

Research on College Students' Physical Training Scheme Decision Based on Big Data Analysis

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Abstract: *With the in-depth study of physical training, people analyze it from all aspects and draw some rules. At the same time, there are many problems to be solved urgently. People began to explore the role of modern new technologies and new means in physical training, such as using big data technology, but they did not solve all the problems in physical training, but they can be sure that the future physical training will be efficient and scientific. Physical training is one of the important contents of the curriculum for students majoring in physical education in colleges and universities, and it is also the core issue of training theory and the key to improve sports performance. Through long-term training practice, it has been found that the improvement of physical fitness plays a very important role in improving the comprehensive ability of athletes. In the future, most students majoring in physical education will engage in front-line teaching or sports training. Therefore, the knowledge and skills reserve of physical fitness training for students majoring in physical education is particularly important. In response to this, the paper proposes a quantitative and personalized physical training organization and management method based on management information systems, designs a physical training management information system based on the actual situation of military academy joint training students, and proposes corresponding physical training management measures. Experimental results show that the data mining algorithm designed in this paper can more efficiently and reasonably formulate athletes' training plans.*

Keywords: *Big data analysis; College student; Physical fitness training; Scheme decision*

1. Introduction

With the continuous improvement and innovation of modern sports technology, physical training has become the key research object of contemporary sports workers. As students majoring in physical education, we should know and master the new trend of physical training in time, which is very important for the improvement of self-technology. The predecessors have conducted in-depth research on all aspects of physical training, and explained and expounded the definition and classification of physical training in great detail [1]. The research mainly focuses on the development status and trend of physical training, the theory and method of physical training, the plan of physical training, the characteristics of physical training, the construction of physical training index system, and the comparison of advantages and disadvantages between physical training methods [2]. Our country has always paid close attention to the physical training of college students. It is not an easy task to improve the future performance. We must proceed from a long-term perspective to ensure that the relevant deficiencies can be made up and adjusted in a scientific and reasonable way. At the same time, the development of college students' physical training must be carried out in a continuous way, and short-term training mode is always adopted, which not only fails to achieve outstanding achievements, but also affects the improvement of college students' physical training, and the contradictions and conflicts are more serious [3].

Currently, physical fitness training in schools is still based on traditional methods, with problems such as unscientific training methods, unprofessional training teams, unsystematic training plans, inaccurate training monitoring, advanced training methods, and ineffective training management, leading to low training efficiency and poor effectiveness, high incidence of injuries and illnesses, and serious impact on the generation of combat effectiveness [4]. With the rapid development of science and technology, using intelligent methods to solve the problems existing in physical training has become a future trend, which has great potential for improving the level of military physical training. Orienteering, as an activity, achieves a good combination of physical fitness and intelligence. The project itself has a good sense of interest, coupled with the wide range of activity locations, so it is

highly favored by people [5]. Orienteering is not only competitive, but also has a strong gameplay. Its embryonic form is the treasure hunt of the Swedish Boy Scouts, and its unique game color cannot be erased until today. Orienteering is also a mass sport, which can be participated by men, women and children. At present, the new changes in the world are accelerating. In order to better adapt to the development of high technology, it is urgent for colleges and universities to train a large number of compound talents for the army to adapt to the new changes. However, for a long time, the training of junior command cadres in our army has been carried out in parallel with academic education and on-the-job training, and the quality of the talents trained by this model has been exposed [6].

For students' physical fitness training, it can be summarized as the following requirements: being able to perceive changes in the movement position of students during training and physical fitness testing, realizing automatic lap counting during the running process through the perception of position changes, and providing auxiliary information and prompts during the lap counting process. In addition, it can provide more targeted physical fitness training programs for them through combining historical data statistics and differential analysis [7]. In the stage of joint training education, more attention is paid to the cultivation of scientific and physical abilities, with the aim of strengthening the ideological and political, scientific and technological, quality, and physical and mental qualities of joint training students to meet the needs of the school. At this stage, both the first job holding ability and development potential are taken into account, and it is emphasized that junior joint training trainees should have both the leadership ability of platoon leaders and the development potential to develop into battalion commanders [8].

Physical training involves many aspects. Traditional small data can no longer meet the needs of the development of modern physical training. Modern physical training needs a large number of effective and real-time data feedback. Big data technology can solve the above problems. Big data is closely related to physical training, and the greatest value of the application of big data in physical training is found. This paper provides some suggestions and opinions for physical training.

2. Feasibility Study on the Application of Big Data in Physical Training

2.1 Application of Big Data in Physical Training Program

Physical training is a huge task. To achieve good training results, a systematic physical training plan must be formulated before physical training. When formulating a physical training plan, many factors need to be considered. The quality of the physical training plan directly determines the effectiveness of physical training, and also reflects a coach's professional level. The content designed in the physical training process is based on the physical training plan [9]. Strength is the most basic ability of human sports. Whether it's running speed training or endurance training, mastering sports techniques, or improving athletic performance, it requires strength to support. There are many methods of strength training. Due to the convenience of training, barbells are generally used, and barbells can be divided into squats, bench presses, and other exercises. Therefore, strength quality is the foundation of the overall quality of athletes. At the same time, strength training can prevent sports injuries and have a positive rehabilitation effect on long-term accumulated local injuries. It is one of the important links of physical fitness training [10].

Judging from the current situation, the development of college students' physical training can really help many students to improve their own performance. However, in order to cultivate their ultimate physical strength reasonably and keep the initiative of training, it is suggested to carry out physical testing reasonably. For example, the traditional test method stays in simple experience, but the development of science and technology is progressing at this stage. We need to make a correct judgment on the physical fitness of students with the help of advanced scientific and technological equipment. There is a common method in physical training-interval training method, which is simply a training method that strictly controls the interval time, that is, a new round of training is carried out before the body returns to the starting level before work. This is a main method to improve physical fitness and a very effective method. Intermittent training method includes repetition method and transformation method, and there are various means in the practice process, but in the final analysis, the core problem of mastering and using this training method is to grasp the specific time of interval.

Physical fitness training evaluation is a way of evaluating the effectiveness of physical fitness training. When evaluating a thing, it is necessary to proceed from multiple aspects and coordinate several aspects of physical fitness training to make it objectively reflect the effectiveness of physical

fitness training. When designing evaluation criteria, one cannot make subjective assumptions, but needs to conduct quantitative and qualitative analysis. At this time, the introduction of big data technology can solve this problem. A fitness training evaluation system that meets one's own situation is required, which requires a scientific and objective evaluation based on the big data environment.

2.2 Construction of a platform for technical methods of data analysis and processing physical fitness training programs

The basic framework and construction idea of the platform of big data analysis and processing physical fitness training scheme are as follows: Collect a large number of physical fitness test data, select other parts as training data, and establish a physical fitness evaluation function based on big data analysis method. A physical fitness evaluation model is established by using neural network method to evaluate the physical fitness status of users (divided into good, medium and poor). According to the design idea of front-end and back-end development, the platform is divided into three parts: user layer, function layer and data layer. As shown in Figure 1.

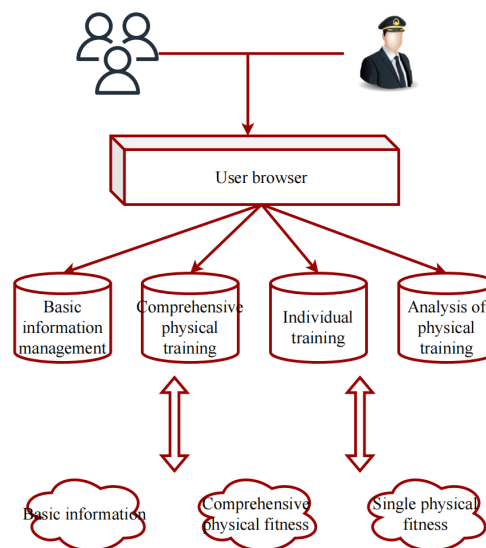


Figure 1: Functional schematic diagram of platform

The user layer is built to enable users to interact with the platform. When the user operates the interface, the user layer transmits the user's operation to the platform functional layer in the form of parameters and codes, thus completing the interaction. The functional layer is the place where all functional modules gather together to play a role, and it completes the information transmission task by receiving the parameters transmitted by the user layer.

Monitoring during physical fitness training is a monitoring of the amount and intensity of training. Generally, heart rate and muscle lactic acid content are used to determine the amount and intensity of training. The method is simple, and heart rate monitoring cannot be accurate. Usually, it is not very accurate to reflect the situation of the entire team based on the situation of some athletes. Big data can solve this problem. Athletes wear equipment and use the monitoring platform of big data to timely reflect real-time data of athletes' training into the hands of coaches. During the training process, coaches can well grasp the situation of athletes during the training process, and make appropriate adjustments to the training in a timely manner. Establish an athlete database, and through processing a large amount of data, you can find suitable recovery methods or measures for athletes, or it can be a combination of two or more recovery methods or measures. Results presentation techniques in big data, such as relational graphs, identify the inherent relationship between athletes and various recovery measures, and select the optimal recovery measures.

3. Analysis of Countermeasures for Intelligent Physical Fitness Training

3.1 Data processing and analysis of physical fitness to assist decision-making

In order to increase the amount of data and make the results more accurate and representative. First

of all, this paper adopts multi-source methods to collect data, including actual testing and questionnaire survey. In this paper, five training groups were randomly selected, and 10 members in each training group were selected for physical fitness monitoring. Five training groups are distributed in different regions, which makes the data sources more extensive. The actual valid data is 43. Secondly, let the athletes log on to the website through the form of questionnaire, check the results of physical fitness test, and fill in the questionnaire according to the results of physical fitness test. Describing in technical language means using technical means to obtain the needed part of the data and eliminate the unnecessary part. During data cleaning, the following two points should be noted: (1) Ensure data integrity. Data integrity refers to the integrity of core data, and any cleanup must be based on the retention of core data entities. (2) Ensure the validity of data. During the cleaning process, the core data should not be deformed or damaged due to cleaning, and the original state of the core data should be guaranteed. Physical fitness training is no exception. After training, athletes need to recover their bodies. Only when they recover, can the level of physical fitness training be improved. Failure to focus on recovery during physical fitness training cannot achieve the expected results, and even lead to overtraining. It can not only improve athletic performance, but also reduce unnecessary energy consumption in sports, improve the economy and effectiveness of athletes in the process of sports, and facilitate the mastery of sports skills.

However, according to the survey, most students majoring in physical education believe that sports skills are the key, while physical training is dispensable. There are also some students who think that engaging in teaching after graduation does not require high physical training, and only needs to have certain educational theory knowledge and certain teaching experience. According to the survey, the vast majority of teachers who are engaged in physical fitness teaching have not really received professional training in physical fitness training. Teachers just keep improving their teaching and training level in the teaching process. Then there are competition teaching and open classes, etc. Competition teaching is a test of one's own ability, and open classes can let others find their own shortcomings and correct them. Short-term training is a way that many teachers are willing to accept now, and they can learn the latest knowledge in a short time.

3.2 Application verification

Testing plays an important role in software development, and it is also a process that must be completed before being ultimately submitted to users for use. During the development process of the platform, testing is mainly divided into performance testing and functional testing. Performance tests mainly include response time, response speed, and concurrent user count tests; Functional testing mainly includes testing of functions, such as the consistency of input and output results, and the integrity of data. The test forms can be divided into white box test, gray box test, and black box test. Typically, third-party testing is done in a black box. Testers do not need to care about internal code, but only about the performance data from actual tests and the consistency of test input and output results. Functional testing mainly tests the consistency of inputs and outputs. Performance testing is to test whether the platform is stable and responsive. The specific professional test content reflects the response time and concurrent user count of the test platform. According to the analysis of the test results, as the number of concurrent users increases, the platform response time gradually lengthens. With the number of concurrent users used for the blue line, the platform has been unable to provide services to users normally, and the platform response time has increased sharply; at the same time, it can also be seen that although the response time has become longer, the platform can still operate stably and output reasonable results. According to Table 1, the total number of use cases for big data platforms using data mining is 10, and the number of bugs is 1. Therefore, the bug rate obtained is 10%, while the rate of passing the use cases is 90%. The overall situation is good.

Table 1: Test Results

	Data mining method	Traditional testing method
Total Use Cases/Example	10	10
Number of bugs/item	1	4
Pass Case Ratio/%	90	60

The pass rate of traditional testing method is only 60%. Before the final launch, the platform was inspected more carefully, and the platform was repaired according to the test results, which increased the proportion of use cases to 100%, thus meeting the needs of the actual scene.

Based on the above analysis, we can envisage that, with the help of intelligent means such as wearable devices, sensor technology, deep learning technology, big data, and cloud computing, we can

build a platform based on big data, guided by physical fitness assessment, centered on scientific program formulation, and based on sports knowledge and action mode learning. A comprehensive and versatile intelligent physical fitness training system that is supplemented by physical fitness enhancement and virtual training, and focuses on training monitoring feedback based on wearable devices. The big data management platform is the foundation and carrier to achieve the integration of all data, function integration, and system input and output; The physical fitness evaluation subsystem, the intelligent construction subsystem of training programs, the sports knowledge base subsystem, the physical fitness enhancement and virtual training subsystem, and the training monitoring feedback subsystem are five functional modules that respectively implement the evaluation, planning, learning, training, and monitoring functions of physical fitness training.

4. Conclusion

In China, the physical training of college students can be improved according to rational ways and methods, and the comprehensive effects obtained in all aspects are very outstanding. At present, big data lacks corresponding scientific basis in physical fitness test analysis, especially the correlation analysis between individual test results and comprehensive test results. Subjects can know their own shortcomings through individual tests or comprehensive physical fitness tests to ensure that their comprehensive physical fitness is improved. It has become an inevitable trend to use the latest intelligent methods and means to solve the problems existing in physical training, research and design military physical training systems with military characteristics based on intelligent conditions, further strengthen the research on military physical training laws under intelligent conditions, and develop functional and practical intelligent software and hardware equipment. It can be seen that big data can better meet the requirements of modern physical fitness training than traditional data. Big data can quickly and accurately solve practical physical fitness training problems and predict the trend of future physical fitness training.

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