Digital Literacy Imbalance in Physical Education and Synergistic Countermeasures

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Abstract: With the rapid development of digital technology, digital literacy plays an increasingly important role in teaching and learning of different disciplines, and physical education is also no exception. There is an obvious imbalance of digital literacy in physical education at present. The imbalance is mainly reflected in the following aspects: the imbalance of teachers' digital literacy level, lack of systematic digital literacy cultivation of students, and unbalanced allocation of educational resources. In order to solve these problems, this paper proposes three optimization countermeasures: strengthen the training and certification of teachers' digital literacy, deepen the reform of school curriculum, and promote the social strength to support the balanced allocation of educational resources.

Keywords: Physical Education; Digital Literacy; Teacher Training; Curriculum Reforms

1. Introduction

The significance of digital literacy in physical education is gradually becoming obvious. With the popularization of information technology, digital technology is widely used as an important way to improve the quality and effect of physical education teaching. Digital literacy can not only improve the teaching ability of teachers, but also stimulate students' interest in independent learning and improve their motor ability. The development of digital literacy in physical education also faces many challenges, such as the uneven level of teachers' digital literacy, the lack of systematic digital literacy education for students, the uneven distribution of educational resources, and the digital education effect is not fully mined. Therefore, this paper analyzes the reasons why the digital literacy of physical education is unbalanced and proposes corresponding optimization strategies, hoping to provide reference for improving the quality of physical education.

2. The Importance of Digital Literacy in Physical Education

2.1 The Role of Digital Literacy in the Improvement of the Quality of Physical Education

Digital literacy is very important in modern education, especially in physical education, to enrich the teaching content and diversify teaching methods. Teachers display teaching content through digital methods. Not only can it arouse students' interest in learning, but also it can improve the learning effect through interactive teaching. Digital technology makes the teaching methods in physical education classroom more flexible and efficient. Students can do physical training, skill simulation and even enhance their sports performance through data analysis in a virtual environment. Therefore, digital literacy can improve the quality of teaching and learning, especially in arousing students' interest in independent learning and improving the interaction of teaching. It has an advantage that can't be ignored. Through the collection and analysis of students' physical activity data, educators can get the feedback information of students' performance in real time, master students' athletic ability correctly, and adjust the teaching according to the data, so as to improve the personalization and accuracy of teaching[1].

2.2 Popularization and Impact of Digital Tools in Physical Education Teaching

With the rapid development of information technology, the application of digital technology in physical education teaching is also gradually increasing. In the teaching process, teachers and students can use sports APPs, intelligent devices, video analysis software and other digital tools to assist students in physical training and sports skills learning. Such as sports tracking and heart rate monitoring devices can help students understand their sports condition and physical health data in real time, and then teachers and students adjust and optimize training according to data. Video analysis software can help students correct the lack of movement and improve skills by watching sports video many times. With the popularization and

application of intelligent sports equipment and digital teaching platform, the physical education teaching has become more scientific and accurate, and the effect of teaching and students' sports performance has been greatly improved. The popularization of intelligent equipment in physical education is not only reflected in the changes of teaching methods, but also in the changes of students' attitudes towards physical education learning. Students can get more achievements in the interaction and feedback, and then enhance the motivation of students to participate in sports[2].

2.3 The Promotion of Digital Literacy for the Professional Development of Physical Education Teachers

Only when the professional development of physical education teachers is supported by digital literacy can it be achieved. With the development of education technology, teachers need not only to master traditional teaching skills, but also how to use modern technology to support teaching and students' learning. Physical education teachers can benefit from digital literacy in terms of using teaching resources more efficiently, such as accessing the latest teaching materials through Internet platforms, using social media to exchange experiences with other teachers and improving themselves. In addition, digital teaching forced physical education teachers to leave behind the traditional single-lecture mode and adopt a more interactive and personalized mode of teaching, which would promote innovation in teaching mode and optimize classroom management. Besides, improving digital literacy enabled teachers to analyze students' learning situation through big data and design personalized training plans for students. It not only improved teaching effect, but also promoted overall development in teaching management and students' communication. Therefore, the improvement in digital literacy is not only an enhancement of personal professionalism in physical education teachers, but also helps promote the modernization of entire physical education[3].

3. Problems with Digital Literacy in Physical Education

3.1 Teachers' Digital Literacy Levels are Uneven

The large variation in digital literacy among physical education teachers is an important issue that is impeding educational reform and requires immediate attention. Many physical education teachers have not had adequate opportunities to learn the competencies needed to effectively use modern information and communication technologies in their teaching practice. This is particularly true for their digital teaching platforms, intelligent hardware devices, and data-driven instructional tools. Some teachers are confident and competent in using traditional pedagogical methods but are weak in understanding, knowledge, or confidence in using digital tools. These teachers are not able to effectively use these tools in classroom teaching or administrative activities. This limitation hinders instructional innovation and classroom efficiency. This inconsistency in digital literacy affects the pedagogical effectiveness of individual teachers and limits teachers from developing digital competencies in their students. Although some teachers have made efforts to improve their digital literacy through self-study or training courses, the situation remains scattered. There is a significant difference in digital competency between schools. In general, teachers who have taught for longer periods are more likely to have lower levels of proficiency in using new technologies and digital instructional designs. This uneven distribution of digital capabilities among teachers has significantly impeded the digital transformation of physical education, which in turn has limited improvements in teaching quality and effectiveness.

When the digital learning environment continues to develop, teachers' limitations in digital proficiency are more evident. This is especially the case in rural or impoverished schools. In many schools, PE teachers do not have timely access to high-quality digital teaching technologies and systematic professional development activities. Even in schools that have started to develop digital infrastructure, teachers' ineffective use of these technologies is often due to their inadequate understanding of digital tools. Traditional instruction remains widespread, and there is a general lack of willingness among teachers to use technological means in teaching. Digital integration is inefficient and superficial. Expansion of instructional content and diversification of instructional methods are hindered. Improving disparities in the digital proficiency of physical education teachersin relation to the use of educational technologies and digitally-mediated instructional strategies is an important issue in the process of educational modernization. Without targeted and systematic efforts to improve teachers' technological literacy, the goal of physically educated, inclusive, and modern teachers will not be realized[4].

3.2 Lack of Systematic Development of Digital Literacy in Students

In the subject of physical education, there is a clear deficiency in the systematic teaching of digital literacy. Even though the majority of schools have provided students with digital technologies and devices to facilitate teaching and learning in physical education, there is a clear deficiency in the provision of structured training to build students' knowledge and skills in how to use these digital tools effectively during lessons. For many students, their experience in using digital tools and resources in physical education is superficial. They have limited opportunities to understand and use digital tools beyond basic familiarity. Notably, in the processes of acquiring motor skills and analysing sports performance, students show a weak understanding of how to interpret data and use information, and this hinders them from making connections between technological tools and the demands of teaching and learning in physical education. Like the use of technological tools, there is also a clear deficiency in students' understanding and recognition of digital technologies themselves. As a result, they are unable to apply technology proactively to enhance their capabilities in digital daily life and physical activities. Such limitations weaken students' holistic development in physical education and hinder them from undertaking self-directed learning and skill improvement.

Currently, digital literacy is not given due consideration in physical education. Most curricula do not provide content that can be used to improve students' digital literacy in a systematic manner. Some upper-grade students might have acquired certain digital competencies through learning outside school or through their own interests, but this is the exception. There is also a clear disparity between the digital literacy levels of students in different educational stages. The majority of students have had little to no experience in digital literacy education before they enter physical education classes. They are not sufficiently familiar with digital technologies, which limits their potential in improving their motor skills, analysing sports performance and undertaking self-directed learning. This, in turn, weakens the effectiveness of digital education in physical education. Therefore, the design and implementation of educational strategies and classroom frameworks that can systematically improve students' digital literacy must be a key focus of reform in physical education.

3.3 Imbalanced Distribution of Educational Resources, Restricting the Development of Digital Literacy

The most obvious problem in promoting and implementing digital education in physical education is the imbalance in the allocation of educational resources. Many schools in these regions are in a state of severe shortage of educational resources, such as digital equipment and network environment. This shortage seriously restricts the full implementation of promoting digital education. This kind of situation also means the existence of the certain degree of imbalance in the digital literacy training of teachers and a great restriction on the development of digital skills of students. In the case of schools with better conditions, the digital teaching equipment and technology are widely used in classrooms, and teachers and students can use digital equipment fully to improve the quality of teaching and learning. While in the schools in poor areas, although there is also policy support to implement digital education, the digital equipment is still limited, and the funds are not adequate to ensure that the educational resources can be popularized to teachers and students. Therefore, the educational resources can't cover all teachers and students, and the implementation of digital education is restricted. In these schools, there is almost no application of digital technology, and teachers can't train students in digital skills. Naturally, students' digital literacy can't be developed.

The problem of unequal distribution does not end with the disparity in hardware and digital infrastructure, but also extends to the unequal distribution of teaching resources and access to training opportunities for digital literacy education. Some schools, because of their limited financial and technical resources, do not have the luxury of offering specialized professional development for teachers and as a result, teachers are not able to access new teaching media and approaches. As a result, digital education training and usage by teachers increases very slowly. This unequal distribution hampers the widespread integration of digital education and ultimately limits the development of digital literacy.

4. Strategies for Optimizing Digital Literacy in Physical Education

4.1 Strengthening Teacher Training and Certification in Digital Literacy

Improving the digital literacy of teachers is an

important starting point for improving the digital literacy of the physical education field. The professional competence of teachers is the key to the effective use of digital educational technology in physical education. The improvement of digital literacy is not only about learning how to use digital technology, but also about the ability to use it effectively in teaching content. Therefore, it is necessary to train teachers in digital literacy in an integrated and systematic way. The training content is not only the basic operation skills of digital technology, but also how to transform digital technology into an effective instrument to improve teaching quality. Teachers should be trained to use devices such as motion trackers and video analysis tools in combination with the principles of sports science to conduct more accurate fitness assessments and motor skill training. Through training, teachers can learn how to use big data to analyze students' athletic performance and develop personalized training programs, which will promote the transformation of physical education from traditional teaching methods to more data-driven and personalized teaching methods. To ensure that digital literacy does not lag behind, the improvement of digital skills can also be integrated into a continuous certification system. Regular assessments and certifications should be carried out to ensure that the digital literacy of teachers can keep up with the rapid development of digital technology. Schools can work with educational technology companies or universities to develop relevant certification systems to evaluate teachers' capabilities in the field of digital education from time to time and motivate teachers to continuously learn and apply new technologies to better meet the educational requirements of students in physical education.

Digital literacy capacity enhancement of teachers cannot depend on one-off training, but should combine long-term cultivation and application in practice. By designing flexible training mechanisms and online education environment, teachers can acquire advanced educational technologies and teaching methods anytime and anywhere. Through online learning platform, teachers can share experience, attend interactive seminar, complete online course, so as to improve teachers' technological capability and awareness of education innovation. In this way, teachers not only can improve their ability of using digital tools through basic training, but also can receive one-to-one support during teaching process to solve the problem in teaching. For example, digital teaching platform can provide video lesson and technical guidance, also can promote community interaction, so that teachers can share experience and discuss problems together, and form a good ring of teaching interaction. Through this kind of training and certification system, teachers' digital literacy can be continuously improved in teaching practice, and finally improve the quality of physical education[5].

4.2 Deepening Curriculum Reform in Schools and Integrating Digital Educational Tools

Curriculum Reform in Schools Should Keep Pace with the Development of Digital Education and Innovate in the Content and Form of Physical Education. With the rapid development of information technology, digital teaching tools have gradually become an important part of teaching resources. In the process of teaching, schools should give full play to the role of digital tools by reforming their curriculum and absorbing digital tools into their physical education courses. The purpose of curriculum reform is not only to innovate the content of teaching, but also to change the methods and ideas of physical education, and improve students' learning effect by innovating the form of teaching. In the process of curriculum reform, schools should further promote the integration of digital education. Schools should focus on providing students with digital teaching tools, and strengthen the training of teaching equipment for teachers. For example, in the teaching of physical skills, video analysis and motion capture technology can be used to help students better understand sports skills and improve their ability to master sports skills. In addition, schools can also use online and virtual reality technology to provide students with virtual sports experience. Students can also participate in online training and get instant feedback. This teaching method creates a form of interaction between teaching and learning and theoretical teaching. It not only stimulates students' interest in physical education, but also improves students' initiative and subjectivity in learning.

In the process of deepening curriculum reform, schools should formulate digital literacy development plans based on the following characteristics of grades and student groups. For the digital literacy teaching of younger students, gamified teaching methods are adopted, and the development of basic motor skills is trained through digital tools to stimulate students' interest in physical exercise. For the digital literacy teaching of older students, data analysis and advanced skills

training are used to enhance sports performance and technical level. This curricular system helps students master the use of digital tools, cultivate digital thinking and problem-solving abilities in the practical teaching environment. Curriculum reform not only requires the active participation of teachers, but also requires the support and participation of school principals to provide adequate digital educational resources and effectively use equipment in practical teaching. Physical education teaching in schools will gradually change from the traditional model to a more diversified and digital physical education teaching model, and students' digital literacy will be gradually cultivated.

4.3 Development and Implementation of Systematic Career Planning Courses

fair distribution of digital education learning resources. It is an important link in ensuring the popularization of digital literacy in physical education. The participation of society and the government are very important in the development of digital education. Currently, schools in some urban and developed areas have already invested a large amount of money in digital education learning equipment, while schools in remote areas still lack basic digital educational equipment and network environment. Therefore, the government should strengthen its financial investment in the construction of digital education in rural areas and poor areas. The government can allocate funds for digital education construction in poor areas, help schools in poor areas to create digital education environment, purchase advanced digital education equipment, and train teachers and students. These will narrow the gap between digital education resources in different areas and schools, and provide equal education opportunities for students. The government should strengthen its support for digital education training. On the one hand, the government should strengthen its support for digital education content development and encourage schools and teachers to share high-quality education content. On the other hand, in the field of physical education, the geographical scope can be expanded by sharing teaching videos, digital sports training materials, teaching cases, etc. online, so that the geographical scope of sharing and using high-quality teaching video resources is wider.

is not negligible. Social forces, especially the efforts of social organizations, businesses and nongovernmental organizations, are also very important in the proliferation and innovation of digital education resources. Companies and technology enterprises can donate devices, provide funds, and cooperate technically to help spread educational resources to schools in poor areas. That is, these businesses provide technical support and donated equipment to schools in poor areas. In addition, businesses can cooperate with schools to develop customized digital teaching aids for physical education and thus advance and popularize the development of educational technology in this field. The participation of social forces solves the problem of imbalanced educational resources and brings new ideas and methods to educational innovation. With the cooperation and efforts of the government, society, and schools, the allocation of digital literacy education resources in physical education can be achieved, and every student has the opportunity to learn digital content equally, which will ultimately improve the level of education. The career planning curriculum also explains the ethical requirements of each profession and the characteristics of long-term career development. It aims to make students establish a sense of social responsibility and adaptability. With the rapid development of technology and the continuous change of society, the future workplace will inevitably face great challenges and opportunities. Therefore, it is very important that the curriculum analyzes the changes in career trend shifts and provides students with guidance on how to deal with uncertainty and volatility in the future workplace. In addition, it provides advice on how to plan and build a bright future in the future workplace. Furthermore, the content of the curriculum must keep up with the times and pay attention to new factors such as technological development and industrial structure adjustment. It must make a profound analysis of their impact on careers and draw useful advice from students, so that they can respond flexibly to changes and challenges in the future workplace. Therefore, the curriculum should analyze how fast-developing industries such as artificial intelligence, automation, and green industries have changed the job market, so that students are not only aware of the current situation but also aware of the future. Schools should adopt a process of regular review to ensure the continuous relevance of the career planning curriculum. That is, it should review the rationality of the course content in line with the latest industry development, review the rationality of the teaching method, and actively listen to the students' opinions on the school's education and teaching, understand what they hope to get from school, and make adjustments and improvements to the curriculum

and teaching methods based on the students' feedback. Only by continuously improving the curriculum can schools better meet the needs of students and the job market, and then make students establish a scientific and systematic concept of career planning, and then lay a solid foundation for their successful transition from the school to the future workplace, so that they can achieve their long-term career development goals and succeed in their future work.

5. Conclusions

Digital literacy training in physical education is an important link in the development of modern education system, especially in the fast development of information technology, cultivating the students' digital literacy has become an important way to improve the quality of physical education. At present, the problem of uneven digital literacy among teachers, lack of systematic cultivation of students' digital literacy and uneven allocation of digital education resources are facing physical education, which restricts the overall improvement of digital literacy. These problems need to be solved from the following aspects. Strengthening the construction of digital literacy training and certification system of teachers, and through the continuous training and certification, it is necessary to ensure that teachers can update their digital education technologies in time, and constantly improve their teaching methods to better serve students in physical education. Deepening the reform of school physical education curriculum and actively using digital education tools so that physical education can keep up with the times and meet the needs of students, giving them more diversified and personalized learning experience. Strengthening the cooperation between society and government and improving the allocation of educational resources, especially in the remote areas. The government should strengthen the investment in digital educational resources so that all students can receive digital education under the same conditions. These measures can effectively promote the improvement of digital literacy in physical education and physical education.

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