Analysis of the Application Effect of Online and Offline Hybrid Teaching Mode in Physical Education Teaching of Undergraduates

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Abstract: With the deepening development of educational informatization, the blended online-offline teaching model has gradually become a key direction for higher education reform. As an essential component of higher education, undergraduate physical education bears the responsibility of enhancing students 'physical fitness, cultivating sports skills, and fostering sportsmanship. Traditional physical education models, constrained by time and space limitations, struggle to meet students' personalized and diverse learning needs. This paper explores the practical application of blended online-offline teaching models in undergraduate physical education, analyzing their actual effects on students' mastery of sports theory knowledge, acquisition of sports skills, learning interest and autonomy, physical health levels, and teaching management efficiency. It also identifies challenges encountered during implementation and proposes corresponding optimization strategies, aiming to provide theoretical references and practical insights for the reform of undergraduate physical education.

Keywords: Blended Teaching; Undergraduate Education; Physical Education; Teaching Effectiveness; Information-Based Teaching

1. Introduction

Under the dual impetus of the "Healthy China" strategy and the modernization of education, the importance of physical education in higher education has become increasingly prominent. Traditional undergraduate physical education is primarily teacher-centered, conducted in fixed time and locations through face-to-face instruction, focusing on the demonstration and repetitive practice of sports skills. Although this model ensures a certain level of teaching order and skill transmission efficiency, its drawbacks have become increasingly apparent: the teaching content and methods are relatively monotonous, making it difficult to accommodate individual differences and interests among students; theoretical and practical teaching are often disconnected, leading to a superficial understanding of sports principles and health knowledge; teaching evaluations are predominantly based on summative skill assessments, with insufficient formative evaluation; furthermore, the limited classroom time fails to meet students' needs for skill consolidation and deeper understanding.

Meanwhile, information technologies represented by the internet, big data, and artificial intelligence are profoundly reshaping educational paradigms. The blended learning model has emerged as a response to this trend. Unlike a simple combination of online learning and offline instruction, it systematically integrates the flexibility of digital learning with the advantages of traditional face-to-face teaching-such as emotional interaction and practical guidance-to optimize educational outcomes [1]. While this model has demonstrated significant potential in many theoretical disciplines, its application in highly practical fields like physical education remains in the exploratory and developmental stages. Therefore, a systematic analysis of blended learning's effectiveness in undergraduate physical education holds important theoretical and practical significance for advancing teaching reforms and enhancing the quality of talent cultivation.

2. Construction and Implementation of Blended Teaching Model in Undergraduate Physical Education

The construction of the undergraduate sports hybrid teaching model should be closely integrated with the practicality, physical participation, and strong safety characteristics of

the sports discipline, and should involve an integrated design of teaching objectives, content, activities, and evaluation [2].

2.1 Hierarchical Design of Teaching Objectives

The blended learning model facilitates multi-dimensional and tiered educational objectives. The online component emphasizes cognitive and comprehension-based goals, including understanding sports history, competition rules, technical principles, biomechanics fundamentals, and sports health and injury prevention. The offline component focuses on application, analysis, and creative development, such as skill imitation, practice, error correction, tactical coordination under teacher guidance, as well as physical fitness enhancement, team spirit cultivation, and willpower building.

2.2 Restructuring of Teaching Content and Resource Development

The key to implementation lies in modularizing teaching content. Theoretical and cognitive components (e.g., rule analysis, nutritional knowledge, and training methodology principles) can be developed into digital resources such as micro-videos, PPTs, documents, and interactive quizzes, which are uploaded to online platforms (e.g., Chaoxing Learning Hub, Yu Classroom, MOOC platforms) for students' pre-class self-study. Practical content remains in offline classrooms to address skill acquisition challenges and individualized learning needs. Resource development must prioritize quality, with videos featuring standardized action demonstrations, error analysis, slow-motion breakdowns, and clear narration.

2.3 Restructuring of Teaching Activity Processes

The typical hybrid physical education teaching process includes:

Pre-class online guidance: Students access designated learning materials on the platform, complete pre-class quizzes on key concepts, and submit questions in the discussion forum. Teachers leverage platform feedback to accurately assess learning progress and adjust in-person teaching priorities accordingly.

In-class offline learning: Classroom time is primarily allocated to: (1) Quick assessments and Q&A sessions to address common challenges in online learning; (2) Detailed explanations and advanced demonstrations of key skills; (3) Organizing group exercises, games, and competitions, with teachers providing on-the-spot guidance and individual feedback; (4) Introducing scenario simulations and case analyses to enhance students' ability to apply knowledge to solve real-world problems [3].

Post-class online extension and consolidation: Students upload their practice videos to the platform for self-assessment and peer evaluation; teachers may release extended learning materials or challenging tasks; the platform's discussion area is utilized for reflection, summarization, and experience sharing. Post-class exercise data (e.g., running distance and workout duration recorded via sports apps) can also be incorporated into the learning process management.

2.4 Innovation in Teaching Evaluation System

Develop a comprehensive evaluation system that integrates online and offline components while connecting learning processes with outcomes. Online assessments may include: resource completion rates, pre-class quiz scores, discussion forum engagement quality, and post-class video assignments. Offline evaluations should cover: classroom participation, in-class skill assessments, physical fitness tests, and competitive performance. By leveraging the platform's data logging capabilities, the learning process can be visualized, ensuring evaluations are more comprehensive, objective, and dynamic.

3. Analysis of the Application Effect of Blended Teaching Model in Undergraduate Physical Education

Based on the existing practice research and teaching feedback, the application effect of the blended teaching mode in undergraduate physical education teaching is mainly reflected in the following aspects:

3.1 Promoting the Deepening and Internalization of Students' Theoretical Knowledge in Physical Education

Traditional physical education classes often compress or neglect theoretical instruction due to time constraints. Blended learning moves theoretical knowledge online, allowing students to self-manage their study schedules. Through

repeated video viewing and material reading, they gain in-depth understanding of sports principles and health knowledge. Pre-class quizzes and interactive discussion forums help consolidate learning outcomes promptly, preparing students to attend offline classes with questions in mind-making theoretical learning more targeted and proactive. Research shows that students using blended learning outperform those in traditional teaching models in both physical education theory exam scores and comprehension of sports science knowledge.

3.2 Enhancing the Efficiency and Personalization of Motor Skill Learning

This model transforms traditional classrooms from one-way skill instruction to interactive learning environments, empowering teachers to provide tailored guidance. Before class, students develop foundational motor skills through standardized action videos, reducing blind imitation during lessons. Instructors can then focus on correcting both common errors and individualized challenges with targeted interventions. After class, students' self-recorded practice videos enable self-reflection while receiving remote feedback from teachers and peers, creating a "learn-practice-feedback-relearn" cycle that extends skill acquisition. This approach proves particularly beneficial for students with weaker foundations or slower learning paces, who can repeatedly review online resources and receive personalized support based on their individual needs.

3.3 Stimulating Students' Learning Interest and Self-Training Awareness

Abundant online multimedia resources-such as highlights of exciting events, expert technical analyses, and fitness instructional videos-prove more engaging than text-based materials alone. Social learning features like online discussions, likes, and peer reviews enhance interactivity and enjoyment. Students transition from passive recipients to active participants and self-managers in the learning process, with their central role becoming increasingly prominent [4]. Moreover, blended learning transcends the classroom confines of physical education by extending exercise routines beyond school hours. Through online task-driven activities (e.g., weekly running check-ins, home workout video follow-ups) and community-based motivation, this approach cultivates lifelong sports awareness and habits.

3.4 Optimizing Teaching Process Management and Decision-Making

The online teaching platform provides educators with robust data support. Teachers can monitor real-time metrics such as individual students' study duration, test scores, and interaction frequency, enabling them to accurately identify struggling learners and disengaged students for timely intervention. Through comprehensive analysis of learning data, educators can scientifically evaluate the effectiveness of instructional designs, dynamically adjust teaching pace and strategies, and implement "teaching tailored to learning needs." This shift from experience-driven to data-driven teaching management enhances the precision and scientific rigor of educational administration.

3.5 Expanding Teaching Dimensions to Alleviate Resource Pressure

Blended learning has partially overcome the limitations of fixed schedules and venues in physical education. By conducting theoretical studies and cognitive tasks online, schools can free up class hours for in-depth skill practice or organizing competitions. For institutions with limited teaching resources or facilities, sharing high-quality online materials helps compensate for resource shortages, providing students with more diverse and higher-quality learning opportunities.

4. Challenges and Issues in Application

4.1 Higher Requirements for Physical Education Teachers' Information Literacy and Instructional Design Competence

Teachers must not only possess solid expertise in physical education but also master information technology skills such as video recording and editing, online platform operations, and organizing online interactions. More importantly, they need to integrate online and offline teaching activities seamlessly through holistic design. This poses a significant challenge for educators accustomed to traditional teaching methods, requiring systematic training and support [5].

4.2 Challenges in Quality Monitoring and Effectiveness Assurance of Online Learning Components

Physical education is inherently practice-oriented, and online learning cannot fully replace hands-on training. Teachers find it challenging to monitor whether students have truly engaged with videos or grasped the principles, or if they are merely going through the motions to complete tasks. The varying levels of self-directed learning and self-discipline among students may lead to polarized outcomes in online learning, ultimately compromising the equity of starting points in offline instruction.

4.3 The Particularity of Sports Practice Puts Forward Higher Requirements for Blended Design

For sports with high dependence on venue equipment, stringent safety requirements, or immediate physical contact (e.g., gymnastics, swimming, and sanda), the design of online components presents significant challenges. Key issues requiring in-depth research include how to effectively convey the power, rhythm, and spatial dynamics of movements through online resources, as well as ensuring student safety during extracurricular self-practice.

4.4 The School's Information Infrastructure and Support Service System Require Comprehensive Improvement.

A stable network environment, convenient video recording conditions, and functional teaching platforms form the foundation for implementing blended learning. Additionally, corresponding teaching management systems, incentive policies, and technical support teams are required as safeguards. However, some universities still exhibit insufficient investment in these aspects, which hinders the widespread adoption of blended learning.

4.5 The Fairness and Scientificity of Teaching Evaluation Require Further Exploration

How to rationally allocate the weight of online and offline evaluations, how to objectively assess the quality of online discussions and the technical proficiency of post-class practice videos, and how to prevent potential "score manipulation" in online evaluations-all require the design of more refined and scientific evaluation criteria and tools.

5. Suggestions for Optimizing the Hybrid Teaching Model of Undergraduate Physical Education

To promote the healthy development of blended online-offline teaching models in undergraduate physical education, the following optimization strategies are proposed to address the aforementioned challenges [6]:

5.1 Enhance Teacher Training and Build a Teaching Community

Higher education institutions should organize multi-level and multi-form training programs on information-based teaching competencies, covering topics such as blended learning concepts, instructional design methodologies, and the application of information technology tools. It is encouraged to establish interdisciplinary research teams or teacher workshops focused on blended teaching, fostering collaboration between physical education teachers and educational technology experts. These initiatives aim to share successful case studies and jointly address practical challenges in the field.

5.2 Carefully Design Online Content to Enhance Interaction and Feedback

Online resource development should adopt a "less but better" approach, focusing on core theories and key action analysis to create high-quality, engaging micro-lectures. Design thought-provoking and challenging online learning tasks rather than mere viewing and quizzes. Leverage platform features like discussion forums, real-time comments, and live polls to enhance interaction between teachers and students, as well as among peers. Teachers should actively participate in online discussions, promptly address student inquiries, and provide constructive feedback.

5.3 Innovate Offline Classroom Formats to Enhance Skill Development

Traditional classroom instruction should completely transform the conventional "teacher-led, student-practiced" model, adopting more inquiry-based, collaborative, and gamified teaching approaches. For instance, students could analyze movement techniques of peers using online learning materials; design small-scale teaching competitions to apply tactical theories in practice; or organize physical fitness challenges. This would transform offline classrooms into core spaces for knowledge application, skill refinement, emotional

exchange, and socialized learning.

5.4 Improve the Evaluation Mechanism, Emphasizing Process and Development

Refine evaluation metrics by incorporating online learning engagement, interaction quality, and reflective depth into formative assessments. For skill evaluation, adopt a hybrid approach combining "self-assessment/peer review via online videos with teacher evaluations in person." Explore using wearable devices and motion sensors to objectively track students 'extracurricular exercise data, which can serve as an evaluation reference. The final assessment should reflect students' progress from initial learning stages to the end point, rather than merely their final proficiency level.

5.5 Increase Investment and Policy Support to Improve the Safeguard System

Schools should increase investment in digital infrastructure and software resources for physical education, including smart gymnasiums and virtual simulation labs. Academic departments need to implement supportive policies for blended learning reform, covering course credit recognition, teaching workload calculation, and teaching achievement evaluation. A stable technical support and teaching consultation service system should be established to alleviate teachers' concerns when adopting blended teaching methods.

6. Conclusion and Outlook

The blended online-offline teaching model has revitalized undergraduate physical education reform. By restructuring curricula, integrating premium resources, and expanding instructional dimensions, it effectively fosters the coordinated development of students' sports theory knowledge, athletic skills, self-directed learning, and exercise habits, while elevating the precision of teaching management. Practice demonstrates that blended teaching does not diminish the practical nature of physical education, but rather empowers hands-on instruction through technology to enhance its efficiency, personalization, and depth.

However, the successful implementation of blended teaching is not an overnight achievement. It constitutes a systematic endeavor that confronts multifaceted challenges including teacher competency, student adaptability, instructional design, evaluation frameworks, and institutional support. Moving forward, the development of undergraduate physical education blended teaching should focus on three key directions: First, advancing toward "deep integration"-evolving from superficial mixing to seamless online-offline integration grounded in learning science theories. Second, pursuing "intelligentization"-exploring AI applications for automated movement recognition and correction, personalized learning path recommendations, and big data analytics for physical health. Third, building an "ecological ecosystem"-strengthening connections between school sports programs, community sports initiatives, and home-based exercise through digital platforms to create a comprehensive sports education environment.

In conclusion, the blended online-offline teaching model is an inevitable trend and an important path for the development of undergraduate physical education in the information age. Only by facing the challenges squarely and continuously exploring and optimizing can we fully tap its potential, truly achieve the shift from "teaching" as the center to "learning" as the center, cultivate high-quality talents with sound minds, strong physique, and all-round development, and lay a solid foundation for the construction of "Healthy China".

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