

Intelligent Development of College Physical Education Teaching Mode Based on “Internet+”

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ABSTRACT

With the rapid development of information technology and the popularization of the internet, physical education teaching in colleges and universities is facing more and more opportunities and challenges. This paper takes the intelligent development of “Internet +” college physical education teaching mode as the theme, introduces the “Internet +” college physical education teaching mode and expounds the intelligent development of “Internet +” college physical education teaching mode, and then looks forward to the intelligent development of college physical education teaching modes future. The research shows that the intelligent development of college physical education teaching mode can give full play to the advantages of Internet technology and intelligent equipment, improve teaching effect and student experience, and promote the innovation and development of college physical education teaching.

KEYWORDS

Intelligence, Internet +, Physical Education, Teaching Mode

Internet+ represents a new economic form, which combines various traditional industries with the Internet to promote the development of all industries. At present, China’s Internet+ has brought opportunities and challenges to the field of higher education. As an important part of higher education, physical education in colleges and universities is facing changes in innovative teaching concepts, teaching processes, teaching resources, and teaching methods under the background of Internet+. On one hand, a variety of information technologies have created more teaching means and resources for college physical education. The popularity of the Internet has made the contents and resources of physical education in colleges and universities more widely disseminated, providing more teaching modes and methods for physical education in colleges and universities. On the other hand, the development of information technology has brought new technologies. College physical education teachers need to constantly learn new technologies and applications. The openness of the Internet has also created problems in information security and copyright protection. In addition, the development of online education and distance education have led to problems of teaching quality

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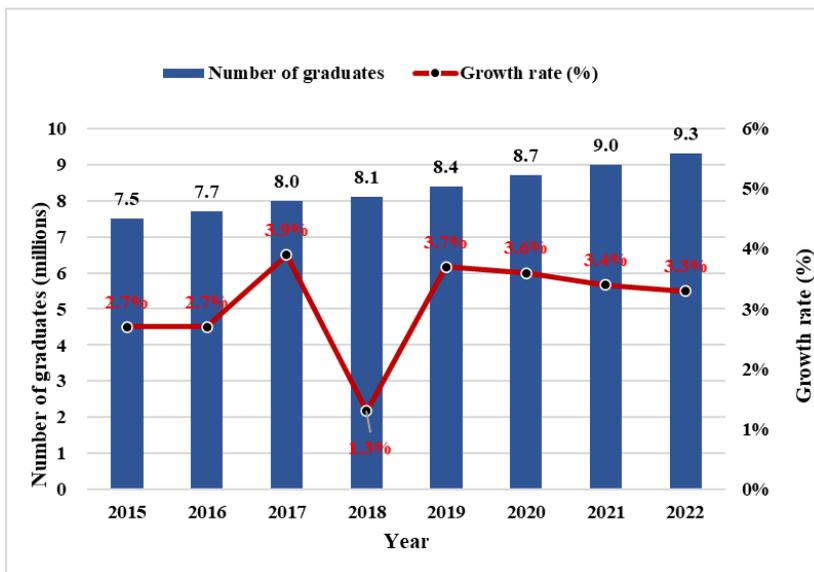
and teaching effect, which require college physical education teachers to seriously consider and actively explore solutions. In order to better adapt to the requirements of current developments, college physical education must continue to innovate and improve (Golden et al., 2024). This article addresses Internet+ intelligent development of physical education teaching modes in colleges and universities, discusses the construction and development of such teaching modes and considers future developments and coping strategies (Casey, 2018).

Relevant studies have shown that the Internet+ college physical education teaching mode is a teaching mode realized under the support of the Internet+ concept and technology. Its theoretical basis includes technologies such as the Internet, information technology, mobile Internet, cloud computing, and big data, as well as educational theories such as curriculum design and teaching methods (Al Maktoum & Al Kaabi., 2024). In the era of Internet+, the construction of college sports intelligent sports management system can fundamentally change the traditional sports teaching mode. Through intelligent teaching services, students' subjectivity is more prominent, stimulating their autonomy and initiative in physical education learning. At the same time, information-based teaching resources and intelligent teaching services can provide students with more personalized and targeted physical education teaching services to meet their personalized development needs. This can promote the comprehensive improvement of students' core literacy and also meet the fundamental needs of talent cultivation in the current education field in China (Quay et al., 2008).

The intelligent development of an Internet+ college physical education teaching mode is an important task that can bring many benefits. To ensure successful development, it is necessary to fully consider various factors in the teaching process, including educational concepts, teaching content, technical equipment, and others. The number and growth rate of Chinese college graduates from 2015 to 2022 are shown in Figure 1.

With the increasing number of college graduates in China year by year, the employment market competition of college graduates is also increasingly fierce. On the one hand, the intelligent development of the Internet+ college sports teaching mode can improve teaching quality, improve the teaching environment, broaden the teaching channels, enhance students' independent learning ability, and improve the comprehensive quality and competitiveness of graduates. On the other hand, college graduates can also gain more advantages and opportunities in using the Internet+ college

Figure 1. Number and Growth Rate of Chinese College Graduates From 2015 to 2022



sports teaching model. For example, through technologies such as computer vision and deep learning, students' postures and movements can be identified and analyzed, providing precise feedback and guidance for teachers and students. Utilizing sensors and data mining techniques to monitor and analyze the psychological state of athletes, providing personalized emotional regulation and psychological training suggestions for teachers and students.

This paper first expounds on the concept of Internet+ and the current situation of college physical education teaching modes. It then discusses the theoretical basis and characteristic advantages of the Internet+ college sports teaching mode; analyzes the construction methods, characteristics, and advantages of the intelligent development of college sports teaching model; shows the specific application of the intelligent development of college sports teaching model through development cases; and summarizes how the intelligent development of college sports teaching model plays an important role in improving teaching effects and students' comprehensive quality. Finally, this paper discusses future trends, challenges, and countermeasures of the intelligent development of college physical education teaching mode.

INTERNET+ COLLEGE PHYSICAL EDUCATION TEACHING MODES

According to one definition, Internet+ education refers to the technological tools and media that assist in the communication of knowledge, and its development and exchange (Abeysekera et al., 2024). This includes various forms of digital technology, such as augmented reality, virtual reality, gamification, artificial intelligence, and personalized learning, that can enhance teacher instruction and student learning (Kim et al., 2024). Internet+ education is also related to the idea of using the Internet as an educational tool that can provide access to information, resources, and opportunities for learning across different contexts and locations (Shen et al., 2024). In this paper, we use the term Internet+ education to describe the integration of these technologies and practices into the physical education curriculum in higher education institutions. For a long time, the three most popular physical education teaching modes in China's colleges and universities were the basic course system, the club system, and the optional course system. For the current teaching process in colleges and universities, from the perspective of students' physical test results, these models have not effectively changed the physical health of college students. The data fed back by the Student Physical Health Test Center of the Ministry of Education shows that the physical health status of college students in China is on the decline (Jing & Chen, 2021). In order to better adapt to current developments and students needs college physical education teaching needs to be combined with the Internet to build an Internet+ college physical education teaching model (Ding et al., 2021). Physical education built by combining the Internet, the Internet of Things, and intelligent terminal equipment needs to provide students with a more scientific, personalized, and intelligent physical education experience. Therefore, Internet+ and college physical education need to be solved first by building a diversified teaching content system and implementing intelligent teaching methods (Simsek & CAPAR, 2024). Intelligent physical education can use video-based electronic teaching materials and online physical education course service platforms to enrich classroom teaching content by providing more abundant and diversified physical education resources. In addition, intelligent physical education needs to build intelligent electronic classrooms and use intelligent interactive devices to enrich the teaching methods of physical education classroom.

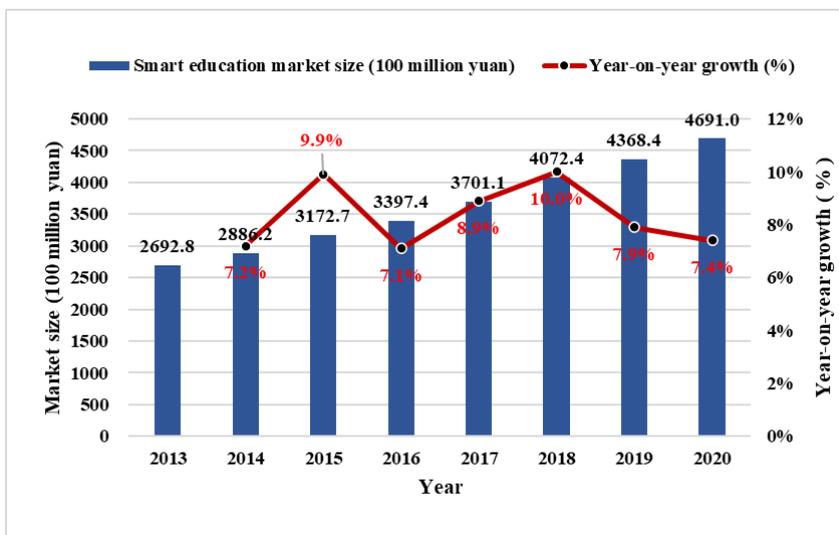
The in-depth application of the Internet+ teaching model has made the online and offline smart sports teaching model an irresistible trend. Offline classroom teaching provides students with teaching services focused on basic knowledge and professional skills of sports. Online teaching provides students with targeted teaching services and practice fulcrums through the sports information integration service platform, breaking the time and space limitations of traditional teaching (Wang, 2021).

Intelligent Development of Physical Education Teaching Modes in Colleges and Universities

With advances in science and technology, intelligence has become an important trend in the development of physical education teaching in colleges and universities. The intelligent development of physical education teaching modes in colleges and universities is supported by information technology, and it is a teaching mode that makes physical education teaching in colleges and universities intelligent, digital, and networked. The intelligent teaching mode is an important direction for the innovation of physical education teaching in colleges and universities, which can better meet the needs of students and improve teaching effect and quality. The theoretical basis of intelligent development of physical education teaching modes in colleges and universities mainly includes artificial intelligence, big data, Internet of Things, cloud computing, and other related technologies (Meng, 2021). In the context of college physical education teaching, Internet+ refers to the use of internet technology to enhance teaching effectiveness and student experience. There are various ways in which Internet+ can interact with college physical education teaching. For example, online platforms can be used to deliver course materials, assignments, and assessments. Additionally, wearable devices and mobile apps can be used to track students' physical activity and provide personalized feedback. Virtual reality technology can also be utilized to create immersive and engaging learning experiences. In conclusion, the Internet+ concept provides numerous opportunities for the development of college physical education teaching. By leveraging internet technology and smart devices, college physical education teaching can be made more personalized, interactive, and effective. These technologies can provide better teaching methods and teaching resources for college physical education teaching. Artificial intelligence technology can realize personalized teaching, and tailor the teaching plan according to the learning situation and ability of different students. Big data technology can collect and analyze students' learning data to provide teachers with better teaching decision support. IoT technology can combine student movement data with learning data for comprehensive student evaluation. Cloud computing technology can provide students with a better online learning environment and resources. Figure 2 shows the market size of China's smart education industry from 2013 to 2020.

As shown in Figure 2, with the update and application of intelligent technology, the teaching mode of university physical education has become intelligent, including intelligent gyms, intelligent sports

Figure 2. China's Smart Education Industry Market Size 2013–2020



equipment, intelligent teaching software, and so on. This is also one of the important reasons for the expansion of the intelligent education industry market. The application of intelligent technology has also provided new ideas and approaches for the reform of physical education teaching in universities. Therefore, it can be said that the expansion of China's intelligent education industry market is closely related to the intelligent development of university physical education teaching models.

Construction of the Intelligent Development of Physical Education Teaching Modes in Colleges and Universities

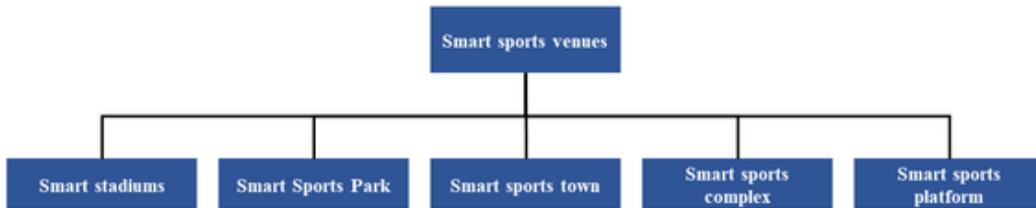
The construction of intelligent development of physical education teaching modes in colleges and universities needs to comprehensively optimize and integrate existing teaching resources and means to realize the digitization, networking, and intelligence of the teaching process (Fu et al., 2021). The specific construction steps are as follows:

1. Establish an intelligent college physical education teaching platform. Through this platform, the sharing and dissemination of teaching resources can be realized, and the teaching efficiency and quality can be improved.
2. Use artificial intelligence and big data technology to develop a smart teaching system. Through this system, the collection and analysis of student learning data can be realized, and better teaching decision support can be provided for teachers.
3. Establish a smart teaching environment (Hosseinpour-Niazi et al., 2024). Using IoT technology, students' movement data and learning data are combined to achieve a comprehensive student evaluation.
4. Integrate and optimize intelligent teaching resources and means to realize the construction of intelligent development of a physical education teaching mode in colleges and universities.

The integration of intelligent teaching resources and means includes various forms, such as online courses, network resource libraries, virtual laboratories, and teaching games. By integrating these resources and means, we can provide students with richer learning content and experience and improve students' learning interest and participation (Yu & Qi, 2018). Virtual reality and motion simulation technology can be applied to sports projects that are difficult to implement due to extreme weather or limited conditions. For example, in rainy or harsh weather, it is not possible to play tennis outdoors. However, in a smart classroom, students can engage in virtual tennis practice by opening an intelligent terminal and using a smart tennis racket with a sensing chip, achieving indoor tennis practice while obtaining a safer and more convenient experience. In addition, virtual reality and motion simulation technology can also be applied to indoor simulation training of other outdoor sports such as skiing and rock climbing. These technologies can not only improve the training efficiency of athletes, but also reduce the risk of sports injuries, provide a safer and more secure training environment for athletes, and promote the healthy development of sports.

In actual operation, the construction of intelligent development of a physical education teaching mode in colleges and universities needs to pay attention to the following points. First, strengthen teacher training (Chen et al., 2022). Teachers must have the concept and ability of intelligent teaching and be good at using information technology for teaching. Second, pay attention to the individual development of students. The intelligent development of a physical education teaching mode in colleges and universities can provide students with personalized learning experience and evaluation, so it is necessary to pay attention to the individualized development of students and differentiated teaching. Finally, continue to optimize the teaching system and teaching quality (Xu & Lin, 2022). The intelligent development of college physical education teaching modes needs to be continuously optimized and improved, and the teaching quality and effect should be continuously improved to meet the needs of the development of the times. Common smart sports venues are shown in Figure 3.

Figure 3. Smart Sports Venues



Students can learn about the operation of sports venues through smartphone applications (APPs). This information includes the geographical location of the sports stadium, the number of facilities, reservation status, and the number of attendees. In addition, social relationship chains can be introduced to enable students to check if their friends are present. By using big data technology to trace historical data, students can compare whether there are any friends among the students present, which provides data support for their exercise decisions. Students can proceed with the next steps, such as booking venues or organizing activities, based on information such as reservation status and attendance. Through these intelligent functions, students can more conveniently participate in sports activities and interact more closely with other classmates.

The Characteristics and Advantages of the Intelligent Development of Physical Education Teaching Modes in Colleges and Universities

Compared with the traditional teaching mode, the intelligent development of physical education teaching modes in colleges and universities has the following characteristics and advantages:

- The intelligent development of physical education teaching modes in colleges and universities is individualized, differentiated and flexible. It can provide personalized learning experience and evaluation according to the different needs and abilities of students.
- The intelligent development of college physical education teaching modes is real-time and interactive (Guo & Li, 2021). Students can study at any time and any place, and teachers can understand students' learning situation and needs in real time.
- The intelligent development of physical education teaching modes in colleges and universities is visualized and experimental. Students can learn relevant knowledge and skills more vividly and intuitively through virtual laboratories and teaching games.

In summary, the intelligent development of college physical education teaching modes is an important trend and direction of college physical education teaching in the future. Through the application of information technology and the optimization of the teaching system, the quality and effect of teaching can be better improved, the learning needs and expectations of students can be met, and the intelligent development of physical education teaching in colleges and universities can be promoted.

THE INTELLIGENT DEVELOPMENT OF INTERNET+ COLLEGE PHYSICAL EDUCATION TEACHING MODES

Development Background and Process

At present, there are some problems in the process of information reform and construction of college physical education, such as outdated teaching structures, insufficient software and hardware conditions,

low status of curriculum, and insufficient ideological awareness (Qazi et al., 2024). In the process of intelligent development of physical education teaching modes in colleges and universities, colleges and universities need to build corresponding educational platforms and resources to support the teaching and learning activities of teachers and students. These platforms and resources include physical education information platforms, online physical education courses, virtual simulation laboratories, intelligent equipment, and so on. Teachers can conduct online teaching through the physical education information platform, upload courseware, assign homework, and conduct interactive exchanges; students can learn relevant knowledge through online physical education courses, simulate physical training scenes through virtual simulation laboratories, and conduct real-time monitoring through intelligent equipment and data analysis (Harris et al., 2024).

In addition, the intelligent development of college physical education teaching models also needs to introduce cutting-edge technologies such as artificial intelligence and big data to improve teaching quality and efficiency. For example, artificial intelligence technology can monitor and analyze students' exercise status and provide targeted training suggestions; through big data technology, students' exercise data can be analyzed to provide data support for teaching improvement.

The Importance of Intelligent Development of Physical Education Teaching Modes in Colleges and Universities

For college education, intelligence is an inevitable trend. Only by adapting to the development of the times can we better meet the needs of students and improve the level of education and teaching. Specifically, the intelligent development of the physical education teaching model in colleges and universities needs to rely on modern technical support, strengthen the interaction between teachers and students, enrich the course content, and improve the quality of education. Only in this way can we truly realize the intelligent development of physical education teaching in colleges and universities. At the same time, the needs and characteristics of students also must be fully considered during development (Jianbang & Changxin, 2021). The purpose of physical education teaching in colleges and universities is not only to enable students to master certain skills and knowledge, but also and more importantly, to enable students to grow up healthy and shape a good personality. Therefore, more consideration should be given to the physical and mental health of students in the development process. In addition, it is also necessary to ensure the stability and security of information technology during development. Network technology is inherently vulnerable, so a series of measures need to be taken to ensure information security (Dapeng, 2020). First, it is necessary to strengthen the safety awareness of teachers and students to avoid unnecessary information leakage. Second, it is necessary to adopt safe network technology and encryption measures to protect the information security in the teaching process. Finally, development also needs to pay attention to the issue of educational equity. Due to the continuous development of network technology, the Internet + college physical education teaching mode has brought convenience to most students. However, some students in poor areas or with poor economic conditions may not be able to enjoy the benefits of this teaching model. Therefore, a series of measures need to be taken to ensure educational equity, such as providing network equipment and online learning resources.

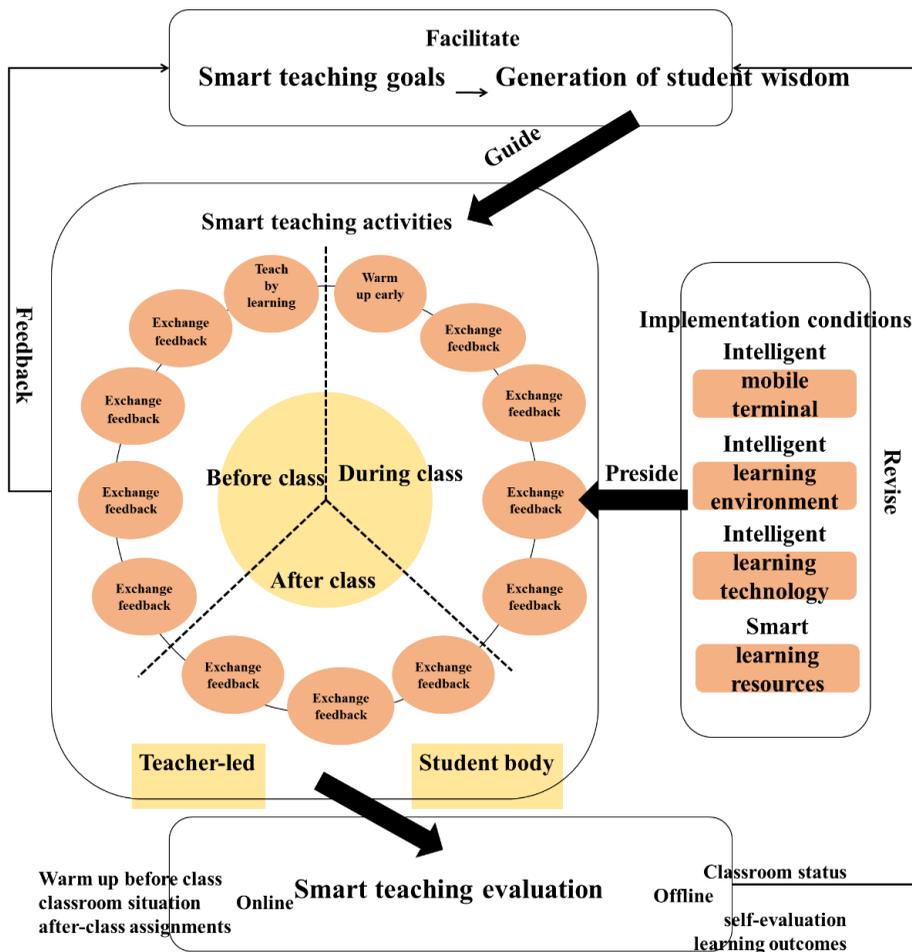
The Achievements of the Intelligent Development of Physical Education Teaching Modes in Colleges and Universities

Until now, the intelligent development of physical education teaching modes in colleges and universities has achieved remarkable results. On one hand, the students are more interested in this new teaching method and are more willing to participate in it. At the same time, their physical quality has been comprehensively improved. On the other hand, the teaching quality and efficiency of teachers have also been improved, because through internet technology, students' performance can be better recorded and analyzed and teaching strategies can be adjusted in time, so that each student can receive more personalized teaching services (Ying, 2016). In the context of Internet+, physical education

teaching in colleges and universities can be conducted in the form of a flipped classroom through the network platform, breaking the restrictions of time and space, so that students with a weak foundation can make full use of a flipped classroom to learn relevant knowledge. And excellent students can also expand their knowledge and enrich their knowledge and skills by flipping the classroom, thus effectively avoiding the aggravation of polarization.

In the teaching process, the use of intelligent equipment has also greatly improved the participation and experience of students. For example, using large screens in the classroom to play sports skills videos in real time allows students to learn skills more intuitively and to master sports skills more deeply. As another example, intelligent equipment can be used during sports competitions to record the data and performance of each student and to analyze and compare the data to help teachers and students understand their performance more comprehensively and make timely adjustments. In addition, the application of intelligent development of physical education teaching mode in colleges and universities will also help to promote the connection between schools and society and improve the social benefits of physical education in colleges and universities. Through internet technology, we can better publicize and promote the school's physical education concepts and teaching achievements, attract more social forces to participate, and provide students with more comprehensive and high-quality educational services. The frame diagram of the smart physical education teaching mode is shown in Figure 4.

Figure 4. Frame Diagram of the Smart Physical Education Teaching Mode



All in all, while ensuring the successful creation of the intelligent development of the physical education teaching model in colleges and universities, it is also necessary to ensure information security and educational fairness to meet the needs of different students. Through continuous exploration and development, we can continuously improve and optimize the Internet+ college physical education teaching model to benefit more students.

FUTURE PROSPECTS FOR THE INTELLIGENT DEVELOPMENT OF PHYSICAL EDUCATION TEACHING MODES IN COLLEGES AND UNIVERSITIES

Trend and Demand of the Intelligent Development of College Physical Education Teaching Modes

With the continuous advancement of information technology, the intelligent development of college physical education teaching modes will become a future trend. Technical equipment will be more intelligent, including intelligent sports equipment, intelligent evaluation equipment, and so on, which will provide more convenience for college physical education teaching (Benítez et al., 2024). Further, the teaching content will be more personalized. Through intelligent technology, the teaching content can be tailored according to the actual situation of the students to improve the teaching effect. In addition, the Internet+ college physical education teaching model will continue to expand to areas such as sports health management and live broadcast of sports events, providing students with more choices and better services.

We have concluded that there are the following requirements in the process of intelligent development of physical education teaching models in colleges and universities. First, the intelligent development of physical education teaching models in colleges and universities requires cooperation and support from various groups (Norouzi et al., 2024). This includes the support of university leadership, the active participation of faculty and students, the assistance of technical teams and the support of related enterprises. Only the cooperation of all groups can ensure the smooth implementation of the intelligent development of the physical education teaching model in colleges and universities (Yong, 2018). Secondly, it is necessary to pay attention to the richness and diversity of teaching content in the development. Teachers need to combine intelligent technology to innovate the content of physical education courses so that students can gain rich knowledge and experience in learning. At the same time, for students of different levels and abilities, different courses and course combinations need to be offered to meet the diverse needs of students (Zhuang & Zhu, 2024). Finally, development requires continuous optimization and improvement. The teaching team needs to keep up with the development of intelligent technology, understand new technologies and new applications, and further optimize and improve the Internet+ college physical education teaching mode. At the same time, timely feedback and solutions are required for developing problems, so as to continuously improve teaching effects and teaching quality.

Challenges and Countermeasures of the Intelligent Development of College Physical Education Teaching Modes

Although the intelligent development of physical education teaching modes in colleges and universities has broad development prospects, there are also some challenges. The problem of technical equipment and network stability still exists, which requires continuous strengthening of the update and maintenance of technical equipment (Wen, 2021). In addition, the issue of education equity still needs to be addressed; it is necessary to increase investment in education and provide students with better educational resources, especially in areas with poor economic conditions. Furthermore, with the continuous development of technology, information security issues are becoming more and more prominent, and it is necessary to strengthen the protection of information security.

In order to meet the challenges faced by the intelligent development of physical education teaching modes in colleges and universities, we need to adopt a series of coping strategies. First, it is necessary to strengthen the update and maintenance of technical equipment and networks to ensure the stability of technical equipment and the smooth flow of the network. Second, it is necessary to increase investment in education, provide more educational resources for areas with poor economic conditions, and ensure educational equity. Third, it is necessary to strengthen information security and adopt safe network technology and encryption measures to ensure information security in the teaching process. Finally, colleges and universities should strengthen the management of intelligent teaching and improve the level of teaching management. Schools should establish a sound teaching management system, clarify teaching objectives and standards, and ensure the improvement of teaching quality and educational effects. At the same time, schools should strengthen the supervision and evaluation of the teaching process, discover and correct problems in a timely manner, and promote the continuous development and improvement of intelligent teaching.

Suggestions for Promoting the Intelligent Development of Physical Education Teaching Modes in Colleges and Universities

In the future, colleges and universities can apply the following suggestions to promote the intelligent development of physical education teaching models in colleges and universities:

1. Establish a sound curriculum system for the intelligent development of physical education teaching models in colleges and universities to meet the needs of students at different levels and in different fields.
2. Colleges and universities need to actively introduce new technologies and carry out various forms of online and offline teaching modes to improve students' learning experience and learning effects.
3. Colleges and universities should establish a complete evaluation system for the intelligent development of college physical education teaching models, and scientifically evaluate its effects, so as to find problems in time, make improvements, and improve teaching quality.
4. Establish a resource sharing mechanism. Colleges and universities can share physical education resources on the sharing platform to improve the efficiency of resource utilization and optimize the allocation of physical education resources.
5. Strengthen the research and development of intelligent education technology. With the continuous development of technology, various intelligent educational technologies will continue to emerge. Colleges and universities should actively participate in the research, development, and application of these technologies and continuously improve the level and effect of the intelligent development of college physical education teaching models.
6. It is necessary to attach great importance to the instruction of the teaching staff for the intelligent development of the physical education teaching model in colleges and universities, strengthen teacher training and disciplinary understanding, and improve the level and ability of teachers' intelligent education to meet the development needs of the new era.
7. Encourage students to actively participate in the learning and development activities of the intelligent development of the physical education teaching model in colleges and universities, cultivate students' awareness of independent learning and lifelong learning, and improve students' learning interest and self-development ability.

CONCLUSION

The intelligent development of college physical education teaching modes is the general trend. This article addresses the concept of Internet+ and the current situation of the physical education mode

in colleges and universities. It then discusses the theoretical basis, characteristics, and advantages of the Internet+ physical education teaching mode in colleges and universities. Further, the specific application of the intelligent development of the physical education teaching model in colleges and universities is shown through a development case, and it is concluded that the intelligent development of the physical education teaching model in colleges and universities plays an important role in improving the teaching effect and the quality of students' comprehension. Finally, it discusses future trends, challenges, and countermeasures of the intelligent development of physical education teaching modes in colleges and universities. Only by constantly exploring, innovating, and continuously improving the quality and level of teaching can colleges and universities better adapt to the requirements of physical education in the new era and contribute to students' physical and mental health and all-round development.

DATA AVAILABILITY

The figures used to support the findings of this study are included in the article.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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