Research on the development of intelligent physical education in colleges and universities

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Abstract: The development of intelligent technology promotes the comprehensive level of physical education teaching, also provides rich content for re -shape of physical education's form and its teaching reform. To explore the current intelligent physical education existing realistic dilemma, optimize the development path, establish a sharing mechanism for domestic and foreign joint maritime construction and promote the teaching paradigm of intelligent physical education are necessary. The path is created to open intelligent sports ecosystem; Also to standardize teachers'thought and behavior and wipe out technical barriers is urgently needed.

1. Introduction

With the rapid development of information technology and Internet, many countries have promoted the application and research and development of artificial intelligence (AI) and other technologies to the national strategic level. From 2018 to 2019, nearly 60 countries and regions are preparing to formulate national strategies for artificial intelligence [1-2]. In 2015, Premier Li Keqiang proposed to formulate the "internet plus" action plan and "Internet+Education" in the "Government Work Report", which became the new engine for the innovation-driven development of the education sector. In 2018, the Ministry of Education issued the Action Plan for Artificial Intelligence Innovation in Colleges and Universities, proposing to build a multi-level education system of artificial intelligence, promote the reform of school education and teaching, build a teaching environment with technology empowerment, encourage the development of intelligent learning platforms, and realize the customization of lifelong education. The State Council issued "China Education Modernization 2035" in 2019, demanding to speed up the educational reform in the information age, build an intelligent campus, and make overall plans to build an integrated and intelligent teaching management and service platform. Physical education in colleges and universities needs to follow the trend, cultivate talents in an all-round way, improve the sports literacy of the whole people, and accelerate the construction and practice of intelligent physical education teaching system.

2. The realistic dilemma of intelligent physical education teaching in colleges and universities

The Third Plenary Session of the 18th CPC Central Committee put forward "to build an effective mechanism to expand the coverage of quality education resources by using information technology" [3], and digital information resources should serve education and teaching. Many platforms have been built in China, such as the project of full coverage of digital educational resources in teaching points, which started in 2012, and now there are 63,600 teaching points, and the activity of "One Teacher, One Excellent Class, One Teacher" launched in 2014 has exposed nearly 20.08 million classes so far. In 2018, the Ministry of Education promulgated the "Education Informatization 2.0 Action Plan", proposing to strengthen the construction of virtual simulation training teaching environment in vocational colleges and universities to serve the needs of information-based teaching. The sudden novel coronavirus epidemic in 2020 triggered the widespread application of the platform, and some problems were exposed immediately. According to the survey of CIQA, online teaching is influenced by many factors, including: students' integration into the course; Teachers' teaching concepts and strategies, and the application level of modern educational technology; The stability of the school teaching platform[4]. It is widely rumored on the Internet that PE teachers lie on the bed to explain

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while demonstrating swimming movements, squatting at the root of the wall to demonstrate how to practice squats correctly, and students upload pictures and submit homework. The pictures are one after another, which makes people laugh. This is much more vivid and intuitive than students learning from words or pictures, but it is impossible to observe and complete the action exercises through the screen, and whether the attitude after class, the intensity and density of practice, and the technical accuracy meet the teaching expectations. The online courses temporarily built by teachers have not established an effective audit mechanism in the form, source and quality of curriculum resources, which can not meet the needs of teachers and students. Exploring the type, scope, mode and effect of intelligent equipment application in physical education teaching is of practical significance to the development of intelligent physical education in colleges and universities. At present, the use of smart devices in colleges and universities is limited. Wearable devices are generally bracelets with testing function. Apps with fitness guidance are more widely used, and the application of AI technology and AR/VR technology in the teaching of sports virtual simulation courses is rare.

2.1 Financial reasons make the system design and implementation slow

From the design of feasible scheme and various indicators to the final formulation and implementation, it needs to be closely linked. In addition, it is necessary to set up pilot projects in batches according to the design. From summing up experience in the pilot projects to popularizing and implementing them, the whole process is time-consuming, labor-intensive and requires a lot of capital investment. In 2019, the investment in national education informatization reached 401.4 billion yuan. With the development of intelligence, the demand for funds will be increasing. The research and development of smart devices, platforms and terminal products are constantly updated, and the market demand is constantly changing. In the process of use, the cost of equipment upgrading and maintenance is very high. Lack of funds, low equipment performance and people's lack of recognition of intelligent physical education lead to the slow development of intelligent physical education.

2.2 PE teachers' concept of intelligent teaching needs to be improved

Intelligent equipment is only a means of intelligent education, and intelligent education needs to adjust educational content, change learning methods and reorganize learning resources. Shannon, an American mathematician and founder of information theory, pointed out that information exists in a certain environment in disorder. The greater the amount of information in the environment, the more information entropy will be, making the environment more complicated and increasing the uncertainty of effective information acquisition [5]. Intelligent education hopes to realize the fairness, personalization and accuracy of education. With the development of intelligence, physical education teachers should change their old ideas and boldly explore effective models and methods.

2.3 Barriers to the implementation of intelligent sports technology are numerous

2.3.1 Technical standards need to be unified

The application integration of digital resources platform resources is not high, and the database of educational government information resources with "nationwide coverage, unified standards, up-and-down linkage and resource sharing" has not been fully established. "Intelligent Leading Education Informatization 2.0" promotes the deep integration of big data and physical education, which is of great significance to the high-quality development of intelligent physical education. There is a lack of norms and standards for data in the early stage, and there will be many problems in data collection, docking, sharing, development and utilization in the later stage. It is necessary to break down information islands and data barriers and establish corresponding mechanisms. In addition, because smart products can't come from the same manufacturer, the interface between all kinds of smart products is not uniform and incompatible, and other problems remain unresolved .

2.3.2 Lack of integration of information fragments

At present, information overload, information fragmentation and limited time make the integration

of physical education teaching resources face new challenges. Network information publishing is no longer limited to traditional media, and everyone can publish information without time and space restrictions. There are various channels and forms of information release, and the existence time is often short, which makes it more difficult for collectors. How to collect, screen, select and sort out data, naturally and seamlessly connect with all aspects of the course, establish the relationship between different data and information, realize the value of information, meet the needs of physical education and establish a basic education model, these problems need to be studied urgently.

2.3.3 Information security needs to be strengthened

With the help of computer simulation, AR/VR, AI and other technologies, a high-level virtual classroom or teaching environment is built to improve the teaching effect of physical education classroom. At present, the development stage of intelligent education and associated problems lead to the failure of intelligent physical education and teaching overnight, and the information security problem caused by technological update is inevitable. With the further development of intelligence, people rely more and more on intelligent tools. However, the estrangement caused by the algorithm, the "information cocoon room" and the threat of ideological security are worrying.

3. The optimization path of developing intelligent physical education in colleges and universities

National policies to provide a good macro-educational environment need to be designed and implemented by governments at all levels, schools and departments according to the actual situation, so as to ensure its comparable, evaluable and sustainable development [6]. It is a long way to go to solve the problems of funds, people and technology that affect the development of intelligent education and teaching, and to find a way to break the ice.

3.1 Internal and external joint construction and sharing

The development of intelligent education and teaching is not isolated, and it needs the coordinated development of multiple departments and roles. Zhang Chen, the General Administration of Sport of China, once said vividly that only when the hands of the General Administration of Sport, the hands of management departments, the hands of local authorities and the hands of enterprises are connected hand in hand, and the outstanding problems are solved in a centralized way, so as to complement each other's strengths and weaknesses, can the situation of sports interconnection be formed and the intellectual governance of sports be realized. To build an intelligent academic community of sports, it is necessary to establish a joint working mechanism by multiple departments, set up a long-term research base in cooperation with key laboratories of the Ministry of Education and innovation centers at all levels, gather some universities, build a research platform, and form a long-term mechanism to support intelligent basic research, applied research and technological development. Government departments and schools adhere to the concept of "please come in and go out" to cooperate with enterprises. Enterprises "deeply cultivate" users, establish a long-term and stable partnership with university research platforms, jointly build platform resources such as virtual courses, carry out intelligent education through smart devices, and promote technological progress quickly, directly and effectively. The policy guidance of the management department, the professional support of the physical education department and the financial and technical support of the enterprise need to work together to create a win-win situation.

3.2 Multi-dimensional intelligent physical education teaching paradigm

3.2.1 Focus on the goal of intelligent physical education, and promote knowledge, action and innovation together

Relying on the data of sports basic resources, constantly updated technical means and equipment, intelligent physical education teaching has changed the traditional display mode, transmission mode and recording mode into "immersive" form, and reformed and changed the teaching system, mode and content. On the basis of the existing digital resources, teaching reform achievements and other "knowledge", we will deepen the top-level design and standardization with foresight and scalability.

Interconnect, expand and update the existing data base, improve the teaching content and system, enrich and upgrade the previous planning and design with the practical results of "doing", and innovate the future technical equipment to provide practical data for the new education and teaching model and put forward new requirements. In the early stage of the development of intelligent physical education, knowledge, action and innovation developed dynamically, promoted each other and rose step by step.

3.2.2 Practice the scientific teaching paradigm of physical education

At present, there are some problems in the implementation of intelligent physical education, such as the lack of identity concept, the omission of standards, the lack of top-level planning and design, the serious application of intelligent technology and the development process of intelligent physical education. Observation, error correction, practice and repetition are the process of traditional sports technical skills teaching. Most colleges and universities still follow the traditional teaching paradigm. Intelligent physical education teaching classroom is not only the inheritance and reappearance of knowledge, but also the five-in-one teaching paradigm of research teaching paradigm, enlightening teaching paradigm, empirical teaching paradigm, interactive teaching paradigm and open teaching paradigm [7]. Virtual Reality (VR) and Augmented Reality (AR) technology immerse the experiencer in a multi-dimensional dynamic scene and entity behavior with multi-source information fusion and interaction, which has changed the traditional teaching mode dominated by textbooks. In the four stages of generalization, differentiation, solidification and automation, sports technical movements are experienced from a multi-dimensional perspective. The course content is a personalized exercise prescription customized by teachers based on the number of students, aiming at enhancing the health awareness level and physical health management skills of college students.

3.2.3 Establish a multi-angle, process and embedded evaluation system

Intelligent teaching enables people to open the immersion deep learning mode and improve the evaluation system in the process of building intelligent physical education teaching. On the premise of respecting students' individual differences, the intelligent system and digital sound video acquisition technology are used to help teachers teach according to their status and facilitate the school to carry out effective teaching quality supervision. The algorithm of facial emotion classification and recognition is realized by convolutional neural network (CNN), and the learning state of each node in students' classroom is counted and analyzed. Capture and analyze the physical state of students' heart rate, GPS, blood pressure, sweat, temperature, calories, breathing, movement and so on through sensors; Adjust sports methods, reduce physical injuries caused by incorrect sports, and timely and accurately monitor and standardize technical movements in sports activities. It is convenient for teachers to timely, accurately and intuitively understand and control students' physical condition, learning state, technical movements and other aspects, and it is convenient for teachers to establish an evaluation system for learning and planning; Data, videos and records are convenient for schools or departments to understand the teaching situation, help teachers adjust and establish a good teaching model, and realize the key changes in education and teaching. The modernization and intellectualization of education make it feasible to establish a scientific, comprehensive, objective and efficient classroom teaching evaluation. Promoting process-based and embedded evaluation is very helpful for teaching feedback, improving learning effect, improving teachers' teaching and developing disciplines.

3.3 To create an all-round open intelligent sports ecosystem

3.3.1 Unify standards and reduce artificial technical restrictions

The technical support function of intelligent tools is embodied in four aspects: identifying the situation, recording the process, perceiving the environment and connecting the community, which is the main feature of intelligent learning environment. In the era of 5G network, creating a full-time, all-airspace, all-audience intelligent sports learning environment will help individuals develop lifelong learning habits and realize the foundation of a strong sports country. The establishment of

national standards or industry standards will help all equipment brands to achieve barrier-free docking, complete the integration of smart equipment and physical education, and form an intelligent physical education system.

3.3.2 Determine information rights and ensure information security

The improvement of intelligence, informationization and digitalization of public service for national fitness provides effective support for organizational management and talent technology management, and colleges and universities need to expand the scope of intelligent physical education. Universal and personalized projects such as sports clubs, clubs and gymnasiums and scientific fitness guidance have led to the problem of how to safely use personal data and information. In physical education teaching, the collection and tracking of data information such as students' physical fitness involves the protection of students' privacy. Only by defining data rights can data privacy be protected by law.

4. Conclusion

Intelligent and informational education and teaching will free teachers from simple and repetitive work. In this revolution of intelligent education, teachers in colleges and universities need to keep pace with the times and actively participate in teaching research. With the support of big data and intelligent equipment, intelligent physical education teaching is gradually trying to prescribe different "exercise prescriptions" for different students. With the progress of science and technology and the continuous improvement of education and teaching methods, intelligent education and teaching will continue to improve and mature, and the new intelligent physical education teaching mode supported by intelligent technology will replace traditional physical education teaching as the mainstream.

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