

“Digital +” Enables the Construction of Intelligent Sports Platform in Universities

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Abstract: With the deepening of the digital transformation of education, “digital +” enabling has become an important path to promote the intelligent development of college sports. Through the integration and application of big data, artificial intelligence, Internet of Things and other technologies, the college sports intelligent platform can optimize teaching, management and service, and realize the precision, personalized and intelligent physical education. This paper focuses on the construction of intelligent sports platform in colleges and universities, discusses the construction of digital infrastructure, the construction of digital learning and training platform and the development of intelligent management system, and puts forward specific implementation paths and optimization strategies.

Keywords: Number +; College physical education; Intelligent platform; Digitization of education; Sports management

Introduction:

In the 14th Five-Year Plan for China's Sports Development, it is also proposed that advanced technologies such as big data and artificial intelligence should be relied on to promote the intelligent development of sports teaching, training, scientific research and management, so as to inject new momentum into the high-quality development of sports education. As an important carrier to improve the comprehensive quality of students, the traditional teaching and management mode is gradually difficult to adapt to the needs of modern education, especially in the allocation of teaching resources, the satisfaction of students' personalized needs and the management of sports health data. The construction of college sports intelligent platform, through the integration of digital technology, to achieve data-driven teaching, personalized training and intelligent management, in order to optimize the teaching and management process, to provide students with accurate sports health services, to promote the overall upgrade of physical education.

1. “Number +” enables the connotation of college sports

“Digital +” refers to the deep integration of digital technology with traditional industries or fields, and the improvement of work efficiency and service level through information technology innovation. In the field of college sports, the core connotation of “digital +” empowerment is not only a single technology application, but the integration of modern information technologies such as big data, cloud computing, artificial intelligence, and the Internet of Things to promote the intelligence, personalization and precision of physical education. Its purpose is to improve the quality of physical education, the efficiency of management and the participation of sports activities through the integration and innovation of digital technology, so as to optimize the physical development and health management of students.

According to the 14th Five-Year Plan for China's Sports Development, strengthening the innovation and application of sports science and technology is a key task for the future development of the sports industry. Especially in the field of college sports, digital construction has been clearly proposed as an important means to improve the quality of physical education and management efficiency. Through the construction of smart sports platform, real-time monitoring and analysis of students' physical fitness data can be realized, a scientific physical education system can be formed, and the sharing and optimization of sports resources can be promoted.

2. Approaches to the construction of college sports intelligent platform

2.1 Build digital infrastructure

2.1.1 Construction of hardware facilities

The hardware construction of college sports digital infrastructure involves many aspects, including intelligent sports venues, intelligent equipment, data acquisition terminal layout, etc. First of all, the stadium should be equipped with advanced intelligent facilities, such as intelligent fitness equipment, physical testing equipment, health monitoring equipment, etc. These devices can collect students' sports data in real time and transmit it to the cloud through the network to facilitate subsequent data analysis and management. At the same time, sports facilities on campus, such as running tracks, basketball courts, football fields, etc., can also be monitored and managed through intelligent technology to ensure the efficient operation and safe use of facilities.

Secondly, various wearable devices (such as smart watches, heart rate monitors, GPS positioning devices, etc.) can record students' exercise process data in real time, including amount of exercise, heart rate, number of steps, calorie consumption, etc., to provide accurate data support for students' exercise performance. In addition, sports classroom or competition can be equipped with high-definition video surveillance equipment, real-time collection of teaching and competition data, for coaches and teachers to provide detailed sports analysis data.

2.1.2 Construction of software system

In addition to hardware facilities, the core of digital infrastructure is the construction of efficient software systems. Colleges and universities should develop or introduce a set of intelligent sports management system to integrate sports data, student information, curriculum arrangement, resource management and other functions. The system needs to have the functions of data storage and analysis, real-time monitoring, report generation, etc., and provide scientific basis for physical education teaching and students' personalized sports programs through big data analysis. For example, by analyzing students' physical health data, the system can tailor an appropriate exercise plan and health management plan for each student.

2.1.3 Cloud Platform and big data support

In order to ensure the timely update of information and data and cross-platform sharing, the smart sports platform needs to rely on cloud computing technology to build a unified cloud platform. The cloud platform can not only realize the storage and analysis of large-scale data, but also realize the interconnection of various types of data, and promote the sharing and collaborative management of sports resources.

2.2 Build digital learning and training platform

2.2.1 Construction of digital learning resources and equipment

The platform needs to integrate multi-modal learning resources, for example, the sports theory content is made into a 10-minute micro-lesson video, and the size of each video file is controlled within 50MB, so that students can learn anytime and anywhere. Through AR technology to develop interactive teaching content, create 300 square meters of virtual sports scene (resolution 1920×1080), to realize the simulation of basketball dribbling, football excel and other skills. At the device level, it is recommended to configure 10 VR headsets (weighing no more than 400g) for students to conduct immersive training experience.

2.2.2 Data-driven personalized learning and training

Students wear wearable devices such as a heart rate band (accuracy ± 1 bpm) and a pedometer (error less than 2%) to record movement data in real time. These devices connect to the platform via Bluetooth 5.0 technology and upload data to the cloud for analysis. Based on the student's BMI (weight/height² in kg/m²) and daily exercise data, the platform generates a personalized exercise regimen, such as walking 8,000 steps per day, jogging for 30 minutes (at a speed of 5-7 km/h), or performing 2 sets of 15 push-ups.

2.2.3 Real-time monitoring and intelligent feedback

When students train, the smart device captures the heart rate range (60-160 bpm), calories burned (in kcal), and exercise intensity (METs). The system provides immediate feedback based on the exercise goal, for example, when the heart rate exceeds the target range of 160 bpm, reminding students to reduce intensity and ensure safety; When the stride length is less than 60 cm, a suggestion is displayed.

2.3 Development of intelligent management system

2.3.1 Information student management module

The intelligent management system should have the function of student personal information management, including the storage and update of basic information, sports health records, sports ability assessment and other data. Each student's exercise data can be automatically uploaded to the system through wearable devices (such as smart wristbands, heart rate bands), and the system will generate a personalized exercise profile based on the student's exercise health status (such as cardiorespiratory endurance, flexibility,

strength, etc.). According to the data analysis, the system automatically recommends suitable exercise items, such as running, swimming and other aerobic training for students with poor endurance, while strength training courses are recommended for students with insufficient strength.

For example, students can record their heart rate (accuracy ± 1 bpm), step frequency (unit: step/minute) and calories consumed (unit: kcal) through the exercise bracelet during exercise, and upload it to the platform in real time for health assessment and data analysis. If the student's body mass index (BMI) is excessive, the system will automatically suggest the appropriate exercise recommendations.

2.3.2 Intelligent curriculum and scheduling management

The intelligent management system can automatically generate the optimal curriculum schedule according to the data of students' course selection, teachers' teaching ability and site usage. The system needs to integrate course resources, and can intelligently arrange physical education courses at the beginning of each semester according to the number of students, the capacity of the field (for example, the basketball court area is 28×15 meters) and the free time of teachers. The generation of curriculum schedule follows the principle of maximizing the use of sports facilities, avoiding the conflict between courses and venues, and reducing the waste of resources.

At the same time, the system also supports students to choose and adjust courses online, ensuring that students choose the right courses according to their interests and health needs, such as choosing basketball, badminton, yoga, etc. Students can check the course schedule (time, place, teacher) through the mobile APP, and make an online reservation and cancellation.

2.3.3 Venue reservation and management

The intelligent management system needs to have venue reservation and scheduling functions, and monitor the use status of each stadium through real-time data. For example, the use of a soccer field (standard size: 100 meters long x 65 meters wide) is displayed in real time through the system, and students can make reservations according to availability. The system can intelligently optimize the use of the site, avoid time conflicts, and avoid excessive occupation of a certain site.

Students can book the venue through APP or self-service terminal, and the venue manager can check the use of the venue in real time through the system for effective scheduling and management. When the equipment fails on the spot, the system will automatically prompt and generate a maintenance order, which will be dealt with by full-time personnel in time.

Conclusion:

In short, by improving the digital infrastructure, building the digital learning and training platform, and developing the intelligent management system, the intelligent upgrading and data-driven accurate management of physical education can be achieved. At the same time, the intelligent platform provides students with personalized and interactive learning and training experience, and promotes the deep transformation of physical education from the traditional mode to the intelligent mode.

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