



Research on Artificial Intelligence Assisted Physical Education Teaching

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Abstract

In recent years, the development speed of information technology has been accelerating, and AI technology has gradually entered the public view, playing an extremely important role in many fields. In the past, physical education in colleges was influenced by multiple factors such as concepts, resources and venues, which made it difficult for students to effectively stimulate students' interest in learning, and the effect of physical education learning is not significant. The introduction of AI technology into physical education teaching in colleges can break through the space-time limitations of physical education teaching, improve the teaching interaction, enrich the teaching content, and meet the needs of personalized learning. However, from the perspective of the practical application of AI technology in physical education in colleges, it still faces great challenges. If these problems cannot be eliminated, it is difficult to fully show the application value of AI technology. Based on this, this paper provides an overview of AI technology, points out the advantages and challenges of AI technology based on artificial intelligence to assist college physical education, and puts forward an effective strategy of AI technology to assist college physical education based on artificial intelligence.

Subject Areas

Artificial Intelligence

Keywords

Artificial Intelligence, Physical Education Teaching, Teaching Integration

1. Introduction

Artificial Intelligence “is a discipline based on computer science that simulates, extends, and expands human intelligence from low-level to high-level, and is also

a rapidly developing emerging field. The combination of artificial intelligence and the field of education is a new educational concept. The application of artificial intelligence in the field of education can make students more interested in learning, the classroom more dynamic, and their grades more improved. At the same time, the application of artificial intelligence technology in the field of education can enable students to achieve more comprehensive development, improve their self-learning ability, innovation ability, and practical ability [1].

2. Research Background and Significance

2.1. Social Background

In the context of the new era, physical education teaching in universities is facing higher requirements. However, due to factors such as insufficient venues and facilities, the frequency and quality of sports training are difficult to guarantee, which leads to unclear results in students' physical education learning and weakens their interest in participating in physical education classes. At the same time, some sports require high attention to detail in their technical movements, making it difficult for students to fully understand the sports using traditional teaching methods, which can also affect learners' interest. AI technology, as a product of the new era, has been widely applied in many fields and has achieved significant results. Nowadays, many physical education teachers have attempted to introduce AI technology into physical education teaching, in order to break through the limitations of traditional teaching models, promote innovative teaching methods, provide a sense of immersion in physical education learning, and meet the diverse learning needs of students. However, the application of AI technology in physical education still faces significant challenges and requires continuous practice and optimization to gradually improve the effectiveness of physical education teaching and fully demonstrate the value of AI technology in the teaching field [2].

2.2. Domestic Research Status

In recent years, the application of artificial intelligence technology in the field of physical education teaching in China has gradually deepened, forming a relatively systematic research system from primary and secondary schools to universities. Many scholars have begun to pay attention to the potential of AI technology in smart sports teaching, improving sports skills, and optimizing teaching evaluation.

Zhang Ying (2025) analyzed the role of smart physical education teaching in improving students' sports skills, and pointed out that through the intervention of AI technology, students' interest in sports and ability to master skills can be enhanced, thereby achieving personalized teaching goals [3]. Chang Haiqiang (2025) explored the feasibility of integrating AI intelligent teaching mode with traditional mode in primary and secondary school physical education classrooms, emphasizing the importance of AI technology in reconstructing teaching logic and stimulating student subjectivity [4].

Lin Shengbo (2025) proposed the concept of “new quality productivity”, emphasizing that in the construction of digital physical education courses in universities, AI is not only a tool, but also an important productivity that guides the transformation of course content and teaching forms [5]. However, Ran Kai (2025) points out from the perspective of innovative teaching paradigms in vocational physical education that AI technology plays a key role in reconstructing teaching content, innovating methods, and formulating evaluation standards [6].

Regarding the application of generative AI, Lin Chuncheng (2025) discussed the driving force of tools such as ChatGPT and DeepSeek for the reform of physical education courses in universities, and proposed new trends such as automatic generation of course content and intelligent teaching interaction [7]. Zou Yuxuan (2025) emphasizes the thinking mode transformation and practical optimization brought by AI in the integration process of physical education teaching and training [8].

The specific applications of smart sports have also received attention. Zhang Ling (2025) discussed the practical path of smart sports in university classrooms, including AI intelligent analysis, data visualization assisted teaching, etc. [9]. Zhang Peng *et al.* (2025) conducted research on intelligent sports equipment in primary and secondary schools, and believed that the current equipment updates quickly but the teacher’s application ability is weak, and teacher training needs to be strengthened [10].

Overall, domestic scholars generally believe that artificial intelligence has broad prospects in physical education teaching, with a focus on technology integration, teaching mode reconstruction, and intelligent equipment development. However, ethical issues, technological lag, teacher training, and other practical problems remain the main bottlenecks.

2.3. Current Research Status Abroad

In the international academic community, research on artificial intelligence in physical education teaching is increasingly being emphasized, mainly focusing on optimizing teaching evaluation, promoting health, modeling student behavior, and applying AI tools.

Zhengjun and Huayang (2025) proposed using the IFWA-BP neural network model in the evaluation of university physical education teaching, which can improve the objectivity and accuracy of the evaluation, and conduct multidimensional modeling of student performance [11]. This study reflects the trend of foreign scholars using AI for complex evaluation systems earlier.

Yilmaz *et al.* (2025) pointed out that in secondary school physical education, AI can become a powerful tool for health education by promoting health awareness and physical activity enthusiasm [12]. They advocate AI based behavioral intervention methods to replace traditional indoctrination based educational methods.

Wu *et al.* (2025) extended the Unified Theory of Technology Acceptance and Use (UTAUT) model to investigate students’ behavioral intentions and usage

behaviors towards AI generated content (AIGC) in physical education [13]. They found that students generally accept AI assisted content, but still hold a cautious attitude towards its accuracy and ethical boundaries.

Cui *et al.* (2025) approached from the perspective of educational innovation and believed that AI can play a role in incentive mechanisms, behavior tracking, and real-time feedback in physical education teaching, which can help achieve the integration of “teaching learning evaluation” [14]. This indicates that the introduction of AI has not only changed the level of teaching technology, but also profoundly influenced teaching concepts and strategies.

Maberah *et al.* (2025) found through a questionnaire survey that the majority of students hold a positive attitude towards the application of AI tools in physical education classrooms, believing that they can improve learning efficiency, provide personalized guidance, and stimulate learning motivation. However, there are also concerns about data privacy and reduced interpersonal interaction [15].

Compared to domestic research, foreign studies place more emphasis on ethical considerations and student experience feedback, while forming a relatively mature system in algorithm model construction, teaching tool development, and policy support.

3. High Quality Development Strategy of Middle School Sports Assisted by Artificial Intelligence

3.1. Data Driven, Scientifically Develop Exercise Training Plans

The widespread application of big data has provided new teaching concepts and methods for secondary school physical education. Through artificial intelligence technology, physical education teachers can understand students' basic situation before class and develop scientific and reasonable exercise training plans for students. Meanwhile, artificial intelligence technology can also provide personalized services for students and promote their personalized development. In the process of middle school sports, artificial intelligence technology can discover students' problems through data analysis and develop scientific and reasonable sports training plans based on this. This can not only help middle school physical education teachers improve teaching efficiency, but also provide better services for students. At the same time, artificial intelligence technology can also help middle school physical education teachers better understand students' physical fitness and provide personalized services for students. In the process of middle school sports, the development of a sports training plan is an important part. Scientifically formulating sports training plans can not only improve the teaching quality of middle school physical education teachers, but also enhance students' physical fitness and athletic ability. In the past, middle school physical education teachers mainly relied on experience and intuition when formulating exercise training plans, which was often not scientific and objective enough. The high school sports training plan assisted by artificial intelligence can use big data technology to collect real-time data during the exercise process, and process and analyze this data through

artificial intelligence algorithms. Through data analysis, it is possible to identify physical problems among students and intervene accordingly. With the help of artificial intelligence technology, middle school physical education teachers can develop scientific, reasonable, and personalized exercise training plans for students' physical problems. In this way, students can develop a more scientific and reasonable training plan based on their own situation.

3.2. Intelligent Assistance to Improve the Efficiency of Sports Training

Under intelligent assistance, the improvement of efficiency in middle school sports training is mainly reflected in the following aspects: 1) Assisted training to enhance athletic performance. With the continuous development of artificial intelligence technology, its application scope is constantly expanding, and the application of artificial intelligence technology in middle school sports teaching can effectively promote the improvement of middle school students' sports performance. For example, during basketball training, teachers can use artificial intelligence technology to analyze and guide students' shooting movements, thereby helping students improve their basketball shooting performance; 2) Assist decision-making and improve the efficiency of sports training. In the process of middle school sports teaching, artificial intelligence assistance can provide real-time and effective data support for sports training to promote the improvement of sports training efficiency. For example, during basketball training, teachers can use artificial intelligence technology to analyze basketball game videos and explain basketball techniques, movements, and tactical arrangements to students based on the video analysis results; For example, in the process of high school football matches, artificial intelligence technology can be used to analyze students' personal abilities and sports status, providing effective guidance for students' football matches; For example, in the process of volleyball training, teachers can use artificial intelligence technology to analyze every movement of volleyball players and provide more technical guidance for them. With intelligent assistance, middle school sports can better meet the personalized and high-quality development needs of middle school students, thereby improving the efficiency of middle school sports training.

3.3. Data Analysis to Assist in Diagnosing Sports Injuries

After introducing artificial intelligence technology into middle school sports, its application effects are mainly reflected in the following aspects: 1) Assisting diagnosis and promoting students' physical health. In the process of middle school sports, students' physical condition is the most concerned issue for teachers and parents. Therefore, after introducing artificial intelligence technology into middle school physical education teaching, it is possible to comprehensively analyze students' physical health status by analyzing their various sports data, and provide timely and reasonable guidance to students who encounter abnormal situations.

For example, in the process of basketball training for middle school students, teachers can arrange basketball training content reasonably based on students' physical fitness; 2) Adjuvant treatment to reduce the rate of sports injuries. In the process of middle school sports, due to various factors such as students' physical fitness, technical level, and equipment, sports injuries are easily caused, which can affect students' normal learning and life. The diagnosis and treatment of sports injuries are important aspects of middle school physical education teaching, and traditional middle school physical education teaching generally uses methods such as visual observation or instrument detection to diagnose sports injuries. These methods have certain drawbacks, such as traditional methods can only diagnose local injuries and cannot detect overall injuries. In addition, traditional methods are greatly influenced by subjective factors and cannot accurately reflect the overall situation of students. After introducing artificial intelligence assisted methods in middle school sports, big data analysis can be used to comprehensively analyze the problems existing in middle school sports teaching and assist in diagnosing sports injuries. The use of artificial intelligence in secondary school physical education plays an important role in improving the quality of secondary school physical education teaching.

3.4. Intelligent Evaluation and Establishment of a Comprehensive Sports Evaluation System

In the process of middle school physical education teaching, teachers should develop reasonable teaching plans based on students' physical condition and technical level, and continuously adjust teaching objectives according to students' actual situation. Therefore, in the process of middle school physical education teaching, teachers should evaluate students in a timely manner to understand their learning situation and technical level, so as to adjust teaching plans in a timely manner and promote the comprehensive development of middle school students. The establishment of a comprehensive evaluation system for middle school sports through artificial intelligence assistance is mainly aimed at comprehensively recording and analyzing various elements in the process of middle school sports, using big data to comprehensively evaluate students' performance in different stages of sports, and thus establishing a comprehensive evaluation system for middle school sports that includes multiple aspects such as teaching, training, and management. By utilizing artificial intelligence technology, the process of data collection and analysis is systematically integrated, enabling students to have a more intuitive understanding of their performance in different stages of movement. Meanwhile, teachers can also develop personalized teaching plans for students based on their evaluation data and results. In addition, artificial intelligence technology can also help teachers objectively evaluate students' performance in sports, and provide reasonable and scientific teaching plans and sports training suggestions for students through data analysis, thereby improving the quality and level of secondary school sports. In addition, teachers can also use artificial

intelligence technology to conduct comprehensive evaluations of students, enabling them to have a more comprehensive understanding of their performance and potential in sports.

3.5. Intelligent Analysis to Promote High-Quality Development of Secondary School Sports

After introducing artificial intelligence technology into middle school physical education teaching, not only can students' sports performance be improved, but their physical fitness can also be comprehensively analyzed, thereby enhancing the sports ability and physical fitness of middle school students and promoting their comprehensive development. With the help of intelligent analysis methods, comprehensive analysis of the physical fitness of middle school students can be conducted. The physical fitness of middle school students is an important part of school physical education teaching. By comprehensively analyzing the physical fitness of middle school students, we can grasp the trend of changes in their physical fitness and make reasonable evaluations of their physical health, so as to develop targeted teaching plans. In the process of middle school sports, students can choose suitable sports projects based on their own physical fitness to carry out sports activities. During this process, students can timely understand the problems they encounter during exercise and make corrections in a timely manner, thereby enhancing their physical fitness. The level of mastery of sports skills among middle school students is influenced by various factors. On the one hand, middle school students are in a stage of rapid physical development and need to enhance their physical fitness through sports activities; On the other hand, middle school students are the hope and talent cultivation targets for the future development of the country, and need to improve their comprehensive quality through sports. For example, in football project teaching, by using artificial intelligence technology to collect and analyze data on students' shooting frequency, shooting distance, shooting angle, etc., it is possible to understand the problems that students have in the process of football and provide reasonable guidance. In addition, middle school physical education teaching should also strengthen the cultivation of students' psychological qualities. Middle school students are in the stage of physical and mental development, and are prone to psychological problems. If middle school students develop negative psychology in physical education classes, it will directly affect their learning efficiency and the development of physical education classes, and even have adverse effects on their physical and mental health. Therefore, in middle school physical education teaching, it is necessary to strengthen the psychological health education of middle school students and help them develop good physical exercise habits. For example, in middle school physical education classes, teachers can use artificial intelligence technology to analyze students' psychological situations and provide reasonable guidance based on their psychological conditions. For example, for students with introverted personalities and high emotional fluctuations, teachers can use artificial intelligence technology

to understand their personality traits and provide targeted guidance. In addition, intelligent analysis systems can also be used to understand various problems that students encounter in their daily lives and provide reasonable suggestions, helping students better understand themselves.

4. Research Methods

This study uses literature analysis to construct a theoretical foundation, focusing on domestic and foreign research results in related fields such as artificial intelligence education application and physical education teaching reform. The sources include academic databases such as CNKI, Wanfang, Web of Science, IEEE Xplore, etc., and are searched and screened by keywords such as “artificial intelligence” and “physical education”. The literature will be used to define research questions, construct theoretical frameworks, identify existing achievements and research gaps, and assist in analyzing the theoretical basis of real-world problems.

5. Challenges of AI Technology

The application value of AI technology in the field of education is beyond doubt, but there are still certain challenges in introducing it into university physical education teaching. Firstly, the price of AI devices is relatively high. Although AI technology has undergone decades of development, it has only received widespread attention in recent years, with an increasing number of companies participating in AI product development. However, product quality is difficult to guarantee. The quality of AI equipment produced by some enterprises is good, but the equipment prices are expensive, which will increase the economic burden on universities; however, cheap AI devices are difficult to meet practical teaching needs. The problem of high costs has prevented the widespread adoption of AI technology. Secondly, AI devices are not yet mature enough. In recent years, AI devices have only achieved success

It has developed rapidly, but production is still in the initial exploration stage. The existing AI devices are relatively large in size, inconvenient to wear, and have poor performance, making it easy for users to experience dizziness during use. Software development is relatively lagging behind, and the existing software simulation environment is prone to distortion and lacks practicality. Once again, AI technology will reduce communication and interaction between teachers and students. In the process of conducting physical education teaching activities, communication between teachers and students is crucial, especially in group activities where communication needs to be strengthened to ensure the safety of members within the group

The degree of tacit understanding. AI technology is a new thing for students, and it can easily stimulate their interest and play a significant role in sports training. However, excessive use of AI devices can have adverse effects on interpersonal communication, especially in group projects where it is difficult to effectively cooperate, and learning outcomes can also be affected. Finally, people’s understanding

of AI technology is not deep enough. AI devices are considered by many to be emerging electronic devices, and their role in teaching has not been highly recognized. Some may even believe that they will affect students' learning. In short, AI technology can have a promoting effect on physical education teaching in universities, but there are still many problems in its specific application, and further exploration and practice are needed.

6. Conclusion

Artificial intelligence technology is an important branch of modern information technology, and its application in the field of education is becoming increasingly widespread. In middle school physical education teaching, artificial intelligence technology can assist teachers in conducting classroom teaching, using intelligent motion recording and analysis systems to achieve scientific evaluation of students' participation in physical education classes; using an intelligent exercise evaluation system to provide personalized exercise advice for students and help them develop scientifically effective exercise plans; using an intelligent accompanying training system to solve problems such as insufficient extracurricular sports training time and inadequate methods for students. With the continuous deepening of the application of artificial intelligence technology in middle school sports, it will gradually become a powerful assistant and "close friend" for middle school sports teaching. The deep integration of artificial intelligence technology and secondary school physical education teaching can not only greatly improve the efficiency of secondary school physical education teaching, but also solve the problems of insufficient extracurricular sports training time and inadequate methods for students. In the long run, this will help promote the high-quality development of secondary school sports in China [1].

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Liang, Y. (2023) High Quality Development of Secondary School Sports with the Assistance of Artificial Intelligence. *Sports and Science*, No. 13, 183-185.
- [2] Zhang, L. (2025) Research on AI Technology Assisted Physical Education Teaching in Colleges and Universities Based on Artificial Intelligence. *Contemporary Sports Technology*, **15**, 59-62.
- [3] Zhang, Y. (2025) Analysis of the Impact of Smart Physical Education Teaching on Empowering Students' Sports Skills Improvement. *Cultural and Sports Supplies and Technology*, No. 11, 193-195.
- [4] Chang, H.Q. (2025) Analysis of the Integration of AI Intelligent Teaching Mode and Traditional Teaching Mode in Primary and Secondary School Physical Education Classroom. *Knowledge Library*, **41**, 151-154.
- [5] Lin, S.B. (2025) Empowering the Construction of Digital Physical Education Curriculum in Colleges and Universities with New Quality Productivity: Transformation

- Direction and Implementation Path. *Liaoning Sports Science and Technology*, **47**, 116-120+140.
- [6] Ran, K. (2025) Research on the Innovation and Practice of Physical Education Teaching Paradigm in Higher Vocational Education in the Digital Age. *Science, Education and Culture*, No. 10, 164-167.
- [7] Lin, C.C. (2025) From ChatGPT to DeepSeek: How Can Generative Artificial Intelligence Drive the Transformation of University Physical Education Courses? *Sports World*, No. 5, 69-71.
- [8] Zou, Y.X. (2025) Thoughts and Practices on Empowering Physical Education Teaching and Training with Artificial Intelligence in the Context of Big Data Era. *Sports World*, No. 5, 75-77.
- [9] Zhang, L. (2025) The Application of Smart Sports in University Physical Education Teaching. *Boxing and Fighting*, No. 9, 128-130.
- [10] Zhang, P., Wang, Q., Wang, X., *et al.* (2025) Research on the Application of Intelligent Sports Equipment in Primary and Secondary Schools. *China Modern Education Equipment*, No. 10, 8-11.
- [11] Li, Z.J. and Kang, H.Y. (2025) Enhancing University PE Teaching Evaluation with IFWA-BP Network. *International Journal of Web-Based Learning and Teaching Technologies*, **20**, 1-21. <https://doi.org/10.4018/ijwltt.376484>
- [12] Yilmaz, E.B., Konukman, F. and Sortwell, A. (2025) Using Artificial Intelligence in Secondary Physical Education to Promote Health and Physical Activity. *Strategies*, **38**, 37-41. <https://doi.org/10.1080/08924562.2025.2479357>
- [13] Wu, Q., Li, S., Xin, S., Hou, Q. and Li, P. (2025) A Study on Students' Behavioural Intention and Use Behaviour of Artificial Intelligence-Generated Content in Physical Education: Employing an Extended the Unified Theory of Acceptance and Use of Technology Model. *Journal of Hospitality, Leisure, Sport & Tourism Education*, **36**, Article ID: 100547. <https://doi.org/10.1016/j.jhlste.2025.100547>
- [14] Cui, B., Jiao, W., Gui, S., Li, Y. and Fang, Q. (2025) Innovating Physical Education with Artificial Intelligence: A Potential Approach. *Frontiers in Psychology*, **16**, Article ID: 1490966. <https://doi.org/10.3389/fpsyg.2025.1490966>
- [15] Maberah, S., Kan'an, A., El-Sayed, N., *et al.* (2025) Students' Attitudes and Perceived Usefulness of Artificial Intelligence (AI) Tools in Physical Education. *International Journal of Information and Education Technology*, **15**, 767-773. <https://doi.org/10.18178/ijiet.2025.15.4.2282>