

# Analysis of the core strength training application strategy in college physical education

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Yili Normal University Student Physical Fitness Monitoring Center Subject Name and No.: Yili Normal University Study on the core strength training on the impact of physical fitness of college students (No.: 2022 TZYB02)

**Abstract.** In the construction and development of modern society, in order to improve the comprehensive quality of college students, colleges and universities around the core strength training program into physical education teaching, and truly realize the basic goal of physical education. From the perspective of practical education and training, although core strength training in college physical education has been paid attention to, it also leads to many problems during the application period, so colleges and universities should take corresponding measures to solve these problems and fully demonstrate the application value of core strength training in college physical education. After understanding the definition and significance of core strength training, this paper studies the efficient physical exercise management information system based on cloud computing according to the current problems faced by physical education in colleges and universities, and defines the application countermeasures of core strength training in physical education in colleges and universities in the new era, so as to provide reference for the reform of physical education in colleges and universities.

**Keywords:** College sports; Physical education teaching; Core strength; train.

## 1. Introduction

Under the background of education reform, how to improve the physical quality of college students and ensure their healthy growth is the main topic of colleges and universities in the new era. According to the practical investigation and research, the comprehensive quality of college students is getting lower and lower at present, and the basic standard of physical education in colleges and universities proposed by the education department requires colleges and universities to regard physical education results as the recruitment criteria, so how to improve the physical quality of students has become an important task for college physical education teachers. The core strength training is mainly divided into two parts: on the one hand, it refers to the torso of the human body, the core of which is the waist, pelvis, hip joint, and also includes the core muscle group composed of the oblique muscle, the vertical spine muscle, and the transverse muscle of the abdomen; On the other hand, it refers to strength training, mainly through physical training, to improve the human waist, pelvis, hip and surrounding core muscle groups. Always maintain the vitality of the muscles is the basic condition of human sports, all professional or non-professional movements or like need to rely on muscles to complete the force to complete the movement, coordination of the body and reduce the center of gravity, etc., need the core muscle group as support. From the current learning and growth environment of college students, the content of sports training is less and less, and students prefer to stay in the dormitory, which leads to their ability and quality getting worse and worse. In this context, the core strength training is integrated into the physical education of colleges and universities, and gradually strengthen the physical quality of students, guide students to master more reasonable and effective training methods, fully mobilize students' interest in independent

participation in physical training, and finally let students establish lifelong exercise awareness and ability. [1.2.3]

Understanding the current physical education in colleges and universities, we can see that although core strength training has been highly valued by schools and teachers and students, there are still many problems related to teaching methods: First, the lack of perfect mechanical equipment. As a new teaching method, both teachers and students need to understand relevant theoretical knowledge and master more practical content combined with existing teaching experience. However, from the perspective of practical education, core strength training depends very much on fitness equipment. In the absence of perfect mechanical equipment, physical education in colleges and universities is difficult to complete teaching tasks in an orderly manner, and students can only passively accept the knowledge provided by teachers. In the long run, core strength training will inevitably lose interest. Secondly, there is no standardized teaching system. Although there is currently no relevant policy requiring colleges and universities to strengthen physical education teaching for students, from the long-term perspective of students' learning and growth, core strength training, as a new teaching method, can not only create new opportunities for college education reform, adapt to the new teaching environment faster, but also guide students to establish a correct outlook on life and values. Improve the comprehensive quality of college students. However, because there is no perfect teaching mode and no standardized teaching system, the application effect of core strength training method in college physical education classroom is limited. Finally, core training methods cannot meet all the needs of students. Nowadays, the physical quality of college students has been declining year by year. While attaching great importance to physical education, colleges and universities around the country have begun to comprehensively think about the existing teaching content and teaching mode. Physical education teachers pay more attention to cultivating students' correct awareness of physical exercise, and students' requirements for physical education have also presented personalized characteristics. Students have individual needs to demonstrate interest in physical education, which is also the basic condition for promoting core strength training. Therefore, after understanding the current situation of physical education teaching in colleges and universities and the definition of core strength training, this paper mainly studies the efficient physical exercise management information system based on cloud computing, and then determines the application strategy of core strength training from the education reform. [4.5.6]

## **2. Methods**

### **2.1 Core strength training methods**

In essence, core strength training refers to a form of strength training for the human core muscle group, which is of great significance for building a harmonious human body shape and can effectively alleviate problems such as lumbar bone injury that may occur in young groups. Nowadays, there are differences in the view of the core muscle group at home and abroad. Chinese scholars believe that the core muscle group refers to the muscle group in the central position of the human body, while foreign countries regard the core muscle group as "lumbar vertebra-pelvi-hip" and other areas. There are many contents in the core strength training methods mastered at present, as shown in Table 1 below. In practical application, it is emphasized to maintain the correctness of human movements, and try not to have deviation or insufficient maintenance time and other problems. [6.7.8]

Table 1 Core strength training methods

Core strength training method	Action essentials	Training purpose
Balance pad standing	Stand on the balance mat with one foot and keep your body stable for one minute.	Strengthen physical stability
Russian twist	Sitting on the yoga mat, legs bent, Bend your legs, bend your upper body and thighs in a V shape, straighten your arms forward and perpendicular to your upper body, then keep your legs fixed, turn your upper body to one side, exhale at the same time, twist your body to the extreme, and then return to the starting position and inhale.	Exercise the external oblique muscle of abdomen.
plank	Lie on your back, elbow your hands on the ground, and put your feet on the ground shoulder-to-shoulder. Then tighten your abdomen, prop up your body, and keep breathing. Remember to tighten your abdomen all the time and keep your body in a straight line for 30 seconds to 1 minute.	Exercise transverse abdominis muscle
Swiss ball push-ups	Face-down push-ups, arms straight support, toes on the Swiss ball.. Squeeze the chest to lift the body and exercise the pectoralis major to return to the initial position.	Exercise pectoralis major

## 2.2 Intelligent physical exercise platform

The physical exercise management information system is designed based on the cloud computing architecture. The system architecture should choose C or access mode according to the needs, so as to ensure that the system users can directly access the system functions after downloading the network client. Colleges and universities can upload the relevant content of core strength training teaching to the network platform to help students use network technology to complete resource learning, resource download, resource search and other services, the specific architecture is shown in Figure 1 below: [8.9.10]

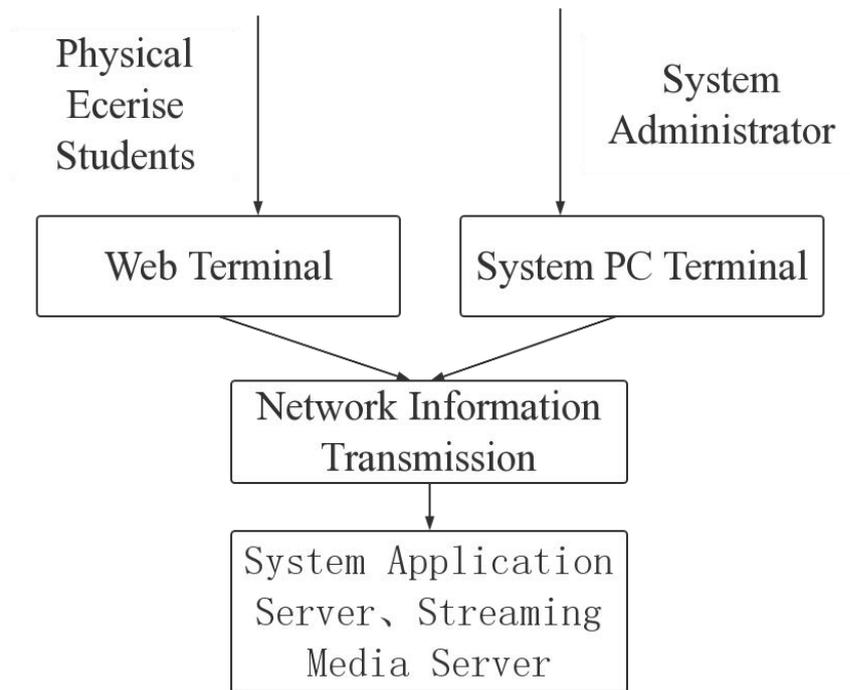


Figure 1 System architecture diagram

The system function module design is shown in Figure 2 below:

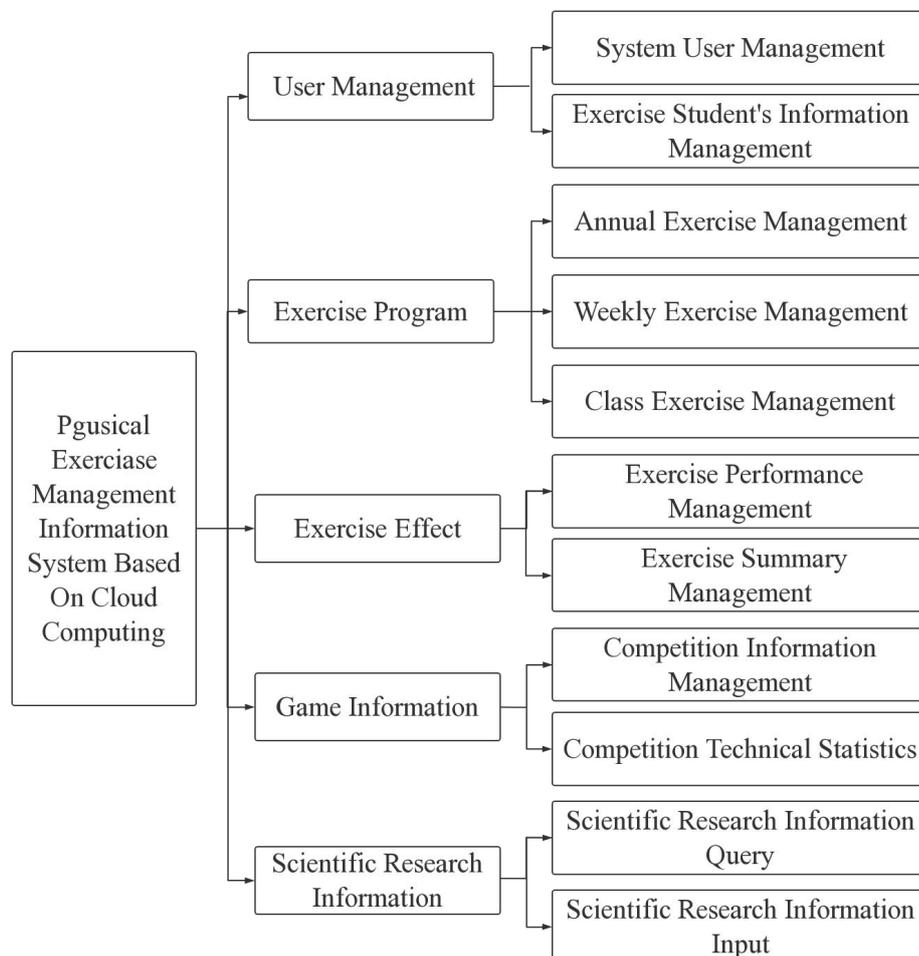


Figure 2 Structure diagram of system function

According to the above analysis, the overall system function modules are divided into the following points: First, user management. This module is a login carrier for administrators, college physical education teachers and teaching and research directors, which is mainly used to edit user information, user interface and user password. After successful registration, students participating in core strength training can use their own account and password to log in directly, create corresponding electronic files, and update them regularly according to the situation of participating in exercise and physical quality. The files can provide reference for teachers' teaching guidance and students' learning. Second, exercise plan. This module is to help PE teachers add, query and design core strength training plans to ensure that the time and efficiency of students' participation in physical training are in line with the expected teaching objectives, and is the basic condition for promoting the systematic development of physical education in colleges and universities. For physical education teachers in colleges and universities, making specific plans during core strength exercise can strengthen students' correct understanding of physical education teaching and regular exercise, and lay the foundation for subsequent education reform. Third, the effect of exercise. The design of this module is mainly used to evaluate the final results of physical exercise of college students, scientifically process the data information of students in different stages of core strength training, facilitate college physical education teachers to scientifically design physical education test activities, summarize the teaching tasks and learning results at different stages, so that students can have subjective understanding. Fourth, competition information. This module is mainly used to store and query the competition information of physical training, focusing on improving the practicability of core strength training teaching; Fifth, scientific research information. The related information of physical education in colleges and universities can be recorded and stored in the system, which can improve the comprehensive level of traditional college teaching after system processing; Sixth, database design. The operation of the system requires the use of large amounts of data information, so the MySQL database should be selected when designing the system architecture, which has a high practicality, not only convenient for users to store management information, but also to avoid problems in data classification. [11.12.13]

### **2.3 Platform construction and algorithm design**

After defining the main content of core strength training in college physical education, the network platform based on cloud computing architecture is regarded as an auxiliary basis to provide rich information for multi-level system users. In this process, combined with the platform architecture as shown in Figure 2 below, the interaction between client and server will meet the individual needs of users, and finally the network feedback data results will be transmitted to the database.

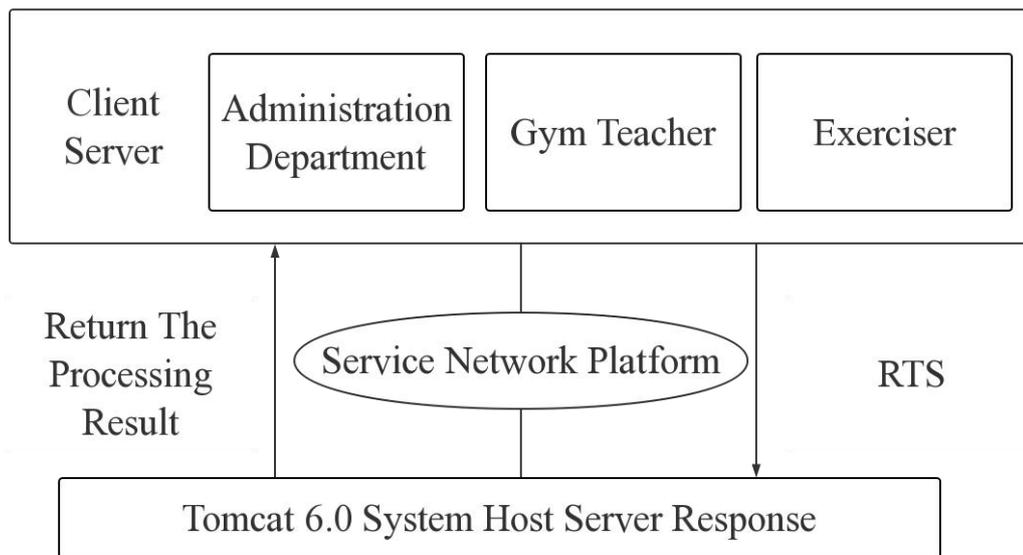


Figure 3 Web platform architecture diagram

It should be noted that during the operation of the system, the information data related to physical exercise in colleges and universities should be encrypted using the algorithm shown in Figure 4 below, so as to avoid threatening the personal and property safety of college students.

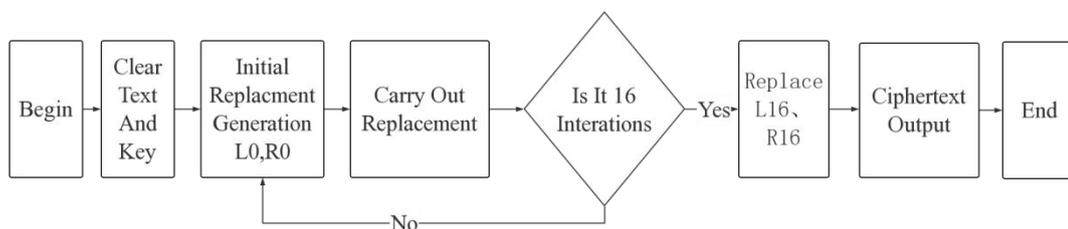


Figure 4 Encryption processing flow chart of EDS algorithm

The encryption and decryption algorithm is used to reversibly encode information bytes, including the same width and different width, the former is the way of corresponding bytes and bytes, and the latter is the way of corresponding bytes and bytes. In the process of system operation, when extracting relevant information, the user must first read the encrypted data in the database, and then decode the response to the data to obtain the required content. It should be noted that this technology is clearly targeted, in other words, user information is not available externally, and can only be identified in the system during the design of the system to use encryption algorithms, which can ensure the security, confidentiality and stability of information. From the perspective of college physical education, the physical exercise management information system based on cloud computing architecture can facilitate teachers and students to use the network platform to query the relevant information of core strength training in real time, gradually improve the existing physical education teaching content, and fully mobilize students' interest in independent participation, which is worthy of promotion and application in the field of education. [13.14.15]

### 3. Result analysis

According to the analysis of the current problems faced by physical education in colleges and universities, after building a physical exercise management information system with cloud computing price as the core, the following teaching countermeasures should be implemented in an orderly manner according to the definition and content of core strength training and from the long-term perspective of college students: First, strengthen basic training and improve students' physical literacy core strength training, which can focus on improving students' core muscle group, fully mobilize students' interest in participating in physical exercise, and gradually realize the impact of core training methods on themselves. For example, before running, physical education teachers will require students to stretch, such as leg press, jogging, etc. Through these preparatory activities, students can clearly feel the changes of their own muscles, have a basic understanding of their own physical condition and activity skills, so as to complete the following physical training; Second, more professional PE teachers should be equipped to update PE teaching resources in real time. As the core strength training needs to provide professional and appropriate amount of sports equipment, colleges and universities should arrange professional personnel to purchase, check and maintain relevant equipment regularly, pay attention to creating a good teaching environment for teachers and students, and teachers should actively participate in school or social organization learning activities, constantly adjust the existing teaching methods and teaching content, and pay attention to allowing students to get a full range of physical exercise. Third, always follow the student-oriented teaching principle, pay attention to the lifelong exercise of students starting from the design of teaching content. Because the teaching time of college physical education is limited, teachers should maximize the teaching benefit in the limited time. By designing different training contents according to students' interests, hobbies and physical conditions, it can not only mobilize students' independent participation in interest, but also guide students to develop good physical exercise habits, so as to lay the foundation for subsequent teaching guidance.

### Conclusion

To sum up, although core strength training still has many problems in college physical education, with the continuous improvement of teaching content and teaching methods, and the application of advanced technologies represented by big data and cloud computing into teaching, core strength training is bound to play an important role and actively guide the innovation and development of college physical education.

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