AI TOOLS IN TEACHING PHYSICAL EDUCATION AND SPORTS

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ABSTRACT
Artificial intelligence has found its role in enhancing teaching and research in physical education and sports, providing possibilities for a high quality education in the field. On searching for uses and applications on several specialized sites in the use of AI in the field, we have concluded that it is important to understand how AI can be involved in teaching physical education and sports, what its role is, what the actual AI tools that can support teachers in their activities are, what the future of teaching becomes through the use of AI and its specialized tools, and the ethical considerations related to practice. The presentation of the principles of AI use, tools, and resources stands as a guideline for the enhancement of teacher training, directing it to the proper use of resources, and forms the skills for further research and application of knowledge in the rapidly improving field of learning and teaching with the latest tools and methods available.

KEY WORDS: *AI tools in PE, PE and sports, teaching PE, uses of AI in PE*

JEL CLASSIFICATION: Z20, Z28, Z29

1. INTRODUCTION

Our curriculum for training students as teachers of physical education and sport includes courses on computer-aided instruction, for which we have searched the ways AI tools can be included in the related teaching and learning activities, basing on our observations on student response to the use of such tools, on observations and conclusions of materials published by other specialists on the use of AI in physical education and sport training, on specialized applications for this purpose, on the generative AI response to our prompts on the subject, in the attempt to optimize our courses and make our instruction process more efficient and applicable for students.
Physical education and sport students need to have detailed training in the use of computers in their teaching and learning activities, as future teachers of this subject. They have done research on their own on the possibilities of using AI in learning and generation of various materials needed for assessment. They rely on ChatGPT, even extensively, in an uncoordinated manner. They lack training in how to generate proper materials, how to select information and use it for their assignments. They still have to understand the responsibility in using generated materials. They also need to be trained to rely on their knowledge in the selection of generated information.
With basics in the use of several applications, they can approach AI tools, but they need to be provided proper suggestions on selecting a tool, with information on what the tool can do, on usage, what result can be obtained, and what the generated material, be it image, video, audio can be used for. Short

assignments to interact with the apps need to be provided, for them to learn how to use apps properly, how to select them, until they can access an AI library and select their own tools.
When we update the computer-aided instruction courses, the focus is on the inclusion of image, video, audio material generating tools and possibilities to include these in the course content. Besides, students need prior training in teaching methodology to decide on their choices of planning, on their own selection of materials.
Their reaction to AI possibilities is enthusiastic, but they need to understand the additional volume of work required by the learning of proper use of AI tools. They also have to get used to documentation and search for information on what AI can provide them with on specialized sites in using AI tools in physical education and sport teaching.
As teachers, students need to observe the technological component of their training and activity, which includes several skills already considered basic: communication by technology, presentation tools, website and blog creating tools, assessment tools, lesson planning tools, digital portfolio creation tools, online teaching platform proficiency, wearable devices.
Adding to the above skills, there comes training in the use of AI- provided possibilities and tools, the use of specialized sites and customization of materials generated, changes in teaching methodology, content creation using AI tools, assessment tools, and the use of results for changes in content and practical training with all the other related elements.
The use of AI tools in teaching and learning also ensures multimodality. Communication is both digital and multimodal. Most of the accessed texts include other means of communication such as images, video and audio elements. Nowadays communication has become more than writing and speaking, and knowledge is based on more elements than language. There are five modes of communication: linguistic, audio, visual, gestural and spatial. When a text contains several communication modes, the text is multimodal, and it can be either in print or electronic. Digital multimodal texts are videos, vlogs, and websites. Multimodality refers to the ability to understand and respond to such texts and to create them. The term of multimodal knowledge encompasses visualization and representation, where visualization implies various communication modes used in the multimodal text. This approach allows the creation of relevant and engaging content for teaching and enhanced learning (OUP, 2023).
Students also need to be taught to use AI tools without the fear of their thinking and creativity being diminished by the output generated by these tools. They also need to understand that the future is not about being replaced by AI teachers, chatbots, but that of multi-skilled teachers who can use AI for better teaching and learning, as Nick Peachey, Director of Educational Technology points out: “We aren’t facing a choice between human teachers or AI teachers. There is a third option and this is what I feel we need genuinely intelligent teachers who have the knowledge and ability to work with artificially intelligent software to develop emotionally and intellectually intelligent students (Peachey, 2023, pg.1).
In view of the above, we have searched and consulted papers and specialized sites in the use of AI for physical education and sports, to see other perspectives on the involvement of artificial intelligence in teacher training, teaching and learning.

2. USING AI IN TEACHING PE AND SPORTS

On searching for uses of AI in the field of sports, Google lists a variety of them: fan engagement, performance analysis, injury prevention, personalized training, match predictions, game analysis, predictive analysis.
On further search, there is the list of the *10 Best AI Tools for Lesson Planning in 2024*, on https://clickup.com/blog/ai-tools-for-lesson-planning/, which tops the following sites: XlickUp,

ChatGPT, LessonPlans.ai, Education Copilot, Learnt.ai, Teachology.ai, Auto Classmate. Jasper, PlanifAI, Curipod, - ConnectedPE on https://connectedpe.com/tools, (York, 2024).
At ConnectPE, a site of interest for this paper, we explored its possibilities, and have found that it provides software for lesson planning, plans which can be personalized, it has a user-friendly interface, which allows exploration and stimulates choice. Another site with complex and useful information in the field is on https://www.supportrealteachers.org/, supportREALteachers, which provides a large variety of topics related to teaching and the use of AI (supportREALteachers, 2023).
In *Applying Artificial Intelligence in Physical Education and Future perspectives*, authors Lee, H. S. and Lee, J. point out that the use of AI brings changes into the creation of content and teaching methods. The implication of educational technology in permanent evolution requires continuous research and enhances teaching and learning. Although there has been little research in the use of AI in teaching physical education and sports, there is the need to establish principles of use based on research and conceptualization (Lee, Lee, 2021).
The use of AI provides support for enhanced learning experience by differential, individualized and personalized physical education and sport teaching. Changes are focused on the teaching-learning process, measuring student performance and achievement. The use of virtual and augmented reality provides a new dimension to the field. Based upon such tools, learner evaluation and counseling are much improved (Lee, Lee, 2021).
The authors foresee a deviation from the present role of physical education and sport teachers in future, focusing on the role of expertise. Teaching and learning will involve other issues like "healthy life with sports, "the direction in which we should move with sports" (Lee, Lee, 2021). The role of teachers to help students learn and create physical activities on their own becomes very important (Lee, Lee, 2021).
Authors Killian, C. M., Martinnen, R., Jones, E. observe that students already rely heavily on AI, even if institution policies require submission of original work. Such reliance may leave students unprepared, as they tend to neglect the construction of solid, deep knowledge, especially in lesson planning, which involves critical thinking, creativity, and handling concepts from courses learnt. Therefore, they need to be taught responsibility in the use of AI-generated materials, methods of generation, evaluation, selection and responsible use of such materials ([Killian, C. M., Martinnen, R., Jones, E., M, 2023).
Using AI in teaching updates and enhances knowledge and understanding, as it brings new ways of organizing, presenting and communicating information, while acting as a timesaver for documentation and creating efficiency, enhancing teaching functions at a time. However, the responsible use of generated materials is necessary, not to shift entirely to machine-generated materials (Killian, C. M., Martinnen, R., Jones, E., M, 2023).
In her article *How Can AI Impact on a Subject like PE*, Emma Evans presents the changes occurring in teaching and learning physical education and sports from the responses of chatbots to the prompts on the subject. Thus, according to ChatGPT, there is the possibility to generate "a personalized fitness program tailored to student needs", "real-time feedback on form and technique, reduce injury risk and improve performance" (Evans, 2024), an enhanced learning experience by offering guidance, increase motivation, and improve instruction in realistic settings using virtual and augmented reality, gamifying physical activities, optimizing coaching, enhance performance analysis, and the use of wearable devices by students to track their own progress. AI tools also provide an enhanced performance analysis, which is important in physical education and sports (Evans, 2024).
Gemini's response to the prompts on the subject points out that physical education is more than physical training, and that it requires experiences that provide a holistic development. This includes health education, nutrition and injury prevention, development of motor skills, social interaction,

cognitive abilities, contributing to emotional well-being and forming a lifelong habit of physical activity and wellness (Evans, 2024).

As there are various tools used in the field, ChatGPT selects a number of physical education-specific tools for actual practice, such as Playsight, an AI-powered sport video analysis tool, analysis of movement during practice and games, Coach's Eye, a video analysis application, Zybek sports – testing systems to assess speed, agility and power, Sweat Worlds, a fitness techno platform that created personalized fitness plans and tracks progress. These applications are useful as they help increase effectiveness, optimize training programs, and provide personalized feedback (Evans, 2024).

In the material entitled *How AI Is Enhancing School PE* , Teachflow.ai observes that AI provides tools and techniques for a better experience, fitness trackers with a real-time feedback on activities, helps motivate students to achieve , tips on nutrition and recovery, personalized physical education programs, guidance on form, technique and performance optimization (Teachflow, 2023).

In his article *The Role of AI in School Physical Education and Sports Science,* published in the International Journal of Physical Education and Sports Science, 2020, author Utsav Chaware, points out that Ai is a revolutionary technology with which students need to be well acquainted, therefore the curriculum should be updated and integrated with AI and its associates {Chaware, 2020). The same idea generated J. Feith's paper on *Introduction to AI for Physical Education Teachers (Part One),* where he underlines the necessity to familiarize students with the necessary terminology and use of AI tools in their teaching of physical education and sports (Feith, 2024).

Taking into account that computer-aided instruction courses in physical education and sports include the teaching of several skills for the integration of such instruction and online teaching and learning, such as online platform use, multimedia integration, digital communication, assessment tools, digital content creation to provide a dynamic and effective online learning for students, we used the following question in the prompt to generate a ChatGPT response on specific skills needed by students who prepare to be physical education and sport teachers in order to involve AI tools in teaching and learning, as it follows:

What skills should PE and sport teachers develop to involve AI tools in teaching and practice?

ChatGPT - released for public use in November 2022, AI-powered large language model LLM, developed by OpenAI, San Francisco- based company (Killian et al., 2023)

Integrating AI tools into physical education (PE) and sport teaching can enhance the learning experience and provide valuable insights for both teachers and students. Here are some skills that PE and sport teachers should develop to effectively utilize AI tools.

Understanding of AI basics: Teachers should have a foundational understanding of artificial intelligence, including its capabilities, limitations, and potential applications in education and sports.

Data literacy: AI tools often rely on data analysis and interpretation. Teachers should develop skills in collecting, analyzing, and interpreting data related to physical activity, performance metrics, and student progress.

Technology **proficiency**: Familiarity with the technology platforms and software used for AI applications is essential. Teachers should be comfortable using AI tools such as motion sensors, wearable devices, video analysis software, and virtual reality systems.

Curriculum integration: Teachers should be able to integrate AI tools into existing PE and sport curricula effectively. This involves aligning AI-enhanced activities and assessments with learning objectives and standards.

Personalized learning: AI can facilitate personalized learning experiences by adapting content and feedback to individual student needs. Teachers should learn how to leverage AI tools to provide tailored instruction, feedback, and support to each student.

Ethical considerations: Understanding the ethical implications of AI in education is crucial. Teachers should be aware of privacy concerns, bias in AI algorithms, and the potential impact on student motivation and autonomy.

Collaboration and communication: Collaboration with AI developers, data analysts, and other educators is essential for successful implementation. Teachers should be able to communicate effectively with stakeholders and collaborate on the design and implementation of AI-enhanced teaching practices.
Continuous learning: AI technology is rapidly evolving, so teachers should stay updated on the latest advancements and best practices in AI integration in education and sports.
By developing these skills, PE and sport teachers can effectively harness the power of AI to enhance teaching and learning experiences, improve performance outcomes, and promote lifelong engagement in physical activity (ChatGPT – generated material).

3. CONCLUSIONS

From both research and practice, the AI tools enhance teaching and learning in the field of physical education and sports, with good and interesting results, provided there is a continuous documentation and update on the applications of various uses, on specialized sites for PE and sports, and research, in order to adhere to the directions taken by methodology and content creation. Upskilling for teachers in the use of AI tools and updating on the latest research become an essential condition in not lagging behind in the field of educational technology, in order to improve efficiency and practice a teaching of interest and motivation for students. The development of digital skills and the actual interaction and work with AI tools can bring about interesting ways to update materials, strategies, reflection, and research.
Attention should be granted to multimodality in teaching and learning, especially in the field of physical education and sports, where the communications modes are important to students, especially those related to image and video. These can highly increase understanding of content and demonstrate what they need to learn.
Multimodality should also be applied to learning, as students need to communicate in this manner, need to learn how to create and use multimodal materials in their teaching and practice.
It is also important to understand and teach students the responsible use of AI output: they must not rely only on machine generated materials, instead they should build up knowledge in order to be able to select the materials they use.
The involvement of chatbots and AI tools in documentation is a timesaver for teachers, helping them to create relevant and engaging course materials, update them continuously, and build up knowledge on the latest information available.
Using AI tools for assessment and analysis of results helps teachers to form a more detailed view on the results and impact of their teaching, draw conclusions and make adjustments in content, strategy, student motivation and engagement.
There is a variety of opinions nowadays on the replacement of teachers by AI teachers, with chatbots taking the place of teachers. However, we consider that artificial intelligence needs human operation and direction, and the solution is that of continuous upskilling and the development of understanding of what adaptability really is and what it actually takes.
Looking at the future of teaching and learning by AI tools in physical education and sports, we observe the possibility of a holistic training, where other elements like well-being, nutrition, sports for life tendencies become important, which can constitute a complete image of what education in this field will be able to provide by the use of artificial intelligence.

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