

Two-handed Dribbling Training on Weak-hand Shooting: Taking Students Majoring in Physical Education in Vocational and Technical Universities as an Example

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ABSTRACT

This paper takes students majoring in physical education at a vocational and technical university as the research object, and conducts an experimental study on the effect of two-handed dribbling training on weak-hand shooting. Through literature research, we sorted out the relevant theories and research status, and used the experimental method to set up an experimental group and a control group. The experimental group conducted special training in two-handed dribbling, and the control group used conventional dribbling training. After an 18-week experimental period, data were collected and analyzed on indicators such as the number of weak-hand shots, hit rate, and shooting stability of the two groups of students. The results show that special training in two-handed dribbling can significantly improve the number of weak-hand shots and hit rate of students in vocational and technical universities, enhance shooting stability, and effectively improve the balance of two-handed shooting techniques. This study provides a scientific basis for optimizing teaching content and improving teaching methods for basketball courses in physical education majors in vocational and technical universities, and is of great significance to improving the comprehensiveness of students' basketball skills and competitive level.

KEYWORDS

Vocational and technical university; Two-handed dribbling training; Weak-hand shooting; Experimental research; Basketball teaching

1 Introduction

Basketball courses in the sports major of vocational and technical universities, cultivating students' comprehensive basketball technical ability is an important goal. However, students currently generally have the problem of weak shooting ability with their weak hand. In the game, they rely too much on strong hand shooting, which limits their offensive means and makes it difficult to effectively break through the opponent's defense. The quality of technology is reflected in the function of the strong and weak hands. Only by using the strong and weak hands reasonably and in a coordinated manner can the advantages of dribbling, shooting and passing skills be reflected, and can the needs of actual combat be adapted more flexibly and creatively. Dribbling technology is the foundation of basketball. Only by mastering dribbling can athletes further improve their basketball level. As an important way to improve the basic basketball skills, two-handed dribbling training can not only enhance students' dribbling flexibility and ball control ability, but also have a positive impact on the development of weak hand shooting technology by strengthening the ball sense, coordination and neuromuscular memory of the weak hand. Conducting an experimental study on the effect of two-handed dribbling training on weak-hand shooting for students in vocational and technical colleges will help to gain a deeper understanding of the actual effect of two-handed dribbling training in improving weak-hand shooting ability, and provide a scientific basis and practical guidance for optimizing basketball course teaching in vocational and technical colleges and improving students' comprehensive basketball literacy.

2 Literature review

By searching academic databases such as CNKI, Wanfang Data, and VIP, literature was collected and sorted with keywords such as "vocational and technical college basketball courses", "two-handed dribbling training", and "weak-hand shooting". The study found that the current research on basketball dribbling training is mostly focused on improving overall dribbling skills, innovating dribbling training methods, and other related training. In terms of weak-hand shooting training, although some studies have pointed out its importance in the comprehensive cultivation of basketball skills, and there are also experimental studies specifically strengthening weak-hand training, there is a relative lack of research on the impact of two-handed dribbling training on weak-hand shooting for the specific group of students majoring in physical education in vocational and technical colleges. At the same time, when evaluating the impact of dribbling training on shooting, the existing research has a relatively single indicator selection, which is mostly limited to shooting hit rate, and lacks comprehensive consideration of multi-dimensional indicators such as the number of shots and shooting stability. Based on previous research, this study will take students majoring in physical education at Guangdong

Industrial and Commercial Vocational and Technical University as the subjects to systematically explore the impact of two-handed dribbling training on weak-hand shooting, fill the gap in related research, and provide theoretical support for the reform of basketball teaching in vocational and technical colleges.

3 Experimental design

3.1 Experimental purpose

Verify the effect of two-handed dribbling special training on students' weak-hand shooting times, shooting accuracy, and shooting stability in vocational and technical college basketball courses, explore effective training methods to improve the weak-hand shooting ability of students majoring in sports in vocational and technical colleges, and provide a scientific basis for optimizing the teaching plan of vocational and technical college basketball courses.

3.2 Experimental subjects

Students from two basketball courses of the 2022 grade of Guangdong University of Technology and Business were selected as experimental subjects. Before the experiment, students from both classes received the same basketball course teaching and passed basic tests such as shooting and dribbling. The results showed that there was no significant difference in their basic basketball level (including weak-hand shooting ability, strong-hand shooting ability, dribbling ability, etc.) ($P > 0.05$). Among them, Class 1 of the 22-grade basketball major was set as the experimental group, with a total of 20 people; Class 2 of the 22-grade basketball major was set as the control group, with a total of 20 people.

3.3 Experimental variables

3.3.1 Independent variables

The experimental group adopted a two-handed dribbling special training method. During the training process, they focused on the standardization and continuity of the movements, and gradually increased the intensity and difficulty of the training. The control group adopted a conventional dribbling training method, mainly one-handed dribbling training, supplemented by various changes of direction and alternating dribbling with both hands. The training content and methods were consistent with the school's previous basketball course teaching.

3.3.2 Dependent Variable

The hit rate of the student's weak-handed shooting 10 times, the stability of the weak-handed shooting while running (measured by counting the number of mistakes such as three misses and missed shots during shooting). In the scenario of a total of 21 points and three-on-three, the data of the student's weak-handed shooting is recorded to evaluate the training effect.

3.3.3 Control variables

During the experiment, the teaching time, teaching venue, and teaching level of the two classes were consistent; the students' participation in extracurricular sports activities and physical conditions were basically the same; the content and intensity of other basketball technical training received by the students before and after the experiment remained consistent.

3.4 Experimental time and training arrangement

The experimental period was 18 weeks, with 2 basketball training sessions per week, each lasting 90 minutes. In each training session of the experimental group, 50% of the time was spent on two-handed dribbling training, and the rest of the time was spent on other basketball skills training; the control group followed the conventional dribbling training plan, with 50% of the time spent on strong-side dribbling and comprehensive dribbling training. In the 50% of class hours outside of the test, when conducting basketball teaching activities, teachers should focus on shooting skills training. To ensure the training effect, teachers should carefully formulate a teaching plan for shooting skills training based on students' actual learning situation and ability level. Both the experimental and control groups strictly followed the training plan to ensure the accuracy and effectiveness of the experiment.

4 Experimental process

4.1 Pre- test

The weak-hand shooting ability test was conducted on the experimental group and the control group students at the school's standard basketball court . Test setting 1: 10 free throw line fixed-point shots, recording the hit rate of the weak-hand shooting; Test setting 2: Shooting outside the restricted area, students need to use their weak-handed hands to shoot and grab in the area within 1 minute ; Test setting 3: In a three-on-three scenario with a total of 21 points, various data of students' weak-hand shooting are recorded, and professional teachers record the number of students' weak-handed shots, the number of shots made, the number of shooting errors, and calculate the weak-handed shooting hit rate and shooting stability. At the same time, video recording is used to record students' shooting movements for subsequent movement analysis . The use of quantitative monitoring teaching for basketball technical movements can enable students to improve their ability to adjust their techniques during the practice of movement techniques, so that the practice of each technical movement can be controlled to the maximum extent within an effective range.

4.2 Training Implementation

The basic training content of two-handed dribbling in the experimental group training includes: two-handed low dribbling at the same time, two-handed high dribbling at the same time, low dribbling with left and right hands out of sync, high dribbling with left and right hands out of sync, low dribbling with two-handed front change, high dribbling with two-handed front change, low dribbling with two-handed front and back pull, high dribbling with two-handed front and back pull, low dribbling with one hand front and back pull and one hand left and right pull, high dribbling with one hand front and back pull and one hand left and right pull, four small-range changes of direction with two-handed left, right and left, one-hand front change and one-hand chest reverse ball, one-hand low dribbling and one-hand high dribbling, two-handed front change dribbling, one-hand front change and one-hand behind the back dribbling, one-hand front change and one-hand crotch dribbling, one-hand low dribbling and one-hand leg dribbling, two-hand leg dribbling; advanced training content includes: two-handed dribbling with one hand to accelerate, one-hand layup and one-hand high shot. Two-handed dribbling change of direction in a zigzag line, etc. Teachers observe the training situation of students in real time and correct wrong movements in time to ensure that students master the correct technical movements. The control group followed the conventional training mode, focusing on one-handed dribbling training, supplemented by various two-handed dribbling and conventional shooting training. During the training process, the teacher focused on standardizing the accuracy of students' technical movements to ensure the normal progress of the training.

4.3 Post- test

After the experiment, the same test methods and standards as the pre-test were used to test the weak-hand shooting ability of the experimental group and the control group again in the same venue . The post-test data were compared with the pre-test data to analyze the effect of two-handed dribbling special training on students' weak-hand shooting ability.

5 Experimental results and analysis

5.1 Comparative analysis of 10 free throw shots

Table 1 Comparative analysis of 10 fixed-point shots

class	Pre-test times (average)	Post-test times (average)
22nd grade basketball main event class 1	3.7	6.3
22nd grade basketball main event class 2	3.8	4.1

The average number of weak-handed shots in the experimental group was 3.7 before the experiment and 6.3 after the experiment, which was a significant improvement; the average number of weak-handed shots in the control group was 3.8 before the experiment and 4.1 after the experiment, with no significant difference. This shows that two-handed dribbling special training can significantly increase the number of weak-handed fixed-point shots of vocational and technical college students. After systematic training, students' confidence and proficiency in weak-handed shooting have been improved.

5.2 Comparative analysis of one-minute shot clock

The average shooting percentage of the weak-handed shooters in the experimental group was (4.2/14.3) 29.3% before

Table 2 One-minute shooting comparison analysis table

class	Pre-test mid /vote (Average)	Post-test pass/vote (Average)
22nd grade basketball main event class 1	4.2/14.3	5.3/14.6
22nd grade basketball main event class 2	4.5/14.7	4.6/14.5

the experiment, and increased to (5.3/14.6) 36.3% after the experiment, which was a significant improvement; the average shooting percentage of the weak-handed shooters in the control group was (4.5/14.7) 30.6% before the experiment, and increased to (4.6/14.5) 31.7% after the experiment, which was only 1.1% higher. This shows that the special training of two-handed dribbling can help improve the shooting percentage of students with weak-handed moves. The strengthening of the weak-handed feel during the training process, as well as the practice of combining dribbling and shooting, enable students to better master the strength, direction and angle of shooting, thereby improving shooting accuracy.

5.3 Three -to-three comparative analysis

Table 3 Three-to-three comparison analysis table

class	Pre-test mid /vote (Average)	Post-test pass/vote (Average)
22nd grade basketball main event class 1	1.2/3.7	1.8/5.1
22nd grade basketball main event class 2	1.1/3.8	1.4/3.7

The experimental group used the weak hand 3.7 times before the experiment and 5.1 times after the experiment; the control group used the weak hand 3.8 times before the experiment and 3.7 times after the experiment, and the difference was not significant. The special training of two-handed dribbling helps to effectively enhance the stability of weak-handed shooting, and has a significant improvement in the application in actual combat. Due to the short experimental time, the effect of two-handed dribbling training on improving the hit rate in actual combat is not significant.

6 Conclusions and recommendations

6.1 Conclusion

In the teaching of basketball courses in the sports major of Guangdong University of Technology and Industry , two-handed dribbling special training can significantly improve the number and hit rate of students' weak-side hand shots, enhance shooting stability, and effectively improve the balance of two-handed shooting techniques, which has a positive effect on improving the comprehensiveness of students' basketball skills . On the other hand, strengthening the weak-side hand teaching strategy has a positive impact on students' learning interest and attitude. Students in the experimental group showed higher learning interest and enthusiasm, held a more positive attitude towards basketball technology learning, and were more confident in mastering the technology.

6.2 Recommendations

6.2.1 Optimize course teaching content

Basketball courses of sports majors in vocational and technical universities should include two-handed dribbling training and weak-hand shooting training as core teaching content, and reasonably increase the relevant training hours . According to the actual level of students, a systematic training plan should be designed, gradually transitioning from basic movement training to actual combat application, to comprehensively improve students' weak-hand shooting ability.

6.2.2 Strengthen professional training of teachers

Schools should regularly organize basketball teachers to participate in professional training related to two-handed dribbling teaching and weak-hand shooting training, and invite industry experts to provide guidance . Teachers are encouraged to conduct teaching research, share teaching experience, and continuously improve teachers ' theoretical level and practical ability in weak-hand shooting teaching.

6.2.3 Deepen relevant research

The effects of different two-handed dribbling training intensities and training frequencies on the weak-handed

shooting ability of vocational and technical college students, as well as the promoting effect of two-handed dribbling training and other basketball technical training on weak-handed shooting . At the same time, the scope of research objects can be expanded to compare the differences in the effects of two-handed dribbling training on weak-handed shooting among students from different vocational and technical colleges, providing richer theoretical and practical basis for basketball teaching in vocational and technical colleges.

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