



Attitudes of Physical Education Teachers Toward Employing Artificial Intelligence in Physical Education Lessons

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Abstract

This research aims to identify the attitudes of physical education teachers towards the use of artificial intelligence in physical education lessons, as well as their acceptance of using AI in teaching practices and the factors influencing these attitudes. A descriptive survey methodology was used with a sample of 1,483 teachers, the data was collected from public schools in Egypt using a questionnaire covering three main areas: teachers' attitudes toward artificial intelligence, their acceptance of its use in practice, and the factors influencing this. The results showed highly positive attitudes toward integrating artificial intelligence, There was strong acceptance of its use in lessons, and no statistically significant differences were found according to gender or years of service. The study recommends providing practical training programs, ensuring the availability of necessary hardware and software, and encouraging the exchange of experiences to maximize the benefits of artificial intelligence in physical education.

Keywords: Attitudes, Artificial Intelligence, Physical Education Lessons.

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Introduction

Education in the modern era is witnessing an accelerated transformation driven by technological developments, and artificial intelligence (AI) emerging as one of the leading tools that affect teaching methods and learning styles. AI applications contribute to charitable the quality of education by supporting lesson planning, Applications of AI participate to improving the quality of education by supporting lesson planning, providing immediate feedback, and personalizing learning experiences according to students' needs, in addition to promote teachers' efficiency in classroom management and the development of their instructional practices. Technological development over recent decades has brought about major changes across various aspects of life, including the educational field (A. Syafruddin, 2023). The integration of AI into the learning process is considered one of the innovations that has gained widespread attention, as AI offers significant opportunities to support educational activities in terms of content delivery, personalized learning, and the assessment of students' achievements (Hooda et al., 2022).

However, the process of adopting this technology still faces many challenges, especially in the field of physical education, which is essentially based on motor activities that are difficult to replace or simulate through digital technologies (Almusawi et al., 2021).

AI exercise are through the most advanced technologies at the present time, as they are now widely used within institutions, and their spread has clearly accelerated in the field of education, The concept of AI refers to a set of computer technologies eligible of performing tasks that usually require human qualification, such as pattern difference and aural version, This technology relies on affecting human thought processes through computer systems that can infer relationships, make decisions, and perform tasks in a mode similar to human behavior(Mokhtar, 2016; Zerouki & Falta, 2020).

Physical education plays a pivotal role in support students' health and holistic development, and has become an main component of educational curricula globally, However, transport goodness classes face diverse challenges, thorough fixed resources, uneven curriculum performance, and certain physical education request in terms of space, safety, and the different of student levels, underscoring the need for innovative and development educational solutions. (Strotmeyer, Kehne, & Herrmann, 2021; Landi, Walton-Fisette, & Sutherland, 2021).

AI has grown as a chance resource for process these challenges by supporting educators and encourage personalized learning climate, across a wide range of educational settings, the blend of AI has shown great word in charitable teaching and learning outcomes. This is completed by support AI-based tools, Educators were able to improve students' academic performance, as well as boost their motivation and connection in learning. moreover, AI technologies provided opportunities to monitor each student's progress individually and provide

personalized feedback, thus enhancing the overall quality of education. (Holmes, Bialik, & Fadel, 2023; Roll & Wylie, 2016).

Integrating AI technologies into physical education requires a thorough understanding of teachers' attitudes and trends toward this technology, as teachers play a pivotal role in ensuring the effectiveness of its applications in classrooms (Ng, Lee, Tan, Hu, Downie, & Chu, 2023; Lv, Jiang, & Jiang, 2022; Pandey & Mishra, 2024).

Despite the great strength of AI in providing personalized returns and tracking student progress, teachers confirm that these tools often lack the growing of the social and cooperating portion of learning, which are essential elements in physical education classes, and from this standpoint, teachers suggest that Integrating artificial intelligence is accompanied by experimental and flexible teaching methods that allow rousing transaction, promote motivation, and developing students' physical and social skills (Kollwitz, 2023; Reddy, 2020; Cao, Lei, Lin, & Xiang, 2022).

By introducing a new form of digital conversation, personal skills programming, and adventure sports learning environments, artificial intelligence (AI) is helping to transform physical education. AI technologies allow for the induction of request training programs that are suited to each student's needs, beneficent learning effect and physical showing They also keep an eye on students' general health and offer real-time feedback and efficient training plan changes. (Cao & Yu, 2025; Zhou et al., 2024).

Through reacting training environments that enable the practice of difficult athletic skills in regulated, actual conditions, The blend of virtual reality technologies with artificial intelligence grow the learning experience in physical education through reactive training environments, allowing the practice of complex athletic skills in controlled, realistic conditions. then, AI tools help to exactly assess athletic performance, participate to the design of more effective training plans. (Zhang, 2021; Deng et al., 2025)

In addition, integrating AI with play-based learning methods contributes to student motivation and enhanced engagement, while systems reliability, accuracy, student data protection, and teacher professional development remain critical factors for application success and improved learning outcomes (Hussein et al., 2025; Francisco, 2025).

Despite the increasing development in applications of artificial intelligence in education, and what the literature has proven of its potential to support learning and improve student performance assessment, its use in physical education lessons is still limited due to the nature of motor activity and social interaction, which requires direct supervision and high organizational skills. The success of integrating these technologies depends on the attitudes of teachers and their willingness to use them effectively, while the actual attitudes have not been adequately measured, which leaves a knowledge gap in understanding the extent of their acceptance of the technology, the potential obstacles, and the extent of its impact on developing teaching methods and improving the quality of education in this field. From this standpoint, the

research aims to identify the attitudes of male and female physical education teachers towards employing artificial intelligence in the lesson, measure the extent of their acceptance of its use in their teaching practices, and identify the factors influencing these trends, while answering questions related to the differences according to the variables. Gender and years of service. The importance of the study is to clarify these trends, fill the research gap, provide a knowledge base for researchers, and benefit decision-makers and curriculum developers in activating intelligence

Methodology

Sample design

The sample was selected using a random sampling method, with a primary sample size of 1,483 teachers' physical education in the Arab Republic of Egypt.

A pilot study was conducted on a separate group of 40 teachers outside the main sample to verify the scientific characteristics and validity of the research instrument. Table 1 presents the frequencies and percentages of the sample members according to the study variables.

Table 1. Demographic characteristics of the participants Demographics Values, n (%)

characteristics	Category	Frequencies	%
Gender	Male	739	49.83
	female	744	50.17
Years of service	> 5	479	32.30
	5-10	480	32.37
	< 10	524	35.33
	Total	1483	100

Research Design

A descriptive survey The descriptive survey method was used because it is suitable for the nature of the research, as it seeks to describe and analyze the attitudes of male and female teachers, reveal their degree of acceptance of the use of artificial intelligence tools, and identify the factors affecting those attitudes.

Research Instrument

A questionnaire was constructed as the main tool for data collection. It was prepared in light of the research objectives and a review of relevant literature and previous studies, and it adopted a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), and consisted of three main domains as follows:

First Domain: Physical Education Teachers' Attitudes Towards the Use of Artificial Intelligence (7 items)

Second Domain: Teachers' Acceptance of the Use of Artificial Intelligence in Teaching Practice (7 items)

Third Domain: Factors influencing the attitudes of physical education teachers towards the use of artificial intelligence (7 items)

Validity of the Research Instrument

Content Validity

To ensure the validity of the instrument, the questionnaire in its initial form was presented to a group of expert reviewers specializing in the fields of physical education, educational technology, and measurement and evaluation. The experts were asked to provide feedback regarding:

- The suitability of the paragraphs to the research objectives.
- The accuracy of the language.
- The clarity of the expressions.

Based on the reviewers' comments, some paragraphs were revised, and others were deleted or merged, until the agreement rate among the reviewers reached over 90%, indicating the validity of the content.

Internal Consistency Validity

The internal consistency validity was calculated by computing the correlation coefficients between each item and the total score of the domain to which it belongs (i.e., the relationship between each item's score and the total score of the items within the same domain).

Table 2. Spearman Correlation Coefficients Between Each Item and the Total Score of Its Corresponding Domain

N	First Domain		N	Second Domain		N	Third Domain	
	spearman	sig		spearman	Sig		spearman	Sig
1	**0.907	0.00	1	**0.737	0.00	1	**0.927	0.00
2	**0.857	0.00	2	**0.672	0.00	2	**0.868	0.00
3	**0.832	0.00	3	**0.641	0.00	3	**0.793	0.00
4	**0.879	0.00	4	**0.670	0.00	4	**0.798	0.00
5	**0.791	0.00	5	**0.746	0.00	5	**0.738	0.00
6	**0.822	0.00	6	**0.750	0.00	6	**0.834	0.00
7	**0.849	0.00	7	**0.816	0.00	7	**0.769	0.00

Table 2 shows strong, positive and statistically significant correlations at the ($p < 0.01$) level between the questionnaire statements and the total score of the axis, indicating a high level of reliability and that the instrument enjoys a good degree of internal consistency. These results

also confirm the construct validity and suitability of the instrument for use in measurement within the context of the study.

Reliability

The reliability of the study instrument was assessed through the test-retest method, where the questionnaire was reapplied at a time interval of 15 days to a random sample of (40) participants from the original study population, excluding the members of the basic research sample, in order to verify the reliability of the instrument.

Table 3. *The arithmetic mean, standard deviation for the application and reapplication, and the correlation coefficient (reliability) for the questionnaire domains. n= 40*

domain	ICC	Sig 95%	KAPPA	Sig
first	0.998	0.997 – 0.999	0.940	**0.00
second	0.985	0.971 – 0.992	0.914	**0.00
Third	0.983	0.968 – 0.991	0.933	**0.00

The results showed that the correlation coefficient (ICC) values for all axes were high, ranging between 0.983 and 0.998, with a 95% confidence interval, indicating the reliability of the questionnaire. Cohen's Kappa coefficients also showed A high level of agreement was observed between the initial and subsequent administrations, ranging from 0.914 to 0.940, all of which were statistically significant ($p < 0.001$). These results indicate that the questionnaire is highly reliable and an accurate and applicable measurement tool.

Results and Discussion

Table 4. *First Domain: Physical Education Teachers' Attitudes toward the Use of Artificial Intelligence (N = 1483)*

N	Statements	mean	SD	χ^2	sig
1.	I believe that artificial intelligence (AI) enhances the quality of physical education lessons.	4.31	1.00	1641.04	P<0.00
2.	I think that using AI promotes students' learning.	4.04	1.20	1169.63	P<0.00
3.	I welcome the implementation of AI technologies in my lessons.	3.75	1.56	991.23	P<0.00
4.	I am convinced that AI develops modern teaching methods.	3.97	1.16	1052.91	P<0.00
5.	I prefer integrating AI tools into physical education activities.	4.48	1.03	2859.01	P<0.00
6.	I believe that AI facilitates the planning of physical education lessons.	4.41	1.10	2341.09	P<0.00
7.	I believe that AI eases the assessment of students' performance in physical education lessons.	4.32	1.18	2311.83	P<0.00

The results indicate that there are high positive orientation through physical education teachers because of spend AI in the lesson, as the arithmetical means of the different elements showed that they extend between 3.75 and 4.48. This reflects teachers' conviction in the role of artificial intelligence in supporting the quality of physical education lessons, grow student learning, improve modern teaching methods, and assist planning and showing evaluation. These findings are regular with those of Tan, Ceylan, & Tür (2023). The study particular that teachers show positive attitudes toward the use of AI in education, think an openness to the use of new technologies in the educational process. These findings also align with the study by Banaz & Maden (2024), which confirmed that teachers' attitudes toward AI applications tend to be positive.

The results showed a growing trend through teachers to merge AI tools into physical education efficacy and use them to facilitate lesson planning and student performance assessment, consider a clear understanding of the practical advantage of these technologies. These findings support the observations of Seyre, Yıldız, Emeşi, Şahin, & Türmen (2024), The findings suggest that AI can effectively contribute to content creation, activity preparation, data analysis, and student progress observation. These results are consistent with those of İç & İç (2024), The high level of knowledge of AI is linked to positive attitudes towards its use in education, which explains the high content shown by physical education teachers about the importance of AI and its role in improving their teaching practices.

Furthermore , these findings are in line with Syafruddin & Ikadarny (2025), This showed that physical education teachers' understanding of AI techniques is still uneven, but they recognize its great potential in improving the quality of learning, especially in the accurate analysis of students' movements and providing prompt feedback, which contemplate their academic and positive readiness to use this technology in the educational environment.

Table 5. *Second Domain: Teachers Acceptance of Using Artificial Intelligence in Teaching Practice (N = 1483)*

N	Statements	mean	SD	χ^2	sig
1.	I can use artificial intelligence (AI) easily during teaching.	4.57	0.93	2869.36	P<0.00
2.	I accept trying new tools that rely on AI.	4.65	0.69	2001.80	P<0.00
3.	I approach smart technologies in physical education lessons positively.	4.48	0.99	2419.62	P<0.00
4.	I adapt quickly to any AI-based tool.	4.11	1.05	1205.01	P<0.00
5.	I benefit from AI applications in teaching sports skills.	3.97	1.30	970.05	P<0.00
6.	I integrate AI technologies into lesson activities without difficulty.	4.63	0.88	1554.16	P<0.00
7.	I implement AI-supported teaching practices with confidence.	4.54	0.98	2041.64	P<0.00

The results indicate that physical education teachers demonstrate a high degree of receptiveness to the use of artificial intelligence in teaching practice, with the arithmetic mean

scores for the various elements showing high values ranging between 3.97 and 4.65. This reflects their ease of use of smart technologies, their ability to adapt to new tools, and their confidence in implementing AI-supported teaching practices.

These findings are consistent with Wang & Wang (2024), The use of artificial intelligence in education depends largely on teachers' acceptance of smart technologies, and affects the extent to which they integrate new educational tools into lesson activities, thus enhancing teaching effectiveness and increasing the quality of student learning ,Similarly, Raza & Farooq (2025) confirmed a positive relationship between the ease of using smart tools and teachers' readiness to try and adopt new technologies.

The results also indicate that the ability to quickly adapt to and utilize smart tools in explaining mathematical skills is a significant factor in enhancing teachers' acceptance of technology. The results suggest that the ability to quickly adapt to and utilize smart tools in explaining mathematical skills promotes teachers' acceptance of artificial intelligence, this aligns with Cabero Almenara et al. (2024), who emphasized that positive attitudes toward the benefits of technology increase teachers' readiness to use smart applications in the classroom. Similarly, Gaafar (2020) Having technical expertise enhances individuals' readiness to adopt and effectively use artificial intelligence tools, and artificial intelligence contributes to improving efficiency and facilitating planning and decision-making processes.

Table 6. *Third Domain: Factors Affecting Physical Education Teachers' Attitudes toward the Use of Artificial Intelligence (N = 1483)*

N	Statements	mean	SD	χ^2	sig
1.	My technical experience affects my willingness to use artificial intelligence (AI).	4.48	1.06	2870.34	P<0.00
2.	The availability of appropriate training encourages me to use AI in teaching.	4.64	0.87	2292.74	P<0.00
3.	The availability of devices and technologies at school facilitates the use of AI in physical education lessons.	4.70	0.65	2289.58	P<0.00
4.	The time available during class influences my ability to use AI applications.	4.57	0.92	1976.56	P<0.00
5.	My belief in the benefits of AI increases my willingness to employ it in teaching.	4.62	0.93	3539.71	P<0.00
6.	Support from school administration encourages me to use AI in physical education lessons.	4.61	0.55	1619.34	P<0.00
7.	The nature of the physical education lesson (outdoor field or indoor gym) affects the feasibility of using AI applications.	4.65	0.49	933.01	P<0.00

The results indicate that several factors influence PE teachers' attitudes using artificial intelligence in teaching, with the arithmetical means of the various elements showing high values ranging between 4.48 and 4.70, reflecting the importance of technical expertise, the availability of exercise, the availability of tools, and executive support., The nature of the lesson fosters teachers' desire to use artificial intelligence. This aligns with research findings showing

that AI not only serves as a support tool but also explain an integrated learning environment that enhances teacher effectiveness, improves planning and assessment, and provides through feedback to students, which positively impacts their learning and performance development. (Bofill-Herrero et al., 2025; Solamillo, 2025).

It was hereafter discovered that the difference of technical skills and experience in using technology growing their skills to take on artificial intelligence tools in lessons (Hwang, Xie, Wah, & Gašević, 2020), and that the availability of local training and support increases the eligibility of using these details and hearten their integration into their educational pursuit (Khosravi et al., 2022).

The findings of Gaafar et al. (2024) moreover point out that the quality of the work environment and institutional support affect teachers' performance and readiness to take on new methods and technologies. This can be attached to teachers' desire to use smart tools and AI in PE lessons, as assistance professional environment grow their acceptance of change and adoption of innovative teaching way.

These results also align with Alqahtani (2024), who advanced that ease of use of artificial intelligence, and digital skills during teachers' growth their admission of new technologies in education, thus promote the blend of artificial intelligence into classroom exercise.

Finally, Raza & Farooq (2025) Which particular that the availability of digital tools and convenient infrastructure in schools clearly contributes to heartening teachers to anticipate AI in lesson planning, creating educational content, and developing modern teaching methods, and perfection of student engagement and performance, highlighting the role of technical, knowledge-based, and common support in promote AI blend in physical education teaching.

Physical Education Teachers' Attitudes toward the Use of Artificial Intelligence in Physical Education Lessons According to Gender and Years of Service

Table 7. *Physical Education Teachers' Attitudes toward the Use of Artificial Intelligence in Physical Education Lessons by Gender*

Domains	GENDER	N	mean	SD	df	T	Sig
First Domain	Male	739	4.19	0.65	1481	0.47	0.639
	Female	744	4.18	0.65			
Second Domain	Male	739	4.41	0.65	1481	0.69	0.489
	Female	744	4.43	0.62			
Third Domain	Male	739	4.59	0.55	1481	1.17	0.244
	Female	744	4.62	0.52			

The table shows that there are no statistically significant differences between male and female physical education teachers in their attitudes toward using artificial intelligence (AI) in physical education lessons. This suggests that affect regarding recent educational technologies

are not significantly influenced by a person's gender. This outcome can be light by the quick digital transition in school, where both genders now have greater access to AI and digital technology, which has led to a convergence of views and awareness levels.

These results are in line with those of Ayanwale et al. (2022) and Kim & Kwon (2023), who found that regular training and digital competency have a greater impact on views about AI than demographic factors like gender. then, Chiu et al. (2024) observed that gender-related difference in the adoption of AI technology is lessened by shared educational practice and institutional support.

Table 8. *Physical Education Teachers' Attitudes toward the Use of Artificial Intelligence in Physical Education Lessons by Years of Experience*

Domains	Years of service	N	mean	SD	F	Sig
First Domain	> 5	479	4.20	0.65	0.674	0.510
	5-10	480	4.19	0.62		
	< 10	524	4.15	0.67		
Second Domain	> 5	479	4.43	0.66	0.413	0.662
	5-10	480	4.40	0.62		
	< 10	524	4.43	0.64		
Third Domain	> 5	479	4.62	0.57	0.202	0.817
	5-10	480	4.60	0.51		
	< 10	524	4.60	0.53		

The findings elucidate those years of service had no statistically considerable impact on physical education teachers' attitudes about the use of AI. This suggest that the degree of approval or rejection of AI in education is not always correlated with the duration of professional experience. The fact that artificial intelligence is a relatively new technology helps to explain this. This stratify with his research findings. According to Fernández-Batanero et al. (2022), digital skills need planned and ongoing training rather than developing naturally via years of experience. According to Demchenko et al. (2021), prospects for utilizing artificial intelligence are identical for novice and seasoned educators due to a lack of institutional support and infrastructure. According to Gaafar et al. (2025), institutional communion and supportive partnerships provide instructors with the resources and training they require to progress in their careers. The findings also showed that when teachers have sufficient resources and a supportive environment, they are more prepared to adopt new tools and technology in the classroom, such as smart applications. This improves student learning and class results. It demonstrates the significance of the institutional climate and outstanding support in encouraging the adoption of innovation and technology in the classroom.



Conclusions

- Physical education teachers' attitudes towards integrating artificial intelligence into lessons are positive and reflect their awareness of its benefits in improving the quality of education and developing teaching methods.
- Teachers' acceptance of employing artificial intelligence tools in teaching practice is high, with ease of use, rapid adaptation, and confidence in applying technology-supported practices.
- There are no statistically significant differences in attitudes based on gender or years of service, indicating a uniformity of attitudes towards the use of artificial intelligence among teachers.
- Providing a supportive learning environment equipped with appropriate resources that promotes the adoption of artificial intelligence tools within the classroom, thereby improving student learning and the quality of lesson outcomes.

Recommendations

- Encouraging the gradual integration of AI tools into physical education lessons in a manner that is appropriate to the level of expertise of teachers and the needs of students.
- Providing practical training programs for teachers to enhance their technical skills and increase their confidence in using AI.
- Providing essential hardware and software within schools to ensure the easy application of artificial intelligence during lessons.
- Strengthen - Strengthening the role of school administration in providing technical and logistical support to teachers to encourage the continued use of AI.
- Raise teachers' awareness of the benefits of artificial intelligence in developing teaching methods and improving student performance.
- Encouraging the exchange of experiences among teachers who have successfully used artificial intelligence to disseminate effective practices.
- Evaluating the effectiveness of using artificial intelligence to improve the quality of teaching and learning.



References

- Abdulghani, L. Y., Abdulghani, M. Y., & Abdulkareem, O. W. (2025). Designing a palm pressure measurement device to improve motor coordination in freestyle swimming among female students. *Journal of Physical Education and Sport*, 25(7), 1506-1513.
- Abdulhussein, A. A., Kadhim, M. J., Abdulkareem, O. W., & Shehab, G. M. (2026). The effect of neurofeedback on free throw accuracy in female basketball players of Baghdad University. *Retos*, 75, 496-507.
- Waleed, O., & Hamed, H. (2017). Analytical – Comparative Study of Some Kinematical Variables Of Jump Shot and Shooting in Youth Basketball Players. *Journal of Physical Education*, 29(4), 255-264. [https://doi.org/10.37359/JOPE.V29\(4\)2017.299](https://doi.org/10.37359/JOPE.V29(4)2017.299)
- Abdulkareem, O. ., Jabbar , H. ., & Obaid , A. . (2025). The Effect of Soft Toss Machine Training on Some Kinematic Variables and backhand accuracy of Tennis Players U16 years. *Journal of Physical Education*, 37(1), 190-205. [https://doi.org/10.37359/JOPE.V37\(1\)2025.2147](https://doi.org/10.37359/JOPE.V37(1)2025.2147)
- Almusawi, H. A., Durugbo, C. M., & Bugawa, A. M. (2021). Innovation in physical education: Teachers' perspectives on readiness for wearable technology integration. *Computers & Education*, 167, 104185.
- Alqahtani, S. A. (2024). Modeling Teachers' Acceptance of Generative Artificial Intelligence Use in Higher Education: The Role of AI Literacy, Intelligent TPACK, and Perceived Trust. *Education Sciences*, 14(11), 1209. <https://doi.org/10.3390/educsci14111209>
- Amer Abdulhussain, A., Sinan Atiyah, H., Hussain Jaber, O., Ridha Ghanim, M., Hashim Hammood, A., & Mohammed Saleh, Y. (2025). The Impact of Jesko's Strategy with Sequential Exercises on Learning the Skill of Dribbling in Basketball. *Annals of Applied Sport Science*, 13(4), 0-0.
- Ayanwale, M. A., Sanusi, I. T., Adelana, O. P., Aruleba, K. D., & Oyelere, S. S. (2022). Teachers' readiness and intention to teach artificial intelligence in schools. *Computers and Education: Artificial Intelligence*, 3, 100099
- Banaz, E., & Maden, S. (2024). Türkçe öğretmen adaylarının yapay zekâ eğitim uygulamalarının farklı değişkenler açısından incelenmesi. *Trakya Eğitim Dergisi*, 14(2), 1173–1180.
- Bofill-Herrero, A., García-Taibo, O., Ferriz-Valero, A., & Baena-Morales, S. (2025). Exploring the role and challenges of AI tools in physical education: qualitative insights from in-service, trainee, and future teachers. *Sport, Education and Society*, 1–16. <https://doi.org/10.1080/13573322.2025.2547869>
- Cabero-Almenara, J., Palacios-Rodríguez, A., Loaiza-Aguirre, M. I., & Rivas-Manzano, M. d. R. d. (2024). Acceptance of Educational Artificial Intelligence by Teachers and Its Relationship with Some Variables and Pedagogical Beliefs. *Education Sciences*, 14(7), 740. <https://doi.org/10.3390/educsci14070740>
- Cao, F., Lei, M., Lin, S., & Xiang, M. (2022). Application of artificial intelligence-based big data AI technology in physical education reform. *Mobile Information Systems*, 2022(1), 1–12.
- Cao, Q., & Yu, Q. (2025). Application analysis of artificial intelligence virtual reality technology in fitness training teaching. *International Journal of High Speed Electronics and Systems*, 34(2), 2440084. <https://doi.org/10.1142/S0129156424400846>



- Chiu, T. K. F., Moorhouse, B. L., Chai, C. S., & Ismailov, M. (2024). Teacher support and student motivation to learn with Artificial Intelligence (AI) based chatbot. *Interactive Learning Environments*, 32(7), 3240–3256. <https://doi.org/10.1080/10494820.2023.2172044>
- Demchenko, I., Maksymchuk, B., Bilan, V., Maksymchuk, I., & Kalynovska, I. (2021). Training future physical education teachers for professional activities under the conditions of inclusive education. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 12(3), 191–213. <https://doi.org/10.18662/brain/12.3/227>
- Deng, H., Xiao, H., Xiang, S., & Liu, J. (2025). Intelligent golf swing assessment: An AI-driven approach to personalized sports education. In *2025 7th International Conference on Computer Science and Technologies in Education (CSTE 2025)* (pp. 1071–1075). IEEE. <https://doi.org/10.1109/CSTE64638.2025.11091979>
- Fernández-Batanero, J. M., Montenegro-Rueda, M., Fernández-Cerero, J., & García-Martínez, I. (2022). Digital competences for teacher professional development. Systematic review. *European Journal of Teacher Education*, 45(4), 513–531. <https://doi.org/10.1080/02619768.2020.1827389>
- Francisco, C. I. (2025). Teachers' perceptions of learning from, about, and with artificial intelligence in education (AIED): Implications for ethical practice and the challenges of AI use in basic education. *EthAIca*, 4, 433. <https://doi.org/10.56294/ai2025433>
- Gaafar A. , Al Yaaribi A. , Al Droushi A R. , Al Kitani M. , Al Jadidi K. , Al Maqbali D. H. , Abunaser F. , Altamimi M. , Alshamy A. , Sharshouh M. (2025). Public-Private Partnerships in Supporting Talented Athletes: Enhancing Sports Development in Educational Institutions. *International Journal of Human Movement and Sports Sciences*, 13(4), 750 - 758. <https://doi.org/10.13189/saj.2025.130410>
- Gaafar, A., (2020). The role of artificial intelligence in human resource management in sports institutions in the Arab Republic of Egypt. *Journal of Comprehensive Educational Research*, 3, 1–26. <https://doi.org/10.21608/JSEI.2020.144293>
- Gaafar, A., Al-Droushi, A., Al Kitani, M., Al Yaaribi, A., & Sharshouh, M. (2024). Strategic vigilance in sports clubs: Insights and practices. *Journal of Ecohumanism*, 3(7), 3479–3486. <https://doi.org/10.62754/joe.v3i7.4479>
- Hassan, M. F. A., & Abdulkareem, O. W. (2025). The Effect of Mental Training on Psychological Hardiness and Selected Personality Traits among Adolescent Male Volleyball Players. *International Journal of Exercise Science*, 18(4), 1186.
- Holmes, W., Bialik, M., & Fadel, C. (2023). Artificial intelligence in education promises and implications for teaching and learning. Center for Curriculum Redesign.
- Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial intelligence for assessment and feedback to enhance student success in higher education. *Mathematical Problems in Engineering*, 2022(1), 5215722. <https://doi.org/10.1016/j.caeai.2022.100099>
- Hussein, L., Yusupova, G., Dilshodbek, M., & Kirit, D. D. (2025). Gamification and artificial intelligence in physical education using a wearable device for athletes. In *2025 International Conference on Computational Innovations and Engineering Sustainability (ICCIES 2025)*. IEEE. <https://doi.org/10.62617/mcb.v21i1.327>
- Hwang, G. J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in Education. *Computers and Education*:



- Artificial Intelligence, 1, 100001. <https://doi.org/10.1016/j.caeai.2020.100001>
- İç, S., & İç, E. (2024). Türkçe öğretmen adaylarının yapay zekâ uygulamalarına yönelik farkındalık düzeylerinin incelenmesi. *U Eğitim Dergisi*, 4(3), 987–1001.
- Khosravi, H., Shum, S. B., Chen, G., Conati, C., Tsai, Y. S., Kay, J., ... & Gašević, D. (2022). Explainable artificial intelligence in education. *Computers and Education: Artificial Intelligence*, 3, 100074. <https://doi.org/10.1016/j.caeai.2022.100074>
- Kim, K., & Kwon, K. (2023). Exploring the AI competencies of elementary school teachers in South Korea. *Computers and Education: Artificial Intelligence*, 4, 100137. <https://doi.org/10.1016/j.caeai.2023.100137>
- Kollwitz, C. (2023). Enhancing the prediction of shot success in NBA basketball games using machine learning techniques—LSTM neural network (Master's thesis, Universidade NOVA de Lisboa, Portugal).
- Landi, D., Walton-Fisette, J. L., & Sutherland, S. (2021). Physical education policy research in the United States: Setting a new orientation. *Quest*, 73(1), 45-62.
- Lv, J., Jiang, X., & Jiang, A. (2022). Application of virtual reality technology based on artificial intelligence in sports skill training. *Wireless Communications and Mobile Computing*, 2022, 1–7.
- Mokhtar, M. A. A. (2016). Applications of artificial intelligence: An introduction to educational development in light of the COVID-19 pandemic. *International Journal of Educational Sciences Research*, 2(2), 220–662.
- Ng, D. T. K., Lee, M., Tan, R. J. Y., Hu, X., Downie, J. S., & Chu, S. K. W. (2023). A review of AI teaching and learning from 2000 to 2020. *Education and Information Technologies*, 28(7), 8445–8501. <https://doi.org/10.1007/s10639-022-11491-w>
- Pandey, A., & Mishra, A. (2024). Application of artificial intelligence in sports analytics: Analysing the ethical and legal perspectives. In *Sports Analytics: Data-Driven Sports and Decision Intelligence* (pp. 163–184).
- Raza, S. H., & Farooq, A. (2025). AI in Pakistani Schools: Adoption, Usage, and Perceived Impact among Educators. arXiv:2509.25293. <https://arxiv.org/abs/2509.25293>
- Reddy, R. (2020). Implementation of new ways of artificial intelligence in sports. *Journal of Xidian University*, 14(5), 5983–5997.
- Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International journal of artificial intelligence in education*, 26(2), 582-599.
- Seyre, M., Yıldız, S., Emeşi, H., Şahin, A., & Türmen, M. T. (2024). Öğretmenlerin eğitimde yapay zekâ kullanımına yönelik algıları. *International Journal of Social and Humanities Sciences Research (JSHSR)*, 11(106), 845–856.
- Solamillo, K. A. (2025). Artificial Intelligence Anxiety and Attitudes among Pre-Service and In-Service Physical Education Teachers: Addressing an Underserved Field in AI Education. *LatIA*, 3, 245. <https://doi.org/10.62486/latia2025245>
- Strotmeyer, A., Kehne, M., & Herrmann, C. (2021). Effects of an intervention for promoting basic motor competencies in middle childhood. *International journal of environmental research and public health*, 18(14), 7343.
- Syafuruddin, A. (2023). Peran teknologi pendidikan terhadap perubahan pembelajaran pendidikan jasmani. *Jurnal Teknologi Pendidikan*, 3(2), 36–44.
- Syafuruddin, M. A., & Ikadarny. (2025). Perception of Physical Education Teachers in the Use of Artificial Intelligence Media in the Learning Process. *Journal RESPECS (Research Physical Education and Sport)*, 7(1), 23–31. <https://doi.org/10.31949/ijsm.v7i1.12940>



-
- Tan, Ç., Ceylan, Y., & Tür, O. (2023). Öğretmenlerin yapay zekâ araştırma tutumlarının incelenmesi. *The Journal of Social Sciences*, 67(67), 72–83.
- Waleed Abdulkareem, O., & Sattar Jabbar, H. (2025). Comparative biomechanical analysis of three-point shooting between elite iraqi basketball players and international counterparts. *Journal of Sport Biomechanics*, 11(3), 326-342.
- Yahya, S. Z., Rida, B. K. A., & Abdulkareem, O. W. (2024). The effect of a laser device on some biomechanical variables of the rotational phase in the achievement of 100 m freestyle swimming for the Iraqi team (16-18 years old). *Scientific Journal of Sport and Performance*, 3(4), 507-512.
- Zerouki, R., & Falt, A. (2020). The role of artificial intelligence in improving the quality of higher education. *Arab Journal of Qualitative Awareness*, 2, 1–12
- Zhang, Y. (2021). An AI-based design of student performance prediction and evaluation system in college physical education. *Journal of Intelligent and Fuzzy Systems*, 40(2), 3271–3279 <https://doi.org/10.3233/JIFS-189367>
- Zhou, T., Wu, X., Wang, Y., Wang, Y., & Zhang, S. (2024). Application of artificial intelligence in physical education: A systematic review. *Education and Information Technologies*, 29(7), 8203–8220. <https://doi.org/10.1007/s10639-023-12128-2>