Chapter 2
Artificial Intelligence in Physical Education: A Review

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ABSTRACT

Artificial intelligence (AI) has emerged as a transformative force impacting various domains, including education. Within the context of physical education, AI presents innovative solutions and opportunities that have the potential to transform traditional instructional and assessment methodologies. The primary objective of this chapter is to critically examine the integration of AI technologies within physical education and explore how they enhance both instructional methods and evaluation processes. This review provides a comprehensive overview of the evolving landscape by analyzing common research designs, key domains, and specific applications of AI in physical education. Furthermore, it highlights the significant role of AI in personalized learning and performance optimization, enabling more tailored feedback and support for students. The review also explores AI-driven advancements in evaluation and quality assessment, course recommendations, teacher development, and innovative classroom technologies.

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INTRODUCTION

Throughout history, humanity has continually explored methods to enhance living, resulting in the striking technological milestones we see today. Intelligence has been critical in accomplishing wonders like the Pyramids of Giza and in satisfying the impossible ideals of exploring outer space. With the advancement of information and communication technology, education is undergoing a revolution, shifting from traditional to virtual and hybrid learning environments. Bond et al. (2024) mentioned that artificial intelligence (AI) has been around since the 1960s, and its use in education, notably through early intelligent tutoring systems, has become a prominent focus of research. While the potential of AI in education has been recognized for some time, it has only recently gone from experimental settings to real classrooms and is now part of the public discourse. This change is part of the greater technological advancement of the twenty-first century, in which AI is increasingly applied in multifaceted disciplines. For instance, in manufacturing, AI is employed to carry out complex tasks with precision, leading to questions about whether robots could replace human professionals, such as chefs, who rely on skills and creativity, humanoid nurses, and receptionists. AI also has a significant impact on sports, where it helps train athletes and analyze their performance through methods such as video analysis. The emergence of tools, such as ChatGPT and DALL-E, has captivated and unsettled the public, prompting educational institutions and organizations to adapt to the growing capabilities of generative AI, as discussed by Bozkurt et al. (2023).

As technology advances, the educational and societal landscapes become increasingly complicated and sophisticated (Fernandez et al., 2022; Miranda & Tolentino, 2023). Higher education institutions and graduate schools must respond to these changes by preparing students for a future in which AI and other technologies play an increasingly important role. Bond et al. (2024) further emphasized the ongoing debate in education about the readiness, ethics, trust, and influence of AI, as well as the need for governance, legislation, research, and training to keep up with the rapid changes AI is bringing about in teaching and learning (Garcia et al., 2024).

MAIN FOCUS OF THE CHAPTER

The incorporation of AI in PE is now in its nascent phase, with a significant portion of the study being experimental and confined to a small number of countries, as evidenced by academic articles included in Scopus. Research conducted by Lee and Lee (2021) indicated that advancements in science and technology have a significant impact on both the content and methods of teaching, as well as the educational models and systems. Despite this, there is currently a lack of awareness