Innovation and practice of aerobics teaching mode based on information technology

Lanying Wang

School of Big Data and Basic Science, Shandong Institute of Petroleum and Chemical Technology, Dongying, 257061, China

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Abstract: With the rapid development of information technology, its application in the field of physical training has become a key force to promote the innovation of teaching mode. This paper first analyzes the current situation of calisthenics teaching based on information technology, and then builds an innovative teaching model, which is helpful to enhance students' training enthusiasm and learning effect, and cultivate students' sense of rhythm and physical quality, so that they can better enjoy the charm brought by calisthenics. The results showed that the average score of the experimental group was 87.7 and that of the control group was 78.2. At grade 22, the average score for the experimental group was 83.1 and 75.6 for the control group. In the analysis of aerobics technical elements, the score of the experimental group was 6.5 points higher than that of the control group. It shows that the application of innovative teaching mode in calisthenics teaching has achieved remarkable results, and it is worthy of further promotion and application.

1. Introduction

Introducing information technology into classroom teaching in universities is an important method for current teaching reform and innovation [1]. Especially in sports training, the use of information technology has not only changed the way universities teach and train, but also improved sports performance and training effectiveness [2]. As an important part of college physical education, calisthenics training has unique qualities and potential both from the perspective of health and from the perspective of adapting to the needs of modern development and current education reform [3]. However, due to the current college aerobics curriculum, teaching materials, teaching content, teaching methods and the most important final assessment and other factors, teachers pay less attention to this course [4]. The current calisthenics neglects the cultivation of students' interest, attitude, ability and knowledge in calisthenics, and lacks students' understanding of experience and new ability [5]. In recent years, the research on the theory and practice of calisthenics reform in Chinese colleges and universities has been increasing, but because of the difficulty and longtime of calisthenics reform training, the results of calisthenics reform training in Chinese colleges and universities are not ideal.

Aerobics is increasingly popular in physical education in colleges and universities, and many students actively participate in the study of this sport. When teaching calisthenics, colleges and universities should pay attention to cultivating students' good learning and exercise habits, and pay attention to the quality of teaching content. Under the background of information technology, this paper adopts innovative teaching mode, which can improve students' learning interest and motivation, and finally realize the reform and innovation of aerobics teaching mode.

2. Related Words

Kravchuk T M et al. conducted empirical and experimental verification of the method of teaching gymnastics to students of physical aerobics. Through the research, this paper provides a method to teach and improve gymnastics skills for college students majoring in physical aerobics. It has been proved that the introduction of specialized exercises for students to engage in aerobic

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exercise in the course of education and training gradually leads to the implementation of gymnastic elements, while partially developing the necessary physical abilities, which helps them to assimilate and improve more effectively. In particular, unlike the control group, the quality of execution of all gymnastic exercises in the experimental group improved by an average of 50%[6-7]. LiQ et al. put forward the reform of physical education teaching in colleges and universities under the PBL teaching concept, and found through comparative experiments that the proposed teaching reform is more effective for students' classroom activity level and knowledge mastery. Chen B et al. built a professional teaching resource library framework, reasonably collected and sorted out learning materials, designed and produced multimedia online courses to facilitate students' learning [8]. NesenO et al. established the grading types of modern student physical activity. The list received attests to the need to adjust the maintenance of physical education projects and programmes [9].

3. Method

At present, the teaching of aerobics in some universities has not reflected the basic principles and unique characteristics of the discipline. The teaching process often becomes a superficial explanation of motor skills, neglecting the cultivation of students' interests, methods, and especially innovative abilities [10-11]. This method hinders the learning potential and comprehensive development of students, and ultimately hinders the overall quality of education provided by these institutions [12]. Therefore, this article advocates the use of information technology and the adoption of innovative teaching methods in college aerobics teaching. It adheres to the teaching strategy of putting health first, consistent with contemporary educational practice, and strives to continuously improve the teaching level of aerobics [13-14].

As the link between information technology and education becomes increasingly close, the use of information technology in teaching has also undergone changes. By combining big data, cloud computing, artificial intelligence, and other information technologies, aerobics courses can promote a shift from teacher centered to student-centered teaching models. These courses play a crucial role in cultivating new skills for students. Therefore, in the current situation, universities must address the unique challenges in aerobics teaching, keep up with the trend, develop teaching methods based on information technology, and ensure that their implementation is both effective and efficient. Through empirical research, this article aims to design a self-innovative classroom teaching model based on information technology [15].

4. Results And Discussion

4.1 Introduction to calisthenics teaching in colleges and universities

Calisthenics teaching materials provide specific guidance and guidance for calisthenics teaching, which is an important basis for teachers and students to carry out teaching activities, and is also the benchmark for students to understand. The survey on the selection of aerobics teaching materials is shown in Table 1.

Table 1 Survey of the selection of aerobics teaching materials

Item	N (Number of schools)	Proportion (%)
National compilation of teaching materials	8	25
Teaching materials compiled by the unified department in normal schools	3	10
Self-compiled teaching material	14	45
Textbooks written by our teachers	5	20

As can be seen from Table 1, self-compiled teaching materials occupy the highest proportion, reaching 45%. This shows that in the teaching of aerobics, many schools are more inclined to write textbooks independently according to their own actual situation and teaching needs. Self-compiled textbooks may be closer to the actual needs of students, and can better reflect the characteristics and

teaching style of the school. The proportion of textbooks compiled by the national government is 25%, and the proportion of textbooks written by our teachers is 20%. The two are relatively close in proportion, indicating that a considerable number of schools nationwide choose to use the national compilation of textbooks, ensuring the uniformity and standard of textbook content. At the same time, a certain number of schools choose to use textbooks written by their own teachers, which reflects the flexibility and personalization of the use of textbooks. The proportion of uniformed teaching materials in normal universities is only 10%, which is relatively low. This may indicate that compared with other types of teaching materials, the recognition and utilization rate of unified teaching materials in normal universities are low.

4.2 Analysis of teaching content of calisthenics practice course in colleges and universities

The teaching content of aerobics course usually includes three aspects: practical teaching, auxiliary teaching and theoretical teaching. The content of calisthenics teaching is the main basis to achieve the goal of calisthenics teaching. The effective content of calisthenics teaching includes basic knowledge, skills and physical quality, which are often reflected in textbooks and textbooks. The survey of aerobics teaching content is shown in Table 2.

Table 2 Investigation of aerobics course teaching content

Teaching content	N (Number of schools)	Proportion (%)
Competition aerobics	0	0
Compose and direct calisthenics	11	35.8
Aerobics routines and steps	15	50
Aerobics for mass exercise	5	14.2

As can be seen from Table 2, the aerobics routines and steps account for the highest proportion in the teaching content of practical courses, reaching 50%. This shows that in the teaching of aerobics, most schools attach great importance to the teaching of basic movements and routines, which is the basis for cultivating students' aerobics skills and physical fitness. The proportion of self-written and self-directed aerobics is 35.8%, indicating that many schools also pay attention to cultivating students' innovative ability and self-written and self-directed ability. Through the teaching of calisthenics, students can better understand the composition and law of calisthenics and improve their practical operation ability. The proportion of competition aerobics is 0%, which means that none of the schools surveyed teach competition aerobics as part of their practical curriculum. This is because competition aerobics has high technical requirements and is suitable for students with a certain foundation, so it is not widely used in teaching arrangements. The proportion of calisthenics exercised by the public is 14.2%, which is relatively low, but it also shows that some schools have paid attention to the needs of public fitness and included the mass exercise calisthenics in the teaching content, aiming at cultivating students' ability to adapt to the needs of society.

4.3 Experimental analysis of innovative teaching model

A total of 130 students from a certain university in 2023 and 70 students from 2022 were selected for the study, and divided into an experimental group and a control group for the study. Invite aerobics experts and students to conduct a comprehensive evaluation of their various levels, and the experimental results are shown in Table 3.

Table 3 Comparison of student indicators before the experiment of innovative teaching mode

Grade	Goup	Number of people	Average score (U)				Correlation and correlation significance coefficient
			Theoretical level	Physical fitness	Technical level	Creation ability	
Lv.23	Experiment	30	76.2	77.1	65.4	51.6	1.0/0.01
	Contrast	30	76.5	75.2	65.0	52.2	
Lv.22	Experiment	35	77.0	71.3	61.4	49.5	1.0/0.01
	Contrast	35	76.8	72.2	62.8	52.6	

According to Table 3, by observing the average grades (U) of students in different grades and groups, it is found that the average grades of the experimental group and the control group are very close, and there is no significant difference, whether it is grade 23 or grade 22. This means that before the experiment, the overall performance of the two groups of students was roughly the same. Observing indicators such as theoretical level, physical fitness, technical level, and innovation ability, the values of the experimental group and the control group are relatively close in most cases, with no significant difference between good and bad. This further indicates that before the experiment, the two groups of students were similar in various ability indicators.

Then, based on information technology, the innovative teaching model proposed in this article was compared with student indicators. The comparison table of student indicators after the innovative teaching model experiment is shown in Table 4.

Table 4 Student indicators after the innovative teaching model experiment

Grade	Goup	Number of people	Average score (U)				Correlation and correlation significance coefficient
			Theoretical level	Physical fitness	Technical level	Creation ability	
Lv.23	Experiment	30	87.7	79.5	80.4	86.5	0.36/0.64
	Contrast	30	78.2	77.6	65.3	60.5	
Lv.22	Experiment	35	83.1	87.3	87.3	87.4	0.55/0.45
	Contrast	35	75.6	63.8	64.6	63.4	

The 23rd and 22nd grades have an experimental group and a control group, respectively, to compare the various indicators of different students under different teaching modes. From the average score (U) column, it can be seen that the scores of the experimental group are generally higher than those of the control group. At level 23, the average score of the experimental group was 87.7, while the average score of the control group was 78.2. In the 22nd grade, the average score of the experimental group was 83.1, while the average score of the control group was 75.6. This indicates that innovative teaching models have a positive impact on improving overall student performance. From other indicators, the experimental group generally performed better than the control group. For example, the experimental group scored higher than the control group in terms of theoretical level, physical fitness, technical level, creativity, and other aspects. This further proves the effectiveness of innovative teaching models in improving students' comprehensive skills.

In the process of aerobics training, the teaching results obtained by using different training methods vary. In order to test the effectiveness of innovative aerobics teaching models based on information technology, the most suitable aerobics training path is selected by comparing the effects of different training methods. In this study, the control group used traditional training methods, while the experimental group used innovative training methods. Evaluate the teaching effectiveness of various training methods by comparing the actual technical levels of two groups of students. The scores for each technical factor are shown in Table 5. We can directly compare the difference in technical factor scores between the traditional group and the innovation group. The control group received traditional training methods and scored 85.2 points on technical elements. The experimental group adopted innovative training methods, with a technical factor score of 91.7 points, which is 6.5 points higher than the traditional group. This indicates that innovative training has significant advantages over traditional training in improving technical elements.

Table 5 Score of aerobics technical elements

Group	Training method	Technical factor score
Control group	Traditional training	85.2
Experimental group	Innovative training	91.8

5. Conclusion

This article analyzes the current situation of aerobics teaching under the background of

information technology and proposes new teaching models. Building an innovative teaching model for aerobics is beneficial for enhancing students' training interest and learning ability, as well as improving their physical fitness. The practical results show that the average score of the 23 classes in the experimental group is 87.7 points, while the control group is 78.2 points. In Class 22, the average score of the experimental group is 83.1, while the average score of the control group is 75.6. The technical factor score of the experimental group was 6.5 points higher than that of the control group. The above data is sufficient to demonstrate the application and effectiveness of innovative aerobics teaching models in teaching, which can effectively improve teaching quality and have broad application prospects.

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