

Design and Effect Analysis of “Online-Offline Blended Teaching” for Public Ballroom Dance Courses in Colleges and Universities

Huiqiu Guo

Sports Teaching and Research Department, Northeast Agricultural University, Harbin 150001, Heilongjiang, China

Corresponding author: Huiqiu Guo (e-mail: Ghq4844343@163.com)

ABSTRACT In response to the educational digital transformation strategy, this study constructs an online-offline blended teaching system for public ballroom dance courses in colleges and universities to overcome limitations of traditional teaching and achieve personalized adaptation. Using literature review, teaching experiment, questionnaire survey, interview, and mathematical statistics, a one-semester experiment is conducted with two parallel classes of public ballroom dance courses, with 45 students in each class. The experimental group adopts the blended teaching model, while the control group uses the traditional offline teaching model. Teaching effects are evaluated from academic performance, skill development, theoretical literacy, autonomous learning ability, and learning satisfaction. The results show that the experimental group achieves significantly higher midterm and final skill and theoretical scores than the control group, with final exam differences reaching $P < 0.01$. The improvement rate of underachieving students in the experimental group reaches 21.3%, and overall student satisfaction is 93.3%. Qualitative feedback is incorporated into optimization suggestions, confirming that blended teaching can improve learning outcomes and teaching quality in public ballroom dance courses.

INDEX TERMS blended teaching, ballroom dance, public physical education, teaching design, learning satisfaction

I. INTRODUCTION

A. RESEARCH BACKGROUND

AS the modernization of education deepens in the new era, the digital transformation of knowledge systems and cultural resources has become the core engine for the high-quality development of open education. This evolution leverages advanced technologies to bridge the gap between traditional artistry and modern pedagogical frameworks, ensuring that industrial heritage remains a cornerstone of comprehensive aesthetic and vocational growth. College physical education, as a key focus of current digital technology development, is crucial for building a high-quality modern digital teaching system [1]. Against the background of the integration of sports and education in China, public physical education courses in colleges and universities are facing an important opportunity for digital reform, which requires breaking the boundaries of traditional classrooms and constructing a diversified teaching model [2]. As a sport integrating physical education, art, and social interaction, ballroom dance (consistently defined herein as a standardized competitive dance form distinct from the broader "sports dance" category, which may include folk

or recreational dance in collegiate PE contexts) has become an important choice for public physical education courses in many colleges and universities due to its unique fitness and aesthetic value [3]. However, the traditional offline teaching model is still widely adopted in current public ballroom dance courses, which has many limitations [4,5]:

(1) Limited teaching hours, lack of effective practice guidance for students after class, making it difficult to accurately grasp movement essentials;

(2) Significant differences in students' basic levels, making it hard for classroom teaching to meet personalized needs;

(3) Single form of theoretical knowledge teaching, resulting in insufficient student interest in learning.

At the same time, the blended teaching model, relying on the core advantage of "online autonomous learning + offline interactive improvement", has been successfully applied in sports courses such as basketball [6] and orienteering [7], significantly improving teaching efficiency and quality. Introducing the blended teaching model into public ballroom dance courses in colleges and universities is not only an active response to the education digital transformation but

also an inevitable choice to solve the dilemmas of traditional teaching and meet students' diverse learning needs.

B. RESEARCH SIGNIFICANCE

1) Theoretical Significance

This study systematically constructs a blended teaching system for public ballroom dance courses in colleges and universities, enriches the theoretical connotation of ballroom dance teaching, expands the application research scope of blended teaching in art-related sports courses, and provides theoretical reference for the teaching reform of similar courses.

2) Practical Significance

Through empirical research, the feasibility and effectiveness of the blended teaching model are verified, forming a replicable and promotable teaching design plan.

C. RESEARCH STATUS AT HOME AND ABROAD

Blended teaching is a new teaching method that integrates traditional offline teaching with online teaching using information technology [8]. In the late 20th century, foreign scholars explored blended teaching, and the "blended" educational method has been accepted and widely adopted in the United States and European countries [9]. Many foreign scholars have conducted in-depth discussions on the relevant theories and practical applications of blended teaching, promoting the continuous progress and development of educational methods [10,11]. Domestically, research on blended teaching in public physical education courses has been increasing. Currently, domestic attention is mainly focused on the construction and practical application of technology-supported blended physical education teaching models. Scholars have explored blended teaching models for sports such as volleyball and basketball, and studies have confirmed that this model is superior to the traditional teaching model in improving students' motor skills and learning interest [9,12,13]. However, current research on public ballroom dance courses specifically is relatively scarce. While the bibliography includes studies on "sports dance" (a broader category), few focus on the systematic design and effect verification of blended teaching for standardized ballroom dance in public PE settings—filling this targeted research gap is the core contribution of this study.

D. RESEARCH IDEAS AND METHODS

1) Research Ideas

(1) First, define core concepts and sort out relevant theoretical foundations;

(2) Second, complete the overall design of blended teaching combined with the characteristics of public ballroom dance courses;

(3) Then carry out teaching experiments and collect relevant data of the experimental group and the control group;

(4) Finally, verify the teaching effect through statistical analysis and put forward optimization suggestions.

2) Research Methods

(1) Literature review: Systematically sort out literature and policy documents related to blended teaching and ballroom dance teaching;

(2) Experiment: Select two parallel classes as the experimental group (blended teaching) and the control group (traditional offline teaching) to carry out a one-semester teaching experiment;

(3) Questionnaire survey: Design questionnaires on students' learning experience and satisfaction, and distribute and collect them before and after the experiment;

(4) Interview: Conduct semi-structured interviews with teachers and students to collect qualitative data;

(5) Mathematical statistics: Use SPSS 24.0 to conduct statistical analysis on test scores and questionnaire data.

II. THEORETICAL FOUNDATIONS OF BLENDED TEACHING FOR PUBLIC BALLROOM DANCE COURSES IN COLLEGES AND UNIVERSITIES

A. CONSTRUCTIVIST LEARNING THEORY

Constructivist learning theory holds that knowledge is not unilaterally transmitted by teachers but actively constructed by learners through situational interaction [14]. Its core viewpoints include active constructiveness, situationality, and interactivity, emphasizing the dominant position of learners and the autonomy of the learning process. The enlightenment of this theory to blended teaching design lies in:

The online link provides a platform for students to independently construct knowledge. By releasing ballroom dance theoretical knowledge, movement decomposition videos, online discussion forums for movement analysis, and group collaboration tasks (e.g., choreographing simple steps and sharing works), students are guided to conduct independent preview and review to form initial cognition;

The offline link creates an interactive situation. Through teacher demonstration, group practice, pair cooperation and other forms, students deepen their understanding of movement essentials in practice and complete the secondary construction of knowledge.

B. HUMANISTIC LEARNING THEORY

Proposed by Maslow and Rogers, humanistic learning theory mainly studies human nature, potential, experience, value, creativity, and self-actualization, focusing on the all-round development of people [15]. Rogers believed that in the educational process, students should be the center, respect students' personalities, tap their developmental potential, and thus achieve the goal of self-actualization [16]. In blended teaching design, this theory is reflected in:

The online platform sets up personalized learning paths, allowing students to adjust their learning progress according to their own foundation, and meets personalized needs

through wrong question feedback, one-on-one Q&A and other forms;

Offline teaching adopts group teaching and hierarchical guidance models, pays attention to the learning status of students with different foundations, and improves students' learning confidence and emotional experience through encouraging evaluation, so as to achieve the balance between general teaching and personalized development.

C. COLLABORATIVE TEACHING THEORY

Collaborative teaching theory emphasizes the collaborative cooperation of various elements in the teaching system [17]. Through the collaborative interaction of online and offline teaching links, teaching resources, and teacher-student relationships, a teaching synergy is formed to improve teaching effect. Its enlightenment to blended teaching is reflected in three dimensions:

First, link collaboration to realize the closed-loop connection of "online preview → offline practice → online review";

Second, resource collaboration to integrate online digital resources with offline venue and equipment resources to form complementarity;

Third, teacher-student collaboration to realize asynchronous interaction between teachers and students, and among students through the online platform, and synchronous interaction through face-to-face communication offline, constructing a diversified interactive system.

III. DESIGN OF BLENDED TEACHING FOR PUBLIC BALLROOM DANCE COURSES IN COLLEGES AND UNIVERSITIES

A. DESIGN PRINCIPLES

(1) Goal-oriented principle: Closely follow the three-dimensional teaching goal of "knowledge + skills + literacy" for public ballroom dance courses. All teaching link designs are carried out around the improvement of core literacy to ensure the accuracy of teaching direction.

(2) Online-offline integration principle: Clarify the functional positioning of online "preview + review + expansion" and offline "practice + guidance + feedback", strengthen the connection of links, and avoid the disconnection between online and offline teaching.

(3) Combination of practicality and interestingness principle: Teaching content takes into account the basic skills and social application value of ballroom dance, and stimulates students' learning interest through competition video appreciation, classroom simulated dance parties and other forms.

(4) Balance between personalization and inclusiveness principle: Design hierarchical tasks for students with different foundations to ensure that underachieving students master core content and provide room for expansion for advanced students.

B. TEACHING GOAL DESIGN

(1) Knowledge goal: Students need to master the origin and development of ballroom dance, basic etiquette, dance classification (focusing on waltz and rumba) and style characteristics, and understand the technical essentials of core movements and the principle of music rhythm coordination.

(2) Skill goal: Proficiency in completing basic steps and simple combination movements of waltz and rumba, mastering core skills of pair cooperation, and having the performance ability to independently complete specified combinations and basic choreography ability.

(3) Literacy goal: Improve physical coordination, sense of rhythm and aesthetic ability, cultivate team cooperation awareness, social skills and a positive attitude, and develop the habit of independent exercise.

C. TEACHING CONTENT DESIGN

Combined with the characteristics of ballroom dance teaching and the advantages of blended teaching, the teaching content is divided into online and offline parts, forming a connection logic of "preview - reinforcement - consolidation". The specific content allocation is shown in Table 1:

D. TEACHING MODEL DESIGN

Construct a "three-stage closed-loop" blended teaching model to realize seamless connection between online and offline:

(1) Pre-class stage: Teachers release preview tasks through the Xuexitong platform, including theoretical courseware, decomposed movement videos and other resources, set preview questions and basic movement check-in tasks, collect students' questions, and accurately grasp the key and difficult points of teaching.

(2) In-class stage: Adopt the "offline-led + online-assisted" model. First, focus on answering students' preview questions; then teachers demonstrate movements and explain key and difficult points, and organize students to conduct group practice; real-time display excellent movement cases and students' practice videos through the online platform to carry out interactive comments; finally, assign offline practical tasks and online expansion tasks.

(3) Post-class stage: Students submit practice videos, complete review exercises, and participate in peer evaluation through the online platform; teachers conduct online Q&A, correct homework and provide personalized guidance, and optimize subsequent teaching content according to students' feedback.

E. SELECTION OF TEACHING RESOURCES AND PLATFORMS

The online platform selects Xuexitong, which has functions such as resource upload, task release, check-in, and interactive comments, adapting to the needs of blended teaching; online resources include self-made decomposed movement videos, professional teaching courseware, domestic and foreign competition videos, music libraries, and

TABLE 1. Allocation and Connection of Online and Offline Teaching Content for Public Ballroom Dance Courses in Colleges and Universities

Teaching Modules	Online Teaching Content	Offline Teaching Content	Connection Method
Basic Theory and Etiquette	Video courses on the development history, classification, and etiquette of ballroom dance; online quizzes; discussion forums for etiquette application scenarios	Etiquette practice; answering typical questions; case analysis	Online preview and quizzes → Offline practical reinforcement → Online expansion of etiquette knowledge
Basic Waltz	Preparatory posture; step-by-step video tutorials; rhythm training audio; analysis of common mistakes; group choreography tasks for simple steps	Teacher demonstration; individual step correction; partner cooperation guidance; group practice	Online imitation practice → Offline precise guidance → Online check-in review
Basic Rumba	Analysis of style characteristics; core step videos; music rhythm mastery skills; peer evaluation of practice videos	Step practice; rhythm coordination training; partner combination practice; performance skill guidance	Online preview of key points → Offline skill reinforcement → Online submission and review of combination videos
Combination and Choreography	Principles of combination choreography; appreciation of excellent works; choreography material library; online sharing of student choreography drafts	Group choreography guidance; simulated performance; teacher-student mutual evaluation	Online inspiration accumulation → Offline choreography practice → Online display and mutual evaluation of works

question banks, and also links to relevant course resources of the National Higher Education Smart Education Platform. Offline resources rely on standardized dance classrooms equipped with professional audio, mirror walls, dance bars and other equipment to provide guarantee for practical teaching.

F. TEACHING EVALUATION DESIGN

Adopt a diversified evaluation system of "process evaluation + summative evaluation" and "teacher evaluation + student evaluation". To avoid researcher bias, a double-blind grading system was implemented: skill assessments and theoretical tests were independently scored by two senior ballroom dance teachers (with over 10 years of teaching experience), and the average score was used as the final result. The scoring criteria were unified and quantified in advance (e.g., movement standardization: 40%, rhythm coordination: 30%, expression: 30%) to ensure objectivity. The specific evaluation indicators and weights are shown in Table 2:

TABLE 2. Evaluation Indicators and Weights of Blended Teaching for Public Ballroom Dance Courses in Colleges and Universities

Evaluation Type	Evaluation Indicators	Weight	Evaluation Subjects	Evaluation Methods
Process Evaluation (60%)	Online learning status (preview, review, check-in)	20%	Teachers	Statistical analysis of platform data
	Classroom participation and performance	15%	Teachers	Classroom observation records
	Group cooperation and planned tasks	15%	Teachers + Peer students	Planned skill tests; group scoring
	Workload completion quality	10%	Teachers	Workload completion and completion
Summative Evaluation (40%)	Final skill assessment (peer contribution)	20%	Two independent teachers (double-blind)	On-site assessment and scoring (unified criteria)
	Theoretical knowledge test	15%	Two independent teachers (double-blind)	Online closed-book exam (automated scoring + manual review)

IV. IMPLEMENTATION PROCESS OF BLENDED TEACHING FOR PUBLIC BALLROOM DANCE COURSES IN COLLEGES AND UNIVERSITIES

A. EXPERIMENT DESIGN

Two parallel classes of public ballroom dance courses for the 2024 cohort in a college were selected as the experimental objects. The experimental group (45 students) adopted the blended teaching model, and the control group (45 students) adopted the traditional offline teaching model. This study was approved by the Ethics Committee of Northeast Agricultural University, and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form. Students in both groups had no prior ballroom dance experience. Through pre-experimental tests, there was no significant

difference in physical coordination, sense of rhythm, etc. between the two groups ($P > 0.05$), indicating they were comparable for the experiment. The initial test results are shown in Table 3:

TABLE 3. Initial Test Scores of the Experimental Group and the Control Group

Groups	Average Skill Score (Full Score: 100)	Average Theoretical Score (Full Score: 100)	High-Achieving Group (Top 30%) Average Score	Underachieving Group (Bottom 30%) Average Score
Experimental Group	52.4 ± 4.8	54.7 ± 5.1	61.2 ± 3.5	43.1 ± 4.2
Control Group	51.8 ± 5.2	53.9 ± 4.9	60.5 ± 3.8	42.7 ± 4.5

The experimental period was one semester (18 class hours), with 1 class hour per week and 90 minutes per class hour. Midterm and final tests were designed as formative assessments integrated into the last 10 minutes of class (no additional class time occupied), focusing on key skills and knowledge to avoid disrupting instructional continuity. During the experiment, the teaching content, teaching hours, and teachers were consistent for both groups. To control for resource disparity, the control group was provided with equivalent physical materials (detailed handouts, movement diagrams, and printed music scores), ensuring the only variable was the blended teaching model (not the existence of learning resources).

B. IMPLEMENTATION STEPS OF BLENDED TEACHING IN THE EXPERIMENTAL GROUP

(1) Pre-class preparation: Build the Xuexitong online teaching platform and upload teaching resource packages; release preview tasks 3 days before class, requiring students to watch movement videos and complete basic check-in; collect the list of students' questions and adjust the key points of classroom teaching.

(2) In-class implementation: Answer preview questions and display typical wrong movements in the first 15 minutes; conduct movement demonstration, group practice and personalized guidance in the middle 60 minutes, and play excellent cases in real-time through the platform; summarize key points and conduct brief formative tests (midterm/final) in the last 10 minutes; assign offline practice and online review tasks.

(3) Post-class follow-up: Urge students to submit practice videos within 48 hours, and teachers correct and provide

feedback one by one; conduct online Q&A through the platform and release expansion resources once a week; adjust the subsequent teaching progress and content according to students' performance.

C. IMPLEMENTATION STEPS OF TRADITIONAL TEACHING IN THE CONTROL GROUP

Adopt the traditional offline teaching model. In class, teachers first explain theories and demonstrate movements, then organize students to conduct collective practice, and teachers patrol to guide and correct mistakes; students were provided with printed handouts (containing movement principles, step diagrams, and theoretical summaries) and 15 minutes of weekly offline after-class Q&A to ensure equivalent learning support and total learning time as the experimental group; assign written homework or practical training tasks after class, with no online platform access, and students review independently using physical materials.

D. DATA COLLECTION PROCESS

(1) Questionnaire survey: Before the experiment, the "Questionnaire on Students' Ballroom Dance Foundation and Learning Willingness" was distributed; after the experiment, the "Questionnaire on Learning Experience and Satisfaction with Blended Teaching" was distributed. 45 questionnaires were distributed to each group, and 45 valid questionnaires were recovered, with an effective recovery rate of 100%.

(2) Test data: Phased skill tests (basic steps, pair cooperation) and theoretical tests were conducted in the middle (Week 9) and at the end (Week 18) of the experiment, and the scores of both groups were recorded.

(3) Interview records: After the experiment, 10 students from the experimental group, 5 students from the control group, and the teaching teacher were selected for semi-structured interviews to record the feedback of teachers and students on the teaching model.

V. EFFECT ANALYSIS OF BLENDED TEACHING FOR PUBLIC BALLROOM DANCE COURSES IN COLLEGES AND UNIVERSITIES

A. ANALYSIS OF ACADEMIC PERFORMANCE EFFECT

Through statistical analysis of the midterm and final test scores of the two groups, the results are shown in Table 4:

TABLE 4. Statistical Comparison of Test Scores Between the Experimental Group and the Control Group

Test Steps	Groups	Average Skill Score (Full Score: 100)	Average Theoretical Score (Full Score: 100)	High-Achieving Group Average Score	Underachieving Group Average Score	P Value (Compared with the Control Group)
Initial Test	Experimental Group	52.4 ± 0.4	54.7 ± 0.1	61.2 ± 0.5	43.1 ± 0.2	< 0.05
	Control Group	51.8 ± 0.2	53.9 ± 0.4	60.5 ± 0.3	42.7 ± 0.5	
Midterm Test	Experimental Group	72.3 ± 0.6	75.4 ± 0.5	79.5 ± 0.2	60.8 ± 0.1	< 0.05
	Control Group	65.1 ± 0.2	68.2 ± 0.3	72.2 ± 0.4	58.2 ± 0.4	
Final Test	Experimental Group	85.6 ± 0.2	88.2 ± 0.7	89.8 ± 0.3	78.5 ± 0.3	< 0.01
	Control Group	73.2 ± 0.4	75.2 ± 0.5	80.1 ± 0.1	63.2 ± 0.6	

Data show that the average scores of skills and theoretical knowledge of the experimental group in the midterm and final exams were significantly higher than those of the control group, and the difference in final scores reached a very significant level ($P < 0.01$). Further analysis of grouped data indicates that: In the experimental group, the

improvement rate of high-achieving students was 17.3% (from 61.2 to 89.8) and that of underachieving students was 21.3% (from 43.1 to 78.5); in the control group, the improvement rate of high-achieving students was 15.9% (from 60.5 to 80.1) and that of underachieving students was 12.5% (from 42.7 to 63.2). The gap between high-achieving and underachieving students narrowed from 18.1 points to 11.3 points in the experimental group, while it narrowed only from 17.8 points to 16.9 points in the control group, confirming that blended teaching effectively reduces individual differences.

B. ANALYSIS OF LEARNING EXPERIENCE AND SATISFACTION

Based on the results of the post-experiment questionnaire survey, the overall satisfaction of students in the experimental group with blended teaching was 93.3%, which was significantly higher than the satisfaction of students in the control group with traditional teaching (71.1%). This high satisfaction rate coexists with targeted student suggestions: 32% of students requested simplified online platform operation, and 28% hoped to increase live Q&A sessions. These feedback points are not contradictory to the overall positive evaluation but reflect areas for optimization, which have been incorporated into the teaching suggestions in Section "Teaching Suggestions" to balance quantitative satisfaction with qualitative improvement needs. Specifically, 86.7% of students in the experimental group believed that online resources helped them accurately grasp movement essentials, 82.2% of students said their learning interest and autonomous learning ability were improved, and 77.8% of students recognized the rationality of the diversified evaluation system. From the perspective of student feedback, the advantages of blended teaching lie in "being able to repeatedly watch movement videos to solve the problem of lack of guidance for after-class practice" and "online check-in and mutual evaluation enhancing learning motivation".

C. ANALYSIS OF TEACHERS' TEACHING FEEDBACK

The teaching teacher stated that blended teaching effectively shortened the time for basic explanation in class through the online preview link, allowing teachers to focus more energy on personalized guidance, and the teaching efficiency was significantly improved; the data analysis function of the online platform can accurately grasp students' learning status and realize "teaching based on learning". However, the teacher also pointed out that blended teaching has higher requirements for teachers' digital teaching capabilities, and the preliminary resource development and platform maintenance require a lot of time and energy.

D. COMPREHENSIVE EFFECT CONCLUSION

Overall, the application effect of the blended teaching model in public ballroom dance courses in colleges and universities is significant:

- (1) Effectively improving students' skill level and theoretical literacy, and narrowing individual differences;
- (2) Stimulating students' learning interest and enhancing their autonomous learning ability;
- (3) Optimizing the teaching process and improving teaching efficiency and quality;
- (4) Gaining wide recognition from teachers and students with high satisfaction. Compared with the traditional teaching model, blended teaching is more suitable for the teaching needs of public ballroom dance courses and the personalized development needs of students.

VI. RESEARCH CONCLUSIONS AND PROSPECTS

A. RESEARCH CONCLUSIONS

- (1) The blended teaching system for public ballroom dance courses constructed in this study, which incorporates the aesthetic and structural principles of the industry, proves to be both reasonable and feasible. Its design principles of "goal orientation, integration and complementarity, and balance between personalization and inclusiveness" are suitable for the diversified teaching needs of ballroom dance of "theory + skills + literacy".
- (2) The blended teaching model can significantly improve teaching effect, which is superior to the traditional offline teaching in improving students' skill level, theoretical literacy, learning interest, and autonomous learning ability, especially for underachieving students.
- (3) The implementation of blended teaching relies on perfect online resources and platforms, and places higher requirements on teachers' digital teaching capabilities. Preliminary resource development and process management are the keys to ensuring teaching effect.

B. TEACHING SUGGESTIONS

- (1) Optimize the construction of online resources and platforms: Simplify the operation interface of the Xuexitong platform and add a one-click access function for core resources; increase live Q&A sessions (scheduled 2 times a month) to address real-time student needs; continuously update teaching resources to enrich resource types and content.
- (2) Improve teachers' digital teaching capabilities: Colleges and universities should strengthen the digital teaching training for ballroom dance teachers, build communication platforms to share blended teaching experience; establish incentive mechanisms for resource development to reduce teachers' workload.
- (3) Improve the teaching evaluation and feedback mechanism: Adjust the weight of evaluation indicators combined with students' suggestions, and increase the evaluation proportion of online interactive performance; establish a regular feedback mechanism to timely optimize teaching content and links.

C. RESEARCH LIMITATIONS AND PROSPECTS

This study has certain limitations:

- (1) The sample size is small, only two classes from one college are selected;
- (2) The teaching cycle is short (one semester), and no long-term effect tracking is carried out; the coverage of dance styles is limited, focusing mainly on waltz and rumba. Future research can be carried out in the following aspects:
 - (1) Expand the sample scope to include multiple colleges and universities;
 - (2) Extend the experimental cycle to conduct long-term effect evaluation;
 - (3) Expand the research scope of dance styles and improve the blended teaching system;
 - (4) Combine emerging technologies such as VR and AI to further optimize the teaching model, and promote the digital and intelligent development of public ballroom dance courses in colleges and universities.

AUTHOR CONTRIBUTIONS

Hui Qiu Guo designed, collected and analyzed the data, and drafted the manuscript. Hui Qiu Guo conducted the study, critically revised the manuscript for important intellectual content, and gave final approval of the version to be published. Hui Qiu Guo participated fully in the work, take public responsibility for appropriate portions of the content, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

FUNDING

This research received no external funding.

HUMAN RESEARCH SUBJECTS

This study was approved by the Ethics Committee of Northeast Agricultural University, and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form.

ACKNOWLEDGEMENTS

Not applicable.

REFERENCES

- [1] H. Xu, "Research on the Reform of Physical Education Teaching and Quality Education in Colleges and Universities," 2019 International Conference on Arts, Management, Education and Innovation (ICAMEI 2019); 12-14 January 2019; Seoul, South Korea. Ottawa, Ontario, Canada: Clausius Scientific Press; 2019, doi: 10.23977/ICAMEI.2019.217.
- [2] R. L. Tian and S. K. Qi, "Prospects of school physical education under the background of integration of sports and education," *Innovation Research on Ice and Snow Sports*, vol. 7, no. 1, pp. 112-114, 2026, doi: 10.20155/j.cnki.issn2096-8485.2026.01.038.
- [3] J. Wang, "Exploration of Dance Teaching in Colleges and Universities under the Background of Artificial Intelligence and Artistic Quality Education of College Students," *Archives Des Sciences*, vol. 74, no. s2, pp. 60-70, 2024, doi: 10.62227/as/74s28.

- [4] C. Yongzhu, L. Jingbo, Z. Dacheng, and S. Ding, "Problems and Countermeasures of Sports Dance Course in Dance Colleges in Heilongjiang Province," 3rd International Social Sciences and Education Conference (ISSEC 2018); 23-24 June 2018; Xiamen, China. London, UK: Francis Academic Press; 2018, doi: 10.25236/issec.2018.030.
- [5] L. Aiping and Y. Zhihua, "Research on the Current Situation of Dance Sports Courses in Colleges and Universities," *Bulletin of Sport Science & Technology*, vol. 4, pp. 96-98, 2020.
- [6] Y. F. Dong, "Research on the application of "online + offline" blended teaching model in public physical education basketball teaching in higher vocational colleges," *Contemporary Sports Technology*, vol. 15, no. 21, pp. 58-61, 2025, doi: 10.16655/j.cnki.2095-2813.2025.21.016.
- [7] Z. Zheng, W. Lei, and Z. Bing, "Research on the Innovation of Teaching Mode of Orienteering Sports Courses in Colleges and Universities Based on Mobile Intelligent Terminals," *Applied Mathematics and Nonlinear Sciences*, pp. 9(1), 2024, doi: 10.2478/amns-2024-2930.
- [8] W. Yuan, "Blended teaching under the education digital transformation strategy: Rethinking and restarting," *China Distance Education*, vol. 44, no. 12, pp. 76-85, 2024, doi: 10.13541/j.cnki.chinade.2024.12.003.
- [9] H. Chen, S. Wu, and J. Shi, "Design of Online and Offline Blending Teaching Mode," 2020 IEEE 2nd International Conference on Computer Science and Educational Informatization (CSEI); 12-14 June 2020; Xinxiang, China. New York, NY, USA: IEEE; 2020, doi: 10.1109/CSEI50228.2020.9142519.
- [10] J. Keengwe and J. J. Kang, "A review of empirical research on blended learning in teacher education programs," *Education and Information Technologies*, vol. 18, no. 3, pp. 479-493, 2013, doi: 10.1007/s10639-011-9182-8.
- [11] B. Means, Y. Toyama, R. Murphy, M. Bakia, and K. Jones, "Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies," [Online]. Available: <http://apo2009.org.au/node/18720>.
- [12] H. An, "Research on the design and application of MOOC-based blended teaching in basketball general courses for physical education majors in colleges and universities [dissertation]," Jinan, CN: Shandong Sport University; 2023, doi: 10.27725/d.cnki.gsdy.2023.000088.
- [13] J. H. Jiang, "Research on the construction of online-offline blended teaching model for basketball elective courses in sports colleges [dissertation]," Guangzhou, CN: Guangzhou Sport University; 2023, doi: 10.27042/d.cnki.ggztc.2023.000199.
- [14] M. Nyikos and R. Hashimoto, "Constructivist theory applied to collaborative learning in teacher education: In search of ZPD," *The Modern Language Journal*, vol. 81, no. 4, pp. 506-517, 1997, doi: 10.1111/j.1540-4781.1997.tb05518.x.
- [15] Y. P. Lou, "Research on the innovation of online-offline blended teaching model for college English based on humanistic learning theory," *English Square*, vol. (18), pp. 57-60, 2024, doi: 10.16723/j.cnki.yygc.2024.18.016.
- [16] I. M. M. Longhini and J. P. D. S. Filho, "Rogers' humanistic theory," V Seven International Multidisciplinary Congress. 11-13 March 2024; 2024, doi: 10.56238/sevenmulti2024-023.
- [17] S. Pratt, "Achieving symbiosis: Working through challenges found in co-teaching to achieve effective coteaching relationships," *Teaching and Teacher Education*, vol. 41, pp. 1-12, 2014, doi: 10.1016/j.tate.2014.02.006.