APPLICATION POSSIBILITIES ARTIFICIAL INTELLIGENCE (AI) IN PHYSICAL EDUCATION

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Abstract

In our research, our aim was to examine the opinions of educators (elementary school teachers, preschool teachers, and physical education teachers) regarding the potential applications of artificial intelligence (AI). Our goal was to explore how the surveyed educators perceive AI in relation to physical education, and in which areas professionals believe it could be applied in their own work during physical education sessions. We used a questionnaire-based method in our research. A total of 383 individuals participated in the study. The sample (N=383) consisted of 33.15% elementary and preschool teachers and 66.84% physical education teachers. The results indicated that the participants of the research saw the greatest significance of AI use in data collection, skill development, and the implementation of individualized development programs. Artificial intelligence can support the work of teachers in many ways. However, teachers must also understand the potential of AI and how to use it. We agree with authors such as Hyun and Junga (2021) and Fatih (2025), who emphasize that future physical education teachers must possess technological and AI expertise to effectively integrate AI tools.

Keywords: *Artifical Intelligence, education, physical education*

JEL: *I21*

Introduction

The integration of artificial intelligence into everyday educational systems presents both significant opportunities and challenges for educators and teachers. The potential of AI depends not only on the teacher's knowledge but also on the framework within which AI operates. Today's rapid technological advancement alone has the power to transform the teaching methods we are familiar with. In the field of physical education, technological expansion can be approached from multiple aspects and adapted to promote more effective teaching (Varga et al., 2019; Varga – Révész, 2023; Bokor, 2023).

AI can support daily practices in physical education from many sides, including performance analysis, individualized or adaptive instruction. Technologies such as educational robots, virtual reality-based applications, and personalized learning programs significantly enhance children's engagement and effectively support their motor development (Fatih, 2025). At the same time, AI plays a crucial role in real-time monitoring and feedback of student performance. As a result, AI technologies significantly contribute to improving the quality of physical education, especially in areas such as performance tracking, feedback, and the development of instructional processes (Fatih, 2025).

The study by Hyun and Junga (2021) provides a comprehensive overview of AI applications in physical education, with a special focus on personalization, assessment, and individualized guidance, emphasizing the development of teacher competencies and future research directions. The authors highlight that future physical education teachers will need not only pedagogical skills but

also technological and AI-related expertise in order to integrate AI tools effectively (Hyun– Junga, 2021).

The research conducted by Karap and colleagues (2025a) focused on educators, and the results revealed that teachers have a positive attitude toward the use of AI tools for educational purposes. They view AI as an innovative tool, although they have limited practical experience with its use. The potential application of AI in education is widely seen by teachers as a positive development and as an opportunity for future improvement (Karap et al., 2025b).

One of the main challenges in applying AI in physical education is that PE teachers lack of the necessary expertise to implement AI in practice (Lee–Lee, 2021). Therefore, teacher training is essential to ensure the effective use of AI tools in education (Fatih, 2025).

AI research in the field of physical education is relatively new. Over the past 10 years, an increasing number of studies have emerged examining AI technologies, including educational robots, virtual reality, and personalized training programs, and their impact on teaching effectiveness. Nevertheless, the number of studies in this area is few.

The Potential Applications of AI in Physical Education

Artificial intelligence can support the work of physical education teachers in a variety of ways. It can enhance the efficiency of the teaching and learning process, assist in tracking student development, enable differentiated instruction, and support many other aspects of a teacher's daily work. Let's look at some specific areas where AI could be particularly useful for a PE teacher.

Movement and Performance Analysis

AI-based systems are capable of recognizing movements and body posture, which can help teach correct movement patterns and correct errors. For example, a teacher could record students' sports activities with a camera and then use AI software to analyze their movements compare to ideal techniques. This provides more accurate feedback for students, enabling them to improve more quickly (Zawacki-Richter et al., 2019).

Tracking Student Performance, Individual Progress, and Adaptive Learning

AI can collect data on students' physical performance and use this information to make personalized recommendations. For physical education teachers, this is highly beneficial, as it helps them better understand individual student needs and adjust training intensity according to each student's abilities (Hyun–Junga, 2021; Toprak–Çolak, 2024; Rajeena– Quraishi, 2024). Teachers can monitor students' performance, provide personalized feedback, and thus more effectively support their development. AI has been shown to improve students' learning processes and increase physical performance by 25% (Garcia–Martinez, 2025). Similar results were reported by Kim and Park (2021), where the use of AI led to a 30% increase in students' physical development.

Monitoring Habit and Lifestyle Changes — "Health Monitoring"

AI-based applications can assist students in tracking their daily physical activity and lifestyle habits. This helps teachers monitor changes in students' lifestyle behaviors and offer appropriate guidance when necessary (Zawacki-Richter et al., 2019; Karaoğlan Yılmaz, 2020).

Optimizing, Personalizing, and Planning Training Programs

AI can analyze the effectiveness of different training programs and provide feedback on their outcomes. This enables AI to support PE teachers in designing the most effective training plans for each student, taking into account their individual strengths and areas for development (Karaoğlan Yılmaz, 2020; Zawacki-Richter et al., 2019)

Motivation and Feedback

AI-based systems can provide automatic feedback on students' performance, which can contribute to increase student motivation. Positive feedback on progress can encourage students to work even harder. In their study, Karaoğlan Yılmaz (2020) reported a 15% performance improvement as a result of this, while Kaynar and Sadık (2021) found a 20% increase.

Administration

AI-supported systems can share data and progress statistics with parents and school administration, offering a more accurate picture of students' physical development and the effectiveness of physical education classes. This is especially useful for teachers, as it allows them to provide regular and transparent feedback to parents. In relation to this, Lee and Lee (2024) noted that AI-based systems significantly reduce teachers' administrative workload, a point also emphasized by Rajeena and Quraishi (2024).

Material and Method

In our research, our aim was to examine the opinions of educators (primary school teachers, preschool teachers, and physical education teachers) regarding the potential applications of artificial intelligence (AI). We sought to understand how the surveyed educators perceive AI in the context of physical education and in which areas they believe it could be applied in their own work during PE classes.

Our research focused on several key questions. First, we investigated teachers' attitudes toward the use of artificial intelligence in physical education lessons. Second, we explored the specific areas in which they believe AI could be effectively applied.

We employed a questionnaire-based research method. The questionnaire included both open-ended and closed-ended questions, as well as Likert-scale items. In the Likert-scale section, respondents rated their agreement with various statements on a scale from 1 to 10. Data collection was performed using a convenience sampling method.

For data analysis, we used the SPSS-27 software package. Descriptive statistics were calculated, including means, standard deviations, and distributions. For nominal variables, we performed cross-tabulation (crosstab) analyses, using the Pearson's chi-square (χ^2) test to assess associations between variables.

A total of 383 individuals participated in the study. The sample (N=383) consisted of 33.15% primary school and preschool teachers, and 66.84% physical education teachers. While the convenience sampling method means the sample is not representative of the entire population, it provides valuable exploratory insights into educators' perceptions of AI in physical education.

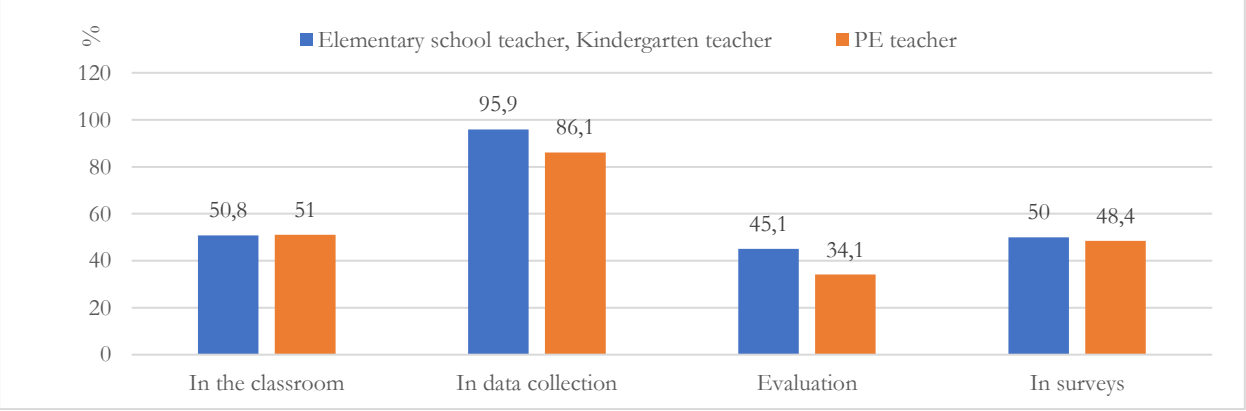
Table 1. Gender distribution of participants in the study (N=383)

PRIMARY SCHOOL TEACHER, PRE-SCHOOL TEACHER	PHYSICAL EDUCATION TEACHER
N=127	N=256
♂ MALE: 1,6%	♂ MALE: 58,4%
♀ FEMALE: 98,4%	♀ FEMALE: 41,6%

Source: Researchers (2025)

Results

We asked the participants in our study to indicate in which areas they see potential for the use of AI in connection with physical education classes. The responses show that data collection is considered the most significant area for AI application. A total of 95.9% of primary and preschool teachers, and 86.1% of physical education teachers indicated that they could use AI for data collection in their own lessons (see Figure 1). There was a statistically significant difference in this area: significantly more primary and preschool teachers identified the potential of AI in supporting data collection compared to physical education teachers.



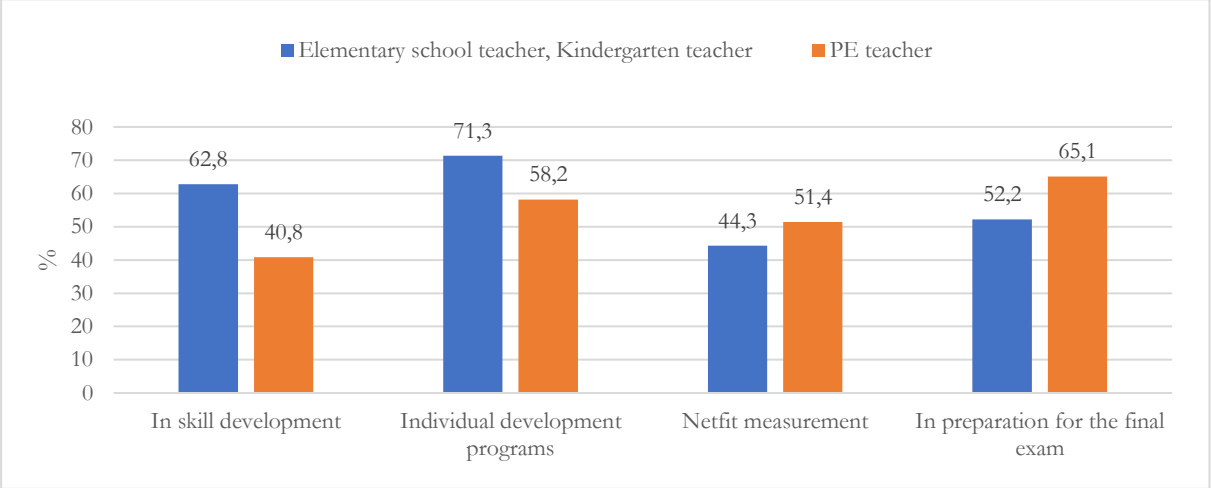
Asymp. Sig. (2-tailed)	**0,782**	**0,016****	**0,101**	**0,760**

*p≤0.05; ** p≤0.01; ***p≤0.001(Pearson Chi-Square)

Figure 1. Perceptions of the use of AI in physical education classes

Source: Researchers (2025)

Figure 2 illustrates the perceptions of AI use in physical education classes based on the opinions of physical education teachers and primary school/preschool teachers, specifically in the areas of skill development, the use of individualized development programs, NETFIT assessments, and preparation for the final secondary school examination. It can be seen that primary school and preschool teachers use AI in their lessons more likely for both skill development and individualized programs than physical education teachers. There were statistically significant differences in the areas of skill development, use of individualized development programs, and preparation for final exams.



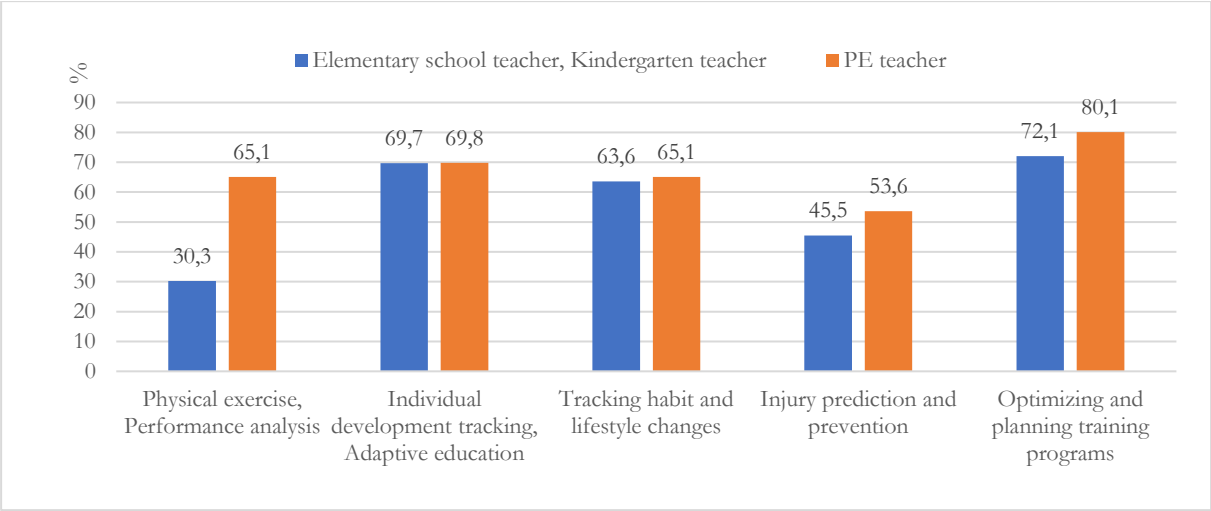
Asymp. Sig. (2-tailed)	**0,000*** **	**0,042***	**0,324**	**0,044***

*p≤0.05; ** p≤0.01; ***p≤0.001(Pearson Chi-Square)

Figure 2. Perceptions of the use of AI in physical education classes

Source: Researchers (2025)

Looking at the additional results, it becomes clear that teachers see the greatest potential for AI in the optimization and planning of training programs and in tracking individual student progress. A total of 80.1% of primary school and preschool teachers believe that AI can be effectively applied to the optimization and planning of training programs. When it comes to monitoring individual development, approximately 70% of both physical education teachers and primary/preschool teachers see potential in the use of AI. In the area of movement and performance analysis, primary and preschool teachers see significantly greater potential for AI support. Only 30.3% of physical education teachers identified AI as useful in this area, compared to 65.1% of primary and preschool teachers (see Figure 3).



Asymp. Sig. (2-tailed)	**0,000*** **	**0,781**	**0,746**	**0,253**	**0,155**

*p≤0.05; ** p≤0.01; ***p≤0.001 (Pearson Chi-Square)

Figure 3. Perceptions of the use of AI in physical education classes in light of AI-generated response categories

Source: Researchers (2025)

Conclusion and Recommendation

The possibilities for applying artificial intelligence in education are extensive and can open up many new approaches not only in classrooms but also in the field of physical education, however, the actual extent of its use is still developing. Since technological change is happening on a global scale, we believe it is necessary to adopt a positive approach to this topic to facilitate collective progress. In the researched area, both theoretical and practical gaps still exist, but in the future, the assimilation of AI into everyday education and physical education teaching will be indispensable. To achieve this, a better understanding of the field is required. In our research, we surveyed primary school teachers, preschool educators, and physical education teachers regarding the potential applications of artificial intelligence. Our goal was to examine how the surveyed educators perceive AI and in which areas professionals could apply it in their work during physical education classes. Our results showed that educators see the greatest opportunity for AI use in data collection, skill development, and the use of individualized development programs. Artificial intelligence can support the work of physical education teachers in many ways. However, teachers must also understand the potential of AI and how to use it. We agree with authors such as Hyun and Junga (2021) and Fatih (2025), who emphasize that future physical education teachers must possess technological and AI expertise to effectively integrate AI tools. This also means that teacher training is necessary. Based on our research, we have formulated several recommendations. Integration of AI into lesson plans. Incorporate AI-based modules into physical education classes, such as movement analysis, individualized development programs, and gamified tasks. Professional development and training for educators. Organize workshops and practical training sessions where teachers can familiarize themselves with and experiment with AI tools—for example, virtual training programs or data collection and analysis software. Incorporation of motivational and gamification elements.

Utilize AI to design gamified activities and challenges that enhance students' engagement, motivation, and participation during lessons. Leveraging AI for parental communication and administrative efficiency. AI systems can facilitate the tracking of students' progress and provide regular, detailed feedback to parents, while simultaneously reducing teachers' administrative workload. Gradual implementation. It is advisable to introduce AI tools in small steps, starting with pilot projects, and then progressively expanding their application to entire school programs based on the experiences gained.

Future research could include experimental studies in which teachers actually implement AI tools during physical education lessons. The outcomes of such experiments could be evaluated based on objective performance indicators, students' developmental progress, and changes in motivation. Another potential research direction involves examining the development of teachers' technological competencies, as well as assessing the effectiveness of specific AI-based applications in physical education.

Limitations of the Study

The research was conducted using a convenience sampling method; therefore, the sample cannot be considered representative. The questionnaires applied in the study were based on self-reporting, which may influence the objectivity of the responses. The findings reflect a local context and may differ in other countries or educational systems.

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