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A Study on the Application of Video Teaching Method in College Tennis Teaching in the Background of Mobile Internet

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Abstract: This study implements and explores the relevance and efficacy of video teaching methods within the context of teaching tennis to college students. By comparing the learning outcomes of traditional classes and video-aided classes through experiments, this study highlights the innovative and practical value of video teaching methods for university-level tennis instruction in China. Various issues encountered during the experimental operation are statistically analyzed and addressed, with our insights and suggestions on specific issues also discussed. The video teaching method not only compensates for the limited opportunity for independent practice during traditional physical education classes but also offers a novel approach to enhance education and teaching. Through literature review, mathematical statistics, and experimental methods, this study conducts an experimental investigation on the tennis techniques of students enrolled in the 2019 tennis class at Guangdong Industrial and Commercial Vocational Technology University. The findings reveal that while video teaching methods do not significantly impact the forehand stroke performance of the students tested, they considerably affect the technical evaluation outcomes. The students in the video-aided class substantially outperformed those in the traditional class regarding the technical evaluation results of forehand strokes. Despite the video teaching method having a marginal effect on students' backhand stroke test scores, it significantly influenced the technical evaluation results. Accordingly, students in the video-aided class had significantly better backhand stroke technical evaluation results compared to those in the traditional class.

1. Introduction

An examination of the China Knowledge Network reveals over 350 papers on tennis instruction in colleges and universities, with approximately 30%-40% focusing on innovative training methods. These include fast and easy teaching methods, video teaching methods, simulation teaching methods, competition teaching methods, and group teaching methods, amongst others[1]. Currently, college tennis teaching primarily features teacher-led indoctrination, which, while effective for teaching, is not conducive to learning [2]. Additionally, a singular teaching mode, uninspiring classrooms, and subpar teaching outcomes present further challenges. The constraints of inadequate

resources and restrictive conditions impede promotion. Despite the emergence of numerous innovative teaching methods in recent years, the limitations imposed by insufficient infrastructure, such as tennis courts and nets, and weather-related interruptions to class schedules, make it challenging to satisfy the diverse needs of students.

2. Materials and Methods

2.1 Data Sources

For this experimental study, we selected sophomore recreational sports class students from the 2019 class of Guangdong University of Industry and Commerce Vocational Technology. Students were chosen based on their final tennis test scores from the previous semester, with only those scoring above 80 included. The students were randomly divided into two classes: an experimental group that utilized video teaching methods and a control group that employed conventional teaching methods. The pretest confirmed no significant difference between the two groups. Post-experiment, the final technical achievement test results of both groups were compared, and relevant data collected during the experiment were recorded to provide comprehensive and accurate experimental data for the in-depth investigation of tennis video teaching methods [3, 4].

2.2 Experimental Control

2.2.1 Selection of Experimental Subjects

The experimental subjects, showing little variability, were chosen via pre-experiment screening. No significant differences were found between the two groups based on pretest data obtained prior to the official experiment.

2.2.2 Control of Teaching Activities

The experimental class utilized a video teaching method, while the control group used a traditional teaching method. Throughout the experimental period, a total of 31.5 hours of tennis lessons were conducted over seven weeks. Additionally, the experimental class shared teaching videos or videos of proficient players demonstrating movements after class to answer student inquiries and previewed the teaching content of the next class in advance for student preparation. Both before and during class, students had the opportunity for video learning. They were instructed to avoid engaging in any additional related sports after class and during spare time. Teachers were available online to answer any questions raised by students [5].

2.2.3 Consistency of Teaching Content

To ensure comparability of the two groups' test scores, the experimental class and control class adhered closely to the same teaching schedule and teaching contents. The teacher used the right-hand dominant hand as a reference standard, employing a two-handed backhand stroke in backhand stroke teaching and a high cut in tennis ball teaching. The end of the seven-week course was designated as the examination week. The final test and technical evaluation of both classes were conducted according to the same standard. Further, the teachers, teaching schedule, and equipment used by the experimental and control groups were identical. The students participating in the experiment were kept unaware of the specific content of the experiment, thereby eliminating interference from other factors and psychological influences to the greatest extent possible [6].

2.3 Experimental Design

2.3.1 Selection of Specific Experimental Contents

The content and assessment standards of specific tennis skills were chosen according to the national physical education standards for college students and the "Beijing Sport University Tennis Teaching Content and Test Evaluation Standards". The specific skills test for tennis focused on the technical evaluation of forehand and backhand strokes.

2.3.2 Pre-Experimental Testing Stage

Prior to the experiment, the pre-experimental test results of the students from the two classes were evaluated. The test content included forehand and backhand strokes and passing rounds across the net. All students had engaged in half a semester of practice on forehand and backhand strokes and passing rounds across the net before participating in the experiment.

2.3.3 Comparative Teaching Experiment

The experiment followed relevant national guidelines on physical education for college students, referred to professional literature on teaching content and schedule, and used universally accepted grading standards. The experimental class was taught through video teaching methods, while the control class was taught via traditional teaching methods. The experiment spanned seven weeks, with three classes per week, each lasting 1.5 hours.

2.3.4 Post-Testing Phase

To ensure the credibility of the final test results, all students in the experimental and control classes were tested at the same time in a randomized order. The technical evaluation scores were jointly graded by two teachers, both of whom were qualified as second-class athletes and national-level referees in tennis.

3. Results

Table 1: Forehand Stroke Test Results Comparison between the Experimental Group and Control Group

Item	Experimental group (N=20)	Control group (N=20)	t	P
	Standard deviation of mean value	Standard deviation of mean value		
Forehand stroke	7.77±0.96	7.46±0.83	1.045	0.306
p<0.05	p<0.01			

Table 1 shows the independent sample t-test results for the forehand stroke test between the experimental group and the control group. The t-value is 1.047; the p-value is 0.302; since p>0.05, there is no significant difference between the forehand stroke test results of the experimental group and the control group. The mean value of the experimental group is 7.75 and the mean value of the control group is 7.45, which also indicates no significant difference between the two groups.

Table 2 shows the results of the independent sample t-test between the experimental group and the control group for the evaluation of the forehand stroke technique.

Results and analysis of backhand stroke test between experimental group and control group after the experiment

Table 2: Evaluation Results of Forehand Technique between Experimental Group and Control Group

Item	Experimental group (N=20)	Control group (N=20)	t	P
	Mean earth standard deviation	Mean earth standard deviation		
Forehand stroke	7.55±0,56	7.02±0.44	1.047	0.003
p<0.05	p<0.01			

Table 3: Backhand Stroke Test Results Comparison between Experimental Group and Control Group

Item	Experimental group (N=20)	Control group (N=20)	t	P
	Mean earth standard deviation	Mean earth standard deviation		
Backhand strokestroke	8.09±0.79	7.35±0.71 2.663	0.011	8.09
p<0.05	p<0.01			

Table 3 displays the independent sample t-test results for the backhand stroke test between the experimental group and the control group. The t-value is 2.663; the p-value is 0.011; p<0.05, which indicates a significant difference between the experimental group and the control group in the backhand stroke test. The mean value of the experimental group is 8.00 and the mean value of the control group is 7.38, suggesting that the experimental group performed better than the control group in the backhand stroke test.

Table 4: Backhand Stroke Technique Evaluation Results Comparison between the Experimental Group and the Control Group

Item	Experimental group (N=20)	Control group (N=20)	t	P
	Mean earth standard deviation	Mean earth standard deviation		
Backhand stroke technique evaluationstrokestroke	7.49±0.45	7.13±0.46	2.318	0.029
p<0.05	p<0.01			

Table 4 presents the independent sample t-test results between the experimental group and the control group concerning the backhand stroke technique evaluation. The t-value is 2.318; P-value is 0.029; P<0.05, which suggests significant differences in the backhand stroke technique evaluation results of the experimental group and the control group. The mean value of the experimental group is 7.47, and the mean value of the control group is 7.12.

4. Discussion

(1) Comparing the results of using video teaching methods and traditional teaching methods, we found no significant difference in the assessment results of the students' forehand stroke in the actual teaching experiment. However, the effect on the technical evaluation results of the forehand stroke was substantial. Students in the video-assisted class significantly outperformed those in the traditional class in the technical evaluation results of the forehand stroke.

Forehand stroke learning in tennis requires students to master the forehand stroke structure, understand the angle between the wrist and the racket, grasp the double bending principle of the forehand stroke, and experience the sensation of muscle movement and wrist tension. The experimental group focused on reinforcing the students' understanding of the preparatory posture, backswing, hitting action, and swing action through video explanations and observations. The absence of a significant difference between the test results of the experimental group and the control group may be due to the prior tennis foundations of the subjects and the relative simplicity of the forehand stroke technique. However, the superior evaluation results of the forehand stroke

technique in the experimental group indicate the efficacy of video teaching methods over traditional teaching methods.

(2) Similar comparisons between the results of video teaching methods and traditional teaching methods showed that while there was no significant difference in the backhand stroke test scores of the subject students, the impact on the technical evaluation results of backhand strokes was significant. Students in the video-assisted class outperformed those in the traditional class significantly regarding the technical evaluation results of backhand strokes.

Learning the backhand stroke in tennis requires mastering the movement structure of the backhand stroke, understanding its technical aspects, and experiencing the power principle of the backhand stroke and the distance between the racket and the body. The experimental group reinforced the students' understanding of the preparatory action, early lead action, swing action, and post-hit swing action through video explanations and observations. Although the test results of the experimental group and the control group did not differ significantly, the better evaluation results of the backhand stroke technique in the experimental group indicate the superiority of the video teaching method over the traditional teaching method.

5. Conclusion

When advocating for innovation and reform in physical education teaching, it is crucial to adhere to national education policy while leveraging the unique advantages of local conditions. Teachers in colleges and universities should receive diverse professional training to improve their adaptability to new teaching methods. There should also be an increase in investment in modernizing information technology in colleges and universities to guide and encourage innovative and flexible teaching approaches. Moreover, there should be an emphasis on sharing and exchanging teaching experiences among teachers of various disciplines, enriching existing video teaching resources, and strengthening collaborations among different schools and programs. The ultimate goal is to optimize existing teaching methods so that students love the classroom, gain valuable knowledge, and apply what they have learned to their lives.

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