Research on the Application Predicament and Countermeasures of Smart Classroom in Middle School Physical Education

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Abstract: *The article investigates and analyzes the application difficulties of smart classrooms in middle school physical education teaching through research methods such as literature review, questionnaire survey, interview, and logical analysis. The results show that most physical education teachers have weak awareness of using smart physical education classrooms, poor popularity of smart classrooms in middle school physical education teaching, lack of trust in the sensitivity and accuracy of smart devices, insufficient construction of smart physical education classroom facilities, and obstacles to the application of smart classroom technology. It is proposed that measures be taken to enhance physical education teachers' understanding of smart classrooms, increase efforts to build smart sports classroom facilities, increase attention, combine information and digital technology, innovate smart sports teaching models, integrate big data technology into smart sports classrooms, provide convenience for teachers' classroom management, and strengthen the cultivation of professional talents in smart sports classrooms. This is intended to provide a theoretical basis for promoting the implementation and development of smart classrooms in secondary school physical education teaching.*

Keywords: *Smart Classroom; Middle School; Physical Education Teaching; Application*

1. Introduction

In order to improve students' physical fitness and promote their comprehensive healthy development, in the context of the rapid development of information technology, more and more advanced technologies such as the Internet, the Internet of Things, cloud computing, big data, and artificial intelligence are being integrated into middle school physical education teaching. Various internet teaching platforms, wearable devices, virtual reality (VR), and augmented reality (AR) are entering the physical education classroom, leading to profound changes in teaching concepts, content, methods, and modes of instruction, as well as the teaching management system and mechanism. This has greatly broken through the time and space limitations of teaching and learning, and has shown great potential in improving the quality of physical education teaching and enhancing the learning experience. It has brought vitality and vigor to the dull physical education classroom, and has greatly improved the teaching effect and quality. Moreover, teachers can more accurately grasp the learning status of students and create more diverse and interactive learning environments for them. Therefore, how to more efficiently implement smart physical education classes and break the shackles of traditional physical education models, promote the development of students' core competencies, has become an important research topic in middle school physical education education in the digital era.

2. Smart Classroom and Smart Sports Classroom

Smart classroom is an intelligent classroom that integrates modern technologies such as cloud computing and the Internet of Things with education and teaching, relying on digital multimedia technology; On the basis of traditional teaching mode, the application of information technology and artificial intelligence is added, and a new teaching mode combining intelligent devices with traditional teaching is implemented. The application of smart classrooms can not only share learning resources and promote communication and interaction between teachers and students, but also make teaching student-centered, simple and efficient. It can also improve the teaching environment and enhance teaching effectiveness.

Smart sports classroom is the organic integration of sports and modern intelligent technology devices, using intelligent sensors and multimedia technology for sports training and testing, and building an intelligent, modern, and digital smart teaching environment. In the information age, smart sports classrooms use intelligent sports devices to monitor, manage, and record sports training data in real time, integrate and analyze them, and monitor students' physical indicators and exercise load. Through real-time interaction with students, feedback information on various indicators is obtained and appropriate exercise prescriptions are formulated in a timely manner to achieve better training results, improve teaching efficiency and management work[1]. In short, the smart sports classroom is a combination of sports and technology, and is a more authentic, reliable, and scientifically effective teaching model.

3. The Application Value of Smart Classrooms in Secondary School Physical Education

3.1. Improve students' interest in learning and stimulate their enthusiasm for exercise

In the intelligent physical education teaching, teachers can show more complex sports skills to students through multimedia technology, so that students can feel the skills and movements more intuitively, and improve the enthusiasm of students. Through virtual simulation technology, students can also feel the real training scene, understand the essentials of action, enhance students' curiosity and improve students' interest in learning. Smart sports can also carry out gamification teaching through virtual simulation technology. The simulated game scene allows students to interact with virtual characters, so that they can actively participate in sports activities, stimulate students' competitive consciousness and improve students' participation. The intelligent sports classroom utilizes IoT sensing technology to monitor sports data in real time, analyze and judge it, provide timely feedback and make adjustments, and enable students to conduct targeted training. Suitable training plans are developed for each student to understand their training direction and comprehensively improve their professional skills.

3.2. Improve the effectiveness and scientificity of PE teaching

In the process of intelligent teaching, students carry out sports training by wearing smart wristbands, smart watches and other devices. The smart wristband is connected with the smart display through sensing technology to monitor the change of students' heart rate during training in real time, reflect the changes of students' body, judge whether the training intensity is appropriate according to the change of students' heart rate during training, and make timely adjustments. Let the students achieve the best training results in the shortest time. Smart sports class records sports training data through multimedia technology to reflect students' various physical indicators for integration and analysis, and formulates appropriate exercise prescriptions according to different data of each student to provide students with more scientific training.

3.3. Sports teaching mode is more diversified

Smart physical education pays more attention to diversification and individuation. Smart classroom uses multimedia technology and network teaching platform to monitor and record students' exercise indicators and exercise load in real time, and formulate appropriate training programs for students to meet their individual needs. The use of virtual reality and information sensing technology allows for the diversification of teaching methods, including situational teaching and virtual game teaching, which can stimulate students' enthusiasm. Smart classroom uses intelligent devices to analyze students' sports data and evaluate all kinds of integrated data, thus realizing the diversification of teaching evaluation. This diversified physical education teaching mode can not only reflect the main body status of students, but also promote the development of students' all-round quality.

3.4. The statistics of sports training data are more convenient and fast

Smart sports classroom can monitor and record students' sports training data in real time by applying some smart sports equipment or corresponding mobile phone APP, and directly input the collected data information into the computer system automatically. For example, when testing pull-ups, the intelligent device is first used for face recognition to enter the basic information of the tester, and then the intelligent system will automatically record the number of tests of the tester and complete the

test. With the continuous development of modern science and technology, there are more and more professional data statistics software and platforms. The application of these intelligent tools not only makes the statistics of sports training data more convenient and fast, but also helps PE teachers to make teaching adjustments and increase the time effectiveness of classroom training.

4. The dilemma of the application of smart classroom in middle school physical education

4.1. Most PE teachers have weak consciousness of using smart PE classroom

Through the field investigation and visit to the middle school in the region, the results show that the number of people who understand intelligent teaching is only 10%, and the number of people who understand it is 22%, which is not enough to half of the total number of people. On the one hand, most physical education teachers do not know enough about intelligent teaching, and even individual physical education teachers do not know how to integrate information technology with education and teaching in physical education classroom, let alone apply intelligent devices to physical education. On the other hand, there are some differences between old and new teachers in the concept of applying smart PE classroom. Most young PE teachers are willing to accept the teaching of smart PE classroom and are more inclined to intelligent teaching. However, for the old teachers who are accustomed to traditional physical education, their teaching concepts are outdated, they do not want to accept the application of new technical knowledge, and some even have a certain psychological resistance [2].

4.2. The popularity of smart classroom in middle school physical education is poor

Through the investigation, it is found that the development of education in various schools is uneven, and the application of smart classroom in schools is very common, but it is rarely applied in physical education. Through communication with school administrators and PE teachers, it is found that they attach little importance to smart PE classroom. They believe that the application of smart classroom not only requires a large amount of funds, but also needs to integrate various scientific and technological means and learn new technical knowledge, and are unwilling to accept new challenges. They believe that traditional PE teaching is more suitable for PE teaching in middle schools.

4.3. Lack of trust in the sensitivity and accuracy of smart devices

According to the feedback from the questionnaire survey, most parents do not trust the monitoring and evaluation of smart devices. They believe more in the strict testing method of teachers on students in traditional PE teaching. They believe that the application of smart classroom makes students more desultorily attend classes and cannot better educate students. The distrust of students' parents is also a specific factor that leads to the unfavorable application of smart classroom [3]. In the communication with physical education teachers and students, I have learned that some data inaccuracies do occur during the use of equipment. For example, when wearing a smart bracelet to exercise, the real-time monitoring of the movement data in the data statistics software or platform does not change; Or look up the data after class, but found that the background does not have any relevant information, of course, most of this is the reason for improper operation.

4.4. The school has invested a lot of funds, and the construction of smart sports classroom facilities is insufficient

Traditional physical education usually uses old equipment and simple venues, so it generally does not require much investment. However, smart sports teaching requires the application of more intelligent facilities, such as intelligent sports equipment, cameras, sensors and data analysis software and platforms, and these costs are relatively high [4]. In addition, it is also necessary to bear the cost of equipment maintenance and stadium construction. As a result, most schools cannot afford these costs. The funds allocated to the education and sports departments are also limited and are simply not sufficient to support the upgrading and renovation of school sites. In addition, the training of professional technical personnel necessitates a certain financial investment. These are the reasons why smart classrooms cannot be implemented smoothly.

4.5. Lack of professional teachers team, sports smart classroom technology application is blocked

According to the field investigation, although the smart classroom is integrated into the physical education of middle schools, there are network delays, delays and instability in the network construction of some schools, which affects the collection and analysis of sports data and limits the application of modern technology. In addition, the use and operation of smart devices requires professionals with relevant knowledge and skills. However, physical education teachers in schools often have not received the guidance and training of relevant knowledge, do not understand the specific operation methods of equipment [5], and cannot carry out the management of smart physical education teaching. Therefore, in the middle school physical education, the application of smart physical education classroom is less.

5. Implementation countermeasures of smart classroom in middle school physical education

5.1. Improve PE teachers' understanding of smart classroom

The application of smart classroom is not only convenient for PE teachers to carry out statistics and analysis of sports data, but also can make full use of time training in PE class and improve learning efficiency. Therefore, in order to better apply smart classroom in middle school physical education, it is necessary to deepen PE teachers' cognition and understanding of smart physical education classroom. Some related activities can be carried out in schools to communicate and interact, interpret the basic concept of smart sports, let people understand the difference between smart sports and traditional sports, understand the advantages of smart sports, and encourage PE teachers to actively try to use smart classroom teaching. Secondly, physical education teachers can be invited to visit the field to observe the actual teaching process, so that teachers and students who have applied smart classroom can share their own experiences, so as to enhance everyone's trust and support for smart sports.

5.2. Strengthen the construction of smart sports classroom facilities and improve the degree of attention

In order to better apply smart classroom in middle school teaching, the government should take some relevant measures. First, the education and sports departments should increase their investment in smart school construction. On the one hand, it is used to buy smart equipment and site construction and train teachers; On the other hand, it is used to strengthen the promotion and publicity of smart classroom. Advertising is the most accessible thing for people, so it is very important to actively promote the characteristics and application advantages of smart classroom. In addition, a professional publicity team should be formed to carry out publicity and promotion activities. Secondly, government departments should be allowed to buy smart sports equipment, and the cost can be reduced and the quality of equipment can be improved through unified purchase from institutions. The support of government departments will also make school administrators and physical education teachers pay attention to the application of smart classrooms.

5.3. Combine information and digital technology to innovate the smart physical education teaching model

School sports are now changing from traditional sports to smart sports, and the teaching mode is gradually becoming diversified and intelligent [6]. Different from smart sports, traditional sports teaching process is more complicated, and sports equipment is old. But traditional physical education is the process of natural environment teaching, natural environment teaching has a role in promoting students' health. In addition, traditional physical education is a holistic learning, which can reflect the creativity of students. While smart sports can improve teaching efficiency, excessive use of virtual technology may affect students' eyesight and balance. Therefore, in order to better carry out physical education, it is necessary to combine traditional sports with smart sports. We can use intelligent tools to assist traditional physical education, use virtual technology to let students understand the teaching content with vision and hearing, and use traditional teaching to let the body perceive and experience skill movements, and pay attention to the all-round improvement of students [7], so as to achieve better teaching effects.

5.4. Integrate big data technology into smart physical education classroom to provide convenience for teachers' classroom management

With big data technology, PE teachers can actively develop learning situation analysis and optimize teaching programs. For example, teachers can add physical exercise "punch" module according to physical education teaching tasks, collect, organize and analyze students' daily exercise data, teachers can not only timely understand students' exercise situation, but also cultivate students' good exercise habits. In the process of teaching, teachers can also understand the heart rate changes of students in time through the terminal equipment, judge the physical state of students, and avoid the occurrence of sports injuries. Through the effective collection of students' movement data information in physical education classroom teaching, we can effectively judge whether the course design is reasonable and adjust the teaching plan accordingly. Through the comparative analysis of the sports data of the whole semester, not only can we understand the improvement of each student's sports ability, but also can compare and analyze the teaching level of each class, so as to provide theoretical support for teachers to formulate rational physical education teaching programs.

5.5. Strengthen the training of smart PE classroom professionals

The application of smart classroom has higher and higher requirements for PE teachers. Training professional technical personnel is one of the important ways to implement smart classroom. First of all, we should pay attention to cultivating cross-professional talents of physical education and information technology [8] to carry out smart physical education teaching. At the same time, schools are encouraged to hold interdisciplinary seminars to promote exchanges and cooperation between sports disciplines and information technology disciplines, which is conducive to training professional sports technicians. Secondly, physical education teachers should strengthen their knowledge and understanding of information technology, as well as the operation methods of intelligent devices, regularly organise physical education teachers to conduct training on digital technology, and observe excellent cases of smart classroom application in other colleges and universities. At the same time, more teaching and research activities should be carried out to explore related issues. In this way, PE teachers can make full use of the intelligent learning platform and better carry out PE teaching.

6. Conclusions

The application value of smart classroom in middle school physical education is rich, but there are also weak awareness of the use of smart classroom by most physical education teachers, poor popularity of smart classroom in middle school physical education, lack of trust in the sensitivity and accuracy of smart equipment, a lot of school investment, insufficient construction of sports smart classroom facilities, lack of professional teachers. In view of these difficulties, it is proposed to improve PE teachers' understanding of smart classroom, strengthen the construction of smart PE classroom facilities, increase the degree of attention, combine information and digital technology, innovate smart PE teaching mode, and integrate big data technology into smart PE classroom. The strategies of facilitating teachers' classroom management and strengthening the cultivation of smart PE classroom professionals provide some theoretical basis for promoting the application of smart PE classroom in middle school PE teaching.

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