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Digital Transformation of Physical Education in Colleges and Universities: Theoretical Logic, Practical Dilemma and Practical Approach

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Abstract: ***With the rapid development of information technology, the digital transformation of education has provided new ideas, new resources and new methods for the practice of physical education in colleges and universities, and has become an important support and power source for the high-quality development of physical education in colleges and universities in the new era. By using the methods of literature and logical analysis, this paper analyzes the theoretical logic, practical dilemma and practical path of educational digitization in the practice of physical education curriculum in colleges and universities. The research holds that the theoretical logic includes conforming to the concept of education modernization, adapting to the individual needs of students, helping to improve the quality of physical education and promoting the fairness of physical education. This paper analyzes the practical difficulties faced in the process of transformation, such as uneven digital literacy of teachers, insufficient integration of digital resources, imperfect teaching evaluation system and weak infrastructure construction. It also puts forward the corresponding practical approaches, including improving teachers' digital ability, optimizing the construction of digital resources, and constructing a scientific evaluation system, aiming to provide a useful reference for promoting the digital transformation of physical education in colleges and universities.***

Keywords: Digital transformation, Physical education, Colleges and universities**.**

1. Introduction

In recent years, 5G, big data, cloud computing, blockchain, artificial intelligence and other digital technologies have developed rapidly and are widely used to solve the teaching problems of college physical education courses and improve the teaching quality. It has gradually shown great potential and value [1]. 'Building a high-quality physical education system ' is the unremitting pursuit of physical education workers during the ' 14th Five-Year Plan ' and even for a longer period of time in the future. Physical education activities are an important means to directly shape the strong physical strength and healthy vitality of the young generation. China 's physical education has entered the stage of popularization. The digitization of physical education is related to the development quality and value proposition of national physique, which determines whether it can adapt to the needs of quality diversification, lifelong sports consciousness, individualized cultivation and modernization of governance in the stage of popularization. With the rapid development of society, the development level of physical education should also be continuously improved. In order to achieve high-quality development of physical education in colleges and universities in China, the digital transformation of education is the top priority, and the high-quality construction of physical education should be guided by national policies. Through literature review, it can be found that in recent years, physical education in colleges and universities has carried out in-depth theoretical discussions based on digital teaching, educational informatization and other contents, and has formed rich research results, which are mainly reflected in the discussion of the basic problems such as the essential characteristics, the requirements of the times, the development trend and the realization path of physical education reform. Based on the background of digital transformation, this study will make an in-depth discussion on the theoretical logic, practical difficulties and solutions of digitalization in college physical education classroom practice. In order to provide theoretical reference for the digital transformation of physical education in colleges and universities.

2. The Theoretical Logic of the Digital Transformation of College Physical Education Teaching

2.1 Conform to the Concept of Education Modernization

The digital transformation of physical education is an important embodiment of the concept of education modernization. Driven by the digital wave, the physical education teaching mode is undergoing profound changes. First of all, the digital transformation of physical education means the innovation of teaching methods. Traditional physical education often relies on physical venues and equipment, and digital technology provides a broader space for physical education. By introducing advanced technologies such as virtual reality and augmented reality, the physical education classroom can display sports skills and action essentials more vividly and vividly, so that students can understand and master them more intuitively. This teaching method not only improves the learning efficiency of students, but also makes physical education more interesting and interactive. Secondly, the digital transformation of physical education teaching is helpful to realize the optimal allocation of educational resources. On the digital platform, physical education resources can be shared and exchanged across regions and schools. Through the application of cloud computing, big data and other technologies, the collection, analysis and application of physical education teaching data can be realized, which can provide scientific basis for teaching decision-making. In addition, digital teaching can also provide students with personalized learning programs to meet the needs and interests of different students. Furthermore, the digital transformation of physical education

is helpful to improve the quality and effect of teaching. Digital teaching can monitor students' learning progress and results in real time, and provide timely feedback and guidance for teachers. At the same time, digital teaching can also evaluate the teaching effect through data analysis and provide a basis for teaching improvement.

In summary, the digital transformation of physical education teaching not only conforms to the concept of educational modernization, but also provides students with a richer and more diverse learning experience. In the future, the digital transformation of physical education will further promote the innovation and development of physical education, and provide strong support for the cultivation of talents with innovative spirit and practical ability.

2.2 Adapt to the Individual Needs of Students

In digital physical education, through the introduction of intelligent equipment, virtual reality technology, etc., students can be provided with more abundant and diverse learning resources. Students can choose their own learning content and methods according to their own interests and needs. At the same time, digital physical education can also scientifically evaluate students' sports performance and physical fitness through data analysis, so as to provide strong support for personalized teaching. In addition, the digital transformation of physical education can also promote the interaction and communication between teachers and students, break the limitation of traditional teaching mode, and make teaching more flexible and convenient. Through online teaching platforms, sports social software and other ways, students can learn, communicate and exercise anytime and anywhere, effectively improving college students' sports ability and sports literacy. Therefore, the digital transformation of physical education teaching is an inevitable choice to meet the individual needs of college students.

2.3 Promote the Quality of Physical Education Teaching

Digital transformation can not only bring more advanced teaching methods to physical education, but also help improve the quality of physical education. First of all, digital transformation means the introduction of more abundant teaching resources. Digital technology can combine traditional physical education teaching methods with advanced technologies such as the Internet and multimedia, making physical education teaching more vivid, vivid and intuitive. For example, through digital technology, students can understand the details of sports skills more clearly, and teachers can display and explain the teaching content more conveniently. Secondly, digital transformation helps to realize personalized teaching. In the traditional physical education, teachers often need to face many students, it is difficult to teach students in accordance with their aptitude. Digital technology can develop personalized teaching programs according to the characteristics and needs of each student to meet the needs of different students. This can not only improve students' interest and enthusiasm in learning, but also better play the potential of each student. Finally, digital transformation can also improve the management efficiency of physical education. Through the digital platform, schools can more easily manage sports teaching resources, arrange teaching plans, and evaluate teaching quality. At the same time, the digital platform can also provide students with more convenient learning methods and feedback mechanisms to help students better grasp the progress and effect of learning.

In summary, the digital transformation of college physical education is of great significance for improving the quality of teaching. It can not only bring more advanced teaching methods and resources for physical education, but also better meet the needs of students and improve teaching efficiency and management level. Therefore, we should actively promote the digital transformation of physical education in colleges and universities, and provide better support and guarantee for the overall development of students.

2.4 Promote the Fairness of Physical Education

In colleges and universities, students of different campuses and different majors may face the problem of unbalanced sports teaching resources. The digital transformation can share high-quality physical education teaching resources through the network, so that students in remote campuses or resource-poor majors can also enjoy high-level physical education. First of all, digital transformation provides more abundant teaching resources for college physical education. Through the network platform, all kinds of physical education curriculum resources can be shared, breaking the barriers between regions and schools. Colleges and universities in both developed and underdeveloped regions can share high-quality physical education teaching resources, which makes it possible to improve the level of physical education and realize the fairness of education. Secondly, digital transformation helps to improve the physical education environment. Traditional physical education is limited by hardware facilities such as venues and equipment, while digital transformation can provide students with a virtual sports training environment through network simulation technology. This not only saves the investment of hardware facilities, but also enables more students to participate in physical education, thus promoting the popularization and fairness of physical education. In addition, digital transformation can also provide students with a personalized learning experience. Through big data, artificial intelligence and other technologies, students' physical education learning can be accurately analyzed to provide personalized learning suggestions and feedback. This can not only improve students' learning efficiency, but also make every student make progress in their own learning path, which further reflects the fairness of physical education.

In short, the digital transformation of college physical education is an important way to promote the fairness of physical education. By sharing resources, improving the teaching environment and providing personalized learning experience, more students can enjoy high-quality physical education resources and promote the fairness and popularization of physical education.

3. The Realistic Dilemma of Digital Transformation of Physical Education in Colleges and Universities

3.1 Teachers' Digital Literacy is Uneven

College physical education is in the new era of digital transformation. In the process of this transformation, the phenomenon of uneven digital literacy of teachers is becoming more and more obvious. In the face of the new digital environment, the problem of digital literacy of college physical education teachers is gradually highlighted. As an essential ability of teachers in the information age, digital literacy plays an important role in the digitization of physical education. However, due to the lack of necessary digital skills and knowledge reserves, some teachers are unable to use digital teaching tools, platforms and resources. Specifically, the differences in teachers' digital literacy are mainly reflected in the mastery of digital teaching tools, the ability to use digital teaching resources, and the proficiency of online teaching platforms. This uneven situation not only affects the effect of physical education, but also restricts the digital transformation process of physical education in colleges and universities.

To sum up, the uneven digital literacy of teachers in the digital transformation of physical education in colleges and universities is an urgent problem to be solved. Only by continuously strengthening the cultivation and improvement of teachers' digital literacy can we better promote the digital transformation process of college physical education teaching and improve the teaching quality and effect.

3.2 Insufficient Integration of Digital Resources

In the context of the digital transformation of college physical education, the lack of digital resource integration has become an urgent problem to be solved. First of all, the integration of digital resources in college physical education is still insufficient. Although many schools have introduced digital teaching methods and resources, they lack sufficient unified planning and effective coordination in integration. This not only affects the utilization efficiency of resources, but also makes physical education lack coherence and consistency. Secondly, the lack of integration of digital resources is reflected in the lack of sharing of resources. At present, the sports resources of many colleges and universities still exist in an independent and isolated form, and it is impossible to achieve cross-school and cross-regional sharing. This leads to the waste of resources and the decline of teaching effect. The purpose of digital integration is to break this isolated state and realize the sharing and optimal allocation of resources. Furthermore, the lack of integration of digital resources is also reflected in the lag of technological updates and upgrades. With the continuous development of science and technology, new digital tools and platforms are constantly emerging, but some universities have lagged behind in updating and upgrading these tools and platforms. This not only affects the effect of digital teaching, but also makes physical education unable to keep up with the pace of the times.

3.3 The Teaching Evaluation System is not Perfect

Under the background of digital transformation of college physical education teaching, the imperfection of teaching evaluation system has become an urgent problem to be solved. First of all, the traditional teaching evaluation system mainly relies on paper and pencil tests and classroom performance, while digital teaching emphasizes more on students' autonomous learning and online interaction. However, the existing evaluation system is not well adapted to this change, resulting in the evaluation results can not fully reflect the true level and ability of students.

Secondly, digital teaching has brought more possible teaching methods and means for physical education, but these factors have not been fully considered in the evaluation system. Whether through the application of virtual reality, motion capture and other technologies, or the development of online sports training and competition, a more scientific and comprehensive evaluation system is needed to support. In addition, the popularization and promotion of digital teaching has also made the imbalance of students' evaluation results between regions and schools more prominent. Different universities and regions may have differences in the process of implementing digital teaching, so the teaching evaluation system needs to be more inclusive and flexible to adapt to the actual situation of different regions and different schools. Finally, a perfect teaching evaluation system should pay attention to the comprehensiveness, objectivity and fairness of evaluation. This requires the joint efforts of the education department and the school to improve and optimize the teaching concept, evaluation methods, technical means and other aspects. Only by establishing a scientific, comprehensive and objective teaching evaluation system can we better promote the further development of digital teaching and improve students' physical literacy and ability. Therefore, in the context of the digital transformation of physical education in colleges and universities, we must recognize the importance of the teaching evaluation system and actively promote its improvement and optimization. Only in this way can we better adapt to the needs of digital teaching and improve students' physical education learning effect.

3.4 Weak Infrastructure Construction

Under the impact of the digital wave, college physical education has also ushered in the transformation from traditional teaching to digital teaching. Although the application of digital technology has brought unprecedented convenience and possibility to physical education, we must also face up to the practical problems of relatively weak infrastructure construction in college physical education. In the digital age, the hardware facilities and software platforms of college physical education play an extremely important role. They not only directly affect the sports experience and learning efficiency of students, teachers and schools, but also affect the optimization and integration of sports teaching resources and data and the efficient exchange of information. However, at present, many colleges and universities still have obvious deficiencies in the construction of digital infrastructure for physical education. First of all, the lack of investment in hardware facilities is one of the key factors restricting the digital transformation of college physical education. Some schools cannot update and upgrade the hardware equipment of physical education in time due to reasons such as funds, policies or management, such as intelligent sports equipment and high-definition projection equipment. This leads to the inability to make full use of the advantages of digital technology in physical education, which affects the quality of teaching and students' learning experience. Secondly, the construction of software platform

also needs to be strengthened. Some colleges and universities' physical education software platforms have problems such as imperfect functions and complex operations, which cannot meet the needs of teaching and learning. At the same time, there are also network security risks, which pose a potential threat to students' privacy information. To sum up, it can be seen that there is an objective situation of weak infrastructure in college physical education, which must be paid attention to and effective measures should be taken to solve it. This includes increasing capital investment, optimizing management mechanism, and strengthening technology research and development, so as to promote the steady progress of college physical education on the road of digital transformation. Only in this way can we make better use of digital technology to improve the quality of teaching and provide students with a better and more efficient physical education environment.

4. The Practical Approach of Digital Transformation of Public Physical Education in Colleges and Universities

4.1 Improving Teachers' Digital Literacy

4.1.1 Conducting targeted training

Colleges and universities should regularly organize digital technology training for physical education teachers. The training content can include the use of online teaching platform, the production of digital teaching resources, the operation of intelligent equipment and so on. The training method can adopt the combination of expert lectures, online course learning and offline practical operation to ensure that teachers can master the relevant digital technology.

4.1.2 Encourage teachers to participate in digital teaching research

Encourage physical education teachers to participate in the research project of digital physical education teaching, and explore new models and methods for the deep integration of digital technology and physical education teaching through research. For example, it studies how to use artificial intelligence technology to intelligently analyze and correct students' sports movements, or how to construct a physical education evaluation system based on big data. At the same time, schools should provide necessary support for teachers to participate in research, such as financial support and academic exchange opportunities.

4.2 Optimizing the Construction of Digital Resources

4.2.1 Establish a unified resource platform

Colleges and universities should integrate the sports digital resources of various departments in the school and establish a unified sports teaching resource platform. The platform should include rich teaching videos, e-textbooks, online courses, etc., and be classified according to sports events, teaching content, etc., so as to facilitate teachers and students to retrieve and use. At the same time, it is necessary to ensure the security and stability of the platform, and regularly update and maintain resources.

4.2.2 Strengthen the development of high-quality resources

Colleges and universities can organize sports experts, teachers and technicians to jointly develop high-quality digital sports teaching resources. These resources should be closely combined with the syllabus of public physical education in colleges and universities, and pay attention to the scientific, normative and practical content. For example, produce high-quality sports action demonstration videos with detailed action essentials and common error analysis; develop interactive physical education courses to increase students' interest in learning.

4.3 Building a Scientific Evaluation System

4.3.1 Improve the evaluation index

In the setting of evaluation indicators, indicators reflecting students' digital learning ability and comprehensive quality should be added. For example, the number of interactive exchanges between students on the digital learning platform, the formulation and implementation of autonomous learning plans, and the creativity of using digital technology for physical exercise are included in the evaluation system. At the same time, it is also necessary to take into account the improvement of students' sports skills and physical fitness, and build a comprehensive evaluation index system.

4.3.2 Innovative evaluation methods

Establish a multi-evaluation mechanism to encourage students to self-evaluate and evaluate each other. For example, after the online physical education course is completed, students can self-evaluate their learning process and effect through online questionnaires; at the same time, teachers can organize students to conduct group peer assessments to evaluate the performance of group members in digital learning. In addition, it is necessary to make full use of digital technology for data mining and analysis to provide an objective basis for evaluation, such as evaluating the effect of physical exercise by analyzing the movement data of students on smart wearable devices.

4.4 Strengthening Infrastructure Construction

4.4.1. Improving the network environment

Colleges and universities should increase investment in campus network construction, improve network bandwidth, and ensure the stable operation of the network in the process of physical education. Especially for sports venues, gyms and other places to carry out physical education, network coverage optimization should be carried out to meet the needs of online teaching, interaction and data transmission.

4.4.2 Improve hardware equipment

Increase the investment in physical education hardware equipment, equipped with a sufficient number of smart wearable devices, such as sports bracelets, heart rate monitors, etc., so that students can monitor their physical condition in real time during physical education. At the same time, digital teaching facilities, such as high-definition screens and

interactive fitness equipment, are installed in stadiums to improve the digital level of physical education.

5. Conclusion

The digital transformation of public physical education in colleges and universities is an inevitable requirement of the development of the times and has a solid theoretical logic foundation. However, in the process of transformation, it faces many practical difficulties such as teachers' digital literacy, digital resources, teaching evaluation system and infrastructure construction. By improving teachers' digital ability, optimizing the construction of digital resources, building a scientific evaluation system and strengthening infrastructure construction, we can gradually overcome these difficulties, promote the development of public physical education in colleges and universities in the direction of digitalization, intelligence and individuation, improve the quality of physical education teaching, and cultivate high-quality talents to meet the needs of the digital era. In the future development, colleges and universities should continue to explore and innovate, and continue to promote the digital transformation process of public physical education.

References

[1] Xu Ye. Digital technology empowers ideological and political education in colleges and universities: value, dilemma and path [J]. Hunan Social Sciences, 2023, (04): 156-163.

[2] Li Weipeng, Ding Shicong, Zhang Xinglin, et al. Research on the application of physical education teaching mode under the background of the construction of high-quality education system in the ' 14th Five-Year Plan' [J]. Bulletin of sports science and technology literature, 2022, 30 (05): 168-170 + 189. DOI: 10.19379 / j.cnki.issn.1005-0256.2022.05.045.

[3] Qi Hongqian, Zhang Jiaxin. Digital technology development and higher education teaching mode reform [J]. China Higher Education, 2022, (18): 56-58.

[4] Ji Yilong, Lu Xing, Zhang Jiahua, et al. Teaching Evaluation of Intelligent Technology Empowering Teachers: Theoretical Framework and Practical Direction [J]. Contemporary Educational Science, 2024, (02): 71-80.

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