Original Paper

Innovation and Optimization of Physical Education Senior High School Examination Based on Digital Transformation: Path, Mechanism and Practice

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Abstract

With the rapid development of digital technology, physical education is ushering in an unprecedented digital transformation. In the physical education high school examination, digital transformation can not only improve the efficiency and accuracy of the examination, but also provide a more fair and just evaluation environment for students. From the perspective of digital transformation, this paper discusses the path, mechanism and practice of innovation and optimization in the evaluation of middle school physical education examination. It aims to provide theoretical and practical support for digital transformation in physical education assessment, and promote the effective integration of modern technology and physical education.

Keywords

digital transformation, Physical education senior high school examination, path

1. Introduction

As an interdisciplinary theoretical framework, digital transformation not only focuses on the application of technology, but also focuses on the deep integration between technology and educational practice. In 2020, the State Council jointly issued the Opinions on Comprehensively Strengthening and Improving School Physical Education in the New Era. This important document clearly states that one of the keys to school sports work in the new era is to "improve the evaluation mechanism". Special emphasis is placed on promoting the reform of school physical education evaluation, improving the content, methods and scoring methods of physical education high school entrance examination, and gradually increasing the physical education high school entrance examination score. This measure is

not only the overall strengthening of the school sports work, but also the embodiment of the promotion of the status of the physical education examination in the school evaluation system. In the field of sports assessment, digital transformation is seen as a potential leading force that is expected to lead to major changes in assessment methods, learning path design and teaching strategies. Through in-depth analysis of the innovative path of digital transformation in sports high school examination, we can have a more comprehensive understanding of how digital technology changes traditional assessment methods and improves the accuracy and effectiveness of assessment.

2. Concept of Digital Transformation and Its Application in the Field of Education

2.1 Concept of Digital Transformation

Digital transformation refers to the adoption of digital technologies by enterprises or organizations to change their business operation model, improve efficiency, and innovate products and services to meet the needs of the market and customers. In the field of education, digital transformation is mainly reflected in teaching methods, teaching content, teaching evaluation and so on.

2.2 Application of Digital Transformation in the Field of Education

In the evolution of teaching paradigm, digital transformation has brought significant changes to the field of education, making the teaching process more flexible and personalized. Taking the network teaching platform as an example, students can choose their own learning content and learning time according to their individual learning progress and needs, so as to realize the possibility of personalized learning. In terms of teaching content, digital transformation has enriched teaching resources, allowing teachers to introduce more practical cases and experimental projects to enhance students' learning interest and cultivate practical hands-on ability. In the aspect of teaching evaluation, digital means provide a more just and scientific basis for teaching evaluation. Through online testing and data analysis, teachers can more accurately understand the learning status of students and provide scientific basis for personalized teaching guidance. This series of digital transformation measures contribute to the continuous optimization of the education system, improving teaching results and student learning experience.

3. Constraints of Digital Transformation and Innovation in Sports High School Entrance Examination

3.1 Inadequate Technical Infrastructure

Schools or specific regions may face technical infrastructure challenges such as aging networks, outdated equipment, and outdated software tools as they undertake digital transformation, a situation that may pose obstacles to the technical implementation of digital transformation. To overcome this problem, a detailed and systematic technology upgrade plan should be developed to clearly define priorities for facility renewal. In developing this plan, it is necessary to carefully consider the urgency of each technological update and its critical importance to the overall process of digital transformation.

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While advancing the technology upgrading programme. It is necessary to actively seek the support of the government or funding agencies to ensure sufficient financial investment to effectively promote the renewal and upgrading of ageing technology and equipment. In addition, it is recommended to establish a dedicated technical support team, responsible for providing real-time technical help to ensure the normal operation of digital equipment. The establishment of a technical support team helps to respond quickly to technical failures, improve the reliability and maintainability of digital equipment, and ensure the smooth implementation of digital transformation.

3.2 Insufficient Digital Literacy of Educators

In the practice of education, some educators lack familiarity with digital technologies and also face the problem of inadequate training and support systems, which leads them to fail to fully utilize the potential of digital tools in teaching. To solve this problem, it is necessary to design a personalized teacher training program according to the individual needs of education practitioners, which should include online and offline training courses designed to cover the basic operation and advanced application of digital tools. To provide a deeper level of support, regular workshops and support networks can be established so that education practitioners can solve problems and share experiences in practice. This ongoing professional development opportunity helps to strengthen educators' digital literacy and enhance their understanding and use of digital tools. It is worth noting that in the context of digital education, it will be difficult to effectively promote physical education if we still insist on supporting traditional teaching models, processes, methods, and educational technologies and tools. Therefore, in order to adapt to the trend of digital transformation, educators need to constantly update their teaching concepts and practices through training programs to better integrate into the framework of digital education, so as to improve teaching quality and innovation level.

3.3 Privacy and Security Concerns

In the process of digital transformation, data privacy and security issues are particularly sensitive, and students, parents and educational institutions generally have serious concerns about the protection of personal information. To effectively address this issue, a clear and comprehensive privacy policy should be in place detailing how data is collected, stored and used to ensure the proper handling of personal information. To further enhance data security, multiple layers of technical measures can be employed, including but not limited to encryption technology and access rights management. Through the use of advanced encryption technology, it is possible to effectively prevent unauthorized data access and disclosure risks, thereby safeguarding the security of personal information involved in digital transformation. On the other hand, it is also crucial to emphasize the importance of access management. By clearly defining and limiting system users' access to data, you can effectively reduce the risk of data leakage and abuse. To ensure broad stakeholder understanding of privacy and security standards in digital transformation, it is recommended that regular privacy training be conducted to cover students, parents and educators. This training is designed to convey the high standards of privacy and security required for digital transformation, so that all participants can effectively understand and comply with

relevant policies and regulations, and work together to uphold data security and privacy rights in the digital environment.

3.4 Difficulty of Integration of Disciplines and Technologies

Education practitioners often feel that the integration of discipline and technology is a complex task, especially in the specific field of physical education examination assessment, finding a balance is quite challenging. To address this, there is a need to provide specialized training and guidance to assist education practitioners to better understand how to effectively integrate physical education disciplines and digital technologies in the classroom environment. While promoting the integration of disciplines and technologies, it is essential to support interdisciplinary teamwork. By encouraging collaboration and sharing among education practitioners, especially the sharing of successful cases and experiences of disciplinary and technological integration, it helps to build a positive professional community and promote innovation and knowledge exchange across disciplines. In order to further enhance the professional development of educators, it is recommended to organize regular seminars aimed at promoting synergies between different subject areas. This form of professional exchange will provide a useful platform for educators to discuss in depth best practices, challenges and innovations in the integration of disciplines and technologies, thereby jointly contributing to the continuous development of the field of physical education.

3.5 Awareness and Acceptance of Parents and Students

In the process of digital transformation, there is often a degree of bias in the perception of parents and students about the change, and some of them may show skepticism about the new technology and worry about its potential impact on learning and privacy. To bridge this perception gap, it is necessary to establish regular parent-student communication channels to explain in detail the practical benefits of digital transformation and the opportunities to improve the learning experience. To promote deeper understanding, it is recommended that dedicated parent meetings and student engagement events be organized to demonstrate the practical effects of digital tools in improving academic achievement and building 21st century skills. These activities can illustrate the positive impact of digital transformation through real cases and empirical data, so that parents and students can more intuitively feel the value of this change. When communicating information to parents and students, it needs to be in language and form that is easy to understand to enhance their digital literacy. At the same time, full attention should be paid to the concerns and questions of parents and students, and regular communication and feedback mechanisms should be used to ensure that their understanding of digital transformation is comprehensive and accurate. This series of measures will help establish the concept of cooperation and sharing between families and schools, and promote the more effective integration of digital education in the learning process of students.

4. The path of Digital Transformation in the Evaluation of Sports High School Entrance Examination

4.1 Data-based Motion Monitoring

Data sports monitoring is to use intelligent sports equipment and sensors to monitor students' movements in real time and collect key sports data such as step count, heart rate, speed, etc. Smart bracelets, sports trackers and other devices are introduced into physical education to achieve real-time recording of students' physiological indicators and sports performance in sports activities through data-based sports monitoring system. This provides teachers with more comprehensive, objective data that can help personalize assessment and instruction. The use of intelligent instruments and equipment in the physical education test, physical education results through the equipment induction automatic input, speed up the test process and improve the accuracy and science of physical education results.

4.2 Application of Virtual Reality Technology

Virtual reality (VR) technology is used to simulate different sports scenes to provide an immersive experience to enhance students' motor skills and cognitive level. In practice, with the help of VR equipment, virtual training scenes are created so that students can perform actual sports and competitions in a virtual environment to improve their skill level. Through the real-time feedback of virtual reality, students can understand and improve their motor skills more deeply and intuitively, thus improving the efficiency of learning and rapid growth of sports performance.

4.3 Construction of Online Teaching Platform

Network technology is used to build a digital online teaching platform to provide rich physical education knowledge, training videos, interactive learning materials and so on. The school builds a digital physical education platform, enabling students to access relevant courses and resources anywhere and at any time. Online platforms can include live lessons, instructional videos, and interactive learning modules to help students learn independently, while providing teachers with mechanisms to assess and monitor student progress online. In education, e-learning portals are a core part of blended learning practices and a pioneer in determining how to digitize educational objects. The introduction of e-learning in education requires more dynamic teaching organizations, including the use of digital resources in blended learning.

4.4 Use of Electronic Evaluation and Feedback Systems

Digital technology is used to design electronic assessment tools to achieve quantitative assessment of students' sports performance and provide detailed feedback reports. Electronic assessment tools, such as online questionnaire and digital examination system, are introduced in physical education to achieve a comprehensive assessment of students' sports skills and cooperation ability. The electronic assessment system provides students with real-time feedback to help them better understand their strengths and room for improvement.

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5. The Innovation and Optimization Mechanism of Digital Transformation for Sports High School Entrance Examination

5.1 Promote Personalized Learning Path Design

Principle of Personalized learning: Digital transformation develops a customized learning path for each student by collecting personalized data on students, including athletic performance, subject knowledge level, etc.

Implementation approach: Using intelligent sports equipment and online teaching platform to collect students' data in sports and online learning behavior. Through data analysis algorithm, according to the characteristics, needs and learning style of each student, a personalized sports learning path is developed for them, so that students can learn in a more suitable environment, improve the learning effect and interest.

5.2 Real-time Data Collection and Analysis

Real-time feedback Principle: Digital transformation uses real-time data collection technology to provide students with timely feedback to help them better understand their movement status and learning progress.

Implementation approach: Using intelligent sports equipment to monitor students' sports status in real time, transmitting data to the system, providing teachers and students with real-time sports data and learning progress reports through data analysis and visualization tools. This real-time feedback helps adjust teaching methods, personalize instruction, and motivate students to learn.

5.3 Establishment of Platform Economy and Ecosystem

Principles of platform economy: Through the establishment of digital platforms, cooperation, communication and sharing between various participants (students, teachers, educational institutions, etc.) are promoted to form a benign ecosystem.

Ways to achieve: to build a digital online teaching platform, to provide learning resources for students, teaching tools for teachers, and management and collaborative cooperation platforms for institutions. Through this digital platform, students can participate in online learning communities and share sports experiences; Teachers can exchange best practices and form professional communities; Institutions can realize information integration and resource sharing based on the platform to form a digital ecosystem.

6. Practical Strategies of Digital Transformation for Innovation and Optimization of Sports High School Entrance Examination

6.1 Technology Investment and Infrastructure Construction

Through the development of a strategic plan for technology investment, the application of different digital tools and technologies is analyzed in detail. This involves research into the latest educational technologies to ensure that investments are targeted and viable over the long term. Strategic planning also takes into account the long-term development goals of the educational institution to ensure a close alignment of technological inputs with educational objectives. Ensure that the school or institution has

adequate financial support to support the facilities and technical infrastructure required for digital transformation. Conduct infrastructure assessments to ensure that hardware such as digital devices, networks and servers can meet the demands of digital transformation. This includes ensuring device compatibility, stability and upgradeability.

6.2 Teacher Training and Capacity Building

Design and implement customized professional development programs designed to meet the needs of diverse educators. The program covers many aspects such as digital teaching theory, technology application, curriculum design and student assessment to enhance educators' comprehensive literacy in digital transformation. Carefully designed academic training courses that include the latest educational technology research, subject knowledge update, and practical use of digital tools. These courses are jointly run by professionals and technical experts in the field of education to ensure that the training content is consistent with the body of subject knowledge and fully integrated with the latest digital teaching trends. Encourage educators to actively participate in educational research, and provide a platform to share their practical experience and research results in digital teaching. This knowledge-sharing approach helps build academic communities that enable educators to learn from each other's experiences and work together to drive digital transformation. In addition to technical training, the focus is on developing educators' digital literacy so that they can integrate more flexibly into digital technologies to better meet the individual needs of students.

6.3 Privacy and Data Security

Establish a detailed privacy policy that defines the principles governing the collection, use, and storage of personal information about students and educators. The policy covers the specific types of data, uses, access rights and the legal basis for privacy protection to ensure that all data processing activities comply with international and regional laws and regulations. Highly secure data encryption technologies are used in the design and implementation of digital transformation tools. From data collection and transmission to storage, ensure that data is always encrypted during transmission and storage, preventing potential information leakage and illegal access. Strictly limit access to students' and educators' personal information, ensuring that only authorized staff have access to relevant data. Through the hierarchical permission system, the access rights of different users are distinguished to minimize the potential risk of data leakage. A regular security review mechanism has been established to conduct a comprehensive review of the security of digital transformation tools. This includes fixing system vulnerabilities, updating security protocols, and compliance with the latest security standards. Through this series of measures, digital tools are always protected against the latest cyber threats and security challenges.

6.4 Communication between Educators and Parents

Establish a multi-level and multi-channel communication mechanism to realize the timely transmission of information between educators and parents. This includes school announcements, e-newsletters, parent meetings, etc., to meet the communication needs of different families and educators.

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Communicate transparently to parents the goals, methods, and impact of digital transformation on students. Establish a mechanism for timely response to feedback from educators and parents. Whether via email, online forums or regular feedback sessions, we ensure that we can respond quickly to their concerns, suggestions and needs and provide practical solutions. This helps maintain smooth operations and positive home-school relationships during the digital transformation process. In order to ensure that educators can fully understand and effectively use digital tools, systematic training programs are implemented. These trainings cover not only technical aspects, but also educational theory and practice to help educators better integrate digital tools into their teaching activities. Make parents aware of the positive impact of digital transformation on student learning and help them better support their students' development in a digital learning environment.

6.5 Continuous Optimization of Evaluation Tools

Establish ongoing feedback mechanisms, including teacher and student feedback on the use of digital transformation tools. Perform regular evaluations to understand the actual effectiveness of the tools and possible improvement points to continuously optimize the evaluation tools and processes. Establish a strict data verification mechanism to ensure the accuracy of the data collected by the evaluation tool through systematic checks. This involves comparison with actual academic performance, detection and correction of abnormal data, etc., in order to ensure the credibility of assessment tools in quantitative evaluation. Ensure that the assessment tools not only meet the needs under the background of digital transformation, but also can be continuously optimized to provide more accurate, efficient and comprehensive support for the sports high school examination evaluation.

7. Conclusions and Recommendations

7.1 Conclusions

The digital transformation provides a new possibility for the reform of the physical education entrance examination. Through the establishment of online test system, the introduction of digital teaching resources and the establishment of online evaluation system, we can realize the fair, efficient, rich and scientific physical education examination. However, digital transformation also brings new challenges, such as how to ensure the safety and accuracy of online tests, and how to improve the quality and effectiveness of digital teaching resources. Therefore, we need to continue to explore and improve in practice, and in the future development, we look forward to more innovative digital technologies to provide more comprehensive and in-depth support for high school entrance examination sports.

7.2 Recommendations

7.2.1 Strengthen the Construction and Management of Digital Teaching Resources

Digital teaching resources are an important support for the reform of the physical education entrance examination. We need to strengthen the construction and management of digital teaching resources to ensure their quality and effectiveness. At the same time, we also need to regularly update and optimize digital teaching resources to adapt to the needs of students and the development of society.

7.2.2 Improve Teachers' Digital Teaching Ability

Teachers are the key to the reform of P. E. high school entrance examination. We need to improve teachers' digital teaching ability, including the ability to use digital teaching tools, the ability to design and implement digital teaching activities, and the ability to analyze and use digital teaching data. At the same time, we need to provide ongoing training and support to help teachers adapt to the challenges of digital transformation.

7.2.3 Strengthen Students' Digital Literacy Education

Students are the main body of the reform of physical education senior high school examination. We need to strengthen students' digital literacy education, including the ability to use digital technologies, understand and evaluate digital information, and use digital technologies safely and responsibly. At the same time, we also need to guide students to correctly view and use digital teaching resources to avoid its negative impact on study and life.

7.2.4 Establish and Improve the Evaluation System of Digital Teaching

Evaluation is an important link in the reform of physical education senior high school examination. We need to establish and perfect the evaluation system of digital teaching, including evaluation objectives, evaluation content, evaluation methods, evaluation standards and so on. At the same time, we also need to regularly evaluate and adjust the evaluation system of digital teaching to ensure its scientific and effective.

7.2.5 Strengthen Communication and Cooperation with Parents and the Community

Parents and society are important participants in the reform of the physical education entrance examination. We need to strengthen communication and cooperation with parents and the community, understand their needs and expectations, and obtain their support and participation. At the same time, we also need to regularly report the progress and results of the reform to parents and the society to improve their satisfaction and trust.

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