Journal of Human Movement Science (2025)
Clausius Scientific Press, Canada

DOI: 10.23977/jhms.2025.060114
ISSN 2523-5850 Vol. 6 Num. 1

Application and Innovation of the Teaching Concept of "Using Competition to Promote Teaching and Learning" in the Teaching of Aerobics Courses in Higher Vocational Colleges

Yiran Dan[1,a,*], Guoli Deng[2,b]

[1]*School of Physical Education and Tourism, Polus International College, Chengdu, Sichuan, China*
[2]*Sports Teaching and Research Group, Chengdu Xichuanhui Jindu School, Chengdu, Sichuan, China*
[a]*695662715@qq.com*, [b]*849475368@qq.com*
[*]*Corresponding author*

Keywords: Aerobics, Teaching Through Competition, Innovative Teaching, Integration of Learning, Practice, Competition

Abstract: To address the problem that teaching models, which primarily rely on fixed routines and passive imitation, fail to fully stimulate students' potential for active learning and creativity, this paper introduces the teaching concept of "using competitions to promote teaching and learning." Combining an integrated learning, practice, and competition curriculum with a diverse faculty strategy, this study aims to comprehensively improve students' skill and movement accuracy, creative creativity, and teamwork through classroom group competitions, periodic practical exercises, and independent creative training. Results show that after eight weeks of intervention, the experimental group performs significantly greater than the control group on all indicators ($p<0.001$), demonstrating that the "using competitions to promote teaching and learning" model significantly enhances students' abilities across all dimensions. Improvements in skill mastery and creative creativity are particularly pronounced, with the experimental group's standardized movement scores and total creative scores approximately 16 and 6 points higher than the control group, respectively. These results demonstrate that this teaching model effectively improves students' skill mastery, creative ability, and psychological well-being, while also enhancing teamwork awareness. This approach provides a feasible path and practical reference for the reform of aerobics courses in higher vocational colleges.

1. Introduction

As vocational education reforms continue to deepen, the role of physical education courses in higher vocational education has become increasingly prominent in talent development. Aerobics, as a sport that combines competition, performance, and fitness, effectively enhances students' physical fitness and plays a vital role in teamwork, psychological development, and the development of

innovative capabilities. However, current aerobics courses in higher vocational colleges still suffer from common problems such as a monotonous teaching model, low student motivation, and a relatively dull classroom atmosphere, which hinders the curriculum's full educational potential. The traditional "imitation-practice-assessment" model fails to stimulate students' active learning and creative thinking, and also fails to effectively meet the comprehensive quality development requirements of vocational education in the new era.

The concept of "teaching and learning through competition" has been gradually introduced into vocational education. Its core principle is to closely integrate classroom teaching with skill demonstration through competition, encouraging students to apply knowledge in real-world situations, hone their abilities, and develop positive learning motivation. Introducing this model into aerobics courses can not only enhance the fun and practicality of teaching, but also cultivate students' innovative spirit, cooperative consciousness, and psychological endurance in the process of combining competition and practice. This paper combines empirical research to explore the application path and innovative practice of this model in the teaching of aerobics courses in higher vocational colleges, focusing on analyzing the impact of this model on students' skill mastery, creative ability, psychological quality and group collaboration, providing theoretical support and practical reference for the reform of higher vocational physical education courses.

2. Related Works

As physical education in higher vocational colleges continues to develop, the teaching models, effectiveness evaluation, and application of information technology in aerobics courses have garnered widespread attention. The following research summarizes the latest achievements of scholars in aerobics teaching design, student physical fitness improvement, teaching technology application and curriculum optimization. Gao analyzed the problems existing in the teaching process of aerobics in higher vocational colleges and elaborated on the relevant countermeasures for improving aerobics courses in higher vocational colleges. After "knowing", the "generative flip" of learning content can be achieved through online classroom exercises, and "understanding" and "using" can be achieved through the online classroom discussion function to achieve "generative flip" of learning content [1]. Yu evaluated the effect of aerobics dance exercises on enhancing the physical health of college students by comparing the endurance, strength and flexibility test results of subjects in the first and 12th weeks of the experiment. The study found that after 12 weeks of aerobics extracurricular exercise intervention, the cardiopulmonary endurance of college students was significantly improved [2]. In response to the problems existing in current education, Ting et al. proposed the viewpoints of building a smart campus and promoting the transformation of educational informatization [3]. Ridwan et al. used a combination of qualitative and quantitative methods to study the effect of simple fitness training models on improving the physical fitness of vocational students [4]. Yang and Zainuddin used CiteSpace software to conduct a visual analysis of 679 core journal articles in the CNK1 database to explore the current status of aerobics research in China. The results showed that the research focus shifted from early public teaching to the current transformation of competitive aerobics, physical education and athletes [5]. Yao et al. explored the impact of smart classrooms on the learning motivation and self-efficacy of students in aerobics courses. By comparing traditional classrooms and smart classroom environments. The study found that the interactive tools, multimedia resources and real-time feedback in smart classrooms significantly improved students' learning motivation and self-efficacy [6]. Chunze et al. conducted integrated physical education teaching and compared the physical conditions of students in the experimental group and the control group before and after teaching. The data showed that after the healthy students in the experimental group received integrated physical education, their

average scores in speed, endurance, flexibility and strength were significantly improved, all at the 0.05 level. However, the difference was not significant at the 0.05 level for the students in the control group who received conventional physical education [7]. Zhao et al. used the Yamane Taro method to conduct a questionnaire survey on 24 aerobics teachers and 327 aerobics students among 2160 students in 6 normal colleges in Guizhou Province. The study constructed a timely teaching model for aerobics dance, and the conclusions included three core categories: cognitive construction of knowledge and skills, internalization and improvement of knowledge and skills, and consolidation and sublimation of knowledge and skills [8]. Liu and Kou analyzed the impact of aerobics online courses on college students' learning satisfaction, and the mediating role of learning investment and learning motivation between aerobics online courses and college students' learning satisfaction [9]. Peng and Wei proposed an aerobics teaching model that uses few-sample learning technology for data flow analysis. Comparative analysis showed that the accuracy was improved by 8.12% compared with the traditional image feature combination classifier model [10]. Karataş evaluated the curriculum setting, content and practice of physical education/sports education in the associate degree program of civil defense and firefighting in Turkey. The results of the study revealed important issues in the high physical fitness requirements of the firefighting profession [11]. Although existing research has achieved rich results in the teaching effect of aerobics, curriculum design and information application, there are still bottlenecks such as limited sample size, short intervention cycle, insufficient attention to individual differences and insufficient verification of intelligent teaching models.

3. Methods

3.1 Using Competitions to Promote Learning: Innovative Practices in Aerobics Classrooms

Under traditional teaching models, aerobics learning is largely passive, a process of collective imitation and copying. "Using competitions to promote learning and integrating competitions and teaching" aims to lay a solid foundation for competitions, preparing students for competitions from the outset. In the classroom, various teaching methods are employed, such as grouping, stratification, itemization, and classification, to encourage students to be innovative and boldly experiment with applied aerobics courses. Through group learning, practice, and periodic competitions, the teaching content is enriched and the classroom atmosphere is enlivened. After-class training and self-study can be conducted based on the interests and characteristics of group members, allowing for the continuation of classroom learning and further consolidating the teaching results. In this process, teachers play a guiding and organizational role, ensuring that competitions are fair and engaging, and guiding students to realize their potential and improve their abilities through competition.

"Sai" means "competition" and is a teaching method in the classroom. By designing competitions to promote learning, practice, and assessment, the "Five Skills" teaching objectives of "being able to speak, to act, to evaluate, to plan, and to teach" can be achieved.

By grouping students into groups, real-time checks on their skills and knowledge can be conducted, ensuring they maintain a moderate level of intensity during class, thereby improving learning efficiency.

Competitions can help students apply acquired theoretical knowledge and skills to practice, enhancing learning efficiency. In this process, students can experience the excitement of competition while honing their skills and improving their mental toughness and adaptability. When organizing competitions, it is necessary to tailor them to the students' individual circumstances and abilities, guiding them to adopt a balanced approach to winning and losing, making competitions a process of learning and improvement. Through appropriate competition methods and content,

students can be encouraged to actively participate, strengthen their team spirit, and foster a sense of collective honor. In short, competitions provide students with a platform to showcase their talents and inspire a spirit of continuous improvement.

3.2 Diversified Faculty Integration Drives Collaborative Teaching

Aerobics teachers in vocational schools need to break away from the limitations of a single professional background and incorporate a variety of resources, such as industry mentors, competition referees, and exhibition planning experts, to establish a comprehensive teaching structure encompassing "teaching-competition-exhibition."

First, a mechanism is established for interaction between schools, enterprises, and teachers and students. By regularly inviting referees from provincial and higher-level competitions and professional club coaches to teach, cutting-edge knowledge, such as competition rules and movement development trends, can be integrated into daily training, enhancing teachers' understanding and adaptability to competition scenarios.

Second, the resources of industry associations are leveraged to provide specialized training for teachers. Professional programs such as the National Aerobics Creation Symposium and Referee Qualification Certification are participated, focusing on improving skills in music editing, lighting design, and other areas to offset the shortcomings of traditional teaching methods in guiding artistic expression.

Furthermore, a "dual mentorship system" is implemented, with senior teachers at the core and professional teachers as supporting staff. Focusing on competitions and activities, this system fosters a mutual infusion of knowledge through collective lesson preparation and collaborative teaching.

On this basis, a dynamic evaluation mechanism for the teaching staff is established, incorporating factors such as the competition winning rate and the social impact of competition activities into the performance evaluation of teachers to achieve a virtuous interaction between teaching and competition guidance.

3.3 Integrated Teaching of Learning, Practice and Competition

(1) Targeted teaching content

The fixed routine teaching in the original teaching plan is completely cancelled, and a specialized teaching team strengthens the teaching and creation of basic aerobics movements and basic skills, and integrates independent creation content into it to enhance the innovation of creation. In the aerobics teaching of higher vocational colleges, creation teaching is a very important link. Students can use the professional basic skills taught by teachers in class and extracurricular learning on the Internet to choreograph aerobics movements of their own interest based on what they know and are interested in. Creation teaching can stimulate students' learning motivation, enhance their self-confidence, and enable students to gradually master the basic aerobics skills, learn while thinking, and achieve collaboration with teachers.

(2) Diversity of teaching methods

"Learning, practice, and competition" points the way for the development of school sports. "LPC" is a modern teaching concept that integrates "learning", "practice" and "competition". "Learning" refers to the theoretical research of aerobic exercise technology, which mainly involves teachers explaining and guiding students. After students master the basic principles and methods, they lay the foundation for subsequent practice and competition. The focus of "training" is for teachers to guide students through hands-on demonstrations and case studies to master each aerobics movement. Because aerobics involves numerous steps, it's important to break down each

movement into its own steps and implement differentiated instruction. "Competitions" involve teachers organizing aerobics competitions to promote teaching and learning, enabling students to develop their sports awareness and physical fitness through individual and team competitions.

4. Results and Discussion

4.1 Subjects

Students enrolled in aerobics courses at vocational colleges were randomly selected from two classes, totaling approximately 60–80 students.

Requirements: No serious sports contraindications and the ability to complete basic aerobics training.

4.2 Experimental Grouping

Experimental Group (adopting the "competition-driven teaching and learning" teaching model):

Students were divided into groups of 3–5 people and underwent differentiated, specialized training, along with periodic classroom competitions.

Teachers employed a diverse faculty model, integrating creative instruction in the classroom.

Control Group (traditional classroom teaching model):

The teaching focused on fixed routines, separating practice from theory. There were no competitions in the classroom, and minimal creative instruction was required.

4.3 Experimental Procedure

This study employed a pretest-intervention-posttest design, lasting nine weeks. A pretest was conducted in Week 0, including a skills test and a psychological questionnaire to assess students' baseline proficiency. Weeks 1–2 involved basic movement training. The experimental group practiced in small groups and encouraged creative experimentation, while the control group focused on teacher demonstration and whole-class imitation.

Weeks 3–4 began the creative movement training phase. The experimental group enhanced their creative abilities through group practice and periodic competitions, while the control group continued with fixed routine training.

Weeks 5–6 involved skill development training. The experimental group practiced in small-group competitions under teacher guidance, while the control group continued with classroom practice.

Weeks 7–8 were dedicated to comprehensive competitions and assessments. The experimental group participated in school-level competitions and underwent self-assessments and psychological assessments. The control group concluded their training with a final skills and theory assessment.

Week 9 included a posttest, which comprehensively assessed skills, creative abilities, teamwork, and psychological well-being. This design allows for a systematic comparison of the impact of the "competition-driven teaching and learning" model and the traditional teaching model on students' comprehensive development at different stages.

4.4 Data Analysis

In Table 1, the experimental group had a significantly higher accuracy rate of skill movements than the control group, with a mean of 84.9% (SD = 5.7) compared to 69.6% (SD = 4.6) in the control group ($t = 11.41$, $p < 0.001$). This indicates that the "competition-driven teaching and

learning" model effectively improves students' movement standardization and skill mastery. Regarding creative ability, the experimental group's mean total creative score was 16.0 (SD = 1.2), significantly higher than the control group's 10.2 (SD = 1.1), t = 18.86, p < 0.001, indicating that the experimental group exhibited significant advantages in movement design, combination innovation, and expressiveness. Regarding psychological quality indicators, the experimental group had a mean score of 4.47 (SD = 0.29) compared to 3.50 (SD = 0.29) in the control group (t = 13.09, p < 0.001), indicating that the experimental group significantly improved their self-confidence, learning interest, and psychological resilience. Overall analysis shows that the competition-driven teaching model can comprehensively promote student development in the three dimensions of skills, innovation, and psychological quality, providing a scientific basis and practical reference for the teaching of aerobics courses in higher vocational colleges.

Table 1 Changes in skills, innovation, and psychological quality (t-test/analysis of variance)

Indicator	Experimental Group Mean ±SD	Control Group Mean ±SD	t-value	p-value
Accuracy of Skill Movements (%)	84.9 ±5.7	69.6 ±4.6	11.41	0
Total Creativity Score (out of 20)	16.0 ±1.2	10.2 ±1.1	18.86	0
Average Psychological Quality (1–5)	4.47 ±0.29	3.50 ±0.29	13.09	0

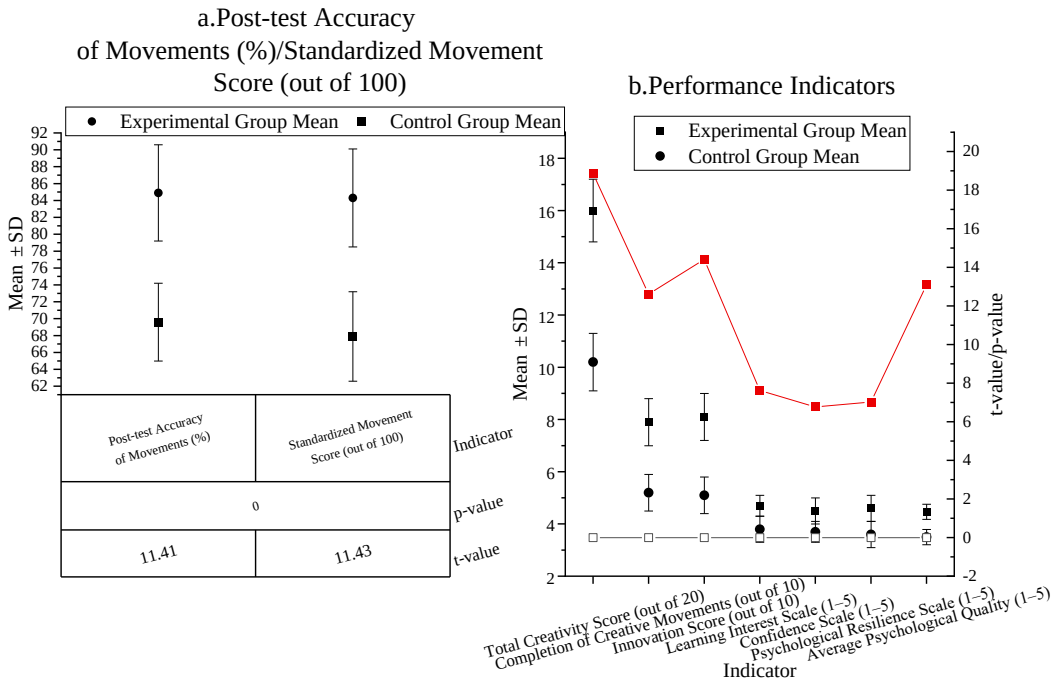

Figure 1: Comparison between the experimental and control groups in the "Competition-Driven Teaching and Learning" model

In Figure 1, the experimental group performed significantly better than the control group in all indicators (p<0.001), indicating that the "Competition-Driven Teaching and Learning" model significantly improved students' abilities in all aspects. Improvements in skill mastery and creative ability were particularly significant, with the experimental group's standardized movement scores and total creative scores approximately 16 and 6 points higher than the control group, respectively, demonstrating that this model effectively improved students' movement standardization and innovative design capabilities (see Figure 1a). In terms of psychological quality, the experimental group outperformed the control group in terms of learning interest, self-confidence, and psychological endurance, with the average psychological quality score increasing by nearly 1 point.

This demonstrates that competition-driven teaching not only strengthens skill training but also helps improve students' psychological quality. Furthermore, the largest difference was seen in teamwork scores, with the experimental group's overall score far exceeding that of the control group, demonstrating the model's significant effectiveness in fostering collective collaboration and team spirit (see Figure 1b). Overall, the competition-driven teaching model can comprehensively improve students' comprehensive qualities across multiple dimensions, including skills, innovation, psychological well-being, and collaborative abilities, providing a scientific basis and practical reference for aerobics courses.

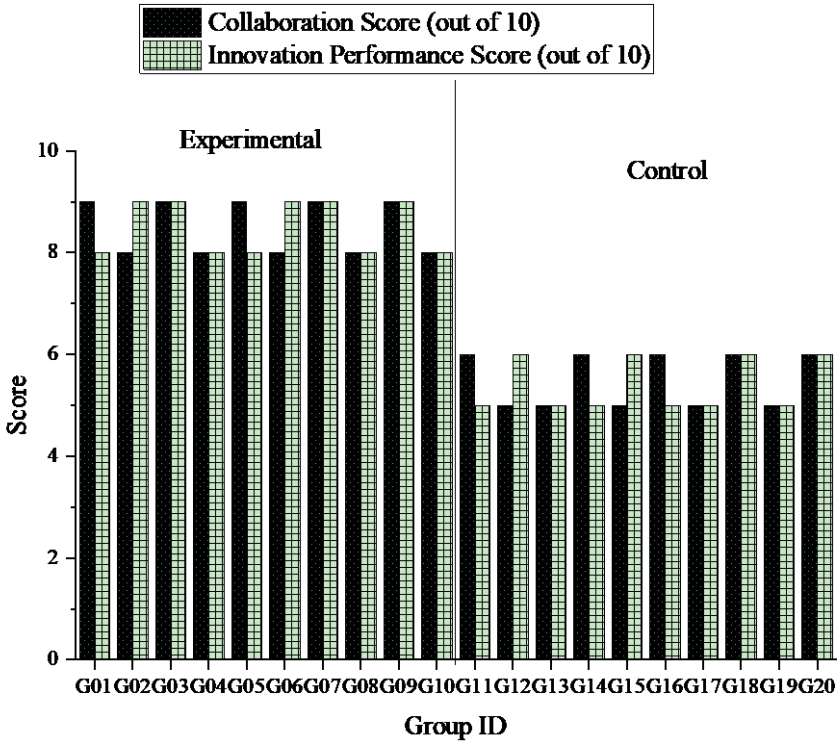

Figure 2: Descriptive statistics of group collaboration and innovation performance

The experimental group's mean collaboration score was 8.5 (SD = 0.5), and mean innovation score was also 8.5 (SD = 0.5); the control group's mean scores were 5.7 (SD = 0.5) and 5.5 (SD = 0.5), respectively. This demonstrated that the experimental group exhibited significant advantages in teamwork and creative performance, as shown in the figure 2. Improvements in collaboration were particularly prominent, with most experimental groups excelling in teamwork, task division, and interactive collaboration. Regarding innovative performance, the experimental group also significantly outperformed in movement creation and innovative thinking, demonstrating that the competition-driven teaching model not only strengthened skill training but also effectively stimulated creative thinking among team members.

Overall, the experimental group significantly outperformed the control group in all indicators, with relatively stable performance. Regarding collaboration scores, the experimental group averaged 8.5 (SD = 0.5) and the control group averaged 5.7 (SD = 0.5). The experimental group generally demonstrated high levels of task division, teamwork, and communication and collaboration. Regarding innovation performance, the experimental group averaged 8.5 (SD = 0.5) and the control group averaged only 5.5 (SD = 0.5). Overall, the "competition-driven teaching and learning" model effectively improved students' group collaboration and innovative performance, demonstrating the significant advantages of competition-driven teaching in promoting teamwork and creative practice. This model provides empirical evidence for the teaching of aerobics courses

in higher vocational colleges, as shown in Figure 3.

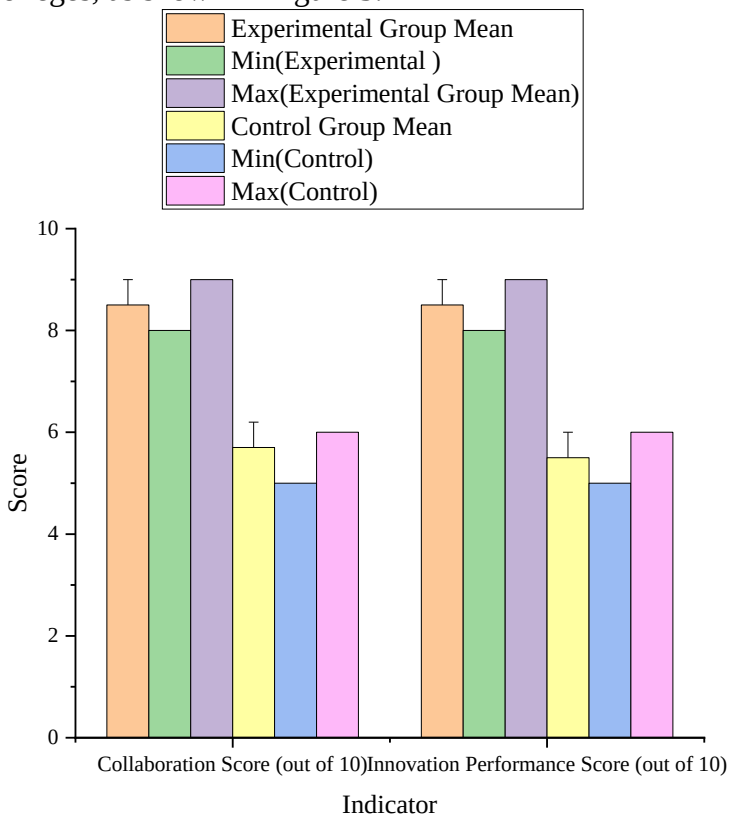

Figure 3: Descriptive statistical analysis of group collaboration and innovation performance

5. Conclusions

This paper systematically explores and empirically analyzes the practical application of the "competition-driven teaching and learning" teaching concept in higher vocational colleges. The results show that this model significantly improves students' movement standardization and skill mastery, while also demonstrating positive effects on innovative performance, teamwork, and psychological well-being. Through competition-driven classroom design, students' learning interest, self-confidence, and stress tolerance are significantly enhanced; the classroom atmosphere becomes more lively, and teaching effectiveness is comprehensively optimized. External factors such as individual teacher differences and curriculum resource allocation may also have influenced the results. Future research can further verify the universality and sustainability of this model by expanding the sample size, extending the experimental period, and incorporating cross-institutional comparative studies. Furthermore, it can explore diversified teaching approaches integrated with information technology to promote the continued innovation and development of aerobics courses in higher vocational colleges.

References

[1] Gao L. Analysis On the Reform Of Sports Calisthenics Curriculum In Higher Vocational Colleges[J]. Journal of Theory and Practice of Humanities Science, 2023, 1(02): 15-18.

[2] Yu X. Impact of Aerobic Dance Program on Fitness (Endurance, Strength, Flexibility) of College Students[J]. International Journal of Sociologies and Anthropologies Science Reviews, 2025, 5(4): 49-60.

[3] Ting L, Rittisom S, Wattanapayungkul Y. Comparison of Aerobics Teaching to Combines Online and Offline Learning with Traditional Teaching of Guangdong Vocational College Students in China[J]. International Journal of

Sociologies and Anthropologies Science Reviews, 2025, 5(1): 605-614.
[4] Ridwan A, Nurhadi F I, Yachsie B T P W B, et al. The effect of the simple fitness exercise model to improve the vocational students' physical fitness[J]. Jurnal Keolahragaan, 2023, 11(2): 228-236.
[5] Yang W, Zainuddin Z A B. Aerobics research in China: characteristics, hotspots, and evolution visualized[J]. International Journal of Public Health, 2025, 14(2): 967-977.
[6] Yao H, Hooi L B, Yan G, et al. Impact of Intelligent Classroom Environment on Students' Learning Motivation and Self-efficacy in Vocational College[J]. Environment-Behaviour Proceedings Journal, 2025, 10(31): 113-119.
[7] Chunze J, Duangkam J, Eakronnarongchai W, et al. The Development of Integrated Physical Education Teaching to Enhance Physical Fitness of Students in Higher Vocational Colleges Kunming City[J]. Journal of Roi Kaensarn Academi, 2024, 9(10): 1032-1043.
[8] Zhao G M, Siriphan C, Gu X Y. Development of Just-in-Time Teaching Model to Enhance Aerobics Dance Learning Outcomes for Physical Education Majors at Normal University[J]. International Journal of Sociologies and Anthropologies Science Reviews, 2025, 5(2): 739-748.
[9] Liu L, Kou H. A Study on the Impact of on Learning Satisfaction Among University Students from the Perspective of Online Aerobics Courses—Focusing on the Mediating Effect of Learning Motivation and Learning Engagement[J]. Research and Advances in Education, 2023, 2(12): 28-40.
[10] Peng Q, Wei N. Aerobics Teaching With Few-Shot Learning Technology for Data Flow Analysis[J]. International Journal of Information and Communication Technology Education (IJICTE), 2024, 20(1): 1-20.
[11] Karataş M. Evaluating Physical Education Courses in Civil Defense and Firefighting Associate Degree Programs in Turkiye[J]. Turkish Journal of Sport and Exercise, 2024, 26(1): 49-61.