

# Research on the Application of Online and Offline Blended Teaching Model in University Basketball Courses

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**Abstract:** This paper adopts the methods of literature review, mathematical statistics, comparative analysis, etc., to conduct two teaching model experiments on basketball courses for university students majoring in physical education. The experimental results show that the passing and shooting scores of both the experimental group and the control group have significantly improved compared to before the experiment, and the scores of the experimental group are higher than those of the control group, showing a significant difference after testing. This paper aims to explore the application effect of online and offline blended teaching model, analyze the differences between different teaching methods, and provide valuable references for improving classroom teaching efficiency.

**Keywords:** Online and Offline Blended Teaching; Basketball; Teaching Model; Physical Education Major

## 1. Introduction

With the advent of the information age, offline teaching, that is, traditional teaching models, has highlighted its limitations, such as neglecting students' personalized development, slow updates of course content, and teachers' inability to keep up with the times in their teaching methods. The development of information technology today enables educators to share resources. Teachers and students can conveniently use various online teaching platforms and tools to combine online and offline teaching and learning, which to some extent addresses the difficulties and pain points in traditional teaching. This paper conducts an experimental study on some teaching content for university students majoring in physical education to test the practical effects of online and offline blended teaching, aiming to provide suggestions for the issues existing in blended teaching methods.

## 2. Analysis of the Complementary Advantages of Online and Offline Blended Teaching Model

### 2.1 Teaching Repeatability and Flexibility

In traditional basketball teaching, when learning a certain skill, the instructor usually demonstrates and explains the methods and essentials of technical movements. Due to the limitation of classroom time, the learning time for new skills is limited, and most students cannot master the new skills well. They need continuous explanation, demonstration, and practice to master the new skills better.<sup>[1]</sup> Online platform teaching videos can be watched repeatedly without time constraints, and can also be previewed in advance, fully reflecting their flexibility. For example, online and offline blended teaching can achieve complementarity, save time, and improve classroom learning efficiency.<sup>[2]</sup>

### 2.2 Rich and Diverse Teaching Resources

Mastering basic teaching skills and specialized techniques is a fundamental requirement for physical education course teaching. However, physical education teachers are not flawless in their professional fields, and there may be shortcomings in certain technical aspects. Students can effectively address this issue by utilizing high-quality teaching videos from renowned schools and teachers during their learning process. Additionally, a variety of open course videos can broaden the learning horizons of both teachers and students, offering them different perspectives on issues.<sup>[3,4]</sup>

### 2.3 Personalized Teaching Adaptation

The personalized development of students is a goal that has always been pursued in the field of education. At the current stage, uniform progress teaching is the norm in the teaching process. Therefore, when encountering uneven

basketball skills among students in a class, it is difficult for classroom teaching to take into account the skill level of each student, which may lead to the contradictory phenomenon of high-level students being "underfed" and low-level students being "overfed". Online and offline blended teaching can utilize pre-class, inter-class, and post-class watching of teaching videos suitable for their own level of development, thereby learning, consolidating, and improving their own level. [5,6] Teachers can guide students in small groups according to their different levels during the classroom teaching process, which can save teaching time, improve teaching efficiency, and promote the personalized level development of students. [7]

### 2.4 Dual Improvement of Teaching Quality and Effectiveness

The online and offline blended teaching model allows teachers to utilize more diversified teaching methods and techniques, such as group teaching, flipped classroom learning, etc. These rich and diverse teaching methods effectively stimulate students' enthusiasm and interest in learning. The complementarity of online and offline teaching can also promote more comprehensive and in-depth teaching, effectively promoting the overall improvement

of students' learning results and comprehensive quality. [8]

### 3. Research Objects, Experimental Methods, and Evaluation Content

#### 3.1 Research Objects

A total of 60 students from the 2022 grade of physical education major in universities were selected, with a grouping of 30 in the experimental group and 30 in the control group.

#### 3.2 Experimental Methods

As show in Table 1, the experimental group underwent a 6-week normal teaching training, focusing on learning the chest passing with both hands in place and the shoulder shooting in place. The experimental group adopted an online and offline blended teaching model, with the online teaching content drawn from the basketball teaching courses on Chinese University MOOC. The control group followed the normal teaching model. The evaluation of passing and shooting skills consists of two parts: one is "achievement", and the other is technical evaluation, each accounting for 50%, as shown in the evaluation methods and content.

**Table 1. Experimental Method Condition Table**

Group	Number of people	Experimental time	Learning content	Learning method	Online resource use platform
Experimental group	30	6 weeks (two classes per week)	1. Chest passing with both hands in place; 2. Shoulder shooting with one hand in place.	Online and offline blended teaching model	Chinese University MOOC (Xu Jianhua Basketball Course of Fujian Normal University) <a href="http://www.icourse163.org">www.icourse163.org</a>
Control group	30	6 weeks (two classes per week)	1. Chest passing with both hands in place; 2. Shoulder shooting with one hand in place.	Conventional offline teaching model	None

### 3.3 Evaluation Methods and Content

(1) Chest passing with both hands in place

Method: As show in the Table 2, each group of

two persons is tested simultaneously, standing 5 meters apart and passing a ball to each other for a duration of 1 minute, counting the number of passes.

**Table 2. Scoring Table for Chest Passing and Receiving with Both Hands in Place**

Score	100	95	90	85	80	70	60	50
Male	43 times	40 times	37 times	35 times	32 times	30 times	28 times	26 times
Female	35 times	32 times	30 times	28 times	26 times	24 times	22 times	20 times

Technical Scoring Criteria:

Excellent 90-100 points: Correct, coordinated, and skilled in passing and receiving the ball.

Good 80-90 points: Correct, coordinated and relatively skilled in passing and receiving the ball.

Relative good 70-80 points: Correct, coordinated, but not skilled in passing and receiving the ball.

Pass 60-70 points: Correct and coordinated in passing and receiving the ball.

Fail below 60 points: Incorrect and

uncoordinated in passing and receiving the ball.

(2) Shoulder shooting in place

Method: As show in the Table 3, with the center of the hoop's projection as the center, and the distance from this point to the free

throw line as the radius, draw an arc. Start by shooting from outside the arc, and start timing. After shooting, grab the rebound yourself, and then move to the arc to shoot again. Continue for one minute, and record the number of successful shootings.

**Table 3. Shooting Target Scoring Table**

Score	100	95	90	85	80	70	60	50
Male	10 shootings	9 shootings	8 shootings	7 shootings	6 shootings	5 shootings	4 shootings	3 shootings
Female	9 shootings	8 shootings	7 shootings	6 shootings	5 shootings	4 shootings	3 shootings	2 shootings

Technical Scoring Criteria:

Excellent 90-100 points: Coherent and coordinated in shooting and correct shooting technique.

Good 80-90 points; Coherent and slightly poor coordinated in shooting, but correct shooting technique.

Relative good 70-80 points: Correct shooting, not skilled technique and not coordinated body.

Pass 60-70 points: Relatively correct shooting, not skilled technique and not coordinated body.

Fail below 60 points: Incorrect shooting, not skilled technique, slow movement, and not coordinated.

parametric or non-parametric tests. As shown in Table 4, before the experiment, students were randomly assigned to the experimental group and the control group. The average scores of the chest passing with both hands in place were 66.86 and 67.67, respectively; the average scores of the shoulder shooting in place were 65.33 and 65.83, respectively. To test the differences between the experimental group and the control group before and after the experiment, a normal distribution test was conducted on the passing and shooting scores of the two groups. The test results in Table 5 show that the significance P values of the passing scores of the two groups before the experiment were 0.104 and 0.172, both of which were greater than 0.05, indicating that the data of the two groups belonged to normal distributions and could be tested using parametric tests; the significance P values of the shooting scores of the two groups before the experiment were 0.052 and 0.183, both of which were greater than 0.05, indicating that the data of the two groups belonged to normal distributions and could be tested using parametric tests.

**4. Research Results and Analysis**

**4.1 Analysis of Data Differences Between the Experimental Group and Control Group Before and After the Experiment**

**4.1.1 Analysis of the differences between the two sets of data: passing and shooting before the experiment**

Before data analysis, a normal distribution test is required to determine whether to use

**Table 4. (Before the Experiment) Analysis of Passing and Shooting Performance of the Two Groups**

Time	Division of classes	N	Minimum value	Maximum value	Average value	Standard deviation
Before the experiment	Experimental group (passing)	30	50	90	66.83	9.692
	Control group (passing)	30	50	90	67.67	9.444
After the experiment	Experimental group (passing)	30	60	95	84.17	8.209
	Control group (passing)	30	70	95	79.33	5.371

**Table 5. (Before the Experiment) Analysis of Normal Distribution Test Between the Experimental Group and the Control Group**

Group	N	Mean, standard deviation	P
Experimental group (passing)	30	66.8±9.7	0.104
Control group (passing)	30	67.67±9.5	0.172
Experimental group (shooting)	30	65.33±10.165	0.052
Control group (shooting)	30	65.83±9.745	0.183

Due to the small sample size, the Shaprio-Wilk

test was used for the independent sample test.

As shown in Table 6, the P value for the pass test is 0.74, which is greater than 0.05, and the P-value for the shoot test is 0.85, which is also greater than 0.05. This indicates that there is

no significant difference between the two groups of data before the pass and shoot tests, and the experimental operation can be carried out.

**Table 6. (Before the Experiment) Passing and Shooting - Shapiro-Wilk Test Analysis**

Group	Passing scores	T value	P value
Experimental group (passing)	66.8±9.7	-0.34	0.74
Control group (passing)	67.67±9.5		
Experimental group (shooting)	65.33±10.165	-0.19	0.85
Control group (shooting)	65.83±9.745		

4.1.2 Analysis of the differences between the passing and shooting data after the experiment According to the experimental method mentioned above, two groups of students were trained in classroom teaching for 6 weeks. The results of the training are shown in Table 7. Both the experimental group's scores and the average scores of the control group have significantly improved, and the average scores of the experimental group are higher than those of the control group. As show in the

Table 8, due to the normal distribution test P values of 0.000 and 0.006 for the two groups of passing, both of which are less than 0.05, they do not follow normal distribution, thus non-parametric tests are used to test the difference between the two groups. In addition, after the experiment the shooting data test P values of 0.094 and 0.053 for the two groups are both greater than 0.05, indicating that they follow normal distribution, thus parametric tests can be used.

**Table 7. (After the Experiment) Analysis of Passing and Shooting Performance of the Two Groups**

Time	Division of classes	N	Minimum value	Maximum value	Average value	Standard deviation
After the experiment	Experimental group (passing)	30	60	95	84.17	8.209
	Control group (passing)	30	70	95	79.33	5.371
After the experiment	Experimental group (shooting)	30	60	95	81.33	9.820
	Control group (shooting)	30	60	90	76.00	6.998

**Table 8. (After the Experiment) Normal Test Analysis of the Experimental Group and the Control Group**

Group	N	Mean, standard deviation	P
Experimental group (passing)	30	84.17±8.209	0.0000
Control group (passing)	30	79.33±5.371	0.0060
Experimental group (shooting)	30	81.33±9.820	0.094
Control group (shooting)	30	76.00±6.998	0.053

Due to the non-normal distribution of the passing data after the experiment between the experimental group and the control group, the

non-parametric test results in Table 9 show a P-value less than 0.001, indicating a significant difference between the two groups.

**Table 9. (After the Experiment) Non-parametric Test Analysis of Two Groups of Passing Data**

Index	Number of people	Score M(Q <sub>L</sub> , Q <sub>U</sub> )	Z value	P value
Experimental group (passing)	30	85(80,90)	-3.329	0.001
Control group (passing)	30	80(75,85)		

As shown in Table 10, P-value is 0.019, which is less than 0.05, indicating a significant

difference between the two groups of data after the shooting experiment.

**Table 10. (After the Experiment) Shooting - Shapiro-Wilk Test Analysis**

Group	Mean, standard deviation	T value	P value
Experimental group (shooting)	81.33±9.820	2.423	0.019
Control group (shooting)	76±6.998		

## 5. Discussion and Analysis

In the physical education majors of many sports universities, basketball is a compulsory course with a relatively small number of class hours, generally 48 hours. Due to the uneven level of students, the use of conventional teaching methods and progress will greatly reduce teaching efficiency. However, in order

to take into account the actual level of all students in the class, teachers have to compromise, which is likely to cause some students to be tired and disgusted with the teaching content and teaching model. The online and offline blended teaching model effectively improves students' initiative, flexibility, and classroom efficiency, and improves teaching quality. However, there are

also many issues in teaching, such as not deep enough of blended teaching, inadequate guarantee system, unreasonable course design, different teaching quality, poor acceptance of teachers, and not effective teaching reform results.<sup>[9]</sup>

The current online and offline blended learning model overlaps with flipped classrooms and research-based learning models, all aiming to enable students to have sufficient autonomy in their learning goals, while allowing them to learn independently and flexibly, and enhancing their sense of participation. Students can learn more knowledge independently through a variety of online open courses, and the change in their learning methods will subvert the role of teachers, course models, and management models.<sup>[10]</sup>

## 6. Conclusion and Outlook

Through the comparative analysis of the passing and shooting technical data of the experimental group and the control group before and after the experiment, the average scores of passing in the experimental group and the control group after the experiment were 84.17 and 79.33, respectively, which were higher than 66.8 and 67.67 before the experiment; the average scores of shooting in the experimental group and the control group after the experiment were 81.33 and 76.00, respectively, which were higher than 65.33 and 65.83 before the experiment. The average score of passing in the experimental group after the experiment was 84.17, while that in the control group was 79.33. The non-parametric test results showed that  $P < 0.05$ , indicating a significant difference between the two groups, with the experimental group performing better than the control group. The average scores of shooting in the experimental group after the experiment was 81.33, while that in the control group was 76.00. The parametric test results showed that  $P < 0.05$ , indicating a significant difference between the two groups, with the experimental group performing better than the control group.

The teaching objectives of the course include knowledge objectives, ability objectives, and emotional objectives. This paper only analyzes the experimental effects of the ability objectives. To better achieve the online and offline blended teaching model, future

experiments should be conducted on the knowledge and emotional objectives, drawing on the teaching experience of similar courses to improve the online and offline blended teaching model.

## References

- [1] Hao Junwen, Bai Jinglu. Research on the Reform of Online and Offline Teaching Model of College English Based on SPOC - A Review of "Research on the Theory and Practice of College English Education and Teaching". *Educational Theory and Practice*, 2024, 44(21):2.
- [2] Ji Jingtong. Construction of Online and Offline Mixed "Gold Courses" in English in Universities. *Journal of Shanxi University of Finance and Economics*, 2023, 45(S1): 193-195.
- [3] Xu Anfeng, Li Bin, Li Yue. Research on Smart Education Model Based on Mixed Online and Offline Methods. *Theory and Practice of Education*, 2024, 44(15): 57-60.
- [4] Wang Cuixia, Xu Zhiyu, Zhou Wei, et al. Exploration of Online and Offline Blended Teaching Mode for Electrical and Electronic Simulation Experiments. *Research and Exploration in Laboratory*, 2024, 43(07): 91-94.
- [5] Yin Donghao, Lu Danyun, Xu Fang. Development of Online-offline Blended Teaching in Higher Education Under Background of Digital Revolution. *Heilongjiang Researches on Higher Education*, 2024, 42(04):156-160.
- [5] Zhang Xiyan, Xu Jimin, Miao Shenghao, et al. Effectiveness of Online and Offline Health Education Myopia Intervention on Primary School Students. *Chinese Journal of School Health*, 2023, 44(11):1720-1723+1728.
- [6] Wang Lamei, Qi Yuanyi, Xiao Jun. Theoretical Framework, Development Path and Future Prospect of Online Merge Offline Integrated Education—From the Perspective of Literature Review. *Adult Education*, 2023, 43(11): 47-56.
- [7] Yu Jie. Online and Offline Blended Teaching Mode of English in Universities. *Journal of Shanxi University of Finance and Economics*, 2023, 45(S2): 258-260.
- [8] Lei Xiao. Deep Integration of Online & Offline Teaching: Design & Practice of

College Classroom Teaching. Journal of Honghe University, 2024, 22(01): 82-85.

- [9] Xie Yaya, Tian Yuan, Sun Xinyu, et al. Research on Online and Offline Mixed Teaching Modes under the Background of "Internet+Education". Printing and Digital Media Technology Study, 2023, (04):

139-145.

- [10] Wang Yubiao, Tian Aili. Research on the Acceptance Degree of Online and Offline Integrated Teaching by Primary and Secondary School Teachers and its Influencing Factors. Modern Educational Technology, 2023, 33(06):109-117.