

# *The Integration of Artificial Intelligence Technology in College Physical Education: Innovation and Challenges*

Yang Jie, Hou Guangding, Hu Xiangyu

*School of Sports Science and Engineering, Hunan Institute of Engineering, Xiangtan, Hunan, 411104, China*

**Keywords:** Artificial intelligence; Universities; Physical education; innovate

**Abstract:** Universities are gathering places for talents and also the cradle of professional talent cultivation. In higher education, physical education teaching, as an essential course, is crucial for the comprehensive development of students' physical and mental health. The author will analyze in depth the application of artificial intelligence technology in the field of physical education, taking into account the current situation of physical education teaching in universities. The specific manifestations include: Accurate diagnostic ability, full monitoring services, personalized learning support, and intelligent decision-making assistance; The application forms include intelligent mentor systems, automated evaluation systems, and sports education robots. By formulating effective teaching reform and development plans, we can provide students with positive and effective guidance in physical education. This not only underscores the significance of physical education programs in universities but also ensures holistic educational support for the physical and mental well-being of students.

As technology continues to advance and artificial intelligence (AI) rapidly evolves, its integration into various sectors has become a prominent trend in contemporary society. Higher education, recognized as a crucial arena for nurturing future talents and driving societal progress, is actively embracing and exploring the applications of AI technology. Within higher education, physical education stands as a vital component undergoing both innovation and challenges in adopting AI technology<sup>[1]</sup>. Traditionally, physical education relied heavily on coaches' expertise and students' individual efforts. However, with the advent of AI, there lies an opportunity to revolutionize physical education in universities, fostering more efficient, personalized, and scientifically-driven teaching and training methodologies. For example, by using data analysis and machine learning algorithms, athletes can be accurately evaluated for their skills and performance, and personalized training plans can be developed for them; Virtual reality technology can provide students with realistic training scenarios and enhance their practical abilities; Intelligent fitness equipment can monitor students' exercise status and provide real-time feedback, helping them improve their movements and enhance training effectiveness. Nevertheless, the incorporation of artificial intelligence technology into university physical education encounters a range of challenges and obstacles. Consequently, the author seeks to investigate the fusion of artificial intelligence technology with college-level physical education. The aim is to explore various modes of expression and application, thereby offering insights into the integration of artificial intelligence

within the realm of physical education. This endeavor seeks to provide valuable guidance for leveraging artificial intelligence effectively in the field of physical education.

## **1. The significance of exploring innovative practices in the integration of artificial intelligence and physical education in universities**

In college physical education, it is a requirement for the development of the education industry to use information technology in a reasonable and targeted manner based on the connection with college physical education. This teaching model can create a new type of teaching environment, which can support the creation of specific scenarios, inspire students to think, enable students to obtain information more intuitively, better share resources, and meet the learning requirements of independent exploration, multi-layer interaction, and collaborative learning. This model not only leverages the subjective initiative of students, but also fully reflects the leading role of teachers. Taking students as the main body, encouraging them to focus on independent exploration, fully stimulating their initiative, enthusiasm, and creativity, breaking away from traditional physical education teaching models, achieving innovation and creativity, will help cultivate innovative talents, which is the goal of quality education in the information age<sup>[2]</sup>.

## **2. The manifestations of artificial intelligence in physical education**

### **2.1 Accurate diagnosis**

Artificial intelligence, rooted in deep machine learning algorithms fueled by extensive data, possesses the capability to pinpoint the weaknesses in student knowledge acquisition more accurately with increased data input. Consequently, it opens doors for delivering highly targeted personalized guidance, thereby enhancing the effectiveness of teaching for educators and learning for students. In sports applications, artificial intelligence can swiftly analyze and compute the learning psychology and external behavioral patterns of individual practitioners. By tracking diverse dynamic movement trajectories, it constructs a comprehensive, three-dimensional portrayal of each practitioner in a visually intuitive manner. This paves the way for precise diagnosis and tailored support for personalized learning, benefiting both learners and physical education instructors alike. It streamlines teaching processes, minimizes redundant tasks, enables students to attain precise mastery of sports techniques, and fosters their interests and capabilities in sports<sup>[3]</sup>.

### **2.2 Personalized Services**

As human society embraces the era of informatization, the Chinese nation is presented with unprecedented opportunities. It is imperative that we firmly grasp this moment and seamlessly integrate student individuality with intelligent education. By doing so, we can foster a comprehensive understanding and development of student personalities throughout the learning journey. The intelligent sports cloud service platform, underpinned by artificial intelligence technology, facilitates the analysis of students' mental states, sports aptitudes, and knowledge. By capturing individual preferences, needs, and prior experiences in sports learning, the platform delivers tailored services that cater to unique differences. It crafts personalized sports curriculum and training plans, custom-tailored to accommodate the diverse growth environments of students. Driven by overarching objectives, this platform orchestrates sports learning activities across various life stages, encouraging learners to embrace a lifelong commitment to sports and learning. Leveraging artificial intelligence, it adeptly records and maps learners' learning trajectories in different phases of physical education. This empowers physical education teachers to deliver

personalized and precise teaching methodologies that cater to individual learner needs and preferences<sup>[4-5]</sup>.

### **2.3 Intelligent decision-making**

In the era of big data, education is undergoing a transformative shift, with education data mining emerging as a prominent format with specific applications. The fusion of artificial intelligence with sports has ignited numerous possibilities. One such innovation is the Artificial Intelligence Classroom Quality Evaluation System (AI-CQE), a teaching evaluation system leveraging the analytical power of artificial intelligence. Drawing from vast repositories of classroom teaching video data, AI-CQE employs deep learning techniques to intelligently analyze the behaviors of both physical education teachers and students. This includes sophisticated capabilities such as facial recognition and expression analysis. By mining big data encompassing student movement trajectories, classroom dynamics, and engagement levels, AI-CQE generates intuitive visualizations to present insights to students, educators, and parents alike. This intelligent decision-making tool provides a scientific basis for educational decision-makers, aiding in the enhancement of teaching quality. Particularly in countries prioritizing education, fostering the holistic development of students across moral, intellectual, physical, aesthetic, and practical dimensions is imperative. However, the scarcity of physical education teachers and the unequal distribution of talent across regions pose challenges. By leveraging artificial intelligence to meticulously record each student's progress in sports skills, teachers can optimize their time allocation, ensuring that every student receives tailored physical education instruction<sup>[6]</sup>.

## **3. The Application Forms of Artificial Intelligence in Physical Education**

### **3.1 Intelligent Mentor System**

With the support of big data, the intelligent mentor system models, analyzes, evaluates and makes decisions, and builds an intelligent online learning and education platform, which is the main application form of "artificial intelligence+education" at present. Intelligent mentors first appeared in 1982. They simulate the teaching experience and methods of teachers through computers, adopt a one-on-one teaching mode for students, and provide guidance and clarification for learners with different needs and characteristics. Intelligent coaching systems harness advanced technologies like language processing and speech recognition to analyze sports scenes and data in real-time and with depth. These systems function as mentors, offering comprehensive diet plans, training regimens, and quantitative performance analysis. By automating repetitive tasks typically handled by sports trainers, they enhance the efficiency of sports training programs. Furthermore, these systems track, evaluate, and offer feedback based on practitioners' performance and problem-solving abilities. They provide tailored suggestions to address individual needs, ensuring personalized guidance throughout the learning process. Even after students transition from direct teacher guidance, the intelligent mentor system continues to offer support. By effectively analyzing data, it offers solutions to students' challenges in physical education teaching, providing them with scientifically proven learning methods<sup>[7]</sup>.

### **3.2 Automated evaluation system**

The initial development phase of the "Artificial Intelligence Ten Sports" automated evaluation system presented a significant engineering challenge, demanding substantial human, financial, and material resources. Traditional manual evaluation methods became insufficient to meet the

increasingly rigorous requirements of sports teaching assessment. Thus, expediting the intelligent advancement of sports teaching evaluation became imperative. Presently, this automated evaluation system finds widespread application in online assessment across various disciplines. Leveraging natural language processing technology and an extensive corpus inventory, it automatically evaluates student assignments by analyzing their proximity to standard corpora. Subsequently, it delivers real-time scoring, suggestions, and content analysis results, streamlining the evaluation process. This system offers corrections and feedback, enhancing the efficiency and accuracy of assessment in sports teaching. In the future, there is still great room for improvement in real-time tracking, management, and evaluation of automated evaluation systems. After the teacher completes the teaching content in physical education class, students can practice their motor skills independently outside of class. The automated evaluation system enables intelligent assessment of students' learning progress in physical education classes, accessible anytime and anywhere. Consequently, it can extend its application to physical health testing, revolutionizing the conventional approach reliant on teachers and sports professionals. This innovation not only enhances the accuracy of test data but also optimizes resource utilization by reducing the need for manual intervention, thereby saving both manpower and financial resources. It can also combine with the evaluation content of students' daily physical education learning effectiveness to improve their physical fitness.

### **3.3 Sports education robots**

The convergence of artificial intelligence with various disciplines has spurred fresh advancements in educational AI within the education sector. Educational robots, once rudimentary educational tools, have evolved into versatile artificial intelligence assistants. These robots now play a multifaceted role, aiding students in organizing their daily learning activities, facilitating resource sharing, and actively engaging students in the learning process, but also establish friendly companionship with students, integrate education with entertainment, and promote their learning and growth. The main forms of applying educational robots to sports include: ① Assisting personalized exercises to make sports training no longer boring. ② Sports lecture hall knowledge assistant, popularize sports knowledge, and explain sports history. ③ A real-time feedback sports assistant that accurately records your exercise time, intensity, heartbeat and other physiological indicators, generates exercise reports, and provides exercise advice based on your actual physical condition. ④ Sports digital portraits help teachers understand the learning situation of each student and continuously improve teaching methods. In the future, the widespread adoption of sports education robots will democratize access to physical education classroom instruction, allowing a greater number of students to actively participate. Parents can be reassured that their children are becoming increasingly enthusiastic about physical activity, fostering a lifelong commitment to sports and a culture of continuous learning<sup>[8]</sup>.

## **4. Innovative measures for improving physical education in current universities**

### **4.1 Updating Physical Education Teaching Concepts**

Amidst the new curriculum reform, it's essential for university physical education instructors to adapt their teaching philosophies, embrace fresh pedagogical approaches, and steer physical education teaching reforms in the right direction. We should focus on adhering to the teaching philosophy of fun guidance and practical training, ensuring that students can actively participate in physical exercise while providing them with a happy learning experience, and stimulating their

lifelong awareness of sports. In the writing of lesson plans, we should adhere to the concept of individualized guidance and personalized teaching. In teaching activities, we should pay attention to analyzing the learning situation and physical fitness characteristics of each student, and try to choose the appropriate activity plan and training mode for each student, so that students can improve their sports efficiency, realize personal value, and improve the effectiveness of teaching organization. In dealing with students, we should adhere to the humanistic ideology and make quality education the main direction. On the basis of strengthening the training of students' sports skills, we should focus on cultivating their self-confidence, give them more encouragement and appreciation, so that they can develop the courage and determination to overcome difficulties and never slack off in training. We should cultivate the willpower and perseverance of students to work hard and persevere, thereby improving the effectiveness of their sports training <sup>[9]</sup>.

#### **4.2 Innovative teaching methods**

In the context of the information age, in the process of organizing and carrying out physical education teaching activities in universities, teachers should improve and innovate teaching methods by integrating multiple teaching methods. Teachers should provide effective physical education teaching guidance to students. In the process of explaining the knowledge points of emergency handling of sports injuries to students, teachers can introduce a combination of scenario creation and simulation exercises in physical education teaching methods. In teaching activities, teachers can create teaching scenarios in which students encounter sports injuries, and then organize students to participate in sports injury emergency handling simulation exercises in specific contexts, promoting the optimization and innovation of teaching activities, so that students can form a deep understanding of the techniques and operating points of emergency handling of sports injuries. In this way, teaching effectiveness can be optimized and innovated, and the learning effectiveness and sports ability of college students can also be further optimized. Students' interest in sports will also be further strengthened.

#### **4.3 Improving teaching evaluation methods**

In the context of the information age, in the process of carrying out teaching activities, in order to improve the overall efficiency of physical education teaching activities, teachers can try to introduce artificial intelligence technology into the teaching evaluation system. By using artificial intelligence systems, a comprehensive physical education teaching evaluation system can be formed to make accurate judgments on students' participation in sports, so as to help students accurately understand and position themselves in their physical education learning practice, accurately understand and position themselves in their physical education learning practice, objectively evaluate their physical education learning situation and physical fitness training, and point out the direction for students to participate in sports systematically. This can change the shortcomings of traditional teaching evaluation methods, highlight the scientific and effective nature of teaching evaluation methods, provide positive guidance for sports practice of college students, and effectively improve the health level and sports ability of college students <sup>[10]</sup>.

### **5. Conclusion**

In the current information age and within the framework of the new era of socialism with Chinese characteristics, educational informatization must remain dynamic and aligned with contemporary trends. In this new era, physical education assumes greater educational significance, and the convergence of artificial intelligence with sports offers expansive opportunities for its

advancement. While artificial intelligence technology continues to evolve, its widespread practical application in education remains limited. Thus, it's imperative to solicit input and insights from grassroots teachers to inform future developments. A comprehensive evaluation of information technology education, centered around learners, is essential, encompassing both its strengths and weaknesses. Simultaneously, adopting an international perspective is crucial, enabling the proactive establishment of a talent training system geared towards the future and fostering the widespread integration of artificial intelligence in education. These endeavors will not only propel educational progress but also contribute significantly to the flourishing of sports.

## Acknowledgments

2021 Hunan Province General Higher Education Teaching Reform Research Project  
Topic Name: Research and Practice on Optimizing the Physical Education Curriculum System in Ordinary Universities under the Background of Smart Sports Construction  
Project number: HNJK-2021-0848

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