

Development and Application of Modern Educational Technology in Physical Education: Trends, Challenges and Recommendations

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Abstract: With the rapid development of science and technology, modern educational technology has been used in various fields, and physical education teaching is no exception. This study explores the development and application of modern educational technology in physical education teaching and analyses its trends, challenges, and suggestions for future development. Through literature review and case analysis, it is found that the application of modern educational technology in physical education teaching has made remarkable progress but still faces some challenges, such as the cost of technical equipment, teacher training, and the adaptation of teaching content and methods. In the future, the technical support and equipment guarantee system should be improved, the professional training of teachers should be strengthened, and the scientific and technological literacy of students should be improved, to promote the better application of modern educational technology in physical education teaching.

Keywords: Modern educational technology; Physical education; Development and application; Trends; Challenges and recommendations.

1. Introduction

At present, under the policy orientation of the state vigorously advocating the digital transformation of education and the high-quality development of higher education, the discipline of educational technology in China will usher in an important opportunity for high-quality development[1]. With the rapid development of information technology and the popularisation of the Internet, the application of educational technology in various fields has also been widely noticed and promoted. Physical education, as an important part of education, also needs to adapt to the development and changes of the times and use educational technology to improve the quality of teaching and the learning effect of students. Modern educational technology has a very positive impact on improving the efficiency and quality of physical training, and through the effective use of modern educational technology, it can promote the comprehensive management of students' physical training[2]. From the current situation of information technology in China's schools: teachers' outdated teaching concepts, lack of innovation, and low utilization of network information resources, all these problems seriously hinder the development of educational technology[3]. Therefore, training a large number of high-quality, specialized, and innovative digital teachers is a basic task for the innovative development of teacher education in the information age[4]. The education sector is also aware of the potential of educational technology in physical education teaching and is actively promoting the development and application of educational technology. For example, the Ministry of Education issued the Opinions on Strengthening and Improving Physical Education in Primary and Secondary Schools, which put forward the requirements and objectives of combining educational technology with physical education teaching. Education departments at all levels are also actively promoting training and support for physical education teachers in educational technology and providing them with appropriate educational technology equipment and resources.

In the current context of educational reform and modernization, the development and application of modern educational technology in physical education teaching in China are of great significance and value. It can not only enhance the effect and quality of physical education teaching, but also cultivate students' comprehensive quality and innovation ability, solve the boring and single traditional physical education teaching mode[5], and promote the overall development and improvement of education. Therefore, strengthening the application of modern educational technology in physical education teaching is one of the important tasks of the current educational reform and development.

2. The Development and Application of Modern Educational Technology in Physical Education Teaching

2.1. The concept and characteristics of modern educational technology

Modern educational technology refers to a teaching mode and method that applies modern scientific and technological means to the process of education and teaching. It makes use of advanced technological means such as information technology, communication technology, multimedia technology, etc., and provides support and assistance for teaching activities through tools such as computers, the Internet, and mobile devices, to improve the teaching effect and the quality of learning. Characterized by diversity, interactivity, personalization, real-time, resource sharing, and innovation, modern educational technology provides a broader space for development and richer teaching means for education and teaching.

2.2. Current status of the application of modern educational technology in physical education teaching

2.2.1. Application of digital teaching materials and network courses

Digital teaching materials and network courses have become one of the main forms of the application of modern educational technology in physical education teaching. Digital teaching materials can update the content in real time, improve teaching efficiency, and stimulate students' interest in learning through interactive sessions. Network courses, on the other hand, allow students to learn at home anytime and anywhere, improving the flexibility and autonomy of learning.

2.2.2. Application of Multimedia Teaching

Multimedia teaching is also widely used in physical education. Through the use of multimedia resources such as images, video, and audio, teachers can better demonstrate technical movements and tactical arrangements to improve teaching effectiveness. In addition, multimedia teaching can provide students with opportunities for independent learning and personalized learning.

2.2.3. Application of intelligent devices and virtual reality technology

In recent years, the use of smart devices and virtual reality technology has also received increasing attention in physical education. Wearable technologies, such as fitness trackers and smartwatches, provide teachers with innovative means for instruction[6] and help teachers better understand students' learning and health. Virtual reality technologies, on the other hand, allow students to better feel the sports situation and improve their learning.

2.3. Advantages and Significance of Modern Educational Technology in Physical Education Teaching

2.3.1. Providing Diverse Teaching Resources and Promoting Cooperation and Communication

The modernization of physical education teaching cannot be separated from the integration and development of modern educational technology[7]. Modern educational technology can provide rich and diverse teaching resources for physical education teaching, including videos, animations, simulators, and so on. These resources can help students understand and master physical education skills and knowledge more intuitively, and enhance learning interest and participation. Through tools such as online platforms and social media, students can share experiences with other students and learn from each other. This kind of cooperation and communication can develop students' teamwork and social skills and improve their overall quality.

2.3.2. Personalized Learning, Enhanced Teaching Effectiveness and Efficiency

Modern educational technology can provide personalized learning content and teaching methods according to the different needs and abilities of students. Through intelligent learning systems and algorithms, teachers can adjust teaching strategies according to students' learning and feedback to help students learn and progress better. Teachers can release teaching tasks and assignments through the online teaching platform, collect feedback on students' learning promptly,

adjust teaching strategies and contents promptly, provide personalized counseling and guidance, and improve teaching effectiveness and efficiency.

2.3.3. Helping students establish complete movement concepts

Because some sports movements are instantaneous and difficult, the complete demonstration of the teacher's movements can not help students establish a correct concept of movement, and the decomposition of the movement demonstration is prone to produce the phenomenon of movement disjointed. The use of modern educational technology, through the classroom animation or image using slow play, pause, replay, and other teaching tools, combined with demonstration, can help students see every instant of technical action, and understand the action.

2.3.4. Changed teaching principles, forms of teaching, and classroom settings

While traditional education is limited to schools within walls, the development of modern educational technology allows learners to escape the limitations of school classroom time and geography. Teachers can teach according to the actual situation of the students and realize tailor-made teaching. At the same time, the application of modern educational technology also allows students to learn more independently and better play the role of the main body.

3. Trends of Modern Educational Technology in Physical Education Teaching

3.1. Application of virtual reality technology in physical education teaching

Virtual reality technology is a kind of simulation reality technology that uses computer technology to create a virtual environment. In physical education teaching, VR technology makes students more concentrated, reduces their dependence on teachers, and reduces students' academic burden[8]. Virtual reality technology mainly includes the following aspects: first, the simulation training and competition of virtual scenes. Through virtual reality technology, teachers can simulate various game scenes, game skills, and tactics, so that students can train and experience in the simulated environment, to better master various skills and tactics in the actual game. Second, the analysis and improvement of motor skills. Virtual reality technology can record students' sports data and movements for real-time analysis and feedback. By simulating the comparison between correct and incorrect movements, students can understand their mistakes more intuitively, to better correct their incorrect movements. Third, the education of physical health and sports safety. Virtual reality technology can simulate various sports scenes and situations to help students learn about physical health and sports safety. Students can learn the correct sports posture and movements in the virtual environment, and understand the prevention and treatment of sports injuries.

3.2. Application of Artificial Intelligence Technology in Physical Education Teaching

Artificial intelligence technology is a technology that simulates human intelligence, and its application has gradually penetrated various fields. In sports teaching, the application of artificial intelligence technology can help

teachers better understand the learning situation and needs of students, to achieve accurate teaching. First, personalized learning and counseling. Artificial intelligence technology can provide personalized learning content and counseling based on students' learning and feedback. Through intelligent learning systems and algorithms, teachers can adjust teaching strategies and content and provide targeted counseling and guidance according to students' abilities and needs. Second, analysis and assessment of motor skills. Artificial intelligence technology can analyze students' motor data and performance to provide accurate assessment and feedback. Artificial intelligence can analyze students' motor postures and movements, assess their skill levels and room for improvement, and help students improve their motor skills. Third, data analysis and decision support. Artificial intelligence technology can analyze a large amount of student data and teaching data to provide decision support and optimization solutions. Artificial intelligence can analyze students' learning and progress to help teachers adjust teaching strategies and provide personalized teaching plans. Meanwhile, AI technology can also be used in sports competitions and training to help coaches better formulate training plans and competition strategies by analyzing athletes' physical conditions and competition data.

4. Challenges of Modern Educational Technology in Physical Education and Sport Teaching

4.1. Problems of high technology cost and equipment replacement

The application of modern educational technology requires corresponding technical support and equipment guarantees, such as digital teaching materials, network courses, and multimedia teaching, which will increase the cost of teaching and technical costs. In addition, the slow replacement of equipment will affect the teaching effect and the improvement of the learning experience.

4.2. Technology dependence and privacy and security issues

The application of educational technology in physical education usually requires the use of a variety of devices and software, such as sensors, cameras, and cloud-based analysis platforms. The use of these technologies may require specialized knowledge and training, and the maintenance and updating of the equipment requires a certain amount of cost and resources. EdTechs may have privacy and security implications when collecting and analyzing student data. For example, some educational technology companies may collect students' personal information and sports data, which may raise the risk of privacy breaches and data misuse.

4.3. Adaptation of teaching content and methods

The application of modern educational technology has changed the traditional teaching mode and learning styles, requiring the redesign of teaching materials and teaching methods to adapt to the new technological tools and teaching methods. This requires teachers to have high technical ability and innovative spirit to better adapt to the new teaching content and methods.

5. Suggestions for the Application of Modern Educational Technology in Physical Education Teaching

5.1. Strengthen the professional training of teachers

Teachers are the core force of teaching, and their professional abilities and qualities are crucial to teaching effectiveness and student development. In the future, there is a need to further strengthen the professional training of teachers to improve their technical skills and literacy so that they can better apply modern educational technology to improve the quality and effectiveness of teaching. This can be done in the following ways: First, organize regular teacher training activities. This includes training in technical skills, teaching methods, and content, to help teachers better adapt to new teaching modes and methods. Secondly, strengthening exchanges and cooperation among teachers. Encourage teachers to participate in academic conferences, seminars, and other academic exchange activities to share their teaching experience and insights and improve their teaching level together. Third, establish a sound teacher evaluation mechanism. Take teachers' application of modern educational technology as one of the important indicators of evaluation to motivate teachers to apply modern educational technology.

5.2. Improve students' technological literacy

Students are the object and main body of teaching, and it is necessary to improve students' scientific and technological literacy so that they can better adapt to new teaching modes and methods, and better utilize modern educational technology for learning and exercising. This can be done in the following ways: First, increase the content of education on scientific and technological literacy in physical education, introduce the background, role, and significance of the application of relevant technologies, to enhance students' scientific and technological awareness and cognition. Secondly, organize relevant scientific and technological activities and competitions, digital sports competitions, intelligent fitness activities, etc., to enhance students' interest and enthusiasm in science and technology. Third, strengthen the integration with subject teaching and integrate science and technology education into physical education theory teaching and practical teaching to improve students' scientific and technological literacy and application ability.

5.3. Improve technical support and equipment guarantee system

Technical support and equipment guarantee is the basis for the wide application of modern educational technology in physical education teaching. In the future, it is necessary to further improve the technical support and equipment guarantee system, to improve the speed of updating equipment and the efficiency of technical support, and to guarantee the smooth application of modern educational technology in physical education teaching. This can be done in the following aspects: First, strengthen the cooperation with enterprises and jointly develop new physical education teaching technology and equipment, to improve the speed of research and development and updating of equipment. Secondly, establish a sound technical support network and technical service system, set up an online technical support platform, provide real-time online technical support, and so

on, to improve the efficiency and response speed of technical support. Thirdly, establish a perfect system of equipment maintenance and management, such as regular inspection, maintenance, and repair of equipment, etc., to ensure the normal operation of the equipment and the use of the effect.

6. Case Analysis

Taking the Chinese Sports Intelligence Cloud SaaS platform as an example, as shown in Figure 1, this platform is a campus sports intelligence cloud platform specifically designed to serve physical education teachers and campus managers. It empowers physical education teachers with

technology and helps them reduce their burden. It mainly promotes the informatization, intelligence, and data-driven development of physical education teaching from three aspects: improving intelligent teaching, improving teacher literacy, and promoting students' comprehensive development. According to the official website data of the Sports Intelligence Cloud SaaS platform, 220000 teachers have registered and certified nationwide, more than 50,000 schools have used the platform, and over 30 million students have participated in sports activities through the platform. This platform can better meet the practical needs of direct demonstration, real-time interaction, real-time evaluation, and data statistics in smart sports teaching.

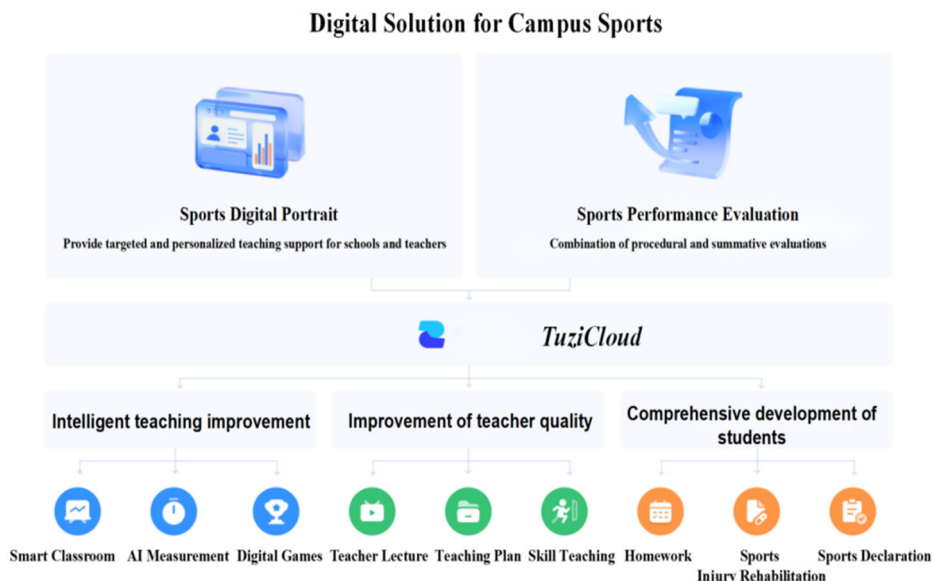


Figure 1. TuziCloud Digital Solution for Campus Sports

The Daily Rope Skipping APP developed by China's Body Intelligence Cloud SaaS platform is a platform for rope skipping counting, AR sports, and sports homework. It better realizes AI counting, and AI interaction, and contains a variety of interactive boards such as rope skipping, physical exercise, running, ball sports, and fun sports to help students learn and master sports skills. Take jumping rope as an

example, as shown in Figure 2, first, find a suitable sports ground and place the mobile phone facing yourself. Then, the AI will recognize the movements during the movement for interactive counting. Before that, students can take the comprehensive assessment of jumping rope and jumping rope teaching, which can more quickly understand their problems with jumping rope.

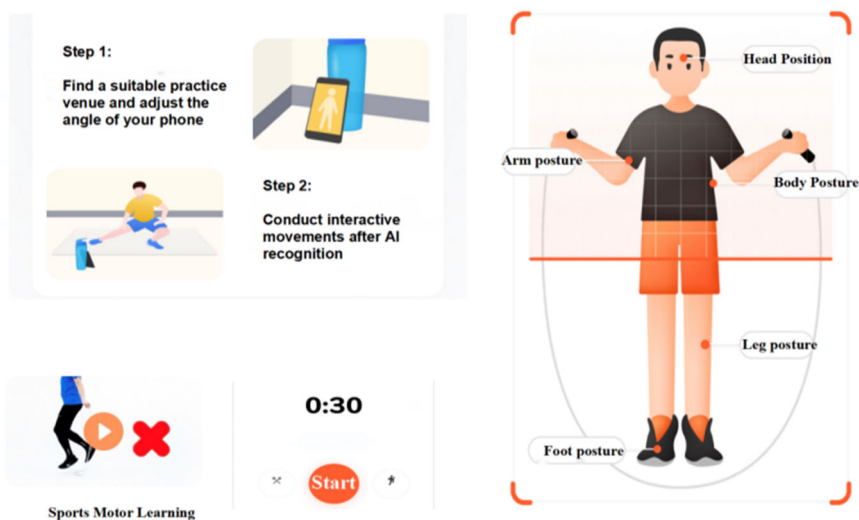


Figure 2. Daily Jump Rope APP AI Interactive Technology

7. Conclusion

The use of educational technology in physical education has become an important trend. With the continuous progress of technology, educational technology brings many opportunities for innovation and improvement in physical education. Modern educational technology can provide more learning resources and opportunities, increase student engagement and motivation, and promote personalized learning experiences. Of course, educational technology in physical education faces challenges such as high technology costs and equipment replacement issues, technology dependence privacy and security issues, and adaptability of teaching content and methods. To give full play to the potential of educational technology in physical education, it is necessary to provide better technological equipment and network infrastructure, strengthen professional training and support for teachers, redesign physical education teaching curricula to integrate educational technology, further promote the in-depth integration of modern educational technology and physical education teaching, and explore more effective teaching models and methods.

References

- [1] Hu Qintai, Wang Shuli. (2022). Opportunities and paths for high-quality development of educational technology disciplines in China in the new era. *Modern Distance Education Research*, 34(4), 21-28.
- [2] Luo Ganglin.(2021).The application of modern educational technology in sports training. *Contemporary Sports Technology*, 11(18), 3.
- [3] Li, N. (2022). On the Influence of the Development of Modern Educational Technology on Primary and Secondary Schools. *The Educational Review, USA*, 6(10), 563-565.
- [4] Yang Jiumin, Ning Guoqin, Zheng Xudong, Li Wenhao,&Yu Qiuchen. (2021).Reconstruction of the "Modern Educational Technology Application" Curriculum for Excellent Digital Teachers in the Intelligent Era. *e-Education Research*, 42(12), 7.
- [5] Yue Mingxiao,&Wu Gang. (2020). The Application of Modern Educational Technology in Physical Education Teaching. *Bulletin of Sport Science & Technology*, 28(2), 2.
- [6] 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.
- [7] Wang Wen.(2014).The Current Situation and Reform of Physical Education Teaching in Universities Based on Modern Educational Technology. *Education and Vocation*,(11), 2.
- [8] Wang, N., Abdul Rahman, M. N., & Lim, B. H. (2022). Teaching and curriculum of the preschool physical education major direction in colleges and universities under virtual reality technology. *Computational Intelligence and Neuroscience*, 2022.