



Research on the Path of Information Technology to Promote Physical Educational Equity in China under the Context of Digital Transformation of Education

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Abstract. The digital transformation of education is an important trend in the current field of education, which has profoundly changed the form, content and methods of education. Under this background, physical educational equity, as an important part of educational equity, is facing new development opportunities and challenges. The rapid development and wide application of information technology has pushed educational equity to a new height. However, in order to fully utilize the potential of information technology and promote the equity of physical education, it is necessary to carry out continuous innovation and improvement at the levels of financial input, digital literacy enhancement, policy system and introduction of talent. By actively exploring effective paths for the in-depth integration of information technology and physical education, and ensuring that every learner receives high-quality physical education on an equal basis, this paper suggests to narrow the education gap and promote the harmonious development of society as a whole.

Keywords: Digital transformation of education, Physical education, Information Technology, Educational equity

1 Introduction

With the continuous changes in the global education environment, the digital transformation of education has become an important driving force for innovation and change in the field of education ^[1]. This transformation is not only a profound reflection and reconstruction of the traditional education model, but also an inevitable choice to adapt to the requirements of the informationization era and meet the needs of diversified learning. In the globalization context, the sharing and exchange of educational resources are becoming more and more frequent, and the rapid development of information technology, especially the widespread application of emerging technologies such as the Internet, Big Data, Artificial Intelligence (AI), etc., provides

unprecedented opportunities and challenges for the digital transformation of education.

In China, educational equity is aimed at eliminating differences in access to education for learners from different geographical areas and socio-economic backgrounds, and ensuring that every learner is given equal opportunities to learn. In reality, however, the unbalanced distribution of educational resources remains a serious constraint on the realization of educational equity. In particular, in the field of physical education, disparities between urban and rural areas, regions and schools have resulted in unequal opportunities and development of physical activities for the learners. In recent years, the Government of China has been actively promoting digital education reform, putting forward the concept of “Internet + Education” and encouraging schools at all levels to actively apply information technology. This policy not only incorporates more digital elements into traditional teaching, but also provides new ideas for the reform of physical education. Meanwhile, the gradual emergence of new teaching modes such as online sports courses, independent learning platforms and virtual sports competitions are expected to provide learners in remote areas with richer physical education resources.

Nevertheless, information technology also faces a number of problems and challenges in promoting equity in physical education. On the one hand, the popularization of technology needs to be supported by appropriate infrastructure and hardware, especially in economically backward regions, where insufficient network coverage and equipment are still constraints. On the other hand, physical education teachers' digital literacy and ability to use technology need to be improved.

As a conclusion, in the context of the digital transformation of education, information technology can provide new solutions for the equity of physical education in China. Yet, realizing this goal is not an easy task. This study will focus on how information technology plays a role in the prevailing physical education system, analyze its impact on educational equity, and propose corresponding policy recommendations.

2 Digital Transformation of Education and Equity in Physical Education

2.1 Physical Education and Educational Equity

Educational equity is not only the goal of educational development, but also the foundation of social harmony, stability and sustainable progress. Chu has emphasized that the essence of educational equity is the pursuit of equality in the educational starting point and process, to ensure that individuals enjoy equal opportunities in access to educational resources, rather than forcing the consistency of educational results or absolute equality ^[2]. Educational equity is reflected in the comprehensive consideration of the principles of equality, difference and compensation in the distribution of educational resources.

Physical education, which emphasizes the development of physical fitness, athletic skills and teamwork through physical activities, requiring equity in education, first and foremost by ensuring that every learner has an equal opportunity to participate. Regardless of their backgrounds, learners should be able to find their own stage in the classroom and sense of accomplishment that sports bring. Educational equity means a balanced distribution of resources to ensure that sports facilities and teachers can meet the needs of all learners, so that each learner can get adequate exercise and development in the field of physical education.

2.2 Information Technology and Educational Equity

Information technology not only brings an unprecedented degree of convenience to education, but also plays a pivotal role in promoting equity in education. Educational equity is an important foundation of social equity, which requires that educational resources be fairly and reasonably distributed among different regions and groups. But because of the constraints of various factors such as geography, economy and culture, the phenomenon of educational inequity prevails globally. The rapid development of information technology provides new possibilities for shattering these barriers and realizing educational equity.

The core of educational equity is to provide equal educational opportunities for educated people, and the core of educational opportunities is the opportunity to attend school, the opportunity to attend high-quality schools, and the opportunity to participate in the educational process, and information technology can accurately act on each component of educational opportunities and vigorously promote educational equity^[3]. Xu et al. have recognized the ability of information technology to promote educational equity and formulated a number of recommendations to promote educational equity in China^[4].

By analyzing the current situation of educational equity in China and the important impact of information technology in the field of education, scholars such as Chen and Chen and Chen have emphasized the correct use of information technology can promote higher levels of educational equity^[5]. Xu^[6], Xu and Hu^[7], Shonfeld et al.^[8], Wolfenden et al.^[9], Lee and Lee^[10], and other scholars have proposed that with the rapid development of information technology, high-quality educational resources had been able to cross the limitations of geography, time and space, and widely spread to every corner. The use of information technology is conducive to promoting “fair and quality” education^[11], and further accelerating the modernization of education.

2.3 Physical Education in the Context of Digital Transformation of Education

With the help of digital technology, physical education teachers can more effectively design and implement the curriculum and conduct teaching, enhance the learner's participation and experience, and promote the high-quality development of physical education^[12].

Wu and Zheng have found that the face of physical education and physical education teaching in colleges and universities is undergoing profound changes, which were

reflected in the gradual transformation of the traditional teaching mode to precision teaching, the leaping attempt from the physical teaching scene to the virtualized teaching space, and the transformation of the one-man teaching mode to the collaborative teaching mode^[13]. Through the implementation of the “1+3+4” physical education program mode, Fujian Normal University adheres to the platform first, resources as the root, educating people as the foundation, and service first, which is an open-ended physical education teaching model that combines inside and outside the classroom, online and offline, teaching and training, and virtual and real life during the four years of the university, and has greatly improved the physical health and physical education level and physical education literacy of the learners^[14].

3 Information Technology Enabling Equity in Physical Education in the Context of Digital Transformation of Education

Information technology not only infuses new vitality into physical education, but also provides an unprecedented opportunity to realize equity in physical education. Although the integration of physical education and digital teaching faces certain difficulties, the in-depth involvement of information technology has undoubtedly injected new vitality into the development of physical education and pushed it to a higher level.

3.1 Information Technology Enhancing the Balanced Allocation of Physical Education Resources

Due to the imbalance in regional economic development, there is an obvious imbalance in the allocation of educational resources between the east and west of China, between urban and rural areas, and between schools. However, the popularization of information technology, especially Internet technology, provides an effective means to solve this problem.

In recent years, the Government of China has issued several policy documents and circulars that clearly point out the urgency and importance of ensuring that the majority of learners can receive education in a more equitable and high-quality educational resource environment. These documents not only reiterate the principle of equity in education, but also further emphasize the need to improve the quality of educational resources, in order to build a more balanced and superior learning platform for all learners.

Taking rural physical education as an example, through technologies such as AI, and cloud teaching platforms, rural learners are not only able to access physical education programs in urban schools, but also enjoy the guidance and teaching of sports experts.

3.2 Information Technology Promoting Science and Fairness in Physical Education Evaluation

Huai Jinpeng, Minister of Education, has argued that a series of digital tools and platforms, such as smart learning companions and smart classroom teaching evaluation systems, should be actively developed as a key force driving education evaluation reform. Through the establishment of a smart education evaluation system, it can more accurately capture the learning effectiveness of learners and more scientifically assess the quality of teaching, thus providing strong support for the continuous progress and innovation of education in China.

Chenghua District, Chengdu City, has been opening up new paths for the improvement of teaching quality through the in-depth analysis of classroom teaching behaviors and the integration and application of an intelligent training platform ^[15]. Relying on advanced AI technology, the district has constructed a classroom teaching behavior analysis system and supplemented it with an intelligent training platform, all of which are accurately implemented to improve the diagnosis and evaluation of classroom teaching.

4 Status and Implementation Path to Information Technology Promoting Physical Educational Equity under the Context of Digital Transformation of Education

4.1 Status of Information Technology for Equity in Physical Education

4.1.1 Lack of Infrastructure Due to Insufficient Funding.

Insufficient funding is one of the major constraints to the widespread use of information technology in all areas of education, especially in physical education.

Due to the special nature of physical education, its digitization requires more complex hardware facilities, such as smart sports equipment, high-definition camera equipment, VR and AR systems, and so on. However, many schools, especially those in rural and remote areas, have difficulties in acquiring such equipment due to limited funding, resulting in a weak foundation for the digital transformation of physical education.

4.1.2 Lack of Digital Literacy of Physical Education Teachers.

In the current social context, the comprehensive ability that our citizens need to have for learning, working and living in the digital society is centered on digital literacy. Digital literacy serves as a bridge between traditional physical education and modern information technology, and is crucial to the digital transformation of physical education.

However, many physical education teachers have obvious shortcomings in digital literacy, which to a certain extent hinders the pace of physical education towards digitalization, intelligence and equity. Therefore, enhancing the digital literacy of physical education teachers has become an important issue that needs to be addressed in the

current digital transformation of physical education as well as the realization of equity in physical education.

4.1.3 Lack of Maturity and Sophistication of the Policy System and Institutional Framework.

In recent years, the state has attached great importance to the digital transformation of education and issued a series of policy documents to promote the integration of digital education and physical education teaching. However, there is still a lack of specific policies for physical education in terms of resource allocation, teacher training, and teaching assessment and evaluation, leading to uneven and fragmented application of information technology in physical education.

4.1.4 Need for Digital Teaching Competency Enhancement for Physical Education Teachers.

The lack of digital teaching knowledge and skills has become a bottleneck for most physical education teachers to enhance their teaching competence. In the context of the digital transformation of education, all teachers need to master a series of advanced digital teaching tools and technologies in order to better present teaching content and optimize the teaching process. However, many physical education teachers are out of their depth in this regard.

4.2 Implementation Path to Information Technology Promoting Physical Educational Equity

4.2.1 Increasing Investment to Improve the Equalization of Infrastructure.

In response to the current unequal distribution of physical education resources, the Government of China should attach great importance to the fairness of educational resource allocation, especially the serious lack of infrastructure in the field of physical education, and ensure a balanced distribution of resources by promoting regional coordinated development, promoting the overall development of urban and rural areas, accelerating the balanced development of inter-schools, guaranteeing the fair development of groups.

To make up for the inherent inadequacy of physical education resources in schools in rural and remote areas, the government should further increase its financial inclination towards these regions to ensure that every school receives the necessary financial support for the procurement of modernized digital physical education teaching equipment and devices. This includes, but is not limited to, high-tech aids such as smart wearable devices and sports data analysis systems, as well as high-quality multimedia teaching materials.

At the same time, the government should also actively promote the construction of a platform for sharing educational resources, so as to realize the interconnection of physical education resources between urban and rural areas and between schools. For example, an online education platform can be set up, so that students in remote areas can also enjoy the teaching resources of first-tier cities.

4.2.2 Enhancing Digital Literacy and Bridging the Digital Divide.

Targeted training courses on digital literacy enhancement for physical education teachers have been organized for this group of teachers, all with a view to ensuring that every teacher is able to master in-depth and flexibly apply the latest information technology and educational technology tools. These trainings should cover not only basic skills such as multimedia teaching resources production and online teaching platform operation, but also in-depth discussions on cutting-edge applications such as how to utilize big data for learning situation analysis and how to detect students' physical fitness status through smart wearable devices.

More importantly, a long-term tracking and support mechanism needs to be established, including regular online seminars, one-on-one technical guidance, and effectiveness evaluation based on teaching practice, to ensure that the effects of the training can be consolidated in a sustained manner, which will truly help the digital transformation of physical education and promote equity in physical education.

4.2.3 Improving the Policy System and Promoting Common Development.

In terms of specific policy formulation, attention should be paid to the following aspects. The first is to clarify the unified user, resource, service and management standards for the digitization of education, so as to ensure the mutual integration and sharing of information between platforms and avoid the phenomenon of information islands. The second is to formulate construction standards for digital education resources and standardize the implementation process of digital teaching, and to strengthen the supervision and evaluation of digital education.

In addition, a reward mechanism for physical education teachers is established to motivate them to better devote themselves to the practice of digital transformation of physical education. Specifically, this can be done in the following aspects include teaching achievement rewards, innovation and practice rewards, professional development rewards, and teamwork rewards.

4.2.4 Developing and Bringing in Talents and Enhancing Digital Teaching Competency.

Firstly, through the establishment of a mechanism for the introduction of digital physical teaching talents, the school has established a long-term cooperative relationship with universities and regularly organizes activities for the introduction of digital physical teaching talents.

Secondly, after physical education teachers formally join the school, the school regularly carries out digital physical teaching skills training, the training course covers the use of digital teaching tools, digital teaching resources development, digital teaching design, etc..

5 Conclusions

Equity in physical education, a comprehensive issue related to equal enjoyment of education rights, substantial improvement of education quality and efficient allocation of education resources, has an intricate path of realization, involving profound changes at multiple levels of society, and constituting a complex ecosystem of interdependence and mutual causation. In this ecosystem, the integration of information technology not only brings unprecedented vitality to physical education, but also provides strong technical support for the realization of educational equity. In the wave of digital transformation of education, physical education teachers must let the fruits of educational development can benefit all learners more widely and more equitably.

To summarize, the digital transformation of education provides unprecedented opportunities for the realization of equity in physical education. Schools, governments, and physical education teachers should grasp this historical opportunity, constantly innovate and improve the relevant systems and practical operations, so that information technology can become a powerful engine to promote equity in physical education, and contribute to the construction of a fairer and higher-quality education system.

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