

Research on the Influence of "Micro-class" Assisted Teaching on College Students' Motor Skills--Take Basketball Half-court Dribbling and Shooting between Trips as An Example

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Abstract: *This study explores the influence of "micro-class" assisted teaching on college students' basketball half-court dribbling and shooting skills. Through questionnaire surveys, data collection, and analysis methods, the potential of "micro-class" in improving students' sports skills and educational effects is deeply researched. Traditional physical education teaching methods have limitations in meeting students' personalized needs and stimulating learning interest. "Micro-class," as a flexible, convenient, and personalized teaching tool, provides new approaches to address these issues. This research conducts empirical research in the field of basketball, exploring the influence of "micro-class" assisted teaching on college students' basketball half-court dribbling and shooting skills.*

Through pre-test and post-test experimental design, college students are randomly divided into experimental and control groups, using "micro-class" assisted teaching and traditional teaching methods respectively. The results show that "micro-class" assisted teaching significantly improves the basketball half-court dribbling and shooting skills of the experimental group, showing significant improvement compared to traditional teaching methods. The experimental group students show higher learning interest and positive evaluation in the questionnaire, confirming the role of "micro-class" in stimulating learning interest.

In conclusion, this study finds that "micro-class" assisted teaching has a significant positive impact on college students' basketball half-court dribbling and shooting skills, providing empirical support for introducing modern teaching methods in physical education. However, although "micro-class" has many advantages, interaction and guidance in teaching are still indispensable. Future research can explore the integration of effective interaction and feedback mechanisms in "micro-class" teaching to better leverage the advantages of "micro-class" in physical education.

Keywords: Micro-class, college students, basketball, sports skills, teaching assistance.

1. INTRODUCTION

In this rapidly changing context, educators and researchers are actively seeking innovative approaches to better meet students' learning needs and improve teaching effectiveness. Among many emerging teaching methods, micro-class has gradually emerged as an important force leading educational reform, thanks to its convenience and flexibility. Physical education, as an indispensable part of students' comprehensive development, also seeks new approaches to enhance students' sports skills in this wave of innovation. This study takes basketball half-court dribbling and shooting skills as an example, aiming to explore the impact of micro-class assisted teaching on college students' sports skills and provide empirical support for the introduction of modern teaching methods in college physical education.

2. RESEARCH METHODS

2.1 Literature Review Method

By searching and studying books, journals, and online resources, a large amount of information on "micro-class" and "physical education teaching" is collected, analyzing the research results of domestic and foreign scholars, providing theoretical and practical references for this study.

2.2 Teaching Experiment Method

2.2.1 Experimental Time

From April 12th, 2023 to May 23rd, 2023, the basketball dribbling and shooting technique learning unit, with a total of 5 class hours, the experimental group and the control group are taught by the same physical education teacher.

2.2.2 Experimental Grouping

Freshman class A was set as the experimental group, freshman class B was set as the control group.

2.2.3 Experimental Procedure

1) Before the experiment, the dribbling and shooting scores of male and female students in the experimental group and the control group are tested. Based on the scores, abnormal individuals are excluded, and finally, 20 male and female students from each class are selected as experimental subjects, and the scores are compared within the same category.

2) The experimental group is taught using a pre-designed "micro-class" assisted teaching mode, while the control group is taught using traditional teaching methods.

3) After the end of the teaching experiment, the scores of the two groups of male and female students were tested for half-court dribbling and round-trip shooting, and the test requirements were referred to the "2022 Guangzhou College of Business Basketball Public Elective Course Examination Outline", and similar comparative analysis was conducted on the test scores.

Excel 2003 software and SPSS 19.0 are used to analyze and statistically analyze the obtained test scores data.

3. EXPERIMENTAL PLAN

3.1 Experimental Group Teaching Plan

3.1.1 Student Grouping

The experimental group consists of 20 male and female students, with male students divided into 4 small groups, each consisting of 5 students, and each small group ensuring the availability of two or more smartphones (or tablets) for watching "micro-class" videos. Each small group selects a student as the group leader; the grouping method and requirements for female students are the same as for male students.

3.1.2 Selection of "Micro-class" Videos

Before the teaching experiment, the teacher uses online resources to select 6 "micro-class" videos on basketball dribbling and shooting based on the teaching design progress and the difficulty points of each class, which are provided to students for storage in smartphones or tablets. At the same time, students are encouraged to explore and download their own group's "micro-class" teaching materials using online resources according to the requirements.

3.1.3 Implementation Methods of Teaching Process

3.1.3.1 Let students use "micro-class" for pre-class preview

Utilizing the flexibility of micro-class, it informs students of the main content of the next class in advance based on the cognitive characteristics of junior high school students. Students watch the micro-class videos with a purpose to understand the key difficulty points of the upcoming teaching content and to visually perceive the technical movements they will learn through the vivid multimedia features of micro-class.

3.1.3.2 Combine "micro-class" with conventional teaching

During the teaching process, the teacher explains and demonstrates the taught technical movements, and combines the videos or images in the "micro-class" to analyze the key difficulty points of the taught technical movements. In the practice process, the teacher uses cooperative learning in small groups together with the "micro-class" for autonomous learning and exploration. During the teaching process, the teacher can provide guidance through

observation and utilize the freeze-frame function of "micro-class" (multimedia playback) to give students a more intuitive visual model of the movements' effects.

3.1.3.3 Strengthen students' after-class practice using "micro-class"

In after-class practice, students can review and watch "micro-class" videos using smartphones (or tablets) conveniently, allowing them to further review and consolidate the learned techniques even without teacher's explanations and demonstrations.

3.2 Control Group Teaching Plan

3.2.1 Student Grouping

The control group consists of 20 male and female students, with the grouping following the traditional grouping method, with two groups for male and female students, with each group having their own group leader.

3.2.2 Access Teaching Materials

Before teaching basketball dribbling and shooting actions, some picture materials related to the taught movements should be found in advance, and the teacher should review the taught movement skills by themselves.

3.2.3 Implementation Methods of Teaching Process

3.2.3.1 Teacher's explanation and demonstration

Before teaching the technical movements, the teacher gives explanations and demonstrations of the movements, pointing out the key difficulty points.

3.2.3.2 Student practice with teacher's guidance

After the teacher's explanations and demonstrations, students practice in groups, with the teacher providing guidance and explaining and correcting any problems they encounter, and organizing student discussions and learning.

3.2.3.3 Assigning students for after-class practice

At the end of each class, the teaching is summarized, problems are pointed out, and after-class practice is assigned. During after-class practice, students independently practice based on the teacher's suggestions to consolidate and improve the learned technical movements.

4. EXPERIMENTAL RESULTS

4.1 Comparison of shooting results between dribbling and traveling in the first half of the experiment

4.1.1 Before the experiment, according to the requirements of the 2022 Guangzhou College of Business Basketball Public Elective Course Examination Syllabus, female students in the experimental group and the control group were tested for half-court dribble shooting between traveling. As can be seen from Table 1, the average score of the experimental group and the control group before the experiment was 36.8 seconds, and the average score of the control group was 36.4 seconds, with no significant difference between the two before the experiment ($p>0.05$).

Table 1: Average score (seconds) for girls in the experimental group and the control group N=20

Group mean	grade standard	deviation
Experimental group	32.8	3.2
Control group	32.4	4.1
	t=1.098	p=0.882

4.1.2 Before the experiment, according to the requirements of the 2022 Guangzhou College of Business Basketball Public Elective Course Examination Syllabus, female students in the experimental group and the control group

were tested for half-court dribble shooting between traveling. As can be seen from Table 1, the average score of the experimental group was 31.6 seconds before the experiment, while that of the control group was 32.1. There was no significant difference between the two before the experiment ($p>0.05$).

Table 2: Average scores (seconds) N=20 for boys in the experimental group and the control group

Group mean	grade standard	deviation
Experimental group	27.8	2.2
Control group	28.1	3.4
	t=0.714	p=0.893

4.2 Comparison of shooting scores between the half-court dribble travel before and after the experiment

4.2.1 Comparison of results of girls in the experimental group before and after the experiment

In this research, the teaching method of shooting technique between half-court dribble and round-trip march of girls' basketball in the experimental group is supplemented by "micro-class". After the unit learning of 5 class hours, the students' shooting performance test between half-court dribble and round-trip march is conducted after the unit teaching.

As can be seen from Table 3, the average score of girls in the experimental group was 28.8 seconds after the experiment, 8 seconds higher than before the experiment, and the improvement was very significant ($P=0$).

Table 3: The average score (seconds) of girls in the experimental group increased by N=20 before and after the experiment

Groups	before the experiment	post-experiment	Performance growth (pre-experiment - post-experiment)
experimental group	32.8	248	8
	t=3.938	P=0.000**	

Note: "*" means $P<0.05$ represents a significant difference, "**" means $P<0.01$ represents a very significant difference.

4.2.2 Comparison of female students' scores before and after the experiment

As can be seen from Table 4, the average score of girls in the experimental group was 31.2 seconds after the experiment, 5.2 seconds higher than before the experiment, and the improvement was very significant ($P=0$).

Table 4: The average score (seconds) of the female students in the control group increased by N=20 before and after the experiment

Groups	before the experiment	post-experiment	Performance growth (pre-experiment - post-experiment)
experimental group	32.8	27.6	5.2
	t=2.001	P=0.000**	

Note: "*" means $P<0.05$ represents a significant difference, "**" means $P<0.01$ represents a very significant difference.

4.2.3 Comparison of scores of boys in the experimental group before and after the experiment

In this research, the teaching method of basketball shooting technique between half-court dribbling and round-trip marching of male students in the experimental group is supplemented by "micro-class". After the unit learning of 5 class hours, the students' performance test is carried out after the unit teaching. As can be seen from Table 5, the average score of male students in the experimental group was 23.5 seconds after the experiment, which was 8.3 seconds higher than that before the experiment, and the improvement was very significant ($P=0$).

Table 5: Growth of average scores (seconds) N=20 for male students in the experimental group before and after the experiment

Groups	before the experiment	post-experiment	Performance growth (pre-experiment - post-experiment)
experimental group	28.1	19.5	8.6
	t=3.271	P=0.000**	

Note: "*" means P<0.05 represents a significant difference, "**" means P<0.01 represents a very significant difference.

4.2.4 Comparison of performance of male students in the control group before and after the experiment

In this research, the teaching method of basketball shooting technique between half-court dribbling and round-trip marching of male students in the experimental group is supplemented by "micro-class". After the unit learning of 5 class hours, the students' performance test is carried out after the unit teaching. As can be seen from Table 6, the average score of male students in the control group after the experiment was 26.4 seconds, 5.4 seconds higher than before the experiment, and the improvement was very significant (P=0).

Table 6: Growth of average scores (seconds) N=20 for male students in the experimental group before and after the experiment

Groups	before the experiment	post-experiment	Performance growth (pre-experiment - post-experiment)
experimental group	27.8	22.4	5.4
	t=2.384	P=0.000**	

Note: "*" means P<0.05 represents a significant difference, "**" means P<0.01 represents a very significant difference.

4.3 Comparison of the improved value of shooting scores during the round trip dribble in the second half of the experiment

4.3.1 Comparison of female students' performance improvement after the experiment

After the experiment, the score growth of girls in the experimental group and the control group was compared. It can be seen from Table 7 that the score of the experimental group increased by 8 seconds after the experiment, and that of the control group increased by 5.2 seconds. The score of the experimental group increased by 2.8 seconds more than that of the control group, and the improvement was more obvious.

Table 7: After the experiment, the increase value of female students' performance (seconds) was compared with N=20

Groups	experimental group	control group	Difference (experimental group - control group)
Achievement increment	8	5.2	2.8

4.3.2 Comparison of the improvement value of male students' scores after the experiment

After the experiment, the score growth of boys in the experimental group and the control group was compared. It can be seen from Table 8 that the score of the experimental group increased by 8.3 seconds after the experiment, and that of the control group increased by 5.4 seconds. The score of the experimental group improved by 2.9 seconds more than that of the control group, and the improvement was more obvious.

Table 8: After the experiment, the increase value of female students' performance (seconds) was compared with N=20

Groups	experimental group	control group	Difference (experimental group - control group)
Achievement increment	8.3	5.4	2.9

5. ANALYSIS OF EXPERIMENTAL RESULTS

5.1 Comparison of the effect of the two teaching methods on students' pre-class preparation

In the traditional teaching mode, students can only have a simple understanding of the technical movements to be taught through the text and simple picture movements in the physical education textbooks due to the lack of visual video viewing, and it is difficult to have a deep understanding of the key and difficult points in the movement techniques. In addition, the teaching method assisted by "micro-lesson" can enable students to have a sensory understanding of the movement technology they want to learn, and understand the key and difficult points of movement technology through simple videos, so as to achieve a good preview effect before class. Take this research as an example. In the first lesson, students in the control group could only learn the basic points of "one, two and three high jumps" of basketball dribbling and shooting technology through the textbook materials, without intuitive movement perception. However, "micro-class" can provide students with an overall and coherent movement concept in movement technology through classroom teaching videos or lesson clips. And can be relatively easy to understand why to do the "big, two small, three high jump", to learn new movement technology provides a good premise.

It can be seen that the auxiliary teaching method of "micro-lesson" has more advantages than the traditional teaching method in the aspect of students' pre-study before learning technical movements.

5.2 Comparison between the two teaching methods in the explanation and demonstration of teachers' movement techniques

Explanation and demonstration is an important link in the process of physical education technology teaching. In junior high school physical education, students often understand the key points and difficulties of movement technology through the teacher's explanation in the process of skill learning, and gradually form their own technical movements by watching the teacher's movement demonstration to imitate and practice. In traditional teaching methods, it is often difficult for teachers to explain the key and difficult points of movement technology in the process of demonstration, and it is difficult to freeze their own movement technology in the key and difficult points of movement demonstration. However, "micro-class" can use its unique function of multimedia to freeze some movement technology pictures or slow down the video for viewing. At the same time, it can also be repeated for many times, so that students can refer to the video to imitate the movement technology even without the teacher's demonstration. For example, in the study of this subject, the body movements and finger and wrist picking movements of students in the time and space of take-off and layup can be repeatedly watched through the slow motion of "micro-lesson", so that students can model for many times; However, it is difficult to freeze the body movements in the air with traditional teaching methods.

It can be seen that the auxiliary teaching method of "micro-lesson" has advantages over the traditional teaching means in the explanation and demonstration of movement techniques.

5.3 Comparative analysis of the two teaching methods in students' movement technique learning

5.3.1 Learn the comparative analysis of dribbling and shooting action cohesion between basketball marching

The connection between dribbling and shooting is one of the key movement techniques for students to learn the basketball half court round trip dribbling. The effectiveness and consistency of the connection between dribbling and shooting directly affect the quality and achievement (time) of technical movements.

In traditional teaching methods, when teaching students the connection technology of dribbling and shooting movements between basketball marching, most of them adopt the mode of teachers' explanation and demonstration, and students' passive acceptance. Teachers generally explain the key and difficult points of movements to students according to their own understanding and feelings, especially in the technical link of students' dribbling, catching,

holding and shooting, teachers often demonstrate and explain for many times. Only by repeated practice can students achieve certain teaching effects. According to the research process of this topic, students' learning in this technical link does not give play to their independent learning ability, the teaching mode is relatively dull, and the teaching effect does not reach the expected value.

"Micro-lesson" as the auxiliary teaching mode In this movement technology teaching process, through the teacher's routine explanation and demonstration, students can rely on "micro-lesson" movement technology teaching video, according to their own needs to carry out targeted technical movement learning, the learning process between students to discuss learning atmosphere is better, improve the students' learning initiative. And the degree of mastery of the link between dribbling and shooting is better than that of the control group.

5.3.2 Study the comparative analysis of dribble turn and round trip movement techniques between marching

It is one of the difficult movement techniques for students to learn the dribble turning and bypassing obstacles in the basketball half court. The quality of the dribble turning and bypassing obstacles in the basketball half court directly affects the score (time) of the shot.

In traditional teaching methods, when teaching the movement technology of dribbling turn around obstacles during basketball marching, most of them adopt the way of teachers' explanation and demonstration and students' exemplary practice. Teachers generally explain the key and difficult points of movements to students according to their own understanding and feelings, especially in the technical link of students' dribbling turn around obstacles, teachers often demonstrate and explain for many times. Only by repeated practice can students achieve certain teaching effects. According to the research process of this subject, it is difficult for students to master the key points and difficulties of the movement technology when dribbling and turning in the study of this technical link. As a result, teachers have to explain and demonstrate repeatedly, and the teaching effect has not reached the expected value.

"Micro-lesson" as the auxiliary teaching mode In this movement technology teaching link, after the teacher's regular explanation and demonstration, students can rely on the movement technology teaching video in the "micro-lesson" to learn the technical movement according to their own needs, especially in the technical link of the grasp of the body's center of gravity when turning around obstacles. Students can further strengthen their understanding of this movement technique by repeatedly watching and broadcasting in slow motion. During the learning process, there is a good atmosphere for students to discuss and learn from each other, which improves their learning initiative. Moreover, they have a better grasp of the movement technique of basketball dribbling and turning around obstacles than the control group.

5.3.3 Comparative analysis of the complete rhythm of shooting technique during the round trip dribble of basketball half court

The good rhythm of the whole course is the guarantee of the good score of the basketball half-court dribble and round-trip shooting, and the good rhythm of the whole course has a great influence on the students' half-court dribble and round-trip shooting.

In the traditional teaching method, when teaching students' complete movement technique rhythm, most of them take the way of teachers' explanation and demonstration, inspection and guidance, and students' exemplary practice. Due to the limited number of teachers' explanation and demonstration, it is difficult for students to have a deep impression, which often makes it difficult for students to master their own rhythm in the process of practice, resulting in new breakthroughs in performance.

In the teaching of complete movement rhythm technology, after the teacher's regular explanation and demonstration, students can rely on the teaching video of whole-movement rhythm technology in "micro-class" to carry out targeted whole-process rhythm exercises according to their own needs, especially in the rhythm distribution of dribbling speed between marching. Students can further strengthen their understanding of dribbling speed distribution between moving points by repeatedly reviewing and broadcasting in slow motion, which makes it easier for students to find their own speed and rhythm. In the learning process, there is a good atmosphere for students to discuss and study with each other, which improves students' learning initiative. In addition, the speed and rhythm of the whole shooting process between the basketball half court dribble travel were better than the control group.

6. RESULTS AND DISCUSSION

Through the detailed analysis of the collected data, we can fully understand the influence of "micro-class" auxiliary teaching on the shooting skills of college students' basketball half-court dribbling. This section presents the experimental results and discusses them in depth.

First, we compared the performance of the experimental group and the control group on the shooting skills between the dribble in the basketball half court.

Data analysis shows that after "micro-class" assisted teaching, the skill level of students in the experimental group is significantly higher than that of the control group. This may be attributed to the characteristics of "micro-class" teaching: the complex skill process is broken down into easy-to-understand steps, and through repeated training, students gradually master the skills. At the same time, students can learn at their own pace and better absorb and digest what they learn. Therefore, it is not surprising that the experimental group of students improved in terms of skills.

Through the analysis of questionnaire data, we reveal students' learning motivation and evaluation of "micro-class" teaching. The students in the experimental group showed higher learning motivation in the questionnaire and expressed strong interest and desire for learning basketball skills. This may have something to do with the personalization and flexibility of "micro-lesson" teaching, where students are able to choose when and where to study according to their own interests and needs, thus stimulating their intrinsic motivation.

This is further confirmed by the positive evaluation of the students in the experimental group on "micro-lesson" teaching. They believe that the "micro lesson" teaching method is lively and interesting, easier to understand and master the skills, and more attractive and effective than the traditional teaching method. These positive comments also reflect the advantages of "micro-class" assisted teaching in stimulating students' interest and enthusiasm in learning.

7. CONCLUSION

The results of this study strongly prove that "micro-class" assisted teaching has a positive impact on the shooting skills of college students' basketball half-court dribbling. Through flexible teaching methods, students can not only learn skills more easily, but also maintain a high degree of enthusiasm and interest in the learning process. Therefore, we strongly suggest that the "micro-lesson" teaching method should be popularized in college physical education. This can not only improve the level of students' motor skills, but also help to cultivate their independent learning ability and comprehensive quality.

However, it is important to note that while "micro-lesson" assisted teaching is excellent in upgrading skills, interaction and guidance in the teaching process are also indispensable. Relying purely on "micro-lessons" may have certain limitations in problem solving and skill correction for individual students. Therefore, future research can further explore how to integrate effective interactive mechanism and feedback system into "micro-class" teaching to further optimize the teaching effect.

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