Chapter 3
The Integration of Artificial Intelligence in Physical Education, Innovation, and Sustainability in Learning Performance

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ABSTRACT

This chapter explores the role of artificial intelligence (AI) in transforming Physical Education (PE), highlighting its potential to personalize learning, enhance motor skill development, and improve motivation. AI tools such as motion analysis systems, virtual trainers, and gamified applications offer real-time feedback and individualized instruction, increasing student engagement and performance. Empirical evidence shows improvements in fitness, technique accuracy, and motivational climate when using AI-driven platforms. However, challenges remain, including teacher preparedness, ethical concerns about data use, and digital inequality. The

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chapter argues for a responsible and inclusive integration of AI in PE through training, infrastructure, and ethical guidelines, while emphasizing the need for further research into its long-term impact

INTRODUCTION

The arrival and impact of artificial intelligence (hereinafter AI) in the educational field since the emergence of ChatGPT has not left any member of the educational community indifferent. Students and teachers use it for various tasks in their respective roles, schools are creating subjects related to AI and the different governments are trying to legislate on an ethical and regulated use, which includes education as one of the points to be taken into account when establishing such legislation. We establish ChatGPT as a reference and disruption because of its revolution with respect to natural language processing, further development, creation of new related applications, etc., and because the development of AI in education dates back several decades, more specifically to the 1960s, with the development of PLATO (automated teaching) at the University of Illinois (Bitzer et al., 1965).

Physical Education (PE) is one of the subjects taught in most of the educational curricula in the compulsory education stages all over the world, and it has not gone unnoticed by the arrival of AI. Among the multiple benefits offered by the application of technology in the area of PE are the following (Martín-Rodríguez & Madrigal-Cerezo, 2025), we find AI. However, it is necessary to go deeper in this regard to detect how it can be implemented effectively within the subject, since training in digital competence provides us with many possibilities within the teaching-learning process. In short, training in digital competence will always have to be aligned with motor skills as a fundamental axis of the educational action as far as the subject of PE is concerned.

Students' acquisition of adequate digital competence is linked to their use of the IA and their mobile devices or that of their families, depending on their age and access to these devices. Exposure to screens is a factor to control and avoid among children aged 0-4 years (World Health Organization, 2019). Various associations, organizations and entities have carried out studies and proposals in this regard. It is not recommended to use technology one or two hours before going to bed, it is advisable to limit the time of use or delay access to devices with screens except for justified reasons (Asociación Española de Psiquiatría de la Infancia y la Adolescencia, 2024). Logically, throughout the development of the child and adolescent, these restrictions decrease and, as a consequence, increase the time spent using technology, autonomy and temporary exposure to screens. It should be noted that the use of mobile devices and their applications for the development of sport by

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