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The Path to Construct the Process Evaluation System of College Sports Based on the Digital Age

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Abstract: *With the rapid development of digital technology, physical education in universities is facing profound changes. The traditional sports assessment model is no longer able to meet the personalized and diversified development needs of students, so it is particularly important to build a process based assessment and evaluation system for university sports that conforms to the characteristics of the digital age. This paper starts with the application of digital technology and explores the construction path and strategies of a process based assessment and evaluation system for college sports in the digital age. Research suggests that digital technology can achieve comprehensive, dynamic monitoring and accurate evaluation of students' physical performance through data collection, analysis, and real-time feedback. Meanwhile, the digital evaluation system can also promote students' self reflection and self adjustment, and improve the quality and efficiency of physical education. This article also points out that in the process of building a digital assessment and evaluation system, challenges such as technology platform construction and data privacy protection need to be overcome. It calls on universities to strengthen the construction of technology platforms and teacher training, and promote the reform and innovation of physical education.*

Keywords: *digital age, college sports, process assessment, evaluation system, reform in education*

1. Introduction

With the rapid development of digital technology, the digital age has profoundly influenced various industries, and the education sector is no exception. College sports, as an important component of higher education, play a crucial role in cultivating students' physical fitness, enhancing teamwork spirit, and improving their psychological resilience. However, the traditional sports assessment and evaluation system mainly relies on final exams and single competitive performance as the main evaluation criteria, which often cannot fully and truthfully reflect students' comprehensive performance in sports activities, nor can it fully reflect the value of process evaluation. This traditional model faces problems such as single evaluation criteria, limited evaluation content, and lack of personalized feedback, and urgently needs innovation and reconstruction with the support of digital technology.

The digital age has brought unprecedented opportunities for physical education in universities[1]. Various digital tools, such as smart bracelets, motion sensors, data analysis software, etc., provide more accurate, real-time, and comprehensive support for physical education teaching and evaluation. These technologies can not only record students' performance in sports activities in real time, but also provide personalized feedback for teaching through big data analysis, thereby promoting the improvement of students' sports skills and the development of their comprehensive quality. Therefore, building a process based assessment and evaluation system for sports based on digital means has become an important way to improve the quality and efficiency of physical education in universities.

Process assessment is a continuous and dynamic evaluation method in the educational process, emphasizing comprehensive attention and feedback on students' learning process. Unlike traditional outcome based assessments, process based assessments focus on students' participation, effort, progress, psychology, and teamwork in sports activities. The introduction of digital technology makes process assessment possible and can compensate for the shortcomings of traditional assessment. Through digital means, we can achieve comprehensive recording and analysis of students' physical activity performance, provide multi-dimensional evaluation criteria, tailor personalized growth paths for students, and enable teachers to adjust teaching strategies in a timely manner based on feedback.

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Although the application prospects of digital technology in sports process assessment are broad, how to design a practical and operational evaluation system in actual operation is still an urgent problem to be solved. This article aims to explore the construction path of a process based assessment and evaluation system for college sports in the digital age, analyze the main problems existing in the current assessment system, propose solutions for digital assessment, and explore how to improve the scientificity and fairness of assessment through data support. By reviewing relevant literature and summarizing practical experience, this article hopes to provide reference and inspiration for the reform and development of physical education in universities.

2. The development of physical education in universities in the digital age and the limitations of traditional assessments

With the rapid advancement of information technology, the arrival of the digital age has brought profound changes to various industries. College physical education is no exception, facing the continuous application and challenges of new technologies and methods. The traditional physical education teaching mode and assessment system have gradually shown certain limitations, while the introduction of digital technology provides new opportunities for the reform and innovation of physical education[2]. This chapter will explore the characteristics of physical education in universities in the digital age, the shortcomings of traditional assessment and evaluation systems, and the theoretical basis of process based assessment, in order to provide a theoretical basis for building a more scientific, fair, and personalized physical education assessment system.

2.1 Characteristics of physical education in higher education institutions in the digital age

The arrival of the digital age has brought about technological revolutions in various fields, especially the transformation of physical education. From traditional paper-based records and face-to-face teaching methods to the use of digital technology, artificial intelligence, big data, wearable devices, and other technological means, the teaching methods, learning content, and evaluation mechanisms of physical education in universities have undergone profound changes.

Firstly, the application of intelligent teaching tools has enriched and diversified the content and forms of physical education teaching. For example, using motion sensors and smart bracelets can monitor students' heart rate, step frequency, exercise intensity, and other data in real time, making teaching more accurate and adjusting teaching content and exercise intensity based on students' personal data. Secondly, the establishment of digital platforms has also provided new ideas for physical education. Through online platforms, students can easily access information on physical education courses, activity schedules, grades, and evaluations. Teachers can also use the platform for remote teaching, video lectures, and sharing of learning resources. Furthermore, the support of big data and artificial intelligence enables sports education to achieve more precise personalized teaching. With the help of big data analysis, teachers can understand the learning progress, strengths, and weaknesses of each student, and thus develop more personalized learning plans to meet their different needs. Finally, physical education in the digital age is no longer limited to classroom teaching and traditional sports projects, but has expanded to emerging fields such as virtual reality (VR) and augmented reality (AR). Through these technologies, students can engage in sports activities in a virtual environment, which not only enhances the fun of sports but also breaks through the limitations of space and time. Therefore, physical education in the digital age is not only an upgrade to traditional physical education teaching models, but also a comprehensive reform of educational concepts, teaching methods, and evaluation standards.

2.2 Shortcomings of traditional assessment and evaluation system

The traditional sports assessment system has played a certain role in promoting the development of students' sports skills, but with the progress of society and technology, its shortcomings in evaluation standards and processes are gradually becoming apparent. Firstly, traditional assessments focus on final exams, mainly focusing on students' physical fitness and competitive performance. The evaluation criteria are single and cannot fully reflect students' various aspects of performance, such as participation and psychological qualities. Secondly, the traditional system neglects the process development of students and lacks personalized feedback, resulting in ineffective attention to their efforts and growth, as well as inability to provide timely guidance and promote sustainable progress. Thirdly, traditional assessment methods are too rigid and rely on standardized testing items, ignoring

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students' diversity, interests, and strengths, resulting in insufficient student participation and even affecting their interests. Finally, traditional assessments are limited by venue, equipment, and time, especially during large-scale testing, making it difficult to achieve full participation and unable to record and analyze students' sports data in real time. Therefore, the traditional sports assessment system is becoming increasingly outdated in the digital age and urgently needs transformation and innovation.

2.3 Theoretical basis of process assessment

Process based assessment is a comprehensive evaluation method that focuses on students' learning process and growth, emphasizing the evaluation of students' efforts, difficulties, progress, and mastery of knowledge in the learning process [3]. Especially in physical education, it can comprehensively assess students' participation in sports, skill progress, teamwork, and psychological qualities, avoiding the limitations of relying solely on results. It is supported by constructivist learning theory, emphasizing that learning is a continuous and dynamic process that helps students continuously construct knowledge and skills through practice, reflection, and feedback. In physical education teaching, process assessment promotes students' comprehensive development by continuously tracking their participation, efforts, and progress. Process assessment also conforms to the theory of dynamic evaluation, which states that evaluation is a constantly updating and adjusting process that requires teachers to provide continuous feedback based on students' changes, helping students identify strengths and weaknesses and achieve self-improvement. In addition, Howard Gardner's theory of multiple intelligences points out that students' intelligence is manifested in various forms, and process assessment is evaluated through a multidimensional evaluation system, which not only assesses physical fitness and skills, but also focuses on teamwork, leadership, strategic thinking, and other aspects, motivating students to showcase their personal strengths and explore their potential. Process assessment also emphasizes personalized development, providing personalized evaluation and guidance based on students' foundation, interests, and progress. Real time tracking of sports data through digital technology provides tailored feedback for each student, promoting comprehensive quality development. Therefore, process assessment not only makes up for the shortcomings of traditional assessment, but also provides a more comprehensive, fair, and personalized evaluation method, focusing not only on students' physical performance, but also on their learning process and growth in sports activities, which can provide richer and more multidimensional support for students' physical education.

3. Application and design of digital technology in the process assessment of college physical education

With the development of digital technology, traditional sports assessment models are no longer able to meet the needs of modern education and sports development. The introduction of digital technology has provided a new path and method for the process assessment of physical education in universities. Digital technology can not only improve the efficiency of physical education teaching, but also provide students with more objective and comprehensive evaluations, promoting their personalized development. Therefore, exploring the application and design of digital technology in the process assessment of college sports is of great significance.

3.1 Assessment path supported by digital technology

The application of digital technology in the process assessment of college sports mainly manifests in four aspects: data collection, process monitoring, evaluation analysis, and feedback. Through digital devices such as smart bracelets and motion sensors, teachers can collect real-time data on students' physical activities, including heart rate, exercise volume, speed, posture, etc. These data can help teachers more accurately understand students' movement status and avoid relying on a single final exam or static test. Digital technology makes sports process monitoring more convenient and comprehensive. By using cameras and intelligent recognition systems, teachers can monitor students' movements at any time, observe their movement norms, teamwork, and improvement in motor skills. Through big data analysis technology, the system can generate real-time reports of students' exercise data, helping teachers adjust teaching plans in a timely manner and providing personalized guidance for students. In addition, digital assessment can also be evaluated and analyzed through online platforms, where every student's sports performance and process will be recorded. Teachers can view students' long-term performance through the system, helping them better identify trends in progress and potential weaknesses. In this process, students not only receive immediate feedback, but also have a clear

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understanding of their progress through data visualization tools, as shown in Table 1.

Table 1: Schematic diagram of assessment path

Data acquisition	Process monitoring	Assessment	Feedback and guidance
Collect exercise data through smart wristbands and sensors	Use cameras and sensors for motion monitoring	Using big data analysis to generate data reports	Using data visualization tools for feedback

3.2 Dimensions and indicator design of process assessment

In the traditional sports assessment system, student evaluation is usually limited to one-time competitive performance and physical fitness tests. Digital technology provides more possibilities for the dimensions and indicator design of process assessment. Process assessment should cover all aspects of students' participation in sports activities, including but not limited to physical fitness, skills, attitude, psychological resilience, teamwork, etc.

In terms of physical fitness, physical fitness is still the most fundamental part of sports assessment. Digital technology can monitor students' heart rate, exercise duration, step frequency, running speed and other indicators in real time through smart bracelets, treadmills, heart rate monitors and other devices. Through long-term data accumulation, students' physical fitness changes can be clearly reflected, helping teachers to conduct comprehensive evaluations of students' physical development.

In the dimension of motor skills, digital technology can evaluate students' movement standardization and skill level through motion sensors and video analysis technology. For example, the use of posture recognition technology can evaluate the standardization of students' movements in events such as high jump and throwing, and help students correct non-standard movements and improve their motor skills through data feedback.

The dimensions of psychological resilience and attitude are crucial for the impact of psychological resilience on sports activities. Digital tools can evaluate students' psychological states, including anxiety, stress, and other emotional responses, through biofeedback technologies such as brainwave monitors and heart rate variability analysis. By monitoring and analyzing students' psychological state, more personalized psychological counseling can be provided to improve their psychological quality.

In addition, teamwork in sports activities also requires assessment, especially in team projects. Digital technology can evaluate students' performance in teams through location tracking, interactive platforms, and team interaction analysis, such as cooperation with teammates, tactical execution, collective collaboration, etc. These indicators can help teachers objectively evaluate students' cooperation and leadership abilities in collective projects, as shown in Table 2.

Table 2: Dimensions and indicator design for process assessment

Dimension	Key indicators	Instrument
Physical fitness dimension	Heart rate, exercise duration, speed, etc	Smart wristband, treadmill
Dimension of motor skills	Action standardization and technical proficiency	Video analysis, sensors
Psychological quality dimension	Anxiety, stress, emotional reactions	Biofeedback apparatus
Team collaboration dimension	Collaboration, cooperation, leadership	Location tracking, interactive platform

Digital technology provides students with more diversified evaluation methods through comprehensive monitoring and analysis of the above dimensions and indicators, and also enables process assessments to more comprehensively reflect students' physical performance. This not only helps to stimulate students' interest in sports, but also helps teachers to more accurately identify students' shortcomings, provide targeted teaching support, and promote students' long-term progress in physical education learning.

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4. Implementation and feedback mechanism of process based assessment system for digital university sports

With the widespread application of digital technology in the field of education, the construction and implementation of a process based assessment system for physical education in universities have become particularly important. The introduction of digitalization not only improves the accuracy of assessments, but also more comprehensively reflects the development and progress of students in the process of physical education learning. Therefore, designing and implementing a practical and feasible digital sports process assessment system, and establishing an effective feedback mechanism, has become a key issue in physical education teaching in universities.

4.1 Implementation steps and methods

The implementation of a process based assessment system for digital sports requires the orderly coordination of multiple stages, from planning and design to specific execution, to data collection and analysis, ultimately forming a comprehensive evaluation system. Firstly, conduct requirement analysis and system design, clarify assessment goals and standards based on the characteristics of university physical education courses and the actual needs of students, and select appropriate hardware equipment and software platforms to meet the needs of data collection, analysis, and feedback. Secondly, data collection and real-time monitoring collect students' exercise data in real time through smart devices and sensors, such as exercise frequency, heart rate, pace, motion accuracy, etc. Combined with video analysis technology, it helps teachers monitor students' movement standards in real time, ensuring timely and accurate evaluation. Next, data analysis and comprehensive evaluation utilize big data technology to analyze students' sports history data, skill improvement status, and psychological state, in order to comprehensively evaluate students' sports performance, help teachers accurately judge students' strengths and weaknesses in various aspects, and provide personalized feedback and guidance. The digital assessment system also supports personalized guidance and adjustment. Teachers can develop targeted training plans based on students' data reports, such as endurance or strength training for students with weaker physical fitness, specialized skill training for students with lower technical levels, and emotional regulation through psychological counseling for students with poor psychological qualities. Finally, the evaluation and feedback report is generated automatically at the end of each semester or semester, and a multidimensional comprehensive evaluation report is generated. Students can view the evaluation results through an online platform and receive detailed progress feedback. Teachers summarize students' learning situation based on the report and provide guidance for their next stage of learning, as shown in Table 3.

Table 3: Schematic diagram of implementation steps

Step	Key content	Objectives and Methods
Requirement analysis and system design	Analyze course characteristics and student needs, and select suitable hardware and software tools	Design a multidimensional and comprehensive digital assessment system
Data collection and real-time monitoring	Use smart wristbands, motion sensors, video analysis and other tools for data collection and real-time monitoring	Real time collection of exercise data to ensure accurate monitoring and analysis
Data analysis and comprehensive evaluation	Using big data analysis technology to comprehensively evaluate students' physical fitness, skills, psychology, etc	Accurately analyze students' sports performance, provide personalized guidance and feedback
Personalized guidance and adjustment	Based on the evaluation results, develop personalized training plans and conduct targeted teaching	Provide precise guidance for students' shortcomings and enhance their physical literacy
Evaluation and feedback report generation	Automatically generate student assessment reports, including analysis from multiple dimensions such as physical fitness, skills, and psychology	Provide feedback on student progress through data reports, and offer teaching summaries and guidance

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4.2 Feedback mechanism and effectiveness evaluation

The implementation of a digital assessment system not only relies on data collection and analysis, but also requires the establishment of an efficient feedback mechanism. The core of this mechanism lies in timely and clear feedback of assessment results to students, and adjusting teaching plans based on feedback to help students improve. The specific feedback mechanism can be designed from the following aspects: Firstly, real-time feedback. Through monitoring and data analysis platforms, teachers can provide feedback to students on their performance at any time, such as monitoring their running speed and heart rate through the system, correcting their posture in real time, and ensuring that students receive timely guidance. Secondly, regular evaluation reports are generated after each data collection, presenting students' physical fitness, skills, psychological performance, and other aspects in the form of charts, helping students to intuitively understand their strengths and weaknesses, and providing data support for teachers to adjust teaching strategies. Thirdly, student self-assessment and feedback are encouraged through digital platforms to reflect on and evaluate their own performance, combined with teacher feedback, to encourage students to actively improve their skills and attitudes, and stimulate learning motivation. Fourthly, the interactive digital platform between parents and teachers enables parents to constantly monitor their children's physical performance, interact with teachers, support students' extracurricular exercise, and improve their sports skills. Finally, the effectiveness of the digital assessment system is regularly evaluated and adjusted to analyze student feedback, assessment results, and teaching effectiveness, optimize physical education courses, and improve teaching quality.

Through effective feedback mechanisms, teachers can better understand students' progress and needs, and then adopt targeted teaching strategies to improve students' physical fitness and abilities. The improvement of feedback mechanism and the effective implementation of digital assessment system will promote the physical education teaching in universities to enter a new stage and better serve the comprehensive development of students.

5. Conclusion

In the context of the digital age, the construction of a process based assessment and evaluation system for university sports has important practical significance and far-reaching impact. By fully utilizing digital technology, the transformation of physical education teaching from traditional single evaluation to comprehensive, diverse, and personalized evaluation models can be achieved. Digital assessment not only improves the efficiency and accuracy of evaluation, but also provides better feedback on students' performance in sports, promoting their comprehensive development in physical fitness, skills, and psychological qualities.

However, building an efficient digital assessment and evaluation system is not achieved overnight. In the implementation process, challenges need to be overcome in terms of technology platform construction, data security and privacy protection, and teacher capacity enhancement. Universities should strengthen research and application of digital technology, integrate resources, and promote the transformation and innovation of physical education teaching concepts. In addition, educators should focus on optimizing feedback mechanisms to ensure that students receive clear and timely guidance in each assessment, and adjust their learning strategies based on feedback.

In the future, with the continuous advancement of technology and the deepening of educational concepts, the digital assessment and evaluation system will be further improved and developed. It can not only improve the quality and effectiveness of physical education teaching, but also provide strong support for students' comprehensive development. Universities should flexibly adjust their assessment methods based on their own characteristics and needs, promote the deep integration of education and technology, and ultimately achieve efficient, scientific, and personalized physical education goals.

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References

[1] Wang J X, Yu F F. New Scenarios, Spaces, and Driving Forces of Digitalization in Physical Education in the Digital Era of Higher Education [J]. Journal of Harbin Sport University, 2024, (1):57-64.
[2] Wu J T, Zheng Q. New Paradigms, Emerging Domains, and New Driving Forces of Physical Education in Higher Education Institutions in the Context of Educational Digital Transformation [J]. Bulletin of Sport Science & Technology, 2024, (5):136-139.
[3] Liu R. Exploration on the Construction of Process Assessment of Sports Performance Courses [J]. Education and Teaching Research, 2024, (4):32-44.