Constructing the Intelligence Management System of Students' Campus Sports

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Abstract. Through the intelligent bracelet of RFID technology, digital campus platform and campus sports intelligence management system, the comprehensive collection and management of students' behavior track, sports data, running, and related data of students' physical activity can be realized, the enthusiasm of students for sports can be stimulated, both the effectiveness and pertinence of teachers' physical education and the scientific and accurate school sports management can be improved for the students' physical health level.

Introduction

To explore the acquisition and information management mode of students' sports data, a new generation of technology, such as Internet of Things technology, wearable equipment and big data analysis, can be applied to school classes, campus and even daily life to realize the intelligence management of students' sports\textsuperscript{[1]}. At the same time, it is of great significance to realize the scientific management of campus sports and enhance students' physical fitness\textsuperscript{[2]}.

Technical Means of Campus Sports Intelligence Management

The technical means of campus sports intelligence management mainly include: intelligent Bracelet collects sports data of physical education class, related data of running and students' sports activities, and digital campus platform collects sports data of students.

Smart Bracelet

Fashionable smart bracelet, based on RFID technology, adopts passive scheme, safe, radiation-free, no charge, and achieves the corresponding waterproof level, anti-allergy, skin-friendly material, human engineering design, can be worn for a long time. Each student is given a bracelet, which takes the digital campus as the information carrier and binds with the students in the digital campus.

Induction Coil

Induction coils should be placed at fixed distances in the campus. Hardware installation is simple and does not affect the existing equipment of the school. Students wear hand rings near the induction coils (a certain area). Induction coils will activate the hand rings and send real-time collected information (ID information of each student) to the digital campus.

Digital Campus Platform

The digital campus platform will process the received data, such as collation, mining, analysis, and feedback the results to the terminal equipment, clearly showing each student's running trajectory, journey, current status and other information.

Collection of Student Movement Data

In the process of teaching, students can obtain individualized sports data in real time, such as heart rate, displacement distance, movement time and step frequency, and exercise intensity.
indicators, so as to effectively monitor and control the movement. The course stages can be arranged reasonably according to different contents such as preparation activities, skill learning and practice, physical fitness exercises, relaxation and arrangement 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 maximum 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.

Composition of Campus Sports Intelligence Management System

Behavior Trajectory Center

Through the location recognition equipment in the campus, or the realization of all-weather automatic acquisition of students' movement trajectories in the school, large data of location trajectories can be formed. By adapting the data logic of different businesses, students' behavior can be automatically determined, which lays the foundation of students' behavior data for the intelligent campus.

System features:
A. Location acquisition covers a wide range of school gates, playgrounds, teaching buildings, classrooms, and school roads, providing convenience for all-round acquisition of students' location information.
B. Data acquisition and real-time processing, the system continuously collects location data, and real-time processing according to business rules, can achieve 24-hour position tracking, automatic completion of business data operations.
C. Data global validation, wide range of applications, real-time data sharing between similar businesses, collaborative analysis, mutual validation, to ensure the accuracy of business processing. At the same time, the global location data are aggregated to the center of the behavior trajectory.

Running Test Management System

Through the physical education teachers' intelligent equipment and position acquisition system, the data of running items and students' running performance are managed, including the length of time, speed, running distance, step number, step length and so on. Students wear smart bracelets while running. Teachers can view students' running data in real time through handheld terminals. After running, the system automatically uploads students' running data to the server for archiving.

System features:
A. Running project management. Running project is initiated in the system, which can set the information of running distance, running time and corresponding users required by the project.
B. Running performance check. After the completion of the running project, the system automatically calculates the running data and uploads it to the server. Users can view the detailed running performance data, ranking results, and historical data on the web side.
C. Teachers' handheld support Pad, which is easy to carry and operate.
D. Real-time synchronization and unified management of data on the Web side.

Running Activity Management System

In order to meet the purpose of improving students' physical health education, schools can set up the general goal of running through the system, and automatically collect students' activity data through the runway monitoring equipment, so as to provide the school with management functions such as running target completion progress and data analysis.

System features:
A. Running goal management. Administrators can set goals for individual students, classes, grades and the whole school, including daily goals, weekly goals, monthly goals, semester goals, etc.
B. Running data calculation. Real-time calculation of students' running distance, speed and other activity data through the campus track center data;

C. Running statistics. Through different dimensions, we can see the data and ranking of running, including personal running goal completion progress, class, grade, school department running goal completion progress and other information.

Running Management System

Through the systematic maintenance of the school's large-class running exercise activities, through the establishment of running exercise projects based on semester, department and class, and based on the definition of running position points in the trajectory center, the data of students' running exercise activities can be collected automatically, which can help the school effectively manage students' running exercise activities, and automatically count and view the exercise data of each student.

Functions of Campus Sports Intelligence Management System

Through the monitoring platform system for information analysis and mining, students' sports activities for intelligent personalized management and overall analysis of the model.

Data Analysis Management System

Only by analyzing the collected data reasonably can we manage the students' sports situation as a whole. Based on the basic information of heart rate and acceleration change collected by intelligent bracelet, the amount of exercise, intensity of exercise and energy consumption are calculated. 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.

Data Feedback and Guidance Management System

At the overall level of data, we can cooperate with scientific research institutes or relevant professional institutions to carry out in-depth data mining. We can analyze students' physical activity and physical fitness level from different perspectives such as time domain and region. For individual students, the data center should process data according to international or domestic authoritative standards, so as to have a complete picture and grasp of students' physical activity and health on campus, which can also be used as an objective basis for evaluating teachers' teaching level and quality[3].

Advantages of Campus Sports Intelligence Management System

Building intelligent campus system of Internet of Things based on mature Internet technology and RFID technology has the advantages of low cost, high stability and accurate data, which can greatly reduce the cost of school construction.

Intelligent Bracelet adopts passive scheme, durable without charging, other hardware adopt solar power supply and internal equipment networking mode, which greatly reduces construction cost and fully achieves green energy saving and environmental protection.

It can realize all-round automatic collection of data of running test and running activities, stimulate students' enthusiasm for exercise, improve the level of school information management, and provide support for the management of students' physical exercise activities.
Open data base design can provide data service through standard interface, and also provide the ability of communicating the existing digital campus system. It is more open and scalable, which lays the foundation for the follow-up sustainable construction.

Summary
The research of sports information management 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, this paper constructs a campus sports intelligence management model, relies on information equipment and means to make up for the shortcomings of traditional education model and monitoring means, can stimulate students' enthusiasm for sports, both the effectiveness and pertinence of teachers' physical education and the scientific and accurate school sports management can be improved for the students' physical health level.

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