Research on Significance and Model of Sports Information Management in Primary and Secondary Schools

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Abstract. Sports informationization management is an important part of the development of education informationization. Through literature analysis and field research, this paper analyses the significance of existing data collection and analysis technology in primary and secondary school sports informationization management, and summarizes its feasible operation mode.

Introduction

Physical education is an important part of primary and secondary education, but also an important factor to promote students' physical and mental health. With the development and application of Internet of Things technology, wearable equipment and big data analysis, sports information management has increasingly become the focus of physical education reform and a hot topic of physical education research. \cite{1} Under this background, in order to achieve the goal of scientific management of sports, strengthening physical activities, reducing sports injuries and improving teaching quality, how to apply information technology to classroom teaching and students' campus and even daily life is a problem we should think deeply and explore. Through literature research and practical investigation, this study studies the significance of sports information management in primary and secondary schools in China from the perspective of application, and explores the feasible operation mode of sports information management.

The Meaning and Significance of Sports Information Management

As early as the rise of information technology, relevant departments and scholars have begun to pay attention to this issue. Article 59 of the National Outline for Medium-and Long-Term Education Reform and Development (2010-2020) clearly states that "to integrate education informatization into the overall strategy of national informatization development and to deploy education information network ahead of schedule". \cite{2} Intelligent physical education classroom, which is based on information technology and through the change of teaching methods and methods, integrates information technology into physical education classroom teaching and constructs individualized, intelligent and digital classroom teaching environment, so as to effectively promote the cultivation of students' innovative ability, the model of intelligent physical education classroom \cite{3} has been constantly explored. But in a broad sense, physical education is not confined to the classroom. Physical education is not only the teaching of skills, but also the cultivation of sports habits and the inheritance of health concepts. Therefore, any student's physical activity during and after class should be included in the overall sports category. The sports information management discussed in this paper refers to the mode of individualized management of students' sports activities by means of information technology, collecting relevant data of students' sports, and through information analysis and mining. The information management of students' sports activities has the following meanings.

Improving the Teaching Quality of Physical Education Classroom

The most important characteristic of the sports classroom under the information management is that the teaching means are integrated into the new generation of information and technology.
According to the students' sports data, the teaching design can make a process evaluation of the students' whole learning stage, and change the single mode of the traditional sports teaching, which mainly focuses on the summative evaluation. [3] Individualized sports data, such as heart rate, displacement distance, time and step frequency, can be obtained in real time during the teaching process, so as to effectively monitor and control the movement. Course stages can be reasonably arranged according to different contents such as preparation activities, skill learning and practice, physical fitness exercises and relaxation activities, so as to make the course arrangement more scientific and reasonable. At the same time, this real-time data collection is also conducive to timely discovery of potential risks, such as high heart rate, high intensity and other situations that may affect the health and safety of students, once they occur, teachers can timely find problems and adjust the intensity, so that every student is in a safe exercise zone.

**Objectively Understanding the Physical Activity Level of Students**

With the increasing obesity rate of children and adolescents and the trend of younger chronic diseases, more and more attention has been paid to the level of students' physical activity. The Ministry of Health of China also recommends that children and adolescents carry out 60 minutes of "moderate to high intensity" physical activity every day. [4] However, how to effectively define the intensity of such activity in daily life is an unsolved problem. The activity time of students is scattered after class, and the way of activity varies greatly. The questionnaire used in epidemiological survey can collect large sample data, but it is vulnerable to subjective factors which make the results deviate. [5] In the process of personalized data analysis, an objective index is needed to collect data. By collecting the heart rate and exercise related indicators collected by wearable equipment, subjective interference can be eliminated, and the overall movement situation of students can be relatively accurately understood during a period of time, thus providing data support for personalized intervention guidance or arranging exercise prescriptions.

**Facilitating the Establishment of Sports Information Database**

The long-term trend and vertical development of students' body shape and physical fitness have always been the focus of research in the field of physical education and public health. In the past, this kind of research mainly relied on sampling survey. The representativeness of samples has always been a difficult problem to solve. With the vast territory of our country, there are huge differences in living habits and living environment between different regions, which will have an impact on students' sports level. In addition to individualized monitoring and guidance, data collection and processing of the overall situation is also a very important part of sports information management. By collecting sports-related data of most students by means of informationization, we can build a multi-regional, long-term and wide-coverage database. By fully enhancing our ability to use and process data, we can bring into play the greater value of big data. [6]

**Operation Mode of Sports Information Management**

In the reform of sports information management, many research institutions and schools have tried and explored in different aspects. For example, around the guidance and supervision of pre-class, in-class and after-class in physical education classroom, [3] Construct the sports information platform from the perspective of big data and cloud computing, and create three-dimensional sports mobile application program [7] from the perspective of integrating sports resources, etc., but overall, in order to improve the management of sports information, a better data collection, analysis and feedback guidance system is needed.

**Data Acquisition System**

Data acquisition system is a means to collect the physical movement of each individual. At present, in most primary and secondary schools, the results of students' physical fitness test organized by the Ministry of Education can be collected and analyzed perfectly. The National Standard for Students' Physical Health stipulates a relatively uniform data acquisition method,
which is tested once a year. However, physical fitness test is only a small part of sports. In view of the limitation of hardware cost in data acquisition of physical activity, there are few large-scale applications. It mainly relies on the centralized distribution of sports bracelets to students, and the modular management of sports data collection based on the bracelets. Or use heart rate band to collect students' heart rate data in physical education class [9]. Wearable devices still have some drawbacks in data collection. Firstly, the accuracy of data acquisition depends on the precision of the equipment, while the equipment with higher accuracy still exists only at the laboratory level. Secondly, after the sensor collects the data, it needs to upload the data to the data center through Bluetooth or smart mobile terminal for storage and analysis. This also requires higher coverage density of campus networks and receivers. [10]

Data Analysis, Feedback and Guidance System

Only by analyzing the collected data reasonably can we manage the students' sports situation as a whole. At the level of parents or teachers, for individual students, the data center should be based on international or domestic authoritative standards when processing data, and calculate the amount of exercise, intensity and energy consumption through the basic information such as heart rate and acceleration changes collected by sensors. In traditional physical education classes, the amount of exercise of all students is almost the same, but because of the difference of individual level, each student has different intensity of exercise relative to himself. Teachers can only arrange according to their subjective feelings. But if there is real-time objective data feedback, teachers can adjust the intensity of exercise according to the different personalization of each student's physical condition to ensure that each student can get moderate exercise. Students can also carry out corresponding quality training according to their different physical qualities, so as to realize the overall development of physical qualities and the comprehensive improvement of health level. In the overall level of data, we can cooperate with scientific research institutes or relevant professional institutions to conduct in-depth data mining, and analyze students' physical activity and physical fitness level from different perspectives such as time domain and region, so as to have an overall grasp of students' sports situation in our country, and can also be used as an objective basis for evaluating teachers' teaching level and quality.

Summary

The research of sports information management in our country is still in the preliminary stage of exploration in theory and practice. Hardware still needs to improve accuracy and reduce costs. Information management mode also needs further demonstration and experiment. From the point of view of real-time and full-time monitoring of physical activity, the sports information management mode constructed in this article relies on information equipment and means. It makes up for the shortcomings of traditional education mode and monitoring means, realizes the organic combination of theory, science and technology and education, stimulates the enthusiasm of students in sports, improves the effectiveness of teachers' physical education, and increases the scientific nature of school physical education management and students' physical education policy formulation.

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References


