

Experimental Research on Dynamic Group Teaching Method in Common Basketball Courses at Colleges and Universities—Taking Henan Normal University as an Example

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Abstract: Amid the comprehensive reforms in Chinese education, an increasing number of physical education professionals, academics, and grassroots teachers are actively investigating and experimenting with fresh pedagogical methodologies and teaching frameworks, with the ultimate aim of discovering new approaches to innovating physical education classes. During group learning, students accomplish predetermined learning objectives whilst simultaneously fostering camaraderie, cultivating a sense of cooperation and competition, enhancing social adaptability, promoting mental wellbeing, developing emotional resilience, and meeting the reform goals of physical education teaching. This study employs the teaching experiment method to analyze and research the dynamic group teaching method in college physical education classrooms. A total of forty-five students from two classes enrolled in the common basketball course at Henan Normal University in Henan Province were randomly selected to participate in the whole-semester experiment. One class served as the experimental group, receiving dynamic group teaching, while the other served as the control group receiving traditional teaching. The research findings from the dynamic group teaching experiment indicate a significant improvement in the basketball skills of students who were taught using the dynamic group teaching method compared to those who were not. Furthermore, the degree and quality of improvement were found to be greater than that observed in the control group. The implementation of the dynamic group teaching method in common basketball courses at colleges and universities has significantly enhanced students' shooting and dribbling abilities. This method carries great educational importance for conducting better teaching experiments and enhancing teaching efficiency.

Keywords: dynamic group teaching, common basketball courses at colleges and universities, physical education teaching

1. Introduction

Basketball is a highly popular sport in Chinese colleges and universities and it serves as a crucial component of the general physical education curriculum. Moreover, college-level basketball competitions have encouraged numerous students to participate in the sport ^[1]. However, the absence of professional and specialized basketball instruction and support results in a strong desire to play but inadequate skill which could ultimately lead to waning interest in sports. Therefore, college physical education instructors should focus on enhancing basketball skill courses, to foster and sustain student engagement in basketball, and ultimately instill a sense of independence and self-awareness in students, who in turn can influence their peers to partake in the joys of sports. Sports classes at most colleges and universities still rely on traditional teaching methods. These methods typically involve teachers explaining and demonstrating skills while students imitate them and practice on their own. The focus is on the teacher as the main source of instruction and little consideration is given to the individual needs and learning situations of the students. Traditional physical education teaching methods lack innovation, are dull in form, and are unable to keep up with modern times. As a result, students' enthusiasm for physical education and sports learning decline, ultimately affecting the quality of instruction ^[2].

Many college students show interest in having the freedom to choose their own sport for physical education classes. This results in basketball classes comprised of students from different majors, including liberal arts, science, and engineering. However, because the ratio of men to women in these classes is skewed, and students from various majors have differing levels of skill and familiarity with

sports techniques, there may be psychological barriers that impede mutual learning. This could result in a reduction in teaching quality, student learning, and enthusiasm for participating in physical education classes. Exercise time may be shortened, intensity may decrease, and physical fitness could continue to decline, ultimately resulting in a vicious cycle. Given the current circumstance of unfamiliar students with varying levels of sporting ability, it is crucial to adopt appropriate teaching methods. In the face of criticisms of traditional teaching methods, it is necessary to actively innovate teaching methods to improve teaching quality. By constantly refining the essence of educational practices, optimizing organization, and constructing concepts and methods that meet the demands of today, we can adapt to modern teaching needs. Chinese researchers, education experts, grassroots teachers, and scholars are actively participating in teaching reform to address the current challenges facing national policy on college-level physical education courses. Specifically, they are focusing on the reform of teaching methods for physical education courses by exploring how theoretical knowledge can be combined with practical applications. These efforts aim to identify and implement efficient methods that meet national teaching standards. The author's research expounds on the dynamic group teaching method, which employs stratified teaching to account for the individual differences between students and promotes collaboration through heterogeneous grouping. Near the end of each class, students compete within their respective groups. The top-performing groups from previous classes are assigned the best group members for the next class. To enhance performance, it is crucial to improve the quality of teaching. One effective approach is implementing dynamic group teaching methods to cultivate a learning environment that fosters mutual assistance, competition, and collaborative learning. Emphasizing these elements can stimulate an atmosphere of mutual aid and learning that ultimately results in academic achievement.

2. Theoretical Background

Teaching methods have been studied by Chinese scholars and experts. According to Gao Wen^[3], the key factor is to tailor teaching to suit students' needs, promote holistic development, cater to the varying characteristics of each student, enhance their engagement, and ultimately achieve active learning. According to Mao Zhenming^[4], there are a variety of methods for teaching physical education. Zhenming emphasizes the importance of a good teaching method in facilitating students' enjoyment and engagement in sports while also promoting the acquisition of skills and knowledge, which are critical components of a successful physical education class. Scholar Bloom contends that regardless of the chosen teaching methodology, the primary goal of teaching is to decrease the disparities among students, enabling most to attain similar or nearly identical levels of learning efficiency and ability, thus ultimately eradicating individual differences among students^[5]. The dynamic group teaching should cater to the unique characteristics of each student, enhance motivation, improve students' sports skills and general knowledge of sports, and gradually decrease the sports gap. The ultimate goal is to attain happy sports, learning of skills, mutual help, and shared progress.

With the increasing focus on teaching efficiency and methods during education reform, exam-oriented education still dominates today's education, neglecting the importance of cultivating interest and resulting in student apathy towards learning and physical activity. Therefore, it is necessary to prioritize emotional education in the implementation of education^[6]. The dynamic group teaching is devised to explore means of engaging students in sports actively while fostering an interest in the activity. The approach aims to reduce emotional resistance to sports, encouraging students to participate willingly.

In light of the diverse individual differences among students, it is imperative to tailor instructions to their aptitude and also address their psychological well-being. Moreover, it is crucial to foster teamwork, healthy competition, and interpersonal communication skills. Wang Yunling^[7] argues that rational competition fosters healthy interpersonal relationships and encourages students to learn from one another by identifying their strengths and weaknesses in order to achieve a common goal. Employing the dynamic group teaching approach, collaborative learning motivates students to help each other, leading to a positive teaching outcome.

Chinese research on group teaching methods lags behind that of foreign countries. During the late Qing Dynasty and early Republic of China, scholars in Japan were studied, and Chinese educators borrowed their teaching methods. This led to the discovery that these methods originated in the West, prompting Chinese scholars to study in Western countries. At the turn of the 20th century, educational discipline in China was in a nascent stage. Over time, educators developed various forms of group teaching methods through gradual learning and evolution. Despite this progress, there is a lack of

dynamic group teaching methods. The following section presents relevant research and analysis by Chinese scholars^[8]. The corrective group teaching method mentioned by Ge Jinwen (1994) means that teachers teach differently according to homogeneous groups, and then help disadvantaged students learn through heterogeneous groups. Teachers tend to teach disadvantaged students. In the experimental study of Liu Wei^[9] employing the dynamic group teaching method for teaching experiments, students could enhance inter-communication while teachers could leverage the student resources to improve interaction within the group and strengthen interpersonal relationships to achieve the desired common objectives. It has also been indicated that the key to dynamic group teaching is how to control the teaching order. Huang Zhonghan^[10] pointed out in analysis that dynamic grouping first screens students' abilities by layers, and then groups them according to different abilities, so as to give full play to students' ability to help each other and communication and collaborative learning.

Developed nations have conducted earlier research on grouping students for teaching. In the 1940s, the West introduced mixed-ability classes, and by around 1960, the United Kingdom had popularized this method of grouping students in all districts. While China and other countries use different names for this practice, the concept remains similar, such as "hierarchical progressive teaching." It refers to an instructional methodology where teachers group students according to their achievement, ability, level, intelligence, and other criteria. However, there has been a lack of further research on dynamic grouping. According to American educator Bruner, the focus on "discovery, understanding, learning" and Bloom's emphasis on mastering ideas and methods aim to promote student initiative. This aligns with the concept of dynamic grouping, which allows for greater flexibility and tailors to student needs, ultimately fostering creativity and initiative^[11]. An American education specialist proposed a flexible grouping style (Flexible Differenzierung) characterized by variability that is tailored to the particular learning situations of students. This style involves grouping students of the same level to learn together, cycling through this arrangement, and then returning to the original group to learn. By alternating between these two grouping modes, most disadvantaged students can be catered to, narrowing the gap between pupils and boosting their self-esteem. This could narrow the achievement gap and enhance student self-esteem. Mosston, an American scholar, developed eight physical education teaching methods, including reciprocal group teaching techniques. These methods foster mutual observation and assistance, encouraging students to improve collectively in a friendly, cooperative classroom setting. They also emphasize the student's subjective position and the teacher's role in counseling, leading to better teaching quality^[12]. Japanese education scholars are grappling with the current state of students. To conduct group teaching research, they are citing various psychological factors of different students to develop student-centered approaches that target specific learning outcomes based on individual situations. With a focus on nurturing students' creativity and learning ability, the approach encourages teachers to adopt a mentorship role and prioritize the student as the main actor in the learning process. Blended learning is a suitable method to increase student interest and motivation towards learning in the rapidly changing educational environment. This approach is in favor of enhancing the quality of teaching.

To summarize, by utilizing effective teaching tools and methods that consider the physical and learning capabilities, learners can cultivate autonomous, creative, and engaged learning skills, diminish achievement discrepancies, and achieve optimal learning outcomes.

3. Research Subjects and Methods

3.1. Research subjects

Table 1: Basic situation of students learning basketball in the two classes before the experiment (N=45)

Sex	No. of students in experimental group	%	No. of students in control group	%
male	15	33.33	14	31.11
female	30	66.67	29	68.89

The basketball elective class students from Henan Normal University in Henan Province were chosen as the experimental subjects (refer to Table 1). Each class consisted of 45 individuals, with one class chosen randomly as the experimental group and the other as the control group. In the experiment, the teaching content, program, progress, venues, and equipment were kept under relatively equal conditions. The control group students followed traditional teaching methods, while the experimental group students followed dynamic group teaching methods. The physical fitness levels and basketball

skill levels of the two student groups were similar at the beginning of the experiment. To guarantee the impartiality of the trial, the author instructed both classes and the original basketball teacher as the overseeing instructor.

3.2. Experimental methods

The control group utilizes traditional teaching methods and teaches according to the original basketball teaching plan, teaching objectives, teaching contents and teaching priorities in accordance with the requirements of the college basketball teaching syllabus. The teaching method is as follows: the teacher shows the complete basketball technical movements, demonstrates the decomposition of basketball technical movements and points out the requirements, main points and difficulties of the movements, the students follow the imitation under the command of the teacher, the teacher gives a complete demonstration of the basketball technical movements, the students imitate the exercises, and the teacher makes an inspection and gives individual guidance, which is carried out throughout the whole semester.

The experimental group uses the dynamic group teaching method to carry out teaching experiments, the teacher in accordance with the requirements of the college syllabus, the first introduces the content to be taught in this group, according to the different levels of students to set up consistent learning tasks, so that they gradually complete the task of learning in different learning stages, to protect their self-confidence in learning and self-esteem, and to enhance the enthusiasm of the students to practise, which makes it easier for students to like and accept the basketball game. Then students at all levels are provided with different learning objectives, demonstrations, details and skills. After the teacher's demonstration, the students practice according to the different learning objectives, and are encouraged to communicate with each other during practice, and the teacher evaluates the students' practice. This teaching method is used throughout the semester.

This experimental evaluation of basketball skills is rated as high-quality by the teacher, author, and two colleagues. The evaluation was conducted in strict accordance with the basketball skill assessment standards for college students (refer to Table 2). The basketball shooting and dribbling test consisted of shooting 10 free throws from the men's free throw line using a one-handed shoulder shot while remaining in place, shooting 10 free throws from the women's free throw line using a two-handed chest shot while standing 75cm inward, and completing a 4 * 15m dribbling and running while being timed. A unified teacher scored the test according to basic technical assessment standards for basketball to ensure consistency. Any differences between results were accounted for in the assessment. The results of the technical test data for both groups are presented in Table 2, using a SPSS22.0 t-test. The analysis indicated that there was no significant difference ($P > 0.05$) between the two groups in set shot and 4 * 15 meter dribbling. Therefore, the experiment can be compared between the two groups.

Table 2: Basketball Basic Skills Assessment Criteria

skill standard	Assessment Program		Technical evaluation results
	In-place shoulder/chest shot	4*15m dribbling and running	
Outstanding	Basic posture standard	Dribbling posture standard	85 points or more
	Skilled in technical movements	Excellent body movement coordination	
	Physical and power coordination	Speed fast	
Medium	Basic posture is relatively standard	Dribbling posture is relatively standard	60-84 points
	Relatively skilled in technical movements	Ordinary body movement coordination	
	Relative physical and strength coordination	Medium speed	
Poor	Basic posture is not standardized	Poor dribbling posture	Below 60 points
	Unskilled technical movements	Poor body movement coordination	
	Physical and strength incoherence	Slow speed	
Number of assessments	10	2 (whichever is best)	

3.3. Statistical Analysis

In this experimental research, the physical quality of the students and basketball skills data obtained are organized, SPSS22.0 is used for statistical processing and related analysis, and then the conclusions of the experimental data are drawn, in order to provide objective and real and effective data support.

4. Results

4.1. Comparison of the results of two basketball skills of students in two classes before and after the experiment

Comparison of basketball skill test results for the experimental group before and after the experiment is presented in Table 3. After a semester of dynamic group experiments, the set shot hits for the experimental group increased from 1.96 per person before the experiment to 5.38 per person after, and the 4-by-15-meter dribbling and running performance per person increased from the pre-experiment 19.62 to 15.43 seconds. The results showed a significant decrease. The T-test indicated a significant difference between the two basketball techniques before and after the experiment, with a P-value less than 0.05. Therefore, the dynamic group teaching method is advantageous for enhancing students' basketball techniques.

Table 3: Comparison of two basketball skills of students in the experimental group before and after the experiment

groups	In-place shoulder/chest shot		4*15m dribbling and running	
	Technical evaluation	number of hits	Technical evaluation	grades
pre-testing x1 ±s1	65.11±7.81	1.96±1.51	64.62±7.48	19.62±2.19
post-test x2 ±s2	77.91±6.87	5.38±1.34	80.67±11.35	15.43±1.65
T	-8.937	-10.962	-7.584	13.072
P	0.000	0.000	0.000	0.000

The final test results for two basketball skills of the students in the control group before and after the experiment are compared in Table 4. The number of shooting hits for the control group students increased from 1.44 before the experiment to 4.56 after. Additionally, the performance of the 4-by-15-meter dribbling and run showed an improvement with the students in the control group decreasing their time from 19.4 to 16.58 seconds. These observed improvements clearly indicate that the two skills were enhanced by the experiment. Also, the evaluation of the two skills showed an obvious increase. After conducting a t-test, the obtained p-value of less than 0.05 indicates that the conventional teaching method has significant discrepancies in enhancing basketball skills.

Table 4: Comparison of two basketball skills of students in the control group before and after the experiment

groups	In-place shoulder/chest shot		4*15m dribbling and running	
	Technical evaluation	number of hits	Technical evaluation	grades
pre-testing x1 ±s1	64.53±8.46	1.87±1.44	65.04±8.31	19.40±2.90
post-test x2 ±s2	74.56±8.24	4.56±1.69	76.93±11.46	16.58±1.68
T	-5.371	-7.828	-5.756	6.771
P	0.003	0.000	0.000	0.000

4.2. Comparative analysis of test results of two basketball skills of the two groups after the experiment

After one semester of practicing basketball skills, including shooting and dribbling, both groups underwent another testing round. Table 5 makes it apparent that there was a significant improvement in the basketball scores of the students in both groups. After conducting a comparison of basketball scores between two groups, it was determined that the students in the experimental group had a higher number of hits per capita, with a score of 5.38, compared to the control group with a score of 4.56. Additionally, a T-test indicated a significant difference in the in situ shooting skills between the experimental and control groups, with the experimental group demonstrating greater proficiency. Furthermore, the

experimental group showed a significant difference from the control group in their shooting skills. Regarding shooting technique, the mean shooting score of the students in the experimental group after the experiment was 77.91 points compared to 74.56 points for the control group. The results of the t-test have shown that there is a significant difference between the two groups with a P-value of less than 0.05. After conducting a 4-by-15-meter dribbling and running, the students in the experimental group had an average time of 15.61 seconds, while the students in the control group had an average time of 16.58 seconds. A t-test revealed a significant difference in performance between the two groups. Based on technical scores, the students in the experimental group achieved a score of 80 in the dribbling and running. The mean score for the experimental group was 67 points per person, compared to 76.93 points per person for the control group. The t-test revealed no significant difference in the dribbling and running scores between the two groups. The experimental group achieved an average score of 80.67 points per capita in the 4 by 15 meters dribbling and running technical assessment post-experiment, whereas the control group achieved an average score of 76.93 points per capita. After one semester of experimentation, the experimental group was instructed in dynamic groups, resulting in a greater improvement in basketball skills compared to the control group. These results indicate that the dynamic teaching method is significantly more effective than the traditional teaching method in improving students' performance and teaching efficiency.

Table5: Comparison of two basketball skills of two groups after the experiment

groups	In-place shoulder/chest shot		4*15m dribbling and running	
	Technical evaluation	number of hits	Technical evaluation	grades
experimental group post-test x1 ±s1	77.91±6.87	5.38±1.34	80.67±11.35	15.61±1.65
control group post-test x2 ±s2	74.56±8.24	4.56±1.69	76.93±11.46	16.58±1.68
T	2.326	2.693	1.880	-2.498
P	0.009	0.000	0.209	0.000

Experimental results indicate that there is a discrepancy in the degree of improvement between the two groups. The experimental group exhibits an overall improvement in basketball performance, and the dynamic group teaching method proves to be more effective in enhancing student performance than traditional teaching methods.

5. Discussion

In the experimental group, dynamic grouping was employed. Each group leader led the students to communicate and learn from one another. Students with superior motor skills led and guided those with weaker abilities, sharing personal experiences to boost confidence and facilitate progress together. Meanwhile, the instructor visited and monitored each group, addressing specific issues faced by the students. This approach not only sustained their motivation but also fostered their independent thinking, while adhering to the principle of differentiation and ensuring the needs of the majority were met. On the other hand, the students in the control group continued to adhere to the traditional teaching method. They practiced in groups, with those who excelled at basketball practicing and communicating together, while those who struggled with basketball practiced in separate groups. Due to limited energy, teachers were only able to provide guidance to individual students who needed it. Thus, the experimental group had a greater number of students who met the standard and demonstrated better overall performance.

6. Conclusion

After the experiment, both groups exhibited substantial improvement in two basketball skills. The experimental group, in particular, performed better than the control group in set shot and 4 by 15 meters dribbling and running back. The experimental group outperformed the control group in terms of shooting and 4-by-15-meter dribbling and running back skills. Moreover, the former demonstrated more prominent improvement in both categories. The control group, on the other hand, displayed a bifurcation phenomenon. The dynamic group teaching method is preferable for students in larger classes and with varying sports skills and abilities, as it enhances the effectiveness of teaching.

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