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Research on digital path of college physical education

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Abstract: In the age of network information, the development of digital technology has a great impact on all walks of life. This paper takes physical education in colleges and universities as the research object to discuss how to improve the quality of physical education in colleges and universities through the application of digital technology such as the construction of intelligent platform for physical education teaching, digital innovation of physical education curriculum resources, data analysis technology and construction of teaching evaluation system.

1. The application of digital technology in college physical education

1.1. It is difficult to integrate digital technology with traditional education mode

Traditional PE teaching is often face-to-face offline teaching, and teachers' direct demonstration, process observation and simple assessment are the main teaching methods. However, the application of digital technology integrates AI technology, online learning platform, data analysis and other teaching methods, which brings great challenges to the traditional teaching concepts and teaching methods of PE teachers. On the one hand, physical education teachers should use digital technology to impact the traditional teaching concept, not only to adjust the traditional teaching methods, but also to integrate new technical means into physical education. On the other hand, the integration of digital technology puts forward higher requirements for teachers' comprehensive literacy, especially for older teachers, whose digital literacy and professional skills need to be improved. The combination of many factors has seriously affected the integration of digital technology and traditional physical education.

1.2. The degree of digital construction is low

The digital transformation of physical education in colleges and universities needs the support of manpower, material resources and financial resources. Looking at the actual situation of the digital construction of physical education in colleges and universities in China, firstly, many colleges and universities do not pay enough attention to the digital teaching practice of physical education majors from the concept, and they still think that physical education curriculum is not suitable for digital transformation. Secondly, physical education educators have not realized the importance of digital and intelligent technology. Based on the concept of informatization and digital teaching, informatization, intelligent equipment and digital technology are applied to physical education teaching practice. However, due to the lack of the correct understanding of the innovation of teaching

concepts, the upgrading of teaching equipment, and the transformation of teaching methods, the digital construction of most universities in sports education is not high, which indirectly hinders the digitalization of sports education.[1-2].

2. Digital strategy analysis of college physical education

2.1. Build a smart platform for college sports teaching

The smart platform for sports teaching is a smart sports management system integrating sports teaching and course management. The main modules and functions of the system are mainly designed around the functions of college students' sports training, simulation examination and final examination, as follows.

2.1.1. Unified management of personnel and equipment

The system management of sports teaching intelligent platform includes three main areas: user, role and personnel management. It supports the platform to add user or role information and use two-dimensional code to input personnel information (students, teachers, administrators, etc.).

Role management is to provide different users with system menu services and data permissions. For example, students can select specific roles according to their own characteristics to obtain the corresponding service permissions of the system.

The system also supports the binding of various types of intelligent sports equipment, and managers can scientifically manage school sports facilities and intelligent equipment through the background data of the system. In the daily teaching process, the system will monitor the running status of intelligent equipment online in real time, and will remind you in time if the equipment is offline, which can effectively improve the efficiency of the use of intelligent equipment in the school and ensure the normal development of physical education and physical training[3].

2.1.2. District-level cloud platform innovation school affairs organization structure

For the physical education teaching process to build the school affairs information module, the specific content is shown in Figure 1:

With the new organizational structure and information module of school affairs, colleges and universities can more comprehensively link the teaching departments of regions, schools and departments, further strengthen the physical education interaction between teachers and students, and create a college physical education culture based on spatial digitalization. For example, the regional, school and campus management modules can present multi-dimensional sports data under the framework of digital and visual platforms. The system regularly summarizes and statistics the number of students in physical education courses in different departments and classes, the ratio of male to female, the use of smart devices, the number of physical exercise, the classroom sports records of physical education, after-school sports data, real-time dynamic videos and other content. The digital platforms are used to reflect the training of different hospitals, different classes, and even every student, and provide data support for the teaching and innovation of physical education teaching decisions.[4].

Figure 1: Content of school affairs information module

2.1.3. Intelligent sports science records the growth process of students' exercise and physical education courses

Students can enter personal information, including name, class, physical education course and face information, through the two-dimensional code of the system. AI intelligent device will provide students with independent training rights in class and after class through personal information and face recognition, and the device will automatically report the information of students' physical exercise, so as to achieve quantitative recording of the training process. In the training process, if there is any illegal action, it will be reminded and recorded in time, so that teachers can understand the students' illegal action and training situation through video playback. For example, Table 1 shows the recorded information of a student's movement during sit-up training:

Table 1: Sit-up movement record information

Serial number	Item	Time
1	preparation	9:07:47
2	Complete action	9:07:51
3	Complete action	9:07:55
4	Illegal actions (hands not covered)	9:08:00
5	Illegal actions (hands not covered)	9:08:05
6	Illegal actions (hands not covered)	9:08:10

On the one hand, students can query their own sports information through the training system, such as sports items, recording videos and other content; On the other hand, the system also supports the training playback function. For example, as shown in Table 1, the system will accurately record the specific time of students' illegal actions, and students and teachers can quickly find the video content of illegal actions, which is convenient for teachers to correct and train students, and provide

data support for teachers' hierarchical guidance and targeted guidance.

2.2. Construction of digital and intelligent physical education curriculum resources

On the basis of the intelligent platform for physical education teaching, intelligent teaching course resources should be provided for students in combination with the content of college physical education courses, including four modules, as shown in Figure 2:

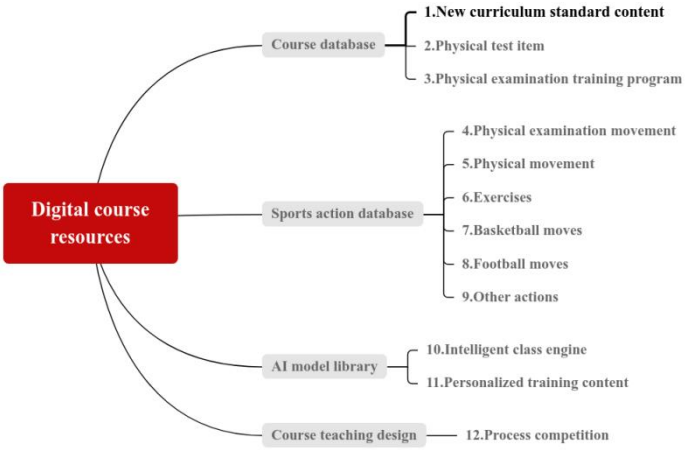

Figure 2: Composition of digital teaching course resources

Among them, the course database and sports activity database are based on the actual situation of authoritative professional physical examination courses and college physical education courses, covering 37 categories, 5 levels and more than 1000 courses. The AI model base generates the personalized sports training content according to the students' personal characteristics, the difficulty of sports training, the teaching time of the course and other factors. The teaching design implements the offline teaching process according to the process competition method, as shown in Figure 3:

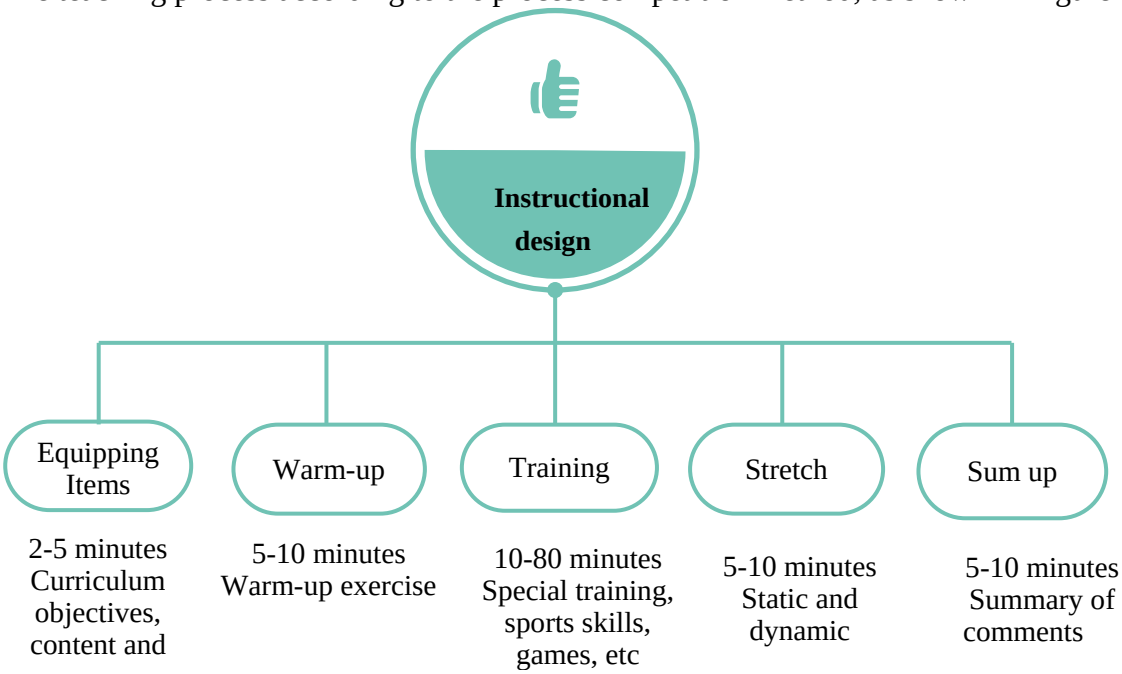

Figure 3: Teaching design of process competition method

2.3. Using data analysis to optimize physical education

Sports teaching data analysis needs to be realized with the help of the smart sports cloud platform, which provides more data support for sports teaching by collecting and analyzing a large number of student training data. The platform includes modules such as data collection, data analysis, data-driven teaching optimization and management.

2.3.1. Data collection and sorting

College smart sports cloud platform needs the support of college sports teaching smart platform, and at the same time with various types of sensors, smart wearable devices, intelligent training equipment and online teaching system, etc., to comprehensively collect the data information of students in physical exercise and course training. Take 1000m special training as an example. The system will collect data such as students' exercise duration, exercise intensity, exercise track, and heart rate change during exercise, and these data information will also be integrated with students' personal information, physical fitness test results, sports health records, etc., to build a more complete data information database of students' physical education courses.

2.3.2. Data analysis

After collecting various sports training data information of students, the smart sports cloud platform will conduct intelligent analysis on these data, such as using comparative analysis, correlation analysis and cluster analysis to understand the before and after the comparison of students' special sports training, and understand the training effectiveness and progress of students through comparative analysis. At the same time, it can also find the problems in the training of students and students' specialties through cluster analysis.

2.3.3. Data-driven teaching optimization

With the support of data visualization technology, the platform will display students' training data to teachers through charts, reports and other ways, so that teachers can intuitively understand students' course learning and physical exercise process, evaluate students' learning situation scientifically and objectively, and help teachers constantly improve teaching plans and develop more feasible teaching strategies[5].

2.3.4. Data-driven sports management

The intelligent sports cloud platform can highly integrate various data information of the intelligent platform of college sports teaching, and provide data information support for college sports management through comprehensive data analysis. For example, through the statistical analysis of the sports data information of students in each department and class, the physical education teaching level of each college, each class or even the whole school can be evaluated, and the physical education situation of each student can be fully understood, so as to provide more scientific data support for the school's physical education curriculum planning and sports policy formulation, and promote the realization of digital and intelligent sports management. In addition, the platform can also monitor the use of school sports intelligent equipment and infrastructure in real time, facilitate the whole process of monitoring students' sports, ensure that students participate in physical exercise in a safe sports environment, provide digital services for school sports management, and constantly improve the level of school sports management.

2.4. Construct a scientific and efficient digital physical education teaching evaluation system

Colleges and universities should build a more intelligent and digital teaching evaluation system on the basis of the intelligent platform for physical education teaching, combined with the needs of digital and intelligent physical education curriculum construction, deeply combined with the characteristics and actual needs of physical education in colleges and universities, and set scientific and feasible evaluation indicators for teaching links and students' learning results.

2.4.1. Digital teacher evaluation

The teaching platform for PE teachers consists of two levels:

First of all, physical education teachers should be able to make a self-platform for their own teaching effectiveness in combination with phased teaching practice, reflect on their own teaching practice in the teaching process and teaching evaluation, sum up teaching experience, find teaching deficiencies, and constantly improve the effectiveness of digital teaching. Secondly, students participate in the teacher platform, and teachers should be able to consciously accept the supervision of students. Students can evaluate the teaching methods of teachers according to the content setting of physical education courses and the classroom training process, and put forward reasonable suggestions for the digital teaching process of teachers.

2.4.2. Student evaluation

Student evaluation also includes two levels:

First of all, students should make an objective self-evaluation of their course learning, combining the physical education training plan, course scoring standards and their actual learning process. Secondly, teachers should evaluate students, which is mainly a process evaluation, and objectively evaluate students through daily teaching observation, data analysis of physical education teaching command platform, physical education knowledge mastery, learning process and other information.

It can be seen from the content of evaluation that both teacher evaluation and student evaluation are actually two-way evaluations. The two-way system of self-evaluation and external evaluation can better promote the implementation of digital teaching and better identify problems in the teaching process.

3. Conclusion

The emergence of digital technology can provide technology, resources and other support for the innovation of physical education in colleges and universities in the new era. The digital transformation and innovation of physical education in colleges and universities should make good use of digital technologies such as big data, cloud computing and AI, constantly optimize physical education means and innovate physical education methods, and promote the improvement of the physical education system in colleges and universities. To provide more scientific and more efficient teaching methods for the improvement of the comprehensive quality of college students.

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