Research on the Design of Intelligent System of College Physical Education in the Era of 5G+ Artificial Intelligence

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Abstract. The functional requirements of physical education class course management in colleges and universities are now very complicated: the generation of elective courses, the management of natural classroom teaching achievements at the end of the term, and the summary and analysis of achievements. This paper aims to study the intelligent system design of college physical education in the era of 5G+ artificial intelligence. This paper discusses the optimization of college sports management and the construction of service functions, and discusses the development and functional orientation of sports management system. Among them, multidimensional management and connection are the main functional lines of today's sports management. In the second part, through interviews and research with students, it is determined that the previous education system was limited to data input and counseling functions, and with the changes of the times, teachers, students, etc. The link between management micro-information and teacher-student management system enables administrators to manage teachers and students through terminals, forming multi-port connection. The third part introduces the early warning mechanism and health guidance in management system, which can monitor and guide both inside and outside activities through application ports, improve the level of teaching management in colleges and universities, strengthen the continuous communication between school administrators and teachers, and improve the quality of the main body.

Keywords: 5g+ Artificial Intelligence Era, College Physical Education, Educational Intelligence System, Educational Administration

1. Introduction

College students' physical education curriculum management system is an educational inquiry system for students to choose courses, inquire about physical education scores and physical education courses, and it also takes into account the task of recording and reporting the national physical fitness test scores. In college teaching, except the academic affairs office, it is the only educational administration for all students, and its cumbersome management and complicated functions really make many colleges and universities feel "overwhelmed". Many colleges and universities have directly

entrusted the educational administration to the school-level educational administration department for notification management, and only reported the physical fitness test data as their own educational administration work. The physical education curriculum management system in the physical education teaching management needs to be improved, and have built relevant teaching management systems for schools by purchasing or hiring special personnel for development. At the same time, it has become a common trend to connect the teaching management system with various educational websites, so that college students who are familiar with the network can operate these systems effectively and conveniently. At present, there are not many P.E. teaching departments in colleges and universities that have the ability to manage students' grades and report their physique grades, so it is a tedious task to manage undergraduate P.E. courses in the whole school [1-2].

For example, Dominguez-Santos D pointed out that foreign educational administration system has gradually extended to the field of teacher-student interaction, including homework [3]. Le Q C pointed out that at present, foreign educational administration systems pay more attention to integrating the function of data mining into educational administration activities, and tend to use the information in educational administration systems as an important basis for the reform of school administration activities [4].

This paper is organized according to the specific work schedule, and the specific organization scheme is as follows: briefly describes the related technical basis of developing the management system software of college physical education, including J2EE technology, MVC model and database technology. This chapter is the basic knowledge for the following specific design and implementation of management system software. Aiming at the university physical education management system software developed in this research paper, this paper analyzes the requirements of the system software, including functional requirements analysis, performance requirements analysis, and database design requirements analysis. On the basis of this analysis, the whole program design process of the university physical education management system software is completed, including the construction of design pattern, the determination of overall structure and the establishment of software system platform. The key lies in designing the software of college physical education management system, mainly completing the design of all levels of the system, specifically completing the application of client layer, application layer and data layer, and designing the MVC mode and system security of the whole management system. Mainly aiming at the realization of the physical education operation management sub-module, a special design and application is carried out. On the basis of function analysis and demand analysis, the function and logic of this management module are emphatically analyzed, designed and implemented. The purpose of the systematic test and functional result analysis of the designed college physical education management system software is to verify that the developed management system software meets the design requirements and practical application needs. Finally, the work done in this paper is summarized.

2. Research on Intelligent Design of Physical Education in the Era of 5G + Artificial Intelligence

2.1 The Core Features of Sports Educational Administration Management System

Like other kinds of educational administration systems, the management system of physical education curriculum should have the functions of storing, mobilizing and processing all kinds of information, so as to realize the management of physical education curriculum with higher efficiency, and at the same time provide data support for the research of students' physical quality changes. At the same time, the construction of P.E. course educational administration system also needs to consider the saving of funds, so it is necessary to build a decentralized calculation and analysis mode, and effectively analyze and calculate the actual utilization of various P.E. course resources, actually need to build a stronger information processing ability compared with professional courses, it needs a stronger computing function to adapt to it [5-6].

The first is resource optimization. The core goal of the educational administration management system of physical education is to meet the needs of teachers and related administrators who teach physical education, use all kinds of school resources, and rationally set up courses, so as to effectively provide students with sufficient physical education needs. If the stadiums and sports facilities in colleges and universities are idle and damaged, they will not be able to realize their use value, which will lead to a huge waste of the budget funds of colleges and universities. The educational administration system of physical education curriculum itself can effectively improve the transparency of physical education resources utilization information to teaching staff and students. Through the network information platform, students, teachers and other subjects can effectively understand the utilization of various resources, and at the same time, different topics can achieve the goal of mutual communication through this platform. For all kinds of information processing and resource allocation required by physical education teaching, it is the core goal to realize the effective utilization of resources by integrating users, providers and other participants, and to optimize the use of teaching facilities in schools. Through this goal, the school's teaching resources can be used by students to the maximum extent, and the advantages of the educational administration platform can be exerted to a great extent. At the same time, we should reduce all kinds of capital investment as much as possible, so as to reduce the work pressure of teaching management activities on the academic staff, and at the same time, improve the teaching effect is the core goal. At the same time, however, the educational administration management system of physical education curriculum itself does not need to deal with the complicated information, so it does not need to update all kinds of software constantly, nor does it need to update the related hardware facilities too quickly. At the same time, the system itself should be universal. Physical education course itself is a course to be offered by different colleges and universities, and it will be difficult to play a corresponding role in different colleges and universities if it can't have a good universality [7-8].

Second, it is easy to use. The educational administration management system of physical education course itself is an information management platform built to

simplify the management process and improve the management efficiency. This means that the application requirements of related systems can be realized without high computer processing power in time. The requirements of simple and direct content and easy training should be reflected when the system is built. In the daily teaching management activities, it has become the core demand for the personnel who actually operate the related systems to be able to use the common software and equipment among different colleges and universities, and to effectively mobilize the relevant resources and information when facing the diverse needs of students. Under this background, the designers and developers of the system platform are required to meet the relevant functional requirements on the one hand, and to achieve the stability of the system on the other. At the same time, once faced with the problem that related functions need to be adjusted urgently, the system should also be able to be modified by professionals. At the same time, however, for those who use the relevant software systems, ensuring that personal information is not stolen and properly safeguarding the legitimate privacy rights and interests of individuals should also become a problem that the physical education curriculum management system of colleges and universities must face. However, the reality is that even the systems with good firewalls in colleges and universities need to face the supply of related information networks by attackers for various purposes. Therefore, a team should be formed to maintain the network.

Third, it is highly integrated. Physical education courses in universities need to include the personal information, student status information and other educational information of almost all departments and majors in their own system. For teachers with management authority, it is very necessary to organically integrate the students' situations in different departments and departments, and finally realize the goal of reading and sharing teaching resources and information. To avoid the errors of educational administration information as much as possible requires the effective integration of the whole system. This means that the sports educational administration information system should store and process the information completely and reliably, so as to ensure the validity and authenticity of the relevant information from the protector. But at the same time, the related network information should be stabilized as much as possible, so as to avoid related problems. The sports educational administration management system itself requires the standardization of all kinds of information, which can effectively summarize the necessary norms and systems from the complicated information ocean, and then form the goal that the information of different departments can be mutually referenced, compared and communicated.

2.2 Functional Analysis of Sports Educational Administration Management System

In order to realize the function of P.E. curriculum educational administration system, developers should accurately grasp the practical needs of teachers, students and administrators for the system function. Only under this background can the sports educational administration management system effectively serve students and teachers. At the same time, forming a complete development process, building a system connecting different functions is also its core requirements. In this context, it should effectively cover the functions of different disciplines, and relevant developers

need to effectively understand their own functions in order to effectively build the system [9-10].

2.3 The Overall Framework for the Realization of the Functions of the Sports Educational Administration System

After the above analysis, the functions that the educational administrative departments should realize include the teaching function and the course management function, the allocation of sports facilities and resources, the analysis and research of students' physique and so on. The related functions have been fully reflected in the overall framework of the current educational administration system of physical education courses.

First of all, in terms of the realization of teaching and course management functions, the functions of course selection, course arrangement and examination management can be fully realized. The setup part of the system can directly connect the physical education educational administration system with the information system of students' status, so as to obtain all the information of students, and then provide convenience for teachers' curriculum arrangement and the management of teaching classes. The information of students' course selection can also be confirmed and finally completed through this link. The teaching plan, starting time and other contents of school physical education courses can also be directly transmitted to relevant teachers and students through this system, thus helping students to take elective courses according to the unified regulations of the school.

Secondly, after confirming all the information of teachers and students through the system setup, the systematic management of students' examination can be formed through modules such as total score management, sports score management, health test management, extracurricular project management and examination management. At present, the physical education curriculum assessment in colleges and universities in China has gradually realized diversification. In fact, students' physical performance is composed of information from many angles, such as academic performance, professional performance, physical fitness test, participation in daily physical exercise and so on. At present, the framework of P.E. educational administration system completely includes these items of P.E. curriculum assessment, which can ensure that students can get effective assessment in the whole process of P.E. curriculum activities, and then form a fair and objective system that can reflect students' achievements.

Then, with regard to the allocation function of resources such as stadiums and other places, the extracurricular project setting part of club management and extracurricular project management can undertake the purpose of guiding students to make optimal use of school sports resources. At present, a considerable part of the school sports equipment can be handed over to relevant clubs and other student organizations for use. Students who need related sports equipment can use them directly by joining related clubs, and the management and maintenance of related clubs have been incorporated into the school's sports educational administration management system. This broadens the channels for students to make use of the resources of stadiums and gymnasiums, thus helping students to further improve their physical fitness through organized fitness activities. At the same time, the utilization of some sports resources is directly guided and regulated by the extracurricular

project management module. After the school sports resources are included in the extracurricular sports assessment, students can choose the sports resources they want to use and the types of extracurricular sports they want to take part in according to the setting of extracurricular exercises.

Finally, the analysis of students' physical quality can be realized through two links: system setup and health test management. The setup link of the system contains the basic information of students' status, while the health test management link can form a comprehensive evaluation of students' physical health. Through these two sets of information, teachers and researchers can analyze the differences in various physical health indicators of students of all ages, genders, majors, etc. through mathematical statistics tools, so as to clarify the problems of various types of students' physical quality and formulate targeted countermeasures and measures [11-12].

2.4   Algorithm Selection

In the forward propagation process, the information is processed .The input of neurons in the input layer is ni:

$$n_i = \sum_{j=1}^{N} w_{ij} * x_j - b_i$$
(1)

$$n_0 = f(n_i) = f\left(\sum_{j=1}^{l} w_{ij} * x_j - b_i \right)$$
(2)

$$o_i = \sum_{j=1}^{N} w_{ij} * n_o - b_k$$
(3)

$$o_o = \phi(o_i) = \phi\left(\sum_{j=1}^{N} w_{ij} * n_o - b_k \right)$$
(4)

Output oo if Er<e; If e, > e, it will enter the process of error back propagation.

3.   Research and Design experiment of Intelligent System Design of Physical Education in Universities in the Era of 5G + Artificial Intelligence

3.1   Determination of Design Pattern

It is not wise to simply use pure B / S or C / S mode management systems.The C/S structure has a prominent effect in a large number of data operations, and its function is more powerful and perfect than before. The advantage of using B/S structure is that it is more convenient and flexible to use, more suitable for publishing and querying data and information, and it doesn't need to maintain the client, but it is best to combine them. In the real environment, considering many factors, such as the huge amount of students' information and the complicated information, this system can adopt the coexistence system of both modes with the support of the campus network hardware environment.

3.2 Experimental Design

Intelligent system of college physical education constructed in this paper is tested. Firstly, the necessity of establishing early warning mechanism in college physical education is tested. The physical health of male and female college students is analyzed. Secondly, the performance of the system in this paper is judged by the change of functional response time of each module when the system is used by many people.

4. Design and Design of Physical Education in Universities in the Era of 5G + Artificial Intelligence

4.1 The Necessity of Early Warning Mechanism

In college physical education, establish an early warning mechanism is necessary. Therefore, this paper tests the physical fitness data of men and women in a certain grade of a college. The first data is shown in Table 1.

Table 1. Physical health data

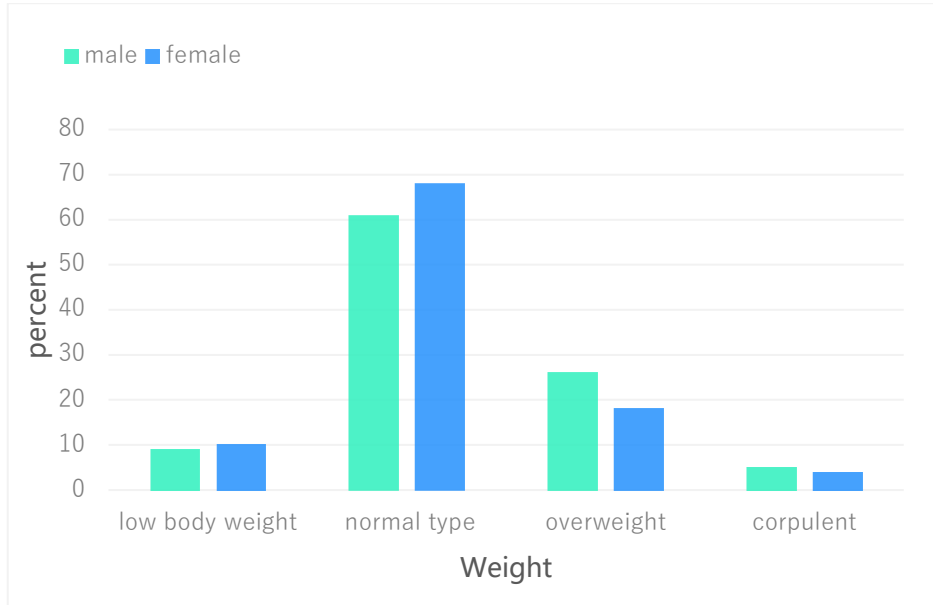|	low body weight	normal type	overweight	corpulent
male	nine	61	26	five
female	10	sixty-eight	18	four

Table 1. Detection of male and female physical health data in a certain school

From Figure 1, we can clearly see that, in contrast, the physical health of boys is worse, with more than 31% of boys' physical fitness falling into the unhealthy range, while that of girls is only 22%. Therefore, colleges and universities should strengthen physical education, optimize its practicality and improve students' physique.

4.2 System Performance

In this paper, the performance of the system is tested, and the response speed of single person and 500 person-times is tested for different modules of the system at the same time. The performance of each module of the system is judged by the change of response speed under different person-times. The experimental data of response speed are shown in Table 2.

Table 2. System response time

	Data upload	Course management	Academic affairs notice	Curriculum elective
one	0.2	0.3	0.2	0.2
500	0.3	0.7	1.3	0.4

Table 2. The system response time changes under multiperson concurrent login

From Figure 2, we can see that the response speed of the two modules, the course management module and the educational administration notice module, has changed greatly under the multi-person situation, and especially, the response time of the educational administration notice module under the multi-person situation reaches 1.3 seconds, so the response speed is slow, which does not meet the needs of normal system use. It is suggested to further optimize this part.

5. Conclusions

Due to the influence of the exam-oriented education system that has existed for a long time in history, colleges and universities and teachers and students in our country don't attach much importance to physical education teaching, and the teaching system aiming at cultivating students' lifelong exercise ability is not complete. This paper attempts to build a more optimized educational administration system of college physical education curriculum, so as to optimize the university course management, and provide help for the level.The conclusions are as follows: First, the sports educational administration management system should have clear function selection and reasonable structure design. The functions of the sports educational administration management system should include the functions of administrators in managing sports educational administration, the allocation of sports facilities and resources, and the analysis of questionnaire survey results. As for the realization of

teaching and curriculum management functions, the functions of course selection, curriculum arrangement and examination management can be completely realized through system setup, total score management, sports score management, health test management, extracurricular project management and examination management. In club management and extracurricular project management, the extracurricular project setting part undertakes the purpose of guiding students to optimize the use of school sports resources. The analysis of students' physical quality can be realized through two links: system setting and health test management. The second is the design and construction of sports educational administration management system. The application scope of college sports educational administration system should cover the functions of administrators, teachers and students in sports educational administration system. The whole client itself should be able to become an important connection hub that supports all users and the whole system. In the end, the diversified sports educational administration management system can effectively show a complete system of multi-client ideas by integrating different subjects into a visual system, and finally promote the transformation from a single inquiry platform to a guidance platform.

References

[1]   Ma X, Cao C, Sun Y. Research on Multimedia Interaction Design of Children's Emotional Education Based on Social Presence[J]. Journal of Computer-Aided Design & Computer Graphics, 2020, 32(7):1087-1094.

[2]   Gaobin, Cao H N, Liu Z Z . An artificial intelligence fuzzy system for improvement of physical education teaching method[J]. Journal of Intelligent and Fuzzy Systems, 2020, 40(1):1-10.

[3]   Dominguez-Santos D . Comparative Study of the Design Seismic Spectra for Spain in the EC-8 and NCSE-02 Standards[J]. Arabian Journal for Science and Engineering, 2022, 47(10):13279-13298.

[4]   Le Q C, Nguyen T K, Trinh X T, et al. Formulation of Geometrically Nonlinear Numerical Model for Design of MEMS-Based Piezoresistive Pressure Sensor Operating in the Low-Pressure Range[J]. Sensing and Imaging, 2022, 23(1):1-27.

[5]   Stergiou C L, Psannis K E . Digital Twin Intelligent System for Industrial IoT-based Big Data Management and Analysis in Cloud[J]. Virtual Reality & Intelligent Hardware, 2022, 4(4):279-291.

[6]   Xu Q, Xu Y. Research on Smartphone's UI Animation Design[J]. Journal of Computer-Aided Design & Computer Graphics, 2020, 32(7):1095-1100.

[7]   Chen T . Research on the Dilemma and Breakthrough Path of Ideological and Political Education in Colleges and Universities in the Era of Big Data[J] . Journal of Higher Education Research, 2022, 3(2):203-206.

[8]   Cui Y, Chen J . An Analysis on the Formation Basis of Young Marxists' Belief in Colleges and Universities in Jilin Province[J]. Journal of Higher Education Research, 2022, 3(2):146-150.

[9]   Vollert J, Macleod M, Dirnagl U , et al. The EQIPD framework for rigor in the design, conduct, analysis and documentation of animal experiments[J]. Nature Methods, 2022, 19(11):1334-1337.

[10]   Telnov Y F, Danilov A V, Diveev R I , et al. Development of a prototype of multi-agent system of network interaction of educational institutions[J]. Open Education, 2019, 22(6):14-26.

[11] Amanda N, Andersen F, Christian R, et al. Learning Math for 1st Grade Primary School Students using Intelligent Tutoring Systems[J]. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 2021, 12(6):2020-2030.

[12] Mikryukov A, Trembach V M, Danilov A V . Modules of Organizational and Technical Systems for Solving Problems of Adaptation in a Rapidly Changing Environment[J]. Open Education, 2020, 24(5):82-90.