Analysis on the application of sports data information management system in school physical education

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Abstract. This paper introduces the function and advantage of the athlete data information management system, studies its practical application in school physical education, and explores its future development trend, in order to point out the direction for the change of school physical education.

Keywords: sports data; Information management; School physical education

1   Introduction

The application of information management system in physical education has an impact on traditional physical education teaching. Because of the diversification of information technology and abundant teaching resources, the mode of physical education has undergone profound changes, resulting in the output of data and big data analysis. In traditional physical education, data is basically zero. The integration of information technology is impacting the traditional physical education teaching mode. Therefore, in the future physical education, the information technology will gradually replace the traditional teaching methods, so that the traditional teaching to the multi-media and modernization. Sports data management system is the inevitable result of PE teaching application and integration, which will lead to the reform of PE teaching form and teaching method.

2   The introduction of sports data information management system

The sports data information management system [1-3] is based on accurate monitoring of sports data of school sports students, and through the application and precipitation of quantifiable teaching results, it builds a digital management system for school sports in the whole scene, builds a scientific, digital and visual physical education teaching system, and realizes the transformation and upgrading of education information (Fig.1). The sports data information management system is aimed at the problems in the development of school sports, such as the teaching effect cannot be quantified and

controlled, the management system lacks systematic support, and the risk avoidance of students' sports. It is based on the high-precision heart rate collection. The use of information means [4-6] to achieve physical education classroom control, physical education homework assignment, student periodic physiological data assessment, open class digital presentation, online distance teaching, physical education teaching results summary and display, digital application of school sports teams, physical education teaching and research and research and other functions as one of the comprehensive data service system.
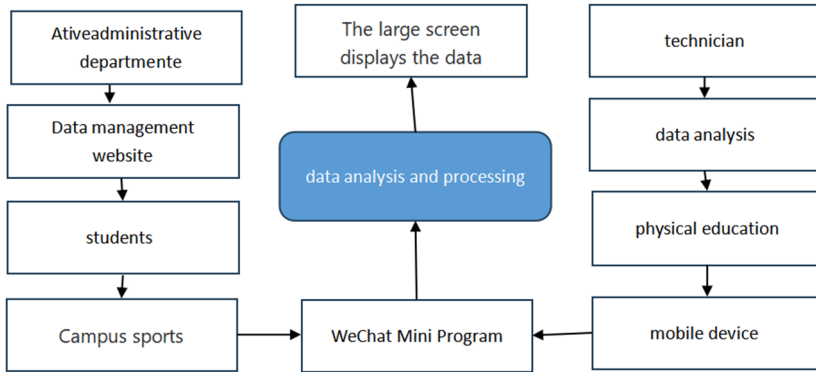

Fig. 1. Composition of sports data information management system

3 Sports data information management system intersects the advantages of traditional teaching mode

3.1 Data support decision-making

Students' movement data are systematically recorded and analyzed to help teachers make teaching plans and personalized guidance more scientifically. Teachers can understand students' strengths and improvement directions according to the data results, and conduct more targeted teaching.

3.2 Real-time feedback

The system can record students' movement data in real time and provide immediate feedback to students. This real-time feedback helps students adjust their movements and postures in time to improve and progress faster.

3.3 Improve learning motivation

Sports data information management system can stimulate students' learning interest and enthusiasm. Students can view their progress and results through the system, thus creating a sense of accomplishment and enhancing learning motivation.

3.4   Independent learning and inquiry

The system provides a variety of learning resources, such as sports skills videos, sports knowledge materials, etc., so that students can learn and explore independently and have a deep understanding of sports knowledge and skills.

3.5   Home-school cooperation

Sports data information management system can realize the information exchange among students, teachers and parents. Parents can learn about students' learning situation and progress in time, promote home-school cooperation, and jointly pay attention to students' physical and mental health and development.

3.6   Improve efficiency

The digital application of the system can improve the efficiency of teaching and management. Teachers can organize and manage teaching resources through the system, and students can also submit homework and participate in discussions through the system, reducing the limitation of time and space.

3.7   Data visualization display

The system can display students' movement data in graphs, making complex data more intuitive and easy to understand. Teachers and students can better understand learning outcomes and performance through visual presentation.

The sports data information management system can realize data-oriented, personalized and interactive teaching and learning [7-8]. This mode can improve the teaching effect and management efficiency, promote the all-round development of students, and bring more opportunities and advantages to physical education. However, when using the system, teachers need to choose and use technical means reasonably to ensure that students' physical and mental health and the actual needs of education and teaching are still paid attention to in the teaching process.

4   The practical application of sports data information management system in school physical education teaching

4.1   Physical education classroom control

On the basis of the daily teaching of PE teachers, the introduction of digital teaching methods, through a variety of intervention techniques, to achieve PE classroom teaching more simple, clearer results, more efficient work. The single exercise goal setting and result control can help teachers to evaluate the teaching effect more pertinence. Stage exercise goal setting and result control, help students insist on sports, enhance sports enthusiasm; Real-time data comparison and group control, increase the

control of class order, improve class interest; Real-time heart rate control, control the classroom rhythm, timely eliminate high-risk situations.

4.2   Physical education homework

Behind the concern of "PE class must leave homework" is the urgent need for the reform of PE teaching informatization. The plan realizes the effectiveness and controllability of PE homework from content setting, process supervision and result submission by means of information technology. To realize the quantitative setting of homework exercise load effectively and promote the implementation of policies; Through the target completion degree reflects the quality of job completion, to achieve efficient supervision; The heart rate data truly reflects the completion of the job, reducing the possibility of laziness; Automatic statistical analysis of data to ensure more efficient and convenient physical education work.

4.3   Periodic physiological data assessment of students

Through periodic physiological data assessment, understand the changing trend of students' various data indicators, form a closed loop of information for schools, teachers, parents and students, and clearly show the growth of children. Maintenance and update of students' basic files, including: update of body shape, physical fitness, athletic ability, etc.; Through the basic information of group students, identify the key students and formulate sports prescriptions; Record the growth process of the students inside and outside the school, establish the students' personal growth files; Based on the advanced nature of the program, the implementation and results of the evaluation are simple and convenient, and easier to promote and implement.

4.4   Digital presentation of open courses

Remote live broadcast of students' sports data, digital display of open course teaching, from quantitative setting of course content, selection of participating students to live course display, presentation and summary of after-class results, fully demonstrate teaching ability. Set teaching goals in advance, control the pace of class and the overall intensity trend; Show the diversity, comprehensiveness and scientificity of the curriculum through the performance of different students' sports data; Through real-time data broadcast, remote class evaluation and other forms, to assist the effect of on-site observation, facilitate the exploration of new teaching plans, new methods of application, reflect the effectiveness of sports teaching and research activities.

4.5   Online remote sports teaching

Through the data system, the remote sports monitoring can be realized to break the dependence of physical education on time and space, and adapt to various scenarios such as the epidemic situation and the sports middle school examination. Real-time data

monitoring, at any time to understand the students' sports status, timely sports guidance and intervention. Real-time data comparison and group control can enhance the interest of online teaching, improve students' self-discipline in sports, presetting and regulation of sports goals, and realize teachers' teaching control of online teaching and evaluation of sports effects.

4.6   Summary of physical education teaching

Provide periodic digital teaching results for PE teachers to summarize the teaching work in PE stage. According to the different objects of the results, help the teachers to report the work results more accurately and more targeted. Report to administrators: digital presentation of student management, teaching process presentation, digital summary of results, etc.; Communicate with parents: students' physical growth and change, students' sports in school, comparison with classmates, etc.; Communication with peers: open class, on-site class and other course evaluation, digital teaching research paper writing, etc.

4.7   Digital application of school sports teams

Provide daily training monitoring, game data recording, team and player data file construction and other contents for the school sports team, scientific physical training, and constantly improve the competitive level of the school sports team. The training objectives are quantified and controlled, so that the team members can always maintain a reasonable exercise intensity and reduce sports injuries. Team and team members stage training, in-depth analysis of the game, targeted strengthening of daily training, improve the team's competitive ability; Build an exclusive elite selection system to scientifically and efficiently select campus elite talents. To promote the comprehensive personality development of students, and create the campus characteristics of "one school, one product".

4.8   Display of digital teaching achievements

Multi-dimensional data results display, driven by big data, scientifically build a set of low-cost, high-efficiency and normalized display system, and choose more suitable results presentation methods according to different scenarios and roles. Large visual screen: display advanced concepts and digital management achievements in school sports and characteristic projects; Data management website: showing the development of school sports work, level differences and the growth and change of students' sports; Wechat public number data entry: access the data results anytime and anywhere, the data is divided into roles and levels of reading, easy to operate and simple to use, suitable for teachers, coaches, students, parents and so on.

4.9   Sports teaching research and scientific research

Based on the practical results of information construction and data results, the existing teaching plans should be improved and new teaching plans and teaching methods should be formed. At the same time, focusing on the innovation and breakthrough in the information construction, the work from special project declaration to micro project research is carried out. Physical education standards implementation and evaluation, physical education teaching plan discussion and project support, scientific arrangement of physical education, big recess sports content.

4.10   Prepare for physical education examination efficiently

For the physical education exam design professional improvement section, can help students quickly find the problems they face, improve the basic physique of students, improve the score of the high school entrance examination while cultivating their interest in sports. Take the data application of middle and long distance running as an example: quickly find the problems faced by students, find the most labor-saving running posture; Reasonable allocation of running speed, efficient guidance of students to control the running rhythm; Find the "pole" of running to help students overcome it psychologically in advance; Growth visualization, multiple data summary to give students motivation to progress.

4.11   School physical education teaching resource management

The system can be used to design and manage PE curriculum plan, including teaching content, teaching objectives, curriculum arrangement, etc. At the same time, the system can also be used to store and share teaching resources, such as teaching plans, teaching videos, teaching materials, etc., to facilitate the communication and reference between teachers. In addition, the system can be used to manage the use of school sports venues, equipment and so on. With the help of the system, schools can better plan and allocate sports resources and improve the efficiency of resource utilization.

5   The future development trend of sports data information management system

5.1   Intelligence and personalization

The future sports data information management system will be more intelligent and can provide personalized learning and training guidance according to students' individual differences and learning needs. The system will combine artificial intelligence and machine learning technology to automatically adjust teaching content and progress according to students' data and performance, making teaching more targeted and efficient.

5.2   Cross-platform and mobile

Future systems will support cross-platform and mobile applications, enabling teachers and students to teach and learn physical education anytime and anywhere on different devices. Whether in the classroom or outdoors, data recording, communication and learning can be carried out through mobile phones, tablets and other devices.

5.3   Virtual reality and augmented reality

Virtual reality (VR) [9-10] and augmented reality (AR) [11] technology will be more widely used in sports teaching information management system. Through VR technology, students can experience different sports scenes immersive; Through AR technology, students can obtain sports data and guidance in the real environment, enhancing the interactive and interesting learning.

5.4   Data privacy and security

With the development and application of sports teaching information management system, data privacy and security will become an important concern. The future system will strengthen data protection measures to ensure that students' personal data is adequately protected, while providing reasonable strategies for data sharing and use.

5.5   Social and collaboration functions

The future system will strengthen social and collaborative functions to support interaction and communication between students, teachers and students. Through the system, students can discuss learning problems with their classmates, share their learning progress with teachers, and promote the formation of learning communities.

In general, the future sports data information management system will tend to be intelligent, personalized, convenient and secure. It will be more suitable for students' learning needs, provide more high-quality teaching resources and tools, and promote the innovation and development of teaching and learning. At the same time, the development of the system also needs to fully consider the nature and concept of education and teaching, ensure the organic combination of technology and teaching goals, and bring real value and significance to the development of physical education.

6   Conclusions

To sum up, the application of sports data information management system in school physical education is helpful to improve the teaching effect and management efficiency, promote the overall improvement of students' physical education ability, and provide scientific basis and decision support for school physical education, which promotes the reform and development of school physical education to a large extent.

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