



Empowering Physical Education And Sports With Ai: A Thematic Analysis On Teaching, Training And Learning

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Abstract: This paper explores the multifaceted role of Artificial Intelligence (AI) in teaching physical education and sports, examining its potential to enhance instructional effectiveness, personalised training, and student engagement. AI tools such as connected PE and Kinovea support teachers by providing customised workout plans, motion analysis, and real-time feedback, optimizing training programs and improving performance. The study investigates how AI can be involved in teaching PE, its role in supporting teacher activities, and the actual AI tools that facilitate these processes. Additionally, it delves into the future of teaching through AI-driven smart transformations, which enable data-driven decision-making and personalized learning experiences. This research aims to equip educators with insights into the transformative potential of AI in physical education, fostering dynamic, inclusive, and effective learning environments.

Index Terms – Artificial Intelligence, Physical Education, Personalized Training, Motion Analysis

1. INTRODUCTION

Our curriculum for training future physical education and sports teachers includes courses on computer-aided instruction, where we have explored ways to integrate AI tools into teaching and learning activities. This effort is based on our observations of student engagement with these tools, insights from published research on AI applications in physical education and sports training, and the use of specialized software and generative AI platforms. Our goal is to optimize the curriculum and enhance the effectiveness of our teaching methods, ensuring they are practical and relevant for students. As future educators, physical education and sports students require comprehensive training in utilizing technology, including computers and AI, in their teaching and learning processes. While students have independently explored the potential of AI for generating materials and aiding in assessments, their use of tools like ChatGPT often lacks structure and guidance. They need proper training on how to create high-quality materials, critically evaluate AI-generated content, and responsibly incorporate it into their work. Additionally, they must develop the ability to rely on their knowledge and judgment when selecting and applying information produced by AI systems.

Recent studies highlight the growing role of AI in education, emphasizing the need for structured training to ensure the ethical and effective use of these tools (Luckin et al., 2022; Holmes et al., 2023). For instance, Holmes et al. (2023) stress the importance of teaching students to critically assess AI-generated content, ensuring it aligns with educational goals and professional standards. Similarly, Luckin et al. (2022) advocate for integrating AI literacy into teacher training programs to prepare educators for the evolving technological landscape. By addressing these gaps, we aim to equip our students with the skills and knowledge necessary to harness AI responsibly and effectively in their future careers as physical education and sports teachers. This includes fostering a deep understanding of the ethical implications of using AI-generated materials and encouraging students to balance technological tools with their expertise and

creativity. To effectively use AI tools, students need foundational skills and structured guidance to select, understand, and evaluate these tools. This involves learning their functionalities, assessing their outputs (e.g., images, videos, audio, or text), and applying them in educational contexts. Short, hands-on assignments can help students practice using AI tools, critically evaluate their results, and gradually build independence in selecting the right tools for their needs (Holmes et al., 2023; Luckin et al., 2022). Research highlights the importance of scaffolding learning experiences with AI tools to develop both technical and critical thinking skills. Educators should provide clear instructions, practical exercises, and iterative tasks to help students explore AI applications and reflect on their outputs (Holmes et al., 2023; Luckin et al., 2022). Additionally, fostering AI literacy is crucial, enabling future educators to ethically evaluate and integrate AI-generated content into their teaching practices (Zawacki-Richter et al., 2019; Selwyn, 2021). When updating computer-aided instruction courses, the focus should be on integrating tools for generating multimedia materials and teaching students how to incorporate these into lesson planning. Prior training in teaching methodology is essential to help students make informed decisions about material selection and lesson design. While students are often enthusiastic about AI, they must also recognize the effort required to master these tools, document their processes, and research specialized AI applications for physical education and sports (Holmes et al., 2023).

Future educators need a strong technological skill set, including digital communication, presentation tools, and proficiency in online teaching platforms. Beyond these basics, they require training in AI-specific tools, such as customizing AI-generated materials, adapting teaching methodologies, and using AI-driven assessment tools to refine their strategies. Practical training in these areas ensures they can effectively integrate AI into their teaching practices (Zawacki-Richter et al., 2019; Selwyn, 2021). The use of AI tools in teaching and learning also promotes multimodality, which is critical in modern communication. Digital communication today is inherently multimodal, combining text, images, videos, and audio elements. According to Oxford University Press (2023), there are five modes of communication: linguistic, audio, visual, gestural, and spatial. Multimodal texts, such as videos, vlogs, and websites, require the ability to interpret and create content that engages multiple senses. This approach enhances the relevance and effectiveness of teaching materials, making learning more interactive and engaging. Students must also be reassured that using AI tools does not diminish their creativity or critical thinking. Instead, AI should be viewed as a complement to their skills, enabling them to become more versatile educators. As Nick Peachey, Director of Educational Technology, emphasizes, “We aren’t facing a choice between human teachers or AI teachers. There is a third option: genuinely intelligent teachers who have the knowledge and ability to work with artificially intelligent software to develop emotionally and intellectually intelligent students” (Peachey, 2023,). This perspective highlights the importance of training teachers to collaborate with AI rather than viewing it as a replacement. To ensure our curriculum remains relevant, we have consulted recent research and specialized resources on the use of AI in physical education and sports teaching. These insights have informed our approach to integrating AI into teacher training, emphasizing the need for a balanced, skill-focused, and ethically grounded use of technology in education.

2. USING AI IN TEACHING PE AND SPORTS

Artificial Intelligence (AI) is increasingly being integrated into Physical Education (PE) and sports, offering innovative tools to enhance teaching and learning. AI applications in this field include personalized fitness programs, real-time feedback on technique, injury prevention, and performance analysis. We have top sites ChatGPT, LessonPlans.ai, Xlickup, Education Copilot, Learnt.ai, Teachology.ai, and Auto Classmate. Jasper, PlanifAI, Curipod Tools such as Play sight, Coach’s Eye, and Sweat Worlds are being utilized to optimize training programs and provide tailored feedback, improving both effectiveness and student engagement (Evans, 2024; Teachflow, 2023). AI also supports lesson planning and content creation, offering personalized and user-friendly interfaces for educators. Platforms like ConnectedPE and tools such as ChatGPT and LessonPlans.ai enable teachers to design customized lesson plans efficiently (York, 2024; Lee & Lee, 2021). However, the reliance on AI-generated materials raises concerns about students' critical thinking and creativity. Educators must emphasize responsible use, ensuring students evaluate and select AI-generated content thoughtfully (Killian et al., 2023). Moreover, AI fosters holistic development in PE by integrating health education, nutrition, and social-emotional learning, promoting lifelong physical activity habits (Evans, 2024). Virtual and augmented reality further enrich the learning experience, providing immersive and interactive environments for skill development (Lee & Lee, 2021). As AI continues to evolve, its role in PE is expected to expand, shifting educators' focus toward expertise in guiding students to create and manage their physical activities independently (Lee & Lee, 2021).

To fully harness AI's potential, curricula must be updated to include AI literacy, ensuring students and teachers are well-versed in its applications and ethical use (Chaware, 2020; Feith, 2024). While AI enhances efficiency and personalization, its integration should complement, not replace, human creativity and critical thinking in PE and sports education.

What skills should physical education (PE) and sports teachers develop to effectively use AI tools in their teaching and practice:

Integrating AI tools into Physical Education (PE) and sports teaching can significantly enhance the learning experience by providing valuable insights for both educators and students. To effectively incorporate AI into teaching and practice, PE and sport teachers should develop the following skills:

Understanding of AI Basics: Teachers need a foundational knowledge of artificial intelligence, including its capabilities, limitations, and potential applications in education and sports (Killian et al., 2023). This understanding helps them make informed decisions about integrating AI tools into their teaching practices.

Data Literacy: Since AI tools often rely on data analysis, teachers should develop skills in collecting, analysing, and interpreting data related to physical activity, performance metrics, and student progress. This enables them to use AI-driven insights to improve teaching and learning outcomes (Killian et al., 2023).

Technology Proficiency: Familiarity with AI platforms and software is essential. Teachers should be comfortable using tools such as motion sensors, wearable devices, video analysis software, and virtual reality systems to enhance instruction and student engagement (Killian et al., 2023).

Curriculum Integration: Teachers must be able to effectively integrate AI tools into existing PE and sports curricula. This involves aligning AI-enhanced activities and assessments with learning objectives and educational standards to ensure meaningful and relevant learning experiences (Killian et al., 2023).

Personalized Learning: AI enables personalized learning by adapting content and feedback to individual student needs. Teachers should learn how to leverage AI tools to provide tailored instruction, feedback, and support, ensuring that each student's unique needs are met (Killian et al., 2023).

Ethical Considerations: Teachers must understand the ethical implications of using AI in education. This includes addressing privacy concerns, recognizing potential biases in AI algorithms, and considering the impact of AI on student motivation and autonomy. Ethical awareness ensures responsible and equitable use of AI tools in teaching (Killian et al., 2023).

3. CONCLUSION

In conclusion, AI tools have significant potential to enhance teaching and learning in physical education (PE) and sports. Effective implementation requires continuous upskilling, staying updated with advancements, and aligning methodologies with evolving trends (Lee & Lee, 2021). Multimodality, particularly visual and video-based communication, plays a key role in improving student understanding and engagement. Educators should train students to create and use multimodal materials while emphasizing the responsible use of AI-generated content to foster critical thinking (Evans, 2024; Killian et al., 2023).

AI tools, like chatbots, streamline documentation and provide insights into student performance, enabling teachers to refine strategies and boost engagement (Teachflow, 2023). While debates about AI replacing teachers persist, human guidance remains essential. Continuous professional development and adaptability are crucial for leveraging AI effectively (Chaware, 2020). Looking ahead, AI promises a holistic approach to PE, integrating well-being, nutrition, and lifelong physical activity, preparing students for healthier, active lives (Evans, 2024). By embracing AI responsibly, educators can create dynamic, motivating learning environments for the future.

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