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Construction and Application Analysis of College Physical Education Evaluation System Driven By Digital Intelligence Technology

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Abstract: This study discusses the problems existing in the current physical education evaluation system in colleges and universities, analyzes the role of digital intelligence technology in physical education evaluation, and puts forward the evaluation system construction scheme based on digital intelligence technology. The research believes that digital intelligence technology can improve the scientific, objective and real-time evaluation of physical education teaching, and realize the accurate evaluation of the teaching process through technical means such as big data analysis, intelligent monitoring equipment and artificial intelligence, providing important support for the reform of physical education in colleges and universities. In addition, the paper analyzes the practical effects of the system and puts forward targeted optimization strategies in order to provide theoretical support and practical guidance for the improvement of the evaluation system of physical education in colleges and universities.

Physical education in colleges and universities is an important link to cultivate students' health quality and improve their physical quality, and its teaching quality directly affects students' sports ability and health level. In recent years, the rapid development of digital intelligence technology provides a new opportunity for the reform of physical education evaluation system in colleges and universities. Based on big data, artificial intelligence, intelligent sensing equipment and other technical means, college physical education teaching evaluation system can achieve more accurate, real-time and dynamic evaluation, and improve the timeliness and effectiveness of teaching feedback. How to use the digital intelligence technology reasonably and build a scientific and efficient evaluation system of physical education has become an important issue to be solved urgently in the field of physical education.

1. Analysis of the current situation and problems of the evaluation system of physical education in colleges and universities

(1) The composition of traditional PE teaching evaluation system

The evaluation system of physical education in colleges and universities is usually composed of

many parts, such as the evaluation subject, the evaluation content and the evaluation method, which together determine the scientificity and rationality of physical education evaluation. The main body of PE teaching evaluation in colleges and universities usually includes teachers, students and administrators. Teachers are mainly responsible for the assessment of students' physical skills, physical fitness level and class participation; Students participate in self-evaluation and mutual evaluation in the teaching evaluation system of some colleges to reflect the teaching interaction; The managers mainly make macroscopic evaluation from the perspective of the overall teaching effect, such as the implementation of the teaching syllabus and the rationality of the course arrangement.

The traditional college PE teaching evaluation system mainly focuses on sports skills, physical fitness test, class participation, sports theory knowledge and so on[1]. Among them, sports skills and physical fitness tests are the most important assessment indicators, such as sprint, long jump, endurance running and other events, become an important basis for measuring students' sports literacy. Classroom participation was evaluated mainly through teacher observation and student self-assessment, and there was a lack of quantitative data support. The traditional physical education teaching evaluation mode mainly adopts the combination of quantitative and qualitative mode. Quantitative assessment relies heavily on physical and skill tests, such as standardized tests to assess student achievement; The qualitative evaluation mainly relies on the subjective judgment of teachers, such as classroom performance rating, student attitude assessment and so on. However, due to the lack of data support, the qualitative evaluation is easily affected by the subjective factors of teachers, which leads to some problems in the objectivity and fairness of the evaluation results.

(2) The problems existing in the traditional PE teaching evaluation system

At present, there are great differences in the evaluation system of physical education in colleges and universities, and the evaluation standards adopted by colleges and universities are not the same, resulting in low comparability of evaluation results. In addition, some physical education teaching evaluation systems in colleges and universities rely too much on physical fitness test results, ignoring the individual differences of students and the long-term cultivation of physical literacy, making the evaluation results difficult to fully reflect students' physical ability. The traditional way of PE teaching evaluation mainly relies on teachers' observation and assessment, and lacks scientific data support. For example, the evaluation of classroom participation and students' sports attitude is mainly based on the subjective judgment of teachers, rather than the objective measurement with the aid of intelligent data acquisition equipment. This kind of evaluation is easy to be affected by the teacher's personal judgment, which leads to the limitation of the fairness and objectivity of the evaluation results.

The traditional PE teaching evaluation usually carries out summative evaluation at the end of the semester, and the data collection and analysis have a strong lag. This method is difficult to dynamically reflect the progress of students in the learning process of physical education, which leads to the low timeliness of physical education teaching adjustment and improvement. In addition, the lack of data tracking means makes it difficult for teachers to grasp the long-term development trend of students' physical literacy, which is not conducive to the formulation of personalized teaching programs. The traditional college physical education teaching evaluation system is weak in the feedback mechanism of evaluation results. Most colleges and universities only provide final scores to students, but lack feedback on the learning process of sports, which makes it difficult for students to timely adjust the sports training plan, and it is difficult for teachers to adjust the teaching according to the learning situation of students. In addition, the lack of in-depth analysis of teaching methods and course contents in some colleges and universities makes it difficult for the evaluation system to provide effective guidance for the reform of physical education.

2. The construction of college physical education evaluation system based on digital intelligence technology

(1) evaluation system design principles

In order to ensure the rationality and effectiveness of the evaluation system of physical education in colleges and universities, the construction of the evaluation system should follow the following basic principles: Scientific and objective principle: The evaluation system should be based on data-driven scientific methods and avoid excessive reliance on subjective judgment. Through the collection of students' sports data by intelligent monitoring equipment and combined with the analysis of artificial intelligence algorithms, the accuracy of evaluation results can be improved, making the evaluation of physical education more objective[2]. Real-time and dynamic optimization principle: The traditional physical education teaching evaluation is mainly at the end of the semester, which has the problem of data lag. The evaluation system based on digital intelligence technology should have the function of real-time data collection and dynamic feedback, so that teachers can adjust the teaching plan immediately according to the movement data of students, and improve the flexibility and pertinence of teaching. The principle of personalized and intelligent evaluation: The evaluation of physical education in colleges and universities should fully consider the individual differences of students, and provide personalized evaluation and learning suggestions for each student through intelligent system analysis of students' sports ability, sports interest and health status, so as to achieve individualized teaching. Data security and privacy protection principles: In the intelligent physical education teaching evaluation system, the security of students' sports data and personal information is crucial. The evaluation system should adopt encryption technology and access management mechanism to ensure that the data is not abused during storage and transmission, and to protect the privacy of students.

(2) Evaluation system framework design

The physical education evaluation system based on digital intelligence technology must establish a perfect frame to ensure its comprehensiveness and applicability. In the concrete design, it is necessary to make comprehensive consideration from the aspects of evaluation subject, evaluation dimension, evaluation method and evaluation tool. In the intelligent evaluation system, the evaluation subject should include teachers, students and intelligent system to form a scientific and reasonable evaluation system. For example, in a university applying intelligent sports evaluation system, students can check their sports performance through mobile APP and submit self-evaluation, while teachers can make adjustments based on the results of system analysis, and the intelligent system is responsible for providing data support and trend analysis to make the evaluation more objective and fair.

The new evaluation system should cover multiple dimensions, such as athletic ability, physical fitness, classroom participation and health literacy. For example, some universities have added a student sports data file system to the physical education curriculum to record the progress of students in different sports, focusing not only on absolute results, but also on growth, so that the evaluation is more comprehensive and reasonable. Intelligent evaluation system does not rely entirely on data analysis, but combines quantitative and qualitative to achieve more accurate assessment. For example, in the basketball course of a university, the AI system can analyze students' shooting movements through video and generate accurate technical analysis reports, but the teacher still needs to conduct qualitative assessment of students' tactical understanding and teamwork, so as to ensure the integrity of the evaluation system.

The core of modern PE teaching evaluation system lies in the support of intelligent technology. The advanced nature of evaluation tools determines the accuracy and operability of the evaluation system. At present, colleges and universities generally use intelligent monitoring equipment, big

data analysis platforms and AI evaluation systems to provide accurate teaching feedback. For example, a university uses an intelligent treadmill in the fitness course, which can record students' stride length, heart rate, heat consumption and other data in real time, and it is linked with the teaching evaluation system, so that teachers can accurately grasp the students' exercise status and give personalized guidance and suggestions.

(3) Key technical support

The core of digital intelligence technology lies in data collection, analysis and application, so the construction of PE teaching evaluation system must rely on advanced technical means to improve the accuracy and science of evaluation. The application of intelligent monitoring equipment in physical education makes data collection more efficient. For example, in the football course, the intelligent chip insoles worn by students can record their running track, acceleration, step frequency and other data, and teachers can analyze the rationality of students' running position through the background, so as to optimize the teaching program. The evaluation system of college physical education needs to deal with a large amount of data, so it needs a big data analysis platform for deep mining. For example, some universities have developed "intelligent sports cloud platforms", which can collect, store and analyze long-term sports data of students, provide scientific basis for teaching evaluation, and predict the development trend of students' sports.

Artificial intelligence technology can be used to automatically analyze students' sports performance and provide accurate assessment reports[3]. For example, in gymnastics classes, the AI visual analysis system can detect whether the student's movements are standard and give suggestions for improvement, making the teaching more accurate. The security of sports teaching evaluation data is crucial, and the introduction of blockchain technology can ensure that the data is true and immutable. For example, some universities have adopted blockchain to store students' athletic scores to ensure the fairness of grades and improve the traceability of the data.

3. Application analysis of college physical education evaluation system based on digital intelligence technology

(1) Application case analysis

A university in Shanghai is a comprehensive university with a sports curriculum that includes basketball, football, track and field, swimming and other electives. In the past, the school's physical education teaching evaluation mainly relied on teacher ratings and final physical fitness tests, which was difficult to accurately measure students' physical education ability, resulting in lagging teaching feedback and low class participation of students. In autumn 2023, the university launched a pilot project for smart sports teaching evaluation, introducing intelligent monitoring devices, AI data analysis systems and online feedback platforms in track and field, basketball and swimming courses to improve the objectivity and scientific nature of teaching evaluation. In the pilot course, students wear smart wristbands that record exercise time, steps, heart rate and calories burned in real time. Smart sports venues are equipped with cameras and pressure-sensing devices to collect running speed, stride length, acceleration and other data. Basketball classes use an AI visual analysis system to evaluate shot accuracy and motion, while swimming classes use underwater cameras to analyze stroke frequency and stroke regularity.

The university uses four dimensions of physical fitness test, skill performance, class participation and health monitoring for comprehensive evaluation. For example, a 1,000-meter run not only records the final performance, but also calculates an endurance score based on changes in stride frequency, stride length, pace and heart rate. Basketball shooting analysis combines shooting accuracy, shooting Angle and shooting percentage to get technical score. At the same time, the class participation was analyzed by the intelligent system to determine the actual exercise intensity of

students. The evaluation results are pushed to teachers and students through an online feedback system. Students can check their personal sports performance and suggestions for improvement, such as "small stride, it is recommended to strengthen core muscle training", and teachers can adjust the teaching content to improve the targeted training. In track and field class, teachers adjusted the training intensity according to students' cardiorespiratory endurance data, increased low-intensity running training for students with weak endurance, and provided higher intensity training for students with better performance.

After the pilot course, the average 1,000-meter running time improved by 6 percent and the swimming speed by 8 percent. The proportion of students who exercised for more than 30 minutes increased from 65% to 85%, and course satisfaction increased from 7.5 to 8.8 (out of 10), indicating that the intelligent evaluation system effectively enhanced students' interest in sports and class participation. 85% of teachers believe that the intelligent evaluation system helps them more accurately grasp students' sports conditions and adjust teaching strategies according to different students. For example, the teacher of basketball course can find the low shooting Angle of students according to the system data, and provide corresponding improvement suggestions to optimize the teaching effect. After analyzing the teaching data with the intelligent system, the school optimized the curriculum and the utilization of sports facilities. For example, the swimming course enrollment rate increased by 15%, but some students have weak cardiorespiratory endurance, so the school adjusted the course content and increased endurance training. Overall, the intelligent PE teaching evaluation system improves the accuracy of teaching evaluation, improves students' sports performance, and provides scientific support for teachers' teaching and curriculum management.

(2) Challenges faced in the application process

Because of the diversity of student sports and the complexity of sports, there are still some errors in the data acquisition accuracy of intelligent devices. For example, in the technical analysis of basketball shooting, the smart camera may be affected by external factors such as light and Angle, resulting in a decline in the accuracy of shot posture recognition. In addition, wearable devices may have data drift problems after prolonged use, affecting the accurate assessment of student sports performance. The existing physical education evaluation system in colleges and universities is mostly based on traditional physical assessment standards, while the intelligent evaluation system introduces a large number of new data indicators, such as heart rate change, exercise efficiency and so on. However, how to find a balance between the traditional evaluation system and the new technical data, and establish a scientific, reasonable and feasible dynamic evaluation standard, is a big problem facing the present.

Since the intelligent physical education teaching evaluation system involves a large number of students' personal data, including physiological indicators, exercise habits, etc., how to ensure the security and privacy of data has become a key issue[4]. Therefore, colleges and universities must strengthen security measures such as data encryption and access control when promoting the intelligent PE teaching evaluation system. Some teachers are not familiar enough with the application of smart technology, resulting in lower efficiency of the use of the system. Some students may also be unfamiliar with the use of smart devices in the early stage, which may affect the normal progress of physical education class. Therefore, how to improve the technical adaptability of teachers and students has become an important link in the promotion of the system.

(3) Coping strategies and optimization paths

In view of the above challenges, universities need to take corresponding optimization measures in the practical application process to improve the effectiveness of digital intelligence technology in physical education teaching evaluation system. On the basis of smart devices, a variety of data acquisition methods are introduced, such as combining smart cameras, pressure sensing floors, biological signal sensors, etc., to improve the accuracy of data acquisition. At the same time, the

data analysis process is optimized by artificial intelligence algorithm to reduce the evaluation bias caused by equipment errors. When formulating evaluation standards, colleges and universities can continuously optimize evaluation indicators based on the results of big data analysis [5]. For example, on the basis of the traditional physical fitness test, the dynamic evaluation factors such as students' exercise habits and physical fitness changes are added to make the evaluation more comprehensive and scientific.

Intelligent evaluation system should adopt blockchain technology and data encryption means to ensure the security of PE teaching evaluation data. At the same time, universities should establish a strict data access management system, allowing only relevant authorized personnel to access, and regularly disclose data security measures to students and parents to enhance transparency and trust. Schools should carry out technical training for teachers and students to ensure that they are proficient in the use of intelligent sports evaluation systems. In addition, colleges and universities can improve the acceptance of intelligent physical education by teachers and students and promote its deep application in teaching by setting up special training courses and setting up technical support groups.

4. In SUMMARY

The evaluation system of college physical education based on digital intelligence technology should follow the principles of scientificity, real-time, personalization and data security, and focus on multiple evaluation subjects, comprehensive evaluation dimensions, intelligent evaluation methods and advanced technical support. Through intelligent monitoring equipment, big data analysis, artificial intelligence evaluation and other technical means, the system can provide accurate and real-time physical education teaching evaluation feedback, and provide scientific basis for the improvement of physical education quality in colleges and universities.

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