, one of the fundamental building blocks of education, and their evaluation from an artificial intelligence perspective.

This technological revolution, which shapes the future of education systems, adds new dimensions to teaching-learning processes and pioneers paradigm shifts in curriculum design and implementation, as stated in the UNESCO (2019) report "Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development." In this context, curriculum development experts, education policymakers, and teachers face a dual responsibility, such as integrating the opportunities offered by artificial intelligence into curricula and, at the same time, preparing students for the age of artificial intelligence (Touretzky et al., 2019).

Integrating AI technologies into education systems has been identified as a strategic priority in various international contexts. For example, the European Commission's "Digital Education Action Plan" (2021-2027) updated the European Digital Competence Framework to include AI and data-related skills. Similarly, the "National AI Strategy" report published in Singapore placed AI education at the center of human capital development goals (Singapore Smart Nation, 2023). This rapid transformation at the intersection of AI and education requires a joint effort from educators, policymakers, and technology developers. In this context, interdisciplinary collaboration and constantly updated curriculum approaches are vital for AI's responsible and effective use in education. This book chapter aims to comprehensively examine the transformative impact of AI technologies on curriculum design and implementation, which are rapidly spreading in education. The chapter first aims to provide an overview of the relationship between AI and education and to explain the basic concepts. Then, by deeply analyzing the transformative effect of artificial intelligence on the curriculum, it reveals how this technology can be used effectively in pedagogical processes and enrich learning experiences.

In addition, this study aims to show how curriculum materials can be made more effective and personalized by examining the opportunities offered by artificial intelligence. It includes application examples specific to each level for integrating artificial intelligence into the curriculum at different levels of education, from preschool to university.