Research on the Construction of "Online and Offline" Blended Teaching Model in Physical Education Curriculum

Taking "Aerobics" as an Example

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ABSTRACT

This study focuses on the students of the 2023 aerobics elective course at Shandong Technology and Business University. The teachers use methods such as questionnaire survey and experimental research to carry out the research, and they implement a online and offline blended teaching approach in the experimental class, while conducting traditional offline teaching in the control class. After the experiment, the following conclusions have been drawn: firstly, the online and offline blended teaching of aerobics courses has relatively high requirements for teachers' professional competence and teaching ability; secondly, through teaching experiments, it has been shown that the experimental class students have significantly improved their aerobic gymnastics movement ability and artistic expression compared to the control class students; thirdly, compared to traditional teaching methods, online and offline blended teaching is more convenient and smooth in terms of student learning and teacher interaction; fourthly, compared to traditional teaching methods, online and offline blended teaching is more conducive to improving students' learning efficiency and promoting the learning of aerobics.

Keywords: *Online and offline model, Blended teaching, Aerobics.*

1. INTRODUCTION

Currently, China's higher education has entered a new era of enhancing educational content and promoting high-quality development of education. The way to establish a new mechanism for high-quality development of talent cultivation is the core task of higher education in China at present. With the further deepening of the reform of physical education teaching in higher education, online and offline blended teaching has attracted increasing attention from educational institutions and departments at all levels. In response to the sudden global outbreak of the COVID-19, in early 2020, the Ministry of Education issued the “Guiding Opinions on Doing a Good Job in the Organization and Management of Online Teaching in Colleges and Universities during the Prevention and Control of the Epidemic”, requiring to improve the traditional physical education teaching mode, and take various online course platforms at all levels as the base to further improve the physical quality of students, and develop good physical exercise habits [1]. In response to the COVID-19 epidemic, the Ministry of Education put forward the requirement of "suspending classes without stopping classes", which made the online and offline blended teaching develop rapidly in a short time. This article focuses on the application of online and offline blended teaching in physical education elective courses. Taking the elective course of "Aerobics" as the research object, the study explores the online and offline blended teaching model of aerobics elective courses in ordinary universities. It has important theoretical and practical significance for constructing high-quality development of online and offline blended teaching in college aerobics courses and promoting the reform of physical education teaching in ordinary universities.

2. RESEARCH OBJECTS AND METHODS

2.1 Research Objects

The research focuses on the students of the 2023 physical education elective course at Shandong Technology and Business University. Related teachers select 52 students from Monday morning session 34 as the experimental class, and 50 students from Tuesday morning session 34 as the control class.

2.2 Research Methods

Teachers use Rain Classroom as an online teaching platform and conduct experimental research on online and offline blended teaching of aerobics using methods such as literature review, interviews, questionnaire surveys, experiments, and mathematical statistics.

3. EXPERIMENTAL DESIGN

3.1 Experimental Course Design

The teachers first establish an online learning group through the Rain Classroom APP, create learning videos for each class and upload them to Rain Classroom. Then, teachers push the learning videos to the Rain Classroom group, and experimental class students conduct video preview first, completing the corresponding knowledge points and pre-class preparations according to the requirements; The experimental class students sign in through the Rain Classroom group before class; The basic part of offline aerobics elective courses is taught by teachers, emphasizing key and difficult points, and students practice in groups. During the teaching process, teachers provide guidance and correction on a tour basis. After centralized learning, the group leaders of each group lead their own group to practice in groups, and the teachers tour to provide individual guidance within each group. After centralized practice in each group, each group will demonstrate their movements, and peer evaluation will be conducted within each group. Finally, the teachers will summarize and evaluate the results; After class, teachers push video assignments through Rain Classroom, students upload completed video assignments through Rain Classroom, and each group watches the videos for evaluation. Teachers promptly go online for online communication between teachers and students to ensure that students' problems are effectively solved. Teachers summarize and reflect, ultimately achieving the goal of improving teaching effectiveness [2].

3.2 Teaching Experiment Arrangement and Teaching Content Arrangement

According to the physical education teaching and training plan and teaching calendar of Shandong Technology and Business University, the teaching hours of the experimental class and the control class are both two classes per week, totaling 32 hours in 16 weeks. The study time and course content of the experimental class and the control class are consistent.

3.3 Experiment Indicators

Before the experiment, according to the assessment requirements of the college aerobics course in the physical education training plan of Shandong Technology and Business University, the third set of public aerobics first and second level prescribed movements are selected as the content of this experiment and corresponding assessment standards are formulated. The assessment content is divided into technical action completion score and action art score, with completion score including action strength and accuracy; Action art includes the sense of rhythm in action music, coordination of movements, and elegance [3]. Both the experimental class and the control class students learn the first to fourth eight beat movements of the first combination of the third set of mass aerobics level one as the assessment content. The control class adopts the traditional teaching model, while the experimental class adopts an online and offline blended teaching model. At the end of the semester, students in the experimental and control classes will be scored based on their completion of movements, and the obtained data will be statistically compared and analyzed.

3.4 Experimental Control and Final Assessment

To ensure the smooth implementation and the effectiveness of teaching experiments, corresponding controls should be made on the teaching tools and course duration required during the experimental process, as well as the relevant experimental comparison content. Throughout the entire experimental teaching process, it is necessary to ensure that the experimental class and control class students have consistent teaching and

assessment content, except for the difference in attendance modes. The assessment content is the third set of public aerobics first and second level prescribed movements; The assessment method is to invite other aerobics teachers from Shandong Technology and Business University who did not participate in this experimental teaching to conduct assessment and scoring.

3.5 Teaching Evaluation

The evaluation of experimental class teaching includes pre-class learning (preview situation, completion of chapter knowledge points, online discussion situation), and scores are calculated based on objective online data; In-class learning (classroom performance, intra group evaluation, inter group evaluation, teacher evaluation); After-class learning (uploading action skill consolidation videos) and final exams [4]. The control class students will be evaluated in the traditional way.

4. RESEARCH RESULTS AND ANALYSIS

4.1 Investigation and Analysis of Aerobics Test Indicators for Experimental and Control Class Students Before the Experiment

Through a survey of the learning situation of aerobic gymnastics among students in the experimental and control classes, it is found that there is no significant difference between the experimental and control classes in terms of their understanding of aerobic gymnastics, channels of understanding, level of interest in aerobic gymnastics, expectations for this semester's aerobic gymnastics courses, and advance preparation of aerobic gymnastics movements [5]. Therefore, it indicates that the pre-experiment grouping meets the experimental requirements and can also ensure the effectiveness of the experiment.

4.1.1 Comparative Analysis of the Completion of Aerobics Techniques Between the Experimental Class and the Control Class Before the Experiment

Before the experiment, a comparative analysis has been conducted on the basic mastery of aerobics between the experimental and control classes. It is found that the average and standard deviation of the experimental and control classes in terms of movement accuracy were 11.15 ± 1.29 and 11.82 ± 0.66, respectively; The average and standard deviation of the action force are 11.56 ± 1.17 and 11.86 ± 0.73, respectively; The researchers conduct an independent sample t-test on the completion scores of the pre-experiment aerobics test between the experimental and control classes, and obtain a T-value of -2.524 and a P-value of 0.013 for the accuracy of the movements; The T-value of the action force is -1.128, and the P-value is 0.262. Except for the P-value of action accuracy, which is less than 0.05, the P-value of action force is greater than 0.05. These indicate that in the preliminary assessment of students' basic mastery of aerobics before the experiment, there is only a difference in the accuracy of movements and no difference in indicators such as movement intensity between the experimental and control groups, which are basically on the same level.

4.1.2 Comparative Analysis of Aerobics Technique Movements and Artistic Expressions Between the Experimental Class and the Control Class Before the Experiment

In the preliminary survey before conducting the blended teaching experiment of online and offline aerobics courses, the average and standard deviation of the experimental group and the control group in terms of the artistic completion of aerobics movements are 10.80 ± 0.76 and 10.78 ± 0.97, respectively; The average and standard deviation of music rhythm sense are 11.11 ± 1.02 and 11.16 ± 0.65, respectively; The average and standard deviation of motor coordination are 11.35 ± 0.77 and 11.02 ± 0.72, respectively; The researchers conduct a T-test on the artistic sub indicators of the pre experiment aerobics test for students in the experimental and control classes. The T-value is 0.112 and the P-value is 0.909. The T-value for music rhythm is -0.230 and the P-value is 0.817. The T-value for movement coordination is 1.702 and the P-value is 0.093; The P-values are all greater than 0.05. These indicate that there is no significant difference in the initial mastery of the beauty, rhythm, and coordination of aerobics movements between the experimental class and the control class students before the experiment.

4.2 Comparative Analysis of Aerobics Learning Between the Experimental Class and the Control Class After the Experiment

After a semester of online and offline blended teaching model in aerobics courses, the experimental class has showed significant changes compared to the control class in terms of self-directed learning, teacher-student interaction willingness, and aerobics scores.

4.2.1 Comparative Analysis of Independent Learning Between Experimental Class and Control Class Students After the Experiment

There is a significant difference in the willingness of the experimental class to learn aerobics independently after a semester of online and offline blended teaching compared to the control class. The reason why control class students are willing to learn aerobics independently after class is that relying solely on pre-class preparation and classroom learning time, they cannot fully master aerobics movements. They need to spend time reviewing independently after class to ensure that they will not quickly forget the newly learned aerobics movements. And the experimental class students are willing to engage in independent learning of aerobics after class because they believe that online teaching platforms can be used for post-class review. Technical movements that they have not mastered in class can be further consolidated and learned through videos posted by the teacher on the online teaching platform. They do not have to worry about forgetting their movements, nor do they have to worry about the teachers checking their review in the next class. In addition, reviewing through online teaching platforms allows for self-reflection and the ability to identify and fill in gaps [6].

4.2.2 Comparative Analysis of Teacher-Student Interaction Willingness Between Experimental Class and Control Class Students

After a semester of online and offline blended teaching in aerobics courses, there is a significant difference in willingness between the experimental group and the control group to interact with teachers and students. The control class students believe that if they interact face-to-face with the teachers, they will feel nervous. They only communicate in class, with a single communication channel. The experimental class students believe that real-time communication with teachers through online platforms is very convenient for teacher-student interaction, and problems can be solved in a timely manner. Moreover, they do not feel nervous when communicating with teachers through online platforms and are very willing to interact with teachers [7].

4.2.3 Comparative Analysis of Aerobics Performance Between Experimental Class and Control Class Students

4.2.3.1 Comparative Analysis of the Completion Scores of Aerobics Technique Movements Between the Experimental Class and the Control Class After the Experiment

The average accuracy and standard deviation of the aerobics technique movements in the experimental and control groups after the experiment are 15.92 ± 0.83 and 16.77 ± 0.81, respectively; The average and standard deviation of the action force are 15.30 ± 0.75 and 16.41 ± 0.65, respectively; The accuracy of the action has a T-value of 3.053 and a P-value of 0.001; The T-value of the action force is 4.105, the P value is 0.001, and the P-value is<0.05 [8]; From the data analysis, it can be concluded that after one semester of aerobics course learning, both the experimental class and the control class have shown an improvement in completion scores before the experiment. However, the overall accuracy and strength scores of the experimental class are higher than those of the control class. From this, it can be concluded that the application of online and offline blended teaching in aerobics teaching can improve students' completion scores.

4.2.3.2 Comparative Analysis of Aerobics Technique Movements and Artistic Scores Between the Experimental Class and the Control Class After the Experiment

A comparative analysis has been conducted on the artistic scores of aerobics technique movements between the experimental group and the control group after the experiment. The average and standard deviation of the artistic score movements in the control group and the experimental group are 14.23 ± 0.90 and 15.67 ± 1.12, respectively; The average and standard deviation of the sense of rhythm in music are 14.72 ± 0.58 and 15.87 ± 0.92,

respectively; The average and standard deviation of action coordination are 14.54 ± 0.68 and 15.63 ± 1.16, respectively; The T-value for graceful movements is 4.573 and the P value is 0.001; The T-value and P-value of music rhythm sense are 4.752 and 0.001, respectively; The action coordination T-value is 4.378 and the P-value is 0.001 [10]. Comparing the data, it can be seen that the P-values of the experimental class and the control class in terms of movement beauty, music rhythm, and movement coordination are all<0.05, indicating that after one semester of aerobics course learning, the artistic scores of the experimental class and the control class before the comparative experiment have also been significantly improved. The overall scores of movement beauty, music rhythm, and movement accuracy in the experimental class are higher than those in the control class. Therefore, it can be concluded that the application of online and offline blended teaching in aerobics teaching can improve students' artistic scores.

4.2.3.3 Comparative Analysis of the Total Scores of Aerobics Techniques and Movements Between the Experimental Class and the Control Class After the Experiment

In the comparison of the total scores of aerobics technique movements assessment between the control group and the experimental group after the experiment, it can be seen that the average and standard deviation of the total scores of the control group and the experimental group are 77.64 ± 2.68 and 83.20 ± 3.43, respectively. Independent sample T-test was conducted on the total scores of students in the experimental group and the control group, and the T-value Is 6.985, the P-value Is 0.001, and P<0.05. There is a significant difference in the total score of the course between the experimental group and the control group students [11]. The total score of aerobics assessment for experimental group students is higher than that of the control group, indicating that the application of online and offline blended teaching in aerobics teaching not only improves students' aerobics completion scores and artistic scores, but also improves their overall scores.

5. CONCLUSIONS AND SUGGESTIONS

5.1 Conclusions

First, the online and offline teaching blended model of aerobics requires high professional competence and teaching ability from teachers. It requires teachers to not only be able to conduct practical teaching, but also proficiently use various functions of the online teaching platform APP, create infectious and attractive teaching courseware, and grasp the learning situation of each student.

Second, through one semester of aerobics course learning, both the experimental and control class students have improved their understanding of aerobics and their aerobics scores. Comparing the scores of the control class students, the experimental class students have showed a more significant improvement in their scores.

Third, after conducting a mixed online and offline teaching experiment in aerobics, over 90% of the students in the experimental class believe that this new teaching model of online and offline blended teaching is significantly different from the traditional teaching model. The online and offline blended learning model is more convenient in terms of student learning and teacher-student interaction.

Fourth, after the online and offline blended teaching experiment, the overall learning satisfaction of the experimental class students is higher than that of the control class. It can be seen that online and offline blended teaching is more conducive to students learning aerobics and improving their learning efficiency.

5.2 Suggestions

Firstly, teachers should produce high-quality teaching videos and courseware, ensuring clear and concise teaching content. They should communicate and solve online problems with students in a timely manner, optimize and adjust courseware based on student feedback, and thus improve students' interest and efficiency in learning.

Secondly, teachers should build a smoother bridge of communication and interaction between teachers and students through online and offline blended teaching. In addition to imparting students' sports skills, more attention should be paid to the cultivation of students' comprehensive abilities, in order to achieve the fundamental goal of sports education.

Thirdly, teachers should improve the knowledge reserve of online teaching platforms, fully tap into the learning resources of online teaching platforms, and take into account students' learning status in real time through the sharing of learning resources.

AUTHORS' CONTRIBUTIONS

Meixia He: overall planning and writing; Wei Li: coordination; Jing Zhou: data collection and organization; Haitao Yu: statistical analysis.

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