Academic Education Publishing House

Higher Education and Practice Vol. 2 No. 1, 2025

Research on the Innovative Application of Dragon Boat Sports in College Physical Education under the Background of Digital Empowerment

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Abstract: With the rapid development of digital technology, digital empowerment has become an important force to promote innovation in various fields. As an important part of Chinese traditional culture, dragon boat movement has been gradually valued in physical education in universities in recent years. This paper discusses the innovative application of dragon boat sports in physical education in colleges and universities under the background of digital empowerment, and analyzes how digital technology improves the teaching effect, student participation and sports performance of dragon boat sports. This paper proposes the teaching mode of dragon boat sports based on digital technology and discusses the path of its implementation and challenges in college physical education. The research results show that digital empowerment can effectively improve the teaching quality of dragon boat sports, promote the all-round development of students, and also provide a new idea for the digital transformation of physical education in colleges and universities.

Keywords: Digital Empowerment; Dragon Boat Sports; College Physical Education; Innovative Application; Digital Transformation

1. Foreword

With the rapid development of digital technology, digital empowerment has become an important force driving the change in education. Digital technology has not only changed the traditional teaching mode, but also provided new possibilities for physical education teaching. As an important part of Chinese traditional culture, dragon boat movement has been gradually paid attention to in physical education in colleges and universities in recent years. Its unique teamwork and cultural connotation have positive significance for students' physical and mental development. However, the traditional teaching mode of dragon boat sports has some limitations in terms of technical means, teaching efficiency and student participation. Under the background of digital empowerment, how to use virtual reality (VR), augmented reality (AR), big data analysis and other emerging technologies to innovate the teaching methods of dragon boat sports, improve the teaching effect and student participation, has become an important topic of the current physical education teaching research in colleges and universities. This paper aims to explore the innovative application of dragon boat sports in physical education in universities under the background of digital empowerment, analyze the influence of digital technology on dragon boat sports teaching through literature review, case analysis and field research, and put forward the teaching mode and implementation path based on digital technology. The research not only provides theoretical support for the digital transformation of dragon boat sports teaching, but also provides new ideas for the innovative practice of physical education teaching in colleges and universities, which has important theoretical significance and practical value.

2. The Combination of Digital Empowerment and Dragon-Boat Sports

2.1 The Concept and Characteristics of Digital Empowerment

Digital empowerment refers to giving new capabilities and value to traditional industries or activities through the application of digital technology. Digital technologies include big data, artificial intelligence, virtual reality (VR), augmented reality (AR), the Internet of Things (IoT), etc., and their core elements include

data-driven, intelligence, connectivity and personalization. Digital empowerment is characterized by the ability to optimize processes, improve efficiency, enhance experience, and inject innovation into traditional sectors. In physical education teaching, digital empowerment changes the traditional teaching mode through technical means to provide a more efficient and intelligent learning and teaching environment for students and teachers.

2.2 The Traditional Teaching Mode of Dragon-Boat Sports

The traditional teaching mode of dragon boat movement mainly relies on the on-site guidance of teachers and the practical training of students. Its advantage is that it can cultivate students' teamwork ability and sports skills through personal practice, while inheriting the connotation of dragon boat culture. However, the traditional teaching mode also has some deficiencies, such as limited teaching resources, difficult to quantify the training effect, and difficult to meet students' personalized needs. In addition, the teaching of dragon boat sports also faces challenges such as site restrictions, weather impact and safety risks, which restrict the further improvement of the teaching effect.

2.3 The Impact of Digital Empowerment on Dragon-Boat Sports

The introduction of digital technology has brought new possibilities for dragon-boat sports teaching. In the teaching scenario, virtual reality (VR) and augmented reality (AR) technology can simulate dragon boat race environment to help students better understand tactics and skills; big data analysis can monitor students' sports performance in real time and provide personalized training advice; online teaching platform supports remote learning and collaboration to break the limitation of time and space. Digital empowerment not only improves the efficiency and quality of the teaching of dragon boat sports, but also enhances the students' sense of participation and interest in learning through the data-driven teaching methods, providing strong support for the innovative teaching of dragon boat sports.

3. The Innovative Application of the Dragon Boat Movement under the Background of Digital Empowerment

3.1 Application of Virtual Reality (VR) and Augmented Reality (AR) Technology

Virtual reality (VR) and augmented reality (AR) technology provide an immersive learning experience for dragon boat sports teaching. Through VR technology, students can simulate the dragon boat race scene in a virtual environment, feel the real water flow, wind speed and teamwork atmosphere, so as to better understand the rowing skills and tactical coordination. AR technology can stack virtual information into real scenes, such as real-time paddle Angle, intensity and rhythm data in training, to help students adjust their movements in time. These technologies not only break through the limitation of space in traditional teaching, but also improve students' interest in learning and training effect through interactivity and interest.

3.2 Big Data Analysis and Sports Performance Assessment

The application of big data analysis technology in the dragon boat sports teaching is mainly reflected in the data collection, analysis and feedback links. Through wearable devices, sensors and video analysis tools, students' movement data can be collected in real time, such as paddle frequency, heart rate, teamwork, etc. Based on these data, teachers can make scientific evaluation of student performance, find problems in training and provide targeted suggestions for improvement. In addition, big data analysis also supports the design of personalized teaching programs, and makes differentiated training plans according to students' physical fitness level and technical characteristics, so as to maximize the teaching effect.

As shown in Table 1, teachers can quickly evaluate the student training performance through the table data, and then develop personalized teaching plans; students can adjust the training strategies according to the improvement suggestions provided by teachers to improve their personal ability and teamwork level; at the same time, the teaching manager can optimize the resource allocation with the help of data analysis, and finally provide scientific basis and data support for improving the overall teaching effect.

3.3 Online Teaching Platform and Remote Collaboration

The emergence of online teaching platform has brought revolutionary changes to the teaching of dragon boat sports. With only one piece of equipment, students can immerse themselves in the vast world of dragon boat sports anytime and anywhere. On the platform, the rich theoretical knowledge system, from the historical origin of the dragon boat to the competition rules, for the students to build a solid foundation for learning. The high-definition teaching video vividly shows the core content of rowing skills and teamwork, so that the students feel as if they are in the training site, and the details show the ingenuity of the coach.

In particular, the platform has also introduced virtual simulation technology, allowing students to conduct remote training in a virtual environment. This immersive experience not only improves the training effect, but also stimulates the students' enthusiasm for learning. The online discussion area has become a stage for the collision of ideas between teachers, students and students, where questions are answered and wisdom is gathered here.

The application of remote collaboration technology has broken the regional boundaries, allowing the dragon boat teams of different universities to cross the mountains and rivers to realize online joint training and simulation competition. This not only promotes the exchange and promotion of dragon boat skills, but also promotes the wide dissemination of dragon boat culture. The coverage of teaching resources has thus been broadened, and the popularity of dragon boat sports has also increased. It can be said that this online teaching platform not only provides a new practical example for the dragon boat sports teaching, but also points out the direction for the digital transformation of physical education teaching in colleges and universities.

Table 1. Application of Large Number Analysis Technology in Dragon Boat Sports Teaching

Student number	Heart rate (sub/min)	Paddle frequency (sub/min)	Paddle strength (N)	Paddle angle (degree)	Team cooperation (%)	Training duration (minutes)	assessment result	recommendations for improvement
1	120	45	150	60	85	60	good	Increase the paddle frequency to 50 times / minute, and optimize the team coordination to 90%.
2	130	40	140	55	80	55	same as	Increase the paddle strength to 160N, and adjust the paddle Angle to 60 degrees.
3	110	50	160	65	90	65	outstanding	Keep the current state and focus on heart rate control to avoid excessive fatigue.
4	140	38	130	50	75	50	Need to improve	Increase the paddle frequency to 45 times / minute and enhance team teamwork to 85%.
5	135	37	135	52	78	52	Need to improve	Increase the paddle strength to 150N, and increase the paddle frequency to 42 times / minute.
6	128	43	142	57	83	57	same as	Increase the paddle frequency to 46 times / minute and enhance team teamwork to 87%.
7	122	49	158	64	91	64	outstanding	Maintain the current state, focusing on heart rate control and paddle strength stability.

4. The Implementation Path of Digital Enabling Dragon Boat Sports Teaching

4.1 Digital Integration of Teaching Resources

The digital integration of teaching resources has inserted the digital wings for the dragon boat sports teaching. Traditional teaching resources, such as teaching videos, courseware, training manuals, etc., have become easy to store, spread and use after careful digital processing. These resources are no longer limited to paper or physical media, but are converted into electronic formats that can be accessed through electronic devices anytime, anywhere.

To make more efficient use of these resources,

we have constructed a unified digital repository. This resource base is not only a huge treasure house of knowledge, but also an orderly information management system. It carefully classifies the resources according to the course content, difficulty level, teaching objectives and other dimensions, so that teachers and students can quickly find the required materials. The addition of the cloud platform has broken the space limitation, realized the seamless sharing of resources, and made learning everywhere.

Digital repository also has the ability of dynamic update. With the continuous progress of dragon boat sports technology and the deepening of teaching research, we continue to incorporate the latest teaching content and research results into the resource pool to ensure the timeliness and practicability of resources. This mechanism of continuous renewal makes the resource pool always keep dynamic and provides a steady stream of learning power for the teaching of dragon boat sports.

Through the digital integration of teaching resources, the teaching of dragon boat sports has more abundant learning materials and more diversified teaching modes, which has laid a solid foundation for cultivating high-level dragon boat athletes..

4.2 Improvement of Teachers' Digital Literacy

Teachers' digital literacy is the core element of the success of digital enabling dragon boat sports teaching. In order to improve teachers' digital literacy, colleges and universities must attach great importance to it and take action. Regular training is an effective way to improve teachers' digital skills. Colleges and universities should carefully organize digital technology training courses, covering virtual reality (VR), augmented reality (AR), big data analysis software and other cutting-edge technologies, to ensure that teachers can keep pace with The Times and master the latest digital tools. These training programs not only impart technical knowledge, but also, more importantly, guide teachers to think about how to integrate these technologies into the teaching of dragon boat sports to maximize the teaching effect. The improvement of teachers 'digital literacy is a continuous process, which requires teachers' own efforts and external support. By participating in professional training and learning, teachers can systematically master the basic principles and application skills of digital technology. At the same time, teaching practice is the touchstone of improvement of teachers' digital literacy. Teachers should have the courage to try, apply the technology they have learned to the actual teaching, and accumulate valuable practical experience through continuous exploration and reflection.

In addition, academic exchanges and cooperation are also an important way to improve teachers' digital literacy. Colleges and universities should encourage teachers to actively participate in academic exchange activities, learn from successful cases in other universities or fields, learn from advanced experience, and broaden their horizons. Finally, a digital literacy evaluation system for teachers should be established to encourage teachers to regularly evaluate their digital skills and teaching application ability to continuously improve their own abilities to meet the needs of digital teaching.

4.3 Increase in Student Participation

The role of digital technology in improving students' participation in dragon boat sports teaching cannot be underestimated. First, the introduction of virtual reality (VR) and augmented reality (AR) technology has brought students an unprecedented immersive learning experience. Through the VR equipment, students can "experience" the tension and passion of the dragon boat race, and feel the strength and tacit understanding of teamwork. This feeling of immersive has greatly stimulated their interest and motivation in learning. AR technology can stack virtual information in the real world, so that students can access professional dragon boat sports data and feedback in daily training, help them better understand the essentials of movements and improve the training effect.

Online teaching platforms and mobile learning applications break the constraints of time and space, allowing students to participate in the learning of dragon boat sports anytime and anywhere. These platforms not only provide rich learning resources, such as teaching videos, training manuals, interactive q & A, etc., but also increase the fun and challenge of learning through gamification design, such as points system, leaderboards, etc., and further enhance students' participation. Students can interact with teachers and students in real time on the platform, share their learning experiences, and

solve problems together, thus forming a positive learning atmosphere.

In addition, digital technology also supports the cultivation of students' autonomous learning ability. The application of big data analysis technology enables students to understand their own training performance in real time, such as paddle speed, strength allocation, teamwork and other key indicators, so as to find their own deficiencies and make personalized improvement plans. This data-driven autonomous learning mode not only improves the training efficiency of students, but also cultivates their independent thinking ability and self-management ability. At the same time, the application of online discussion and collaboration tools also enables students to give full play to their strengths in teamwork and jointly contribute to the progress of the team.

To sum up, the application of digital technology in the teaching of dragon boat sports not only improves the participation of students, but also promotes the cultivation of their independent learning ability and team spirit, injecting new vitality into the future development of dragon boat sports teaching.

5. Challenges and Countermeasures

5.1 Challenges of Technology Application

The application of digital technology in dragon boat sports teaching is facing the challenges of technical cost and equipment demand. First of all, the price of virtual reality (VR), augmented reality (AR) and other high-end technology equipment is high, and universities need to invest a lot of money to purchase equipment and maintain its normal operation. In addition, the development and maintenance of big data analysis and online teaching platforms also need professional technical support, which puts forward high requirements for the technical ability and resource allocation of universities. In response to these challenges, universities can reduce the cost of technology by cooperating with enterprises and applying for funding for scientific research projects, and introduce digital technology in stages to give priority to meeting the core teaching needs. Secondly, the popularization and promotion of technology application is also an important issue. Colleges and universities can organize technical training, develop demonstration courses and through the promotion of successful cases, teachers and students to improve the cognition and acceptance of digital technology, and gradually realize the comprehensive popularization of technology.

5.2 Change of Teaching Mode

While digital empowerment promotes the transformation of teaching mode, it also brings the challenge of the integration of traditional teaching mode and digital teaching. The traditional teaching model is teacher-centered and pays attention to face-to-face guidance and practical training, while the digital teaching emphasizes students' independent learning and technical assistance. How to combine the two organically is the key of teaching reform. On the one hand, teachers need to redesign the course content and integrate digital technology into the teaching link, such as combining VR simulation training with field training to improve the teaching effect. On the other hand, the role of teachers also needs to be changed from knowledge imitator to learning guide and technical supporter, which puts forward higher requirements for teachers' digital literacy and teaching ability. Colleges and universities can help teachers adapt to the role change and promote the innovation of teaching mode by organizing teaching seminars and providing teaching resource support.

5.3 Improve Student Acceptance

Students' acceptance and adaptability to digital technology are important factors for the success of digital enabling teaching. Some students may feel unfamiliar or uncomfortable with the new technology, resulting in low participation. To this end, colleges and universities can adopt the following strategies to improve students' acceptance: First, by carrying out technical experience activities and interest groups, students can personally experience the advantages of digital technology and stimulate their interest in learning. Secondly, in the teaching process, we should pay attention to step by step, starting from the simple technology application, and gradually increase the difficulty to help students adapt to the digital learning methods. In addition, universities can also increase students' participation by designing highly interactive and interesting teaching content (such as gamified learning, virtual competitions, etc.). At the same time, a student feedback mechanism should be established to

timely understand students 'learning experience and needs, and teaching strategies should be adjusted to ensure that the application of digital technology can truly meet students' learning needs.

6. Conclusion

This study discusses the innovative application of dragon boat sports in college physical education under the background of digital empowerment, and shows that digital technology has a positive impact on the teaching of dragon boat sports. Through the application of virtual reality (VR), augmented reality (AR), big data analysis and online teaching platform and other technologies, dragon boat sports teaching has been significantly improved in teaching methods, learning experience and teaching effects. Digital technology not only breaks through the venue and time limit in traditional teaching, but also enhances students' participation and interest in learning through data-driven personalized teaching and immersive learning experience. At the same time, digital empowerment provides a new idea for the digital transformation of physical education in colleges and universities, showing its great potential in improving the teaching quality and optimizing the allocation of teaching resources. In the future, with the further development of technology, the application of digital technology in the teaching of dragon boat sports will be more extensive and in-depth. For example, the introduction of artificial intelligence technology can further optimize teaching evaluation and personalized learning support, while the popularization of 5G technology will provide more powerful technical support for remote collaboration and real-time interaction. Colleges and universities should actively explore the deep integration of digital technology and physical education, promote the comprehensive digital transformation of physical education, and provide strong support for the cultivation of high-quality talents with innovative ability and practical ability.

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