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The Innovative Concept and Practice of College Martial Arts Teaching from the Perspective of Sports Power

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Abstract

Background and Aims: Martial arts play an important role and value in promoting college students' physical fitness, self-defense, moral and cultural development, and helping to build sports power. The objectives of this study were to compare the effects of different teaching modes on the movement technique teaching of primary Changquan (third routine) and to build an efficient martial arts teaching model and practice program.

Materials and Methods: Using the random sampling method, 120 first-year students of Qiqihar University's martial arts elective course were randomly divided into four groups, 30 students in each group. The mathematical statistics method was used to make statistical analysis on the test scores of experimental groups 1 (strengthening martial arts cultural verbal incentives), experimental group 2 (strengthening visual representation), experimental group 3 (strengthening martial arts cultural verbal incentives + visual representation) and control group (regular teaching mode).

Results: 1) Before the teaching experiment, there was no significant difference in the performance of Wushu's basic skills between the three experimental groups and the control group. 2) After the teaching experiment, the test scores of the primary Changquan (third routine) of experimental group 3 were better than those of experimental group 1 and experimental group 2, and there were significant differences. 3) Tracking and retesting, experimental group 3 were better than experimental group 1 and experimental group 2 in keeping the effect of movement technique respectively.

Conclusion: The teaching mode of experimental group 3 has the best effect on promoting the improvement of college students' martial arts cultural literacy and the learning and maintenance of movement skills.

Keywords: College Martial Arts Teaching; "Teacher-Student Resonance" Martial Arts Teaching Method; Teaching Mode

Introduction

In the new era, China is accelerating the construction of a sports power. Adhering to people-oriented, reform and innovation, continuously improving the quality and efficiency of sports development, realizing the transformation from a big sports country to a sports power, and striving to build sports into a landmark cause of the great rejuvenation of the Chinese nation is an important development goal of my country's sports work in the new era (Office of the State Council, 2019). As an important part of Chinese excellent traditional culture, martial arts play an important role in cultivating more outstanding sports talents and

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assisting in the construction of China's sports power. Martial arts education is an important way to improve the physical, psychological, and cultural quality of college students, and it is also an important means to develop college students' body movement function and improve physical fitness. It plays an important role in promoting the development of college students' physical fitness, self-defense, moral character, and cultural accomplishment (Liu Minglong, 2021).

Martial arts teaching refers to the activities in which teachers and students participate together to complete certain teaching tasks. It is an activity guided by teachers, practiced by students, re-guided, and re-learned based on a timely evaluation of learning effects, and the understanding and practice of gradually mastering special techniques and activity process (Cai Zhonglin, Zhou Zhihua, 2009). Martial arts teaching in colleges and universities plays an important role in promoting the physical and mental health of college students, honing the will and quality of college students, and enhancing the moral sentiment of college students (Yang Jianying, 2021). Martial arts teachers must not only master good "teaching methods" but also pay attention to the teaching of students' "study methods". Only by clearly making students aware of what to do in class can they better cooperate with teachers in learning and training Chinese martial arts movement skills.

Martial arts teaching ability refers to the ability of martial arts teachers to teach students the theory and skills of martial arts according to the syllabus of martial arts in the teaching process and to cultivate students' comprehensive quality (Qin Hua, 2019). Evaluate the essence of martial arts teaching ability to see whether it can achieve the effective teaching of martial arts courses. The teaching strategy is the process in which teachers consciously choose and plan teaching methods and flexible handling to improve teaching efficiency (Li Xiaowen, Wang Ying, 2011). Successful teaching strategies play an important role in effectively achieving the expected results of course teaching. Martial arts teachers should pay attention to the improvement of self-teaching ability, rely on the Confucian benevolence, righteousness, propriety, wisdom, and trustworthiness contained in "martial arts morality" (Liu Mingdong, Ma Chenjun, et al., 2022), pay attention to the integration of martial arts knowledge, movement skills and moral and humanistic education, and realize the educational effect of both internal and external cultivation (Zeng Yihan, Gu Hongjia, 2021). At the same time, we must fully understand the physical, psychological, and emotional characteristics and learning characteristics of college students, innovate and formulate effective teaching strategies, and strive to improve the effect and quality of martial arts teaching.

The definition of resonance in the Modern Chinese Dictionary is the phenomenon that an object makes a sound due to resonance; another definition refers to the same emotion caused by a certain emotion of others (Chinese Academy of Sciences Dictionary Editing Office, 2016). Based on summarizing related concepts such as resonance and teaching strategies, the martial arts teaching method of "teacher-student resonance" is proposed, that is, in martial arts teaching, to enable both teachers and students to cooperate effectively, form a tacit understanding, and achieve the optimal state of martial arts teaching, choose and implement strategies for optimizing teaching programs and methods (Su Yong, 2016). Applying the "teacher-student resonance" teaching strategy in martial arts teaching, students can deeply understand the

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teacher's teaching intentions, and better invest in martial arts learning and practice, which is conducive to the improvement of students' learning efficiency and teachers' teaching quality.

At present, the effective and innovative teaching of martial arts courses is the focus and core task of martial arts instructors. To promote college students to effectively master martial arts movements and improve martial arts cultural literacy, this study rationally uses the latest scientific research results of martial arts teaching strategies based on in-depth research on college students' psychological characteristics, learning characteristics, and many teaching theories. Aiming at the complexity of the Chinese martial arts action technology system, the concept of "teacher-student resonance" martial arts teaching method is put forward, which emphasizes the education of martial arts cultural theory and martial arts spirit, strengthens the explanation of the essential attributes, characteristics and offensive and defensive meanings of martial arts movements, and pays attention to the stimulation of students' interest in learning and the innovative application of teaching strategies. To construct an effective martial arts teaching mode and practice plan, three experimental groups and a control group were designed in combination with the teaching of primary Changquan (third routine), respectively to verify the teaching effects of different teaching modes and to summarize the optimal teaching plan, and serve for improving the efficiency of martial arts teaching and realizing the high-quality development of martial arts courses.

Objectives

1. To compare the effects of different teaching modes on the movement technique teaching of primary Changquan (third routine).
2. To build an efficient martial arts teaching model and practice program.

Literature Review

Martial arts culture education

Martial arts culture is a part of the traditional culture of the Chinese nation, and it is a kind of peaceful culture, which covers the three levels of material, system, and spirit. Martial arts culture has important significance in improving the quality of education and promoting the all-round development of students in martial arts teaching in colleges and universities; mobilizing students' enthusiasm and promoting the efficient development of martial arts teaching; promoting the formation of students' will and quality (Wang Chunlin, 2020). Wushu cultural education is conducive to the inheritance and development of excellent traditional Chinese culture and is conducive to the development and dissemination of the spirit of the Chinese nation. Colleges and universities should attach importance to martial arts culture education, innovate martial arts teaching models, improve the martial arts culture teaching system, and strengthen in-depth research on martial arts culture (Fang Shunhui, 2022). The construction of martial arts culture in colleges and universities should combine the value orientation of contemporary college students, and use various means and methods to carry out diversified inheritance. Based on national self-confidence, we should better face global culture and improve our cultural soft power (Zhang Fan, 2022).

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Martial arts fusion-related theory teaching

In 1983, the American psychologist Howard Gardner proposed the theory of multiple intelligences, pointing out that "every individual has a relatively weak aspect and a relatively advantageous aspect in a certain aspect at the same time, and their ability to fully demonstrate their advantages. At the same time, improve your weaker aspects, and then improve your weaker aspects". Martial arts teachers in colleges and universities should introduce high-tech means and innovate teaching methods under the theory of multiple intelligences; they should expand the evaluation content in combination with the theory of multiple intelligences to make it more scientific (Mei Jiaojiao, 2020). The hypercycle theory was created by the famous German scientist M. Eigen. It mainly aims to explore and describe the laws of self-organization and the evolution of complex systems. Gao Jianrong (2021) believes that the super cycle theory pays attention to every link in the physical education teaching process, and the application of this theory in martial arts teaching in colleges and universities is conducive to the orderly development of "teaching and learning", "learning and practicing" and "practicing and teaching" in martial arts teaching.

Martial arts teaching methods

The Model Law facilitates the improvement and development of martial arts theory, teachers' professional skills, and student's ability to practice. At present, martial arts demonstration education in China is still at a low stage, and martial arts demonstration teaching methods should be used scientifically to improve the quality of martial arts teaching (Geng Yingying, 2020). The game-teaching method can improve students' interest in martial arts learning, create a cheerful classroom atmosphere, promote interaction between teachers and students, and improve students' martial arts learning efficiency (Zeng Qingguo, 2020). The representation training method is conducive to college students mastering the most basic martial arts skills, which can effectively improve the efficiency of students' martial arts training and improve students' interest and enthusiasm for martial arts learning (Zhou Xinliang, 2021). In the teaching of martial arts in colleges and universities, group cooperation can highlight students' dominant position, and student's enthusiasm for learning, sense of unity and cooperation, and self-confidence will be significantly improved (Du Shougao, et al., 2022).

Martial arts teaching mode

The "BOPPPS" teaching mode divides the classroom into six modules: introduction, goal, pre-test, participatory learning, post-test, and summary, emphasizing students as the main body of the classroom, fully mobilizing students' interest in learning, and enhancing the interactivity of the classroom. Using the "BOPPPS" teaching mode to carry out martial arts teaching can enhance students' interest in learning, enhance interaction in the classroom, and improve the efficiency of martial arts teaching (Zhang Xiaomiao, 2020). The "MOOC + flipped classroom" teaching model is based on the teaching concept of multi-platform based on time-space teaching and autonomy, and this martial arts teaching mode should be continuously improved in actual martial arts teaching, which can promote the improvement of martial arts teaching effect (Wang Dan, 2021). The application of blended teaching mode in martial arts wisdom classrooms in colleges and universities has important theoretical significance and practical value. Zhang Jing, Lu Haoran, et al. (2021) demonstrated the integration of the application of blended teaching mode in

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college martial arts wisdom classrooms from four aspects: teaching ability, teaching literacy, teaching requirements, and teaching purpose. Put forward a scientific and reasonable teaching concept that makes good use of "smart" classrooms.

Martial arts teaching network technology

Micro-lessons can make martial arts teaching in colleges and universities more flexible and efficient. In the development and application, attention should be paid to disseminating a complete and correct martial arts culture and handling the relationship between teaching and training (Yang Rong, Li Zhengen, 2021). The introduction of VR technology in the teaching of martial arts in colleges and universities has significantly increased the time for students to practice martial arts independently, and the quality of movements, individual movement scoring, and group collaboration have all improved (Wang Wei, 2023). With the continuous development of information technology, new media provides a convenient channel for teachers and students to obtain martial arts teaching information. Building an integrated development system of "Internet + martial arts", accelerating the process of online reform of martial arts teaching, and innovating the supervision and management mechanism of online martial arts teaching can promote the dissemination and development of online martial arts teaching (Li Chunqiao, Chang Yi, 2021).

In summary, scholars have conducted research on martial arts culture and education, theoretical teaching related to martial arts integration, martial arts teaching methods, martial arts teaching modes, and martial arts teaching network technology from different perspectives, and the above research has important enlightenment significance. However, it is found that the literature on the combination of different martial arts teaching methods and teaching modes using teaching experimental methods is relatively lacking, especially the research on the teaching experiment of "martial arts cultural verbal incentives" and "visual representation" is less, so further in-depth and systematic research is needed.

Conceptual Framework

The experimental procedure is divided into three stages: the pre-teaching experiment test stage, the post-teaching experiment test stage, and the two-week follow-up retest stage after the teaching experiment. Figure 1 illustrates the conceptual framework.

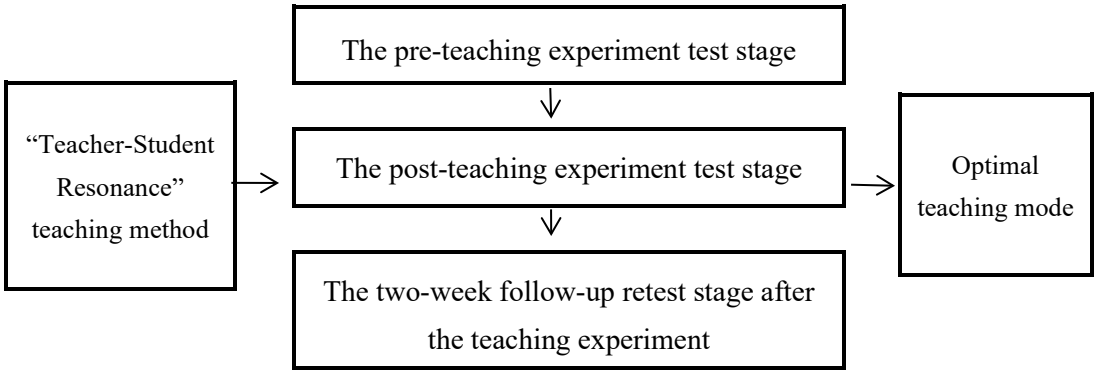

Figure 1 Conceptual Framework for Martial Arts Teaching

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Methodology

Population and sample: A total of 120 college students who took the Chinese Wushu course in their first year of Qiqihar University were selected as the experimental subjects, and they were randomly organized into four classes (30 students in each class) to participate in the learning of the primary Changquan (third routine) of the Chinese Wushu course in college sports. The college students in the four groups have never studied and trained in primary Changquan (third routine), and have not participated in similar teaching experiments.

Research design: In the teaching of primary Changquan (third routine), experiments with different teaching modes were designed according to the teaching strategy of "teacher-student resonance", and different teaching methods and strategies were implemented. Table 1 describes the experimental design.

The teaching experiment is arranged in the second semester of freshman students. The four classes who take the Chinese Wushu course participate in the 18-week (36 class hours) study of primary Changquan (third routine). Classes are conducted as normal according to the syllabus.

Table 1 List of teaching modes of the experimental group and the control group

Group	Teaching content and method strategy
Experimental group 1 (strengthening martial arts cultural verbal incentives)	Highlight the teaching of moral education, traditional philosophy, and health preservation; Strengthen the explanation of the characteristics of martial arts movements and attack and the meaning of attack and defense; Incentive teaching method encourages students and stimulates students' learning interest and motivation.
Experimental group 2 (strengthening visual representation)	Pay attention to the combination of martial arts theory, humanistic education, and multimedia; Highlight the visual effects of martial arts video multimedia teaching; Pay attention to the visual effects of martial arts movements; Multimedia after class to assist students in reviewing and consolidating applications.
Experimental group 3 (strengthening martial arts cultural verbal incentives + visual representation)	Pay attention to the education of martial arts culture, morality, and psychology; Pay attention to the application of multimedia teaching; Pay attention to the visual effects of martial arts movements; Pay attention to the effective combination and innovative application of incentive methods, error correction methods, competition methods, etc. with multimedia and equipment.
Control group (regular teaching)	Martial arts theoretical knowledge, routine teaching of martial arts movement techniques.

Research instrument: Through CNKI and Wanfang database, the relevant literature on martial arts teaching was retrieved, and related concepts were summarized and defined. Use the questionnaire star to design and arrange the questions related to the martial arts test to form an expert questionnaire, and then

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invite 6 experts to fill it out through WeChat, QQ, and other methods. In the testing stage before the teaching experiment, there are 5 judges, and each judge tests 2 basic martial arts movements, a total of 10 basic martial arts movements. Part of the movement test will use tools such as a stopwatch and a sitting and forward bending tester. In the test stage after the teaching experiment and the follow-up retest stage, five judges judged the performance of the students in the experimental group and the control group on the primary Changquan (third routine) movement skills. The scoring standard is based on the syllabus of the Wushu course at Qiqihar University.

Data collection: Use Excel to create a student record sheet. Before the teaching experiment, the students in the experimental group and the control group were assessed on their basic martial arts movement levels. Five judges tested 2 items per person, totaling 10 basic martial arts movements. The judges scored on the spot, and the recorder recorded and entered the results; after the teaching experiment, the students' primary Changquan (third routine) movement skills were assessed, and the 5 judges evaluated the students' movement quality (60%) and practice level (40%) on the spot Grading is carried out, and the scores are entered into the corresponding student list in the Excel sheet. Remove the highest score and the lowest score, and take the average of the other three evaluation scores, which is the student's final grade.

Data analysis: Use the computer program to analyze the martial arts test scores of the three experimental groups and the control group, and then compare them separately, analyze the differences between different teaching modes, and summarize the optimal martial arts teaching mode.

Results

1. Testing and analysis of students' basic skills in Wushu Changquan before teaching experiments

Before the teaching experiment, the students' basic skills of Wushu Changquan were tested, including legwork (forward kick, bounce kick), footwork (bow step, squat step), balance movement (golden rooster independence), flexibility movement (Body forward bending) and other 10 movements, each movement is 10 points, a total of 100 points. As shown in Table 2, the test results showed that there was no significant difference between the experimental group and the control group. It shows that the overall level of college students in the basic skills of Wushu Changquan is at the same level.

Table 2 Test for the difference in martial arts basic skills scores between the experimental group and the control group students before the experiment (n=120)

Test content	Experimental group $\bar{X}$±SD (point)	Control group $\bar{X}$±SD (point)	t	df	P-value
Basic skills of martial arts Changquan	Experimental group 1 78.13±11.18	76.93±12.36	0.204	113	0.816
	Experimental group 2 77.63±10.61	76.93±12.36	0.281	113	0.794

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Test content	Experimental group $\bar{X}$±SD (point)	Control group $\bar{X}$±SD (point)	t	df	P-value
	Experimental group 3 76.93±10.11	76.93±12.36	0.191	113	0.819

2. Analysis of the examination results of students' primary Changquan (third routine) movement skills after the teaching experiment

Changquan assessment results are one of the important indicators to measure the teaching effect of teachers, and it is also an important indicator to test the student's mastery of Changquan movement techniques. The assessment of primary martial arts (third routine) is mainly based on two aspects: the quality of movement (60%) and the level of practice (40%). The full score is 100 points. The assessment mainly adopts the deduction system to judge the quality of Changquan movements and the level of practice of the students.

2.1 Comparison and analysis of primary Changquan (third routine) assessment results between the experimental group 1 and the control group after the teaching experiment

Table 3 shows that the total average score of the students in experimental group 1 (strengthening martial arts culture verbal incentives) in the primary Changquan (third routine) movement technique assessment is higher than that of the control group, but there is no significant difference.

Table 3 Test of the difference in test scores of primary Changquan (third routine) between the experimental group 1 and the control group after the experiment (n=60)

Test content	Experimental group 1 $\bar{X}$±SD (point)	Control group $\bar{X}$±SD (point)	t	df	P-value
Movement quality	52.17±4.63	50.13±4.63	1.625	56	0.073
Level of exercise	31.81±4.57	30.93±4.82	1.517	56	0.109
Points deducted for mistakes	1.98±1.62	2.63±2.38	-0.813	56	0.217
Total score	82.06±9.72	76.31±10.16	1.723	56	0.106

2.2 Comparison and analysis of primary Changquan (third routine) assessment results between the experimental group 2 and the control group after the teaching experiment

Table 4 shows that in the same teaching content and teaching time, the total score of the second experimental group (strengthening visual representation) is higher than that of the control group, and the difference is significant. It shows that the enhanced visual imagery teaching method is more conducive to

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the student's learning of Changquan movement skills than the traditional teaching method, so the teaching effect is improved. Compared with the control group, the movement quality of the students in experimental group 2 is significantly improved, and there is a very significant difference; the exercise level test group 2 is higher than the control group, and there is also a significant difference. Therefore, the teaching method of strengthening visual representation is better than the traditional teaching method in improving the learning effect of Changquan.

Table 4 Test of the difference in test scores of primary Changquan (third routine) between the experimental group 2 and the control group after the experiment (n=60)

Test content	Experimental group 2 $\bar{X}$±SD (point)	Control group $\bar{X}$±SD (point)	t	df	P-value
Movement quality	52.65±3.48	50.13±4.63	2.792	56	0.007
Level of exercise	32.72±2.61	30.93±4.82	2.418	56	0.031
Points deducted for mistakes	1.94±1.15	2.63±2.38	-1.316	56	0.109
Total score	83.41±6.91	76.31±10.16	2.515	56	0.013

2.3 Comparison and analysis of primary Changquan (third routine) assessment results between the experimental group 3 and the control group after the teaching experiment

Table 5 shows that the total average score of the Changquan assessment of the students in experimental group 3 (strengthening martial arts cultural verbal incentives + visual representation) was significantly higher than that of the control group, and there was a very significant difference in the scores; From the analysis of the quality of movements and the level of practice, the movement quality and practice level of the experimental group 3 was significantly higher than the control group, and there was a very significant difference; The error penalty points of the experimental group 3 was also significantly lower than those of the control group. Therefore, the learning effect of the students in the experimental group 3 (strengthening martial arts cultural verbal incentives + visual representation) is much better than that of the control group.

Table 5 Test of the difference in test scores of primary Changquan (third routine) between the experimental group 3 and the control group after the experiment (n=60)

Test content	Experimental group 3 $\bar{X}$±SD (point)	Control group $\bar{X}$±SD (point)	t	df	P-value
Movement quality	53.97±2.68	50.13±4.63	4.142	56	0.000
Level of exercise	34.61±2.73	30.93±4.82	3.842	56	0.000
Points deducted for	1.27±1.18	2.63±2.38	-3.275	56	0.002

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Test content	Experimental group 3 $\bar{X}$±SD (point)	Control group $\bar{X}$±SD (point)	t	df	P-value
mistakes					
Total score	86.34±5.63	76.31±10.16	4.521	56	0.000

2.4 Comparison and analysis of three experimental groups' primary Changquan (third routine) movement technical assessment results after the teaching experiment

Table 6 shows that through the teaching experiment, the students in the third group of the experiment who implemented the teaching mode of "strengthening martial arts cultural verbal incentives + visual representation" performed better than the students in the second group of the experiment who implemented the teaching mode of "strengthening visual representation", and the assessment results were significant differences; the students in the experimental group 3 performed better than the students in the experimental group 1, and there was a significant difference in the evaluation results; the students in the experimental group 2 performed better than the students in the experimental group 1, but there was no significant difference in the evaluation results.

Table 6 Test of the differences in the test scores of the three experimental groups after the experiment (n=90)

Comparison group		Total score $\bar{X}$±SD (point)	t	df	P-value
Comparison 1	Experimental group 3	86.34±5.63	1.913	86	0.049
	Experimental group 2	83.41±6.91			
Comparison 2	Experimental group 2	83.41±6.91	0.738	86	0.352
	Experimental group 1	82.06±9.72			
Comparison 3	Experimental group 3	86.34±5.63	2.614	86	0.015
	Experimental group 1	82.06±9.72			

To sum up, the teaching mode of "strengthening martial arts cultural verbal incentives + visual representation" in experimental group 3 has the best effect on promoting students' mastery of Changquan movement skills and improving their martial arts performance. In the teaching process of the Chinese Wushu Changquan course, the teaching mode of "strengthening martial arts cultural verbal incentives + visual representation" is adopted, which is conducive to enhancing students' understanding of Wushu culture and movement techniques, and promoting students to better master Wushu routines; it is conducive to stimulate students' interest and enthusiasm in learning martial arts, and giving full play to students' self-consciousness and initiative in practicing; It will help improve the teaching effect and quality of university martial arts courses.

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3. Two weeks after the teaching experiment, follow up and re-test the students' primary Changquan (third routine) movement technique maintenance effect assessment analysis

The maintenance effect of the Changquan movement technique is one of the important indicators to test the student's mastery of the Changquan movement technique. The maintenance effect of the motor skills learned in college is an important measure of the formation of lifelong exercise habits in the future. Therefore, it is of practical significance to follow up and retest the experiment two weeks after the design of the teaching experiment.

3.1 Comparison of the test results of the experimental group 1 primary Changquan (third routine) movement technique maintenance effect before and after the follow-up retest

Table 7 shows that two weeks after the end of the experiment, the overall average score of the primary Changquan (third routine) movement technique assessment of experimental group 1 (strengthening martial arts culture verbal incentives) was significantly lower than that of the previous test, and there is a significant difference with the pre-test; the error penalty is significantly higher than the pre-test, and there is also a significant difference. It shows that the teaching mode of experimental group 1 has an unsatisfactory effect on the maintenance of students' primary Changquan (third routine) movement skills.

Table 7 Experimental group 1 primary Changquan (third routine) movement technique follow-up retest results and experimental results difference test (n=30)

Test content	Experimental Group 1 (before) $\bar{X}$±SD (point)	Experimental group 1 (after) $\bar{X}$±SD (point)	t	df	P-value
Movement quality	52.17±4.63	48.27±4.67	14.104	28	0.000
Level of exercise	31.81±4.57	30.25±4.52	9.416	28	0.000
Points deducted for mistakes	1.98±1.62	3.12±1.84	-8.023	28	0.000
Total score	82.06±9.72	74.84±10.26	14.638	28	0.000

3.2 Comparison of the test results of the experimental group 2 primary Changquan (third routine) movement technique maintenance effect before and after the follow-up retest

Table 8 shows that two weeks after the end of the experiment, the overall average score of the primary Changquan (third routine) movement technique assessment of the students in experimental group 2 (strengthening the visual representation) was significantly lower than that of the pre-test, and there is a significant difference; the error penalty is significantly higher than that in the pre-test, and there is also a significant difference, which shows that the teaching method of the experimental group 2 is also not ideal for the students to maintain the Changquan movement skills.

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Table 8 Experimental group 2 primary Changquan (third routine) movement technique follow-up retest results and experimental results difference test (n=30)

Test content	Experimental group 2 (before) $\bar{X}$±SD (point)	Experimental group 2 (after) $\bar{X}$±SD (point)	t	df	P-value
Movement quality	52.65±3.48	49.63±4.12	11.724	28	0.001
Level of exercise	32.72±2.61	30.15±3.11	13.679	28	0.011
Points deducted for mistakes	1.94±1.15	2.83±1.73	-9.724	28	0.017
Total score	83.41±6.91	77.73±8.78	15.386	28	0.025

3.3 Comparison of the test results of the experimental group 3 primary Changquan (third routine) movement technique maintenance effect before and after the follow-up retest

Table 9 shows that two weeks after the end of the experiment, the total average score of Changquan students in experimental group 3 (strengthening martial arts cultural verbal incentives + visual representation) was significantly lower than that of the pre-test, and there is a significant difference; There is a significant difference in the quality of the assessed actions compared to the pre-test; There is a significant difference in the exercise level indicators; The error penalty is higher than that of the pre-test, but there is no significant difference.

Table 9 Experimental group 3 primary Changquan (third routine) movement technique follow-up retest results and experimental results difference test (n=30)

Test content	Experimental group 3 (before) $\bar{X}$±SD (point)	Experimental group 3 (after) $\bar{X}$±SD (point)	t	df	P-value
Movement quality	53.97±2.68	52.91±2.62	3.195	28	0.002
Level of exercise	34.61±2.73	34.11±2.58	2.193	28	0.026
Points deducted for mistakes	1.27±1.18	1.67±1.41	-1.824	28	0.061
Total score	86.34±5.63	85.83±6.19	3.027	28	0.047

3.4 Tracking and re-testing the comparison and analysis of the three experimental groups' primary Changquan (third routine) movement technique maintenance affect results

Table 10 shows that after two weeks of follow-up and re-testing of the teaching experiment, the effect of maintaining the movement skills of the students in experimental group 3 (strengthening martial arts cultural verbal incentives + visual representation) is better than that of the experimental group 1 (strengthening martial arts cultural verbal incentives) and the experimental group 2 (strengthening visual representation), there is a very significant difference in the assessment results of the follow-up retest

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students; the movement technique follow-up assessment of the students in the experimental group 2 is better than that of the students in the experimental group 1 teaching mode, but there is no significant difference in the follow-up retest assessment scores. The teaching mode of experimental group 3 is the best for students to maintain the movement technique of Changquan.

Table 10 Tracking and re-testing the test of the differences in the results of the primary Changquan (third routine) maintenance effect assessment of the three experimental groups (n=90)

Comparison group				**Total score $\bar{X}$±SD (point)**	**t**	**df**	**P-value**
Comparison 1	Experiment (Tracking)	group	3	85.83±6.19	4.214	86	0.000
	Experiment (Tracking)	group	1	74.84±10.26			
Comparison 2	Experiment (Tracking)	group	3	85.83±6.19	3.727	86	0.001
	Experiment (Tracking)	group	2	77.73±8.78			
Comparison 3	Experiment (Tracking)	group	2	77.73±8.78	1.453	86	0.283
	Experiment (Tracking)	group	1	74.84±10.26			

Discussion

Through the experiment, the students in experimental group 1 performed better than the control group in the primary Changquan (third routine) movement technique assessment, but there was no significant difference. The movement quality and drill level of the students were better than those of the control group, and the penalty points for mistakes were lower than those of the control group. The performance of the students in experimental group 2 is higher than that of the control group, and there is a significant difference. The quality of students' movements is improved, the level of drills is significantly improved, and the error rate is reduced. The performance of the students in experimental group 3 was significantly higher than that of the control group, and there was a very significant difference. The movement quality and drill level of the students were significantly higher than those of the control group, and the penalty points for mistakes were also significantly lower than those of the control group.

Through the experimental comparison, the students in experimental group 3 performed better than experimental group 2 in the primary Changquan (third routine) movement skill assessment score, and there was a significant difference; it was better than experimental group 1, and there was a significant difference.

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The performance of the students in the experimental group 2 was better than that of the experimental group 1, but there was no significant difference.

In the follow-up retest two weeks after the experiment, the performance of the students in experimental group 1 was significantly lower than that of the pre-test, and there was a very significant difference. The quality of movement and the level of practice of the students were significantly lower than those of the pre-test, and the penalty points for mistakes were significantly higher than those of the pre-test, and there were significant differences. The performance of the students in experimental group 2 was significantly lower than that of the pre-test, and there was a significant difference. The quality of movement and the level of practice of the students were lower than those of the pre-test, and the penalty points for mistakes were significantly higher than those of the pre-test, and there was a significant difference. The performance of the students in experimental group 3 was significantly lower than that of the pre-test, and there was a significant difference. There is a very significant difference between the quality of students' movements and the pre-test; there is a significant difference in the performance level indicators; the error penalty is higher than the pre-test, but there is no significant difference.

Compared with the follow-up and retest, the students in experimental group 3 had significantly better results in the primary Changquan (third routine) follow-up assessment than those in experimental group 1 and experimental group 2; the follow-up assessment scores of experimental groups 2 were better than those of experimental group 1, but there was no significant difference.

Conclusion

In the third experimental group (strengthening martial arts cultural verbal incentives + visual representation), the performance of the students in the examination of movement skills and the effect of maintenance of movement skills were better than those of experimental group 1 (strengthening martial arts cultural verbal incentives) and experimental group 2 (strengthening visual representation). In the teaching of martial arts courses, the teaching strategy of "teacher-student resonance" is adopted, and the teaching mode of "strengthening martial arts cultural verbal incentives + visual representation" is implemented, which is conducive to improving students' humanistic quality, helping students learn and maintain martial arts movement skills, and promoting martial arts teaching increased efficiency.

Recommendations

Martial arts culture teaching: Innovatively use the teaching strategy of "teacher-student resonance", pay attention to the education of martial arts culture and martial arts ethics, adopt the form of combining the reading of the classic "University" with martial arts teaching, and increase the value of Chinese philosophy, traditional medicine, health science, aesthetics, and other content explanation; Pay attention to the cultivation and improvement of students' psychological quality and martial arts emotion.

In terms of teaching martial arts technical movements: Strengthen the explanation of the characteristics of martial arts and offensive and defensive movements, and pay attention to the standardized teaching and practice of movements; Pay attention to the application of teaching methods such as incentive methods,

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error correction method, and competition method, and use teaching methods and teaching means flexibly in combination with new media, sports equipment, and sports games; Pay attention to the synergy of various elements of teaching, and create a favorable teaching environment for the improvement of students' martial arts skills; Pay attention to safety education, avoid injury, and teach students following their aptitude.

Martial arts courses should pay attention to innovative development: Pay attention to the creative transformation and innovative application of the latest scientific research results; Learn from the teaching theories, teaching methods, and practice models of "Psychology" "Education" "Communication" "Philosophy" and other disciplines, and innovatively apply them to martial arts teaching to form an effective teaching force and promote the innovative dissemination and high-quality development of Chinese Wushu in schools.

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