

APPLICATION OF BASKETBALL CURRICULUM IN GUANGZHOU VOCATIONAL AND TECHNICAL UNIVERSITY OF SCIENCE AND TECHNOLOGY BASED ON BLENDED TEACHING METHODOLOGY

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ABSTRACT

The objectives of this study were 1) to study whether blended learning method was applicable to undergraduate basketball classes and, 2) to compare the blended learning method more effective than traditional teaching methods in improving students' skill learning. This research was quantitative research. The conceptual framework of this research was applied from Motor learning, theory constructivist theory and learning assessment theory of Ducan, Xi Yang's studies. The population consisted of 65 students in Class 1 and class 2 of the Computer Science program at G University. The samples of 28 students in Class 1 and Class 2 of the Computer Science major at Guangzhou Vocational and Technical University, totaling of 56 students. Class 1 was the experimental class, and Class 2 was the control class as selected by purposive sampling. The instrument used in the study was an achievement test. The statistics used for data analysis were percentage, frequency, mean, standard deviation, and t-test. The result of this study found that 1) the blended learning method can be applied to undergraduate basketball teaching and is generally superior to traditional teaching methods, and the research hypothesis was valid, 2) the blended learning method has a significant effect on improving basketball skills. In the post test, all indicators of the experimental group were better than those of the control group; in the pre-test and post-test, both classes showed significant improvement in various posttests compared to the pre-test.

Keywords: Application, Basketball Curriculum, Blended Teaching Methodology

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INTRODUCTION

In recent years, China's rapid economic growth and increasing global competitiveness have placed a premium on higher education as a critical factor for nurturing talent and fostering innovation. As the nation pushes to remain competitive on the international stage, significant attention has been focused on improving the quality of education. The Chinese government has actively promoted contemporary pedagogical strategies to meet this demand, one of which is blended learning. This educational approach, which merges traditional in-person teaching with digital learning platforms, is seen as an innovative strategy to enrich educational experiences and outcomes across various disciplines, including physical education.

Physical education plays a pivotal role in China's broader national fitness initiative, which seeks to promote physical well-being, develop athletic skills, and foster a lifelong appreciation for sports among students. Basketball, in particular, is one of the core sports in physical education programs, given its popularity and the comprehensive physical and cognitive skills it develops. Despite its importance, the traditional methods of teaching basketball in higher education have faced challenges in adapting to the diverse needs of students and keeping up with modern educational trends.

The outbreak of the COVID-19 pandemic further catalyzed a shift toward integrating blended learning models, accelerating the adoption of online and offline instructional methodologies across all levels of education. As universities worldwide grappled with the need for remote learning, the pandemic underscored the flexibility and potential advantages of hybrid teaching methods, especially in maintaining educational continuity and quality during disruptions. In the context of physical education, particularly basketball, this shift opened up new possibilities for improving the delivery of skill-based courses, which have traditionally relied on in-person instruction.

Blended Learning in Basketball Education, Blended learning has emerged as a transformative approach in physical education due to its ability to combine the best of both worlds: the interaction and hands-on learning that in-person instruction offers, and the flexibility, personalized content, and rich resources provided by digital platforms. In the realm of basketball instruction, blended learning enables students to access online materials, such as instructional videos, skill-based quizzes, and interactive software, which complement their physical practice. This approach allows students to review techniques, strategies, and rules at their own pace, thereby reinforcing their in-class learning experiences.

Several key benefits make blended learning particularly well-suited to basketball education:

Flexibility: Students can learn and practice basketball skills at their own pace, revisiting key concepts and exercises through online resources as often as needed.

Personalization: Digital learning platforms offer tailored content and assessments that track each student's progress, helping instructors identify areas where individual students may need more focused attention.

Diversity of Resources: Blended learning provides access to a wide range of materials, from instructional videos to real-time feedback on performance, fostering a more dynamic and engaging learning experience.

However, despite the potential of blended learning to enhance basketball instruction, there are several challenges and limitations in the traditional teaching methods that have been slow to change. Conventional basketball education often relies on a one-size-fits-all approach, where the same methods and drills are used for all students, regardless of their individual skill levels or learning preferences. This lack of adaptability can lead to disengagement and lower motivation among students, as they may struggle to keep up with the pace or find the lessons irrelevant to their needs.

The Need for Further Research, while some schools and universities have successfully implemented hybrid teaching methods for basketball education, the approach remains

underutilized and understudied in many parts of the world, including China. Research on the specific benefits and challenges of blended learning in basketball education is still in its infancy, particularly concerning how this method compares to traditional teaching in terms of improving skill acquisition, student engagement, and overall physical fitness. Understanding these dynamics is crucial for designing more effective basketball curricula that cater to the diverse needs of students and prepare them for a lifetime of physical activity and well-being.

This gap by exploring the application of blended learning in undergraduate basketball classes at University G. By comparing the outcomes of a blended learning model with those of traditional basketball instruction, the research seeks to determine whether the hybrid approach offers significant advantages in terms of skill development and student engagement. Specifically, this research will examine whether blended learning leads to better performance in key basketball skills, such as shooting, dribbling, passing, and defensive strategies, and whether it fosters a higher level of student participation and enthusiasm for the sport.

The current landscape of basketball instruction in higher education presents several challenges that hinder the effectiveness of teaching. Traditional methods, while foundational, are limited by their lack of flexibility and failure to cater to individual student needs. These methods often emphasize rote drills and in-person demonstrations, which, while necessary, do not provide opportunities for students to reflect on their progress or engage with the material outside of class. Moreover, the absence of diverse instructional tools in conventional teaching.

LITERATURE REVIEWS

Blended Learning: A Transformative Approach to Education

Blended learning, as an educational methodology, integrates traditional face-to-face instruction with online learning, combining the strengths of both modalities to provide a more flexible, dynamic, and personalized learning experience. The history of blended learning can be traced through three distinct phases: first, the amalgamation of technology and education during the 1990s; second, the formalization and implementation of blended learning in the early 2000s; and finally, its widespread adoption and continuous improvement since the mid-2000s (Garrison & Vaughan, 2008). This approach is particularly well-suited to physical education, including sports like basketball, where online resources can complement practical, in-person training.

Blended learning often includes several key components: in-person instruction, online materials such as video lectures or interactive tools, self-directed learning opportunities, and real-time evaluation and feedback (Means et al., 2010). It enhances the educational experience by offering flexibility and fostering student engagement. For instance, students can access instructional materials at their convenience, allowing them to learn at their own pace, which is particularly useful in skill-based courses such as physical education. Additionally, blended learning can provide a platform for continuous interaction between students and teachers, with real-time feedback and assessments that help track students' progress and understanding of course material (Bonk & Graham, 2006).

Advantages of Blended Learning in Physical Education

The advantages of blended learning are particularly evident in physical education. In traditional settings, physical education often relies heavily on direct, teacher-centered instruction. However, this method may not always account for students' varying levels of ability, prior knowledge, or learning styles. Blended learning offers a solution by incorporating diverse teaching tools and methods that can be tailored to individual students' needs (Bailey et al., 2009). Through blended learning, students can engage in both physical practice and theoretical learning, using online resources to review techniques, strategies, or game rules at their own pace.

Moreover, the interactive nature of online learning platforms can encourage students to take a more active role in their learning process, leading to better engagement and improved outcomes. For example, video tutorials or interactive simulations can help students visualize and understand complex movements or strategies, which can then be applied during in-person practice sessions. The flexibility offered by blended learning also allows for more consistent practice, as students can review material or complete assignments outside of scheduled class times, leading to more continuous skill development (Griffiths & Toghil, 2012).

Conventional Pedagogical Approaches in Physical Education

Traditional pedagogical approaches, which have long dominated physical education, are characterized by a teacher-centered methodology. In this model, the teacher is the primary source of knowledge, and students are expected to absorb and replicate the information provided through direct instruction, demonstrations, and practice (Mosston & Ashworth, 2008). While this approach has its merits, particularly in providing structured and focused instruction, it often lacks the flexibility and adaptability needed to meet the diverse needs of students in physical education classes (Hardman & Marshall, 2009).

In the context of basketball education, traditional methods may involve repetitive drills, physical conditioning, and technique instruction, all directed by the teacher. While effective in building foundational skills, these methods often fail to engage students on a deeper cognitive level, as they emphasize rote learning over problem-solving, creativity, or strategic thinking. Additionally, traditional approaches can struggle to maintain student motivation and engagement, particularly if students feel they are not progressing or if the material does not connect to their personal interests or goals (Bailey et al., 2009).

The use of blended learning in basketball education offers a significant improvement over these conventional methods by allowing for greater individualization and student participation. For example, students can access video replays of their practice sessions to reflect on their performance, or they can engage in online discussions about game strategies, which can enhance their understanding and application of skills in real game situations (Armour & Harris, 2013).

Blended Learning in College Basketball Education

Research on blended learning in physical education, particularly in sports such as basketball, is still emerging, but initial findings suggest that this approach can lead to improved learning outcomes. A study by Keathley et al. (2013) demonstrated that students in a blended learning environment for basketball showed higher engagement and greater improvement in both physical skills and theoretical knowledge than those in traditional settings. The study found that the integration of online resources, such as instructional videos and interactive quizzes, allowed students to better retain information and apply it during in-person training sessions.

The general basketball course in college aims to provide students with a comprehensive understanding of the sport, including its rules, strategies, and physical skills (Harrison et al., 2007). By incorporating blended learning, instructors can offer a more well-rounded educational experience that combines the cognitive and physical aspects of basketball. Students can study the theoretical components of the game, such as rules and strategies, through online resources, while practical skills can be honed during in-person practice sessions. This dual approach helps students develop a deeper understanding of the sport and enhances their ability to apply theoretical knowledge in real-world scenarios (Griffiths & Toghil, 2012).

Curriculum Development and Implementation in Physical Education

The design and implementation of physical education curricula, particularly in the context of blended learning, must prioritize student engagement, physical development, and the cultivation of collaboration and social skills (Siedentop, 2009). Blended learning can support these goals by offering a variety of instructional methods and materials that cater to different learning styles and preferences. For example, students who struggle with traditional instruction

may benefit from the use of interactive online tools, while others may prefer the hands-on learning that comes with in-person instruction.

Moreover, blended learning encourages the development of self-directed learning skills, which are crucial for lifelong learning and physical fitness. By allowing students to access materials and complete assignments at their own pace, blended learning fosters a sense of responsibility and autonomy, helping students to take ownership of their learning and development (Bailey et al., 2009). This approach is particularly beneficial in physical education, where students must develop not only technical skills but also the motivation and discipline to maintain an active and healthy lifestyle.

Blended learning represents a significant advancement in the field of education, particularly in physical education and sports instruction. By combining the strengths of traditional in-person teaching with the flexibility and interactivity of online resources, blended learning offers a more personalized and effective learning experience. In the context of college basketball education, blended learning can enhance student engagement, improve skill acquisition, and foster a deeper understanding of the game.

The integration of online learning platforms allows for continuous feedback and assessment, helping students track their progress and identify areas for improvement. Meanwhile, in-person instruction provides the hands-on practice and direct interaction with instructors that are essential for skill development. This dual approach not only improves learning outcomes but also prepares students for lifelong physical activity and fitness.

Future research should continue to explore the potential of blended learning in physical education, with a focus on developing best practices for curriculum design and implementation. As educational technology continues to evolve, blended learning is likely to become an increasingly important component of physical education programs, offering new opportunities for student engagement and learning.

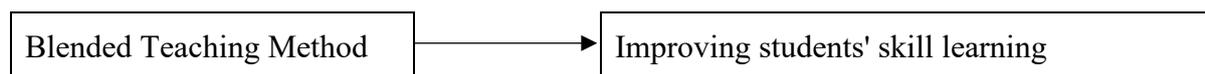


Figure 1 Conceptual Framework

RESEARCH METHODOLOGY

The population and Sample Group

The total population comprises 65 students from two courses within the Computer Science degree at G University. A total of 56 students were recruited from two classes, including 28 students in Class 1 (the experimental group) and 28 students in Class 2 (the control group), as per Krejcie & Morgan's table.

Research Instruments

This study's experimental practice material was rigorously aligned with the Syllabus established by the University of G, informed by expert interviews and current experimental research on collegiate basketball courses. The conventional teaching technique class was designated as the control group, and its course practice adhered to the standards and progression outlined in the syllabus. The hybrid teaching method class is classified as an experimental class, with the implementation plan restructured to align with the hybrid teaching method's requirements, while maintaining the core teaching content, credit hour distribution, and course timeline. The comprehensive plan design is detailed in the paper "4 Teaching Design and Application of Hybrid Teaching Method in Basketball General Courses of the University of G". The test indexes mostly include.

Data Collection

Control of experimental factors

1) The experimental group and the control group were taught by the author of this paper himself, and the teaching was completed according to the teaching design of the blended teaching method. On the premise of teaching content and maintaining the same teaching progress, the teaching environment, teaching venue, teaching content, teaching progress, etc., are kept as consistent as possible during the teaching practice.

2) Reasonable control of the time occupied by pre-class pre-study and post-class review in the experimental and control groups, to ensure the consistency between the experimental and control groups to the greatest extent possible.

3) Reasonable control of the intensity, density and attendance of practice in each class. The rest of the time in the same form to encourage students to actively participate in extracurricular basketball practice, but follow the interest of students and voluntary, not mandatory.

4) Both the pre-test and post-test were scored by the same teacher to maximise the reliability of the data.

Data Analysis

The statistics used for data analysis were percentage, frequency, mean, standard deviation, and t-test.

RESEARCH RESULTS

Table 1 The corresponding relationship between the teaching contents, teaching methods and teaching objectives stipulated in the Outline

Teaching objectives	Content of courses	Teaching method
Goal 1	The origin and development of basketball, the basic skills of basketball, the rules of basketball competition, the teaching and training of basketball skills.	1) Language method 2) Heuristic teaching method 3) Classroom discussion
Goal 2	Teaching methods of passing, dribbling in situ and dribbling past, catching, dribbling under the legs, dribbling behind the back, dribbling around, layup and basketball.	1) Intuitive method 2) Language method 3) Error prevention and correction method
Goal 3	Basketball technical and tactical practice, actual basketball competition, basketball teaching ability, basketball theoretical knowledge and basketball technical practice.	1) Intuitive method 2) Language method 3) Error prevention and correction method

The research results highlight the alignment between teaching objectives, content, and methods in the context of basketball instruction, particularly in applying blended learning methods. The use of varied teaching methods (intuitive, language-based, heuristic, error prevention and correction) aligns with the learning goals, which are rooted in skill acquisition, tactical understanding, and game theory. Here, each goal addresses different aspects of basketball instruction, from foundational knowledge to advanced skills and tactics.

Goal 1: Theoretical Understanding and Basic Skills

Teaching Objective: The objective here is to instill an understanding of the origin, development, and basic skills of basketball. This goal focuses on the cognitive and foundational knowledge necessary for students to comprehend the history and basic framework of basketball.

Course Content: The content here involves the basic rules, origins, and development of the sport, in addition to basic basketball skills (e.g., dribbling, passing).

Teaching Method: The methods used, such as the language method, heuristic teaching, and classroom discussion, focus on delivering information and facilitating understanding.

Language Method: This method involves clear communication of concepts through verbal explanations and descriptions. It is well-suited for imparting theoretical knowledge about the sport's rules and development.

Heuristic Teaching: This method encourages students to explore and discover concepts through guided questioning, which supports critical thinking and deeper engagement with basketball's historical context.

Classroom Discussion: Discussion fosters collaboration and knowledge-sharing among students, reinforcing understanding of basketball's foundational knowledge and developing students' ability to think critically about the sport's evolution.

Analysis of Results for Goal 1:

Effectiveness: This approach aligns with the goal of fostering an intellectual and foundational understanding of basketball. The combination of these teaching methods ensures that students not only memorize facts but also engage with the material in a way that deepens their understanding, which is essential in laying the groundwork for practical skills later on.

Blended Learning Application: In the context of blended learning, online tools such as videos about the history of basketball or online quizzes testing rule comprehension could supplement the in-person discussions and lectures. This would increase student engagement and allow for flexible learning outside the classroom.

Goal 2: Skill Acquisition and Practical Application

Teaching Objective: This objective focuses on mastering specific basketball skills, such as passing, dribbling (stationary and moving), layups, and advanced dribbling techniques like dribbling behind the back or between the legs.

Course Content: The content here is purely skill-based, focusing on the mechanics of basketball movements and the improvement of motor skills critical to game performance.

Teaching Method: Methods like intuitive learning, the language method, and error prevention and correction are used to guide students toward mastering these practical skills.

Intuitive Method: This method involves learning by observation and imitation, where students can watch demonstrations and imitate proper techniques. This is critical in a sport like basketball where correct form and movement are key to success.

Language Method: Clear verbal instructions help in breaking down complex skills like dribbling and passing into manageable steps for students to follow.

Error Prevention and Correction Method: This method allows instructors to observe students' performances closely and provide immediate feedback, correcting improper techniques and helping students refine their abilities through practice.

Analysis of Results for Goal 2:

Effectiveness: The combination of these methods is effective for skill development. Observation (intuitive method) helps students understand the mechanics of movement, while error correction ensures that bad habits are addressed early. The real-time feedback and hands-on instruction can significantly improve motor skills.

Blended Learning Application: Videos demonstrating basketball techniques, coupled with self-assessment quizzes or interactive simulations, could allow students to practice skills outside of class time. Online tutorials that provide visual breakdowns of complex movements could enhance understanding, while in-class time would be used for hands-on practice and immediate feedback from instructors.

Goal 3: Advanced Basketball Techniques and Tactical Knowledge

Teaching Objective: The third objective is centered on higher-level basketball knowledge, including tactical practices, gameplay strategies, and the development of theoretical basketball

knowledge. The objective also includes improving teaching ability for those who might go on to teach or coach basketball.

Course Content: This goal encompasses practical basketball competitions, tactical drills, and the theoretical study of basketball, including both individual and team tactics.

Teaching Method: As with skill development, this objective relies on a mix of the intuitive method, language method, and error prevention and correction.

Intuitive Method: In this context, students watch actual basketball games and practice tactical decisions, understanding how theoretical knowledge applies in real-life situations.

Language Method: Verbal explanations and strategy discussions help students grasp complex team dynamics and tactical approaches to basketball.

Error Prevention and Correction Method: By applying these methods in simulated or real game situations, instructors can guide students in making strategic decisions while correcting misunderstandings of tactical execution.

Analysis of Results for Goal 3:

Effectiveness: These teaching methods are highly suited to advanced basketball instruction, where students need to apply theoretical knowledge in game situations. Observing professional gameplay and participating in tactical drills allow students to understand not just the "how" but also the "why" behind basketball strategies.

Blended Learning Application: Tactics and gameplay strategies can be studied through online platforms, where students could watch recorded games, analyze plays, or participate in virtual strategy-building exercises. In-class time would then be used to practice these strategies in real games, where instructors could offer immediate feedback.

Blended Learning Potential: Across all three goals, the combination of traditional in-class instruction and blended learning tools offers substantial benefits. The flexibility of online resources complements the hands-on, real-time nature of basketball education, providing both cognitive and practical engagement with the subject.

Enhanced Engagement and Learning Outcomes: The research suggests that blended learning, through its combination of theoretical learning online and practical learning in class, may lead to greater engagement, skill acquisition, and understanding of both individual and team dynamics in basketball.

Flexibility in Learning: One of the standout benefits of blended learning is its flexibility. Students can engage with the material at their own pace outside of class, giving them more time to focus on skill development during in-class practice sessions.

Table 2 The final score results and analysis of the two classes

experimental class	Control class	T value	P value
87.57±3.53	82.82±3.34	3.289	0.001

From Table 2 presents the final score results of both the experimental class and the control class in the basketball course. The analysis focuses on the comparison of the two classes' performance, with particular attention to the effectiveness of the blended learning method.

Experimental Class Final Score: 87.57 ± 3.53

Control Class Final Score: 82.82 ± 3.34

T-value: 3.289

P-value: 0.001

1) Score Comparison:

The final scores show that students in the experimental class, who received instruction via the mixed (online+offline) teaching method, outperformed those in the control class, which followed the traditional method. The mean score of the experimental class (87.57) is

significantly higher than that of the control class (82.82), with a difference of approximately 4.75 points.

This result indicates that the blended learning method had a positive impact on student performance, leading to better learning outcomes compared to the traditional approach. The relatively low standard deviations (± 3.53 and ± 3.34) in both classes show that the students' performance was consistent within each group, implying that the blended method was effective for most students, not just a few outliers.

2) T-Value Analysis:

The t-value of 3.289 represents the difference in final scores between the two groups. In statistical analysis, a t-value greater than 2.00 usually indicates a significant difference between the two groups. A t-value of 3.289 is notably higher, further supporting the conclusion that the performance improvement observed in the experimental class was statistically significant and not due to random chance.

3) P-Value Significance:

The p-value of 0.001 confirms the statistical significance of the score difference between the two classes. A p-value below 0.05 (the standard threshold for significance) indicates that the observed difference in performance between the experimental and control groups is highly unlikely to have occurred by chance. In this case, the p-value of 0.001 suggests that the results are significant at the 1% level, meaning there is less than a 1% probability that the performance difference is due to randomness.

4) Effectiveness of Blended Learning:

The results of this analysis strongly support the effectiveness of the blended learning approach for teaching basketball skills. The higher scores in the experimental class suggest that combining online and offline learning methods provided students with a more comprehensive and engaging learning experience. Students in the experimental class likely benefited from the flexibility of online resources (e.g., video tutorials, self-paced learning) alongside hands-on practice during in-person sessions, which contributed to their better performance in assessments.

Enhanced Skill Acquisition: Blended learning likely allowed students to practice basketball skills at their own pace outside the classroom, using video tutorials and online resources. This self-paced learning could explain the significant improvement in their practical performance during offline sessions.

Immediate Feedback and Reinforcement: In-person practice in the experimental class ensured that students received immediate feedback from the instructor, enabling them to correct their mistakes and refine their skills more effectively than in the control class, where instruction was more rigid and teacher-centered.

The final score analysis demonstrates that the experimental class, which employed the blended learning method, significantly outperformed the control class, which relied on traditional teaching methods. The t-value and p-value both indicate that the difference is statistically significant. This supports the hypothesis that blended learning is a more effective teaching approach for basketball education, leading to improved student outcomes in both practical skills and theoretical knowledge.

This evidence suggests that blended learning can be an effective strategy for physical education, promoting better engagement, skill retention, and overall academic performance. Therefore, it is recommended that blended teaching methods be considered for wider implementation in physical education courses, particularly those focused on skill development, such as basketball.

DISCUSSION & CONCLUSION

This study investigated the effectiveness of blended learning in teaching basketball at the collegiate level. The results demonstrated that the blended learning method, which combines online and offline instructional strategies, significantly enhanced students' performance compared to traditional teaching methods. The experimental class, which utilized blended learning, scored notably higher (87.57 ± 3.53) than the control class (82.82 ± 3.34), with a t-value of 3.289 and a p-value of 0.001, confirming statistical significance.

Discussion

Blended Learning Impact: The findings highlight that blended learning facilitates better student engagement, flexibility, and practical skill acquisition. The integration of online resources (e.g., video tutorials, self-paced learning) enabled students to understand theoretical concepts and practice basketball techniques at their own pace, which resulted in improved performance during offline sessions.

Skill Reinforcement: The immediate feedback provided during in-person sessions, combined with self-paced online learning, allowed for effective skill correction and reinforcement, contributing to the superior performance of the experimental class.

Conclusion

Blended learning proved to be a more effective pedagogical approach for basketball education, enhancing both theoretical understanding and practical skills. Its flexibility and ability to cater to different learning styles led to better student outcomes. This study supports the wider implementation of blended teaching methods in physical education to improve learning outcomes and student engagement.

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Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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