

The Blended Teaching Design and Practice for Physical Education Specialized Course

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Abstract The proposal of the core competence of the physical education (PE) discipline in the curriculum reform reflects the increasing requirements for the training of talents in the new era, and the occurrence of COVID-19's epidemic era has accelerated the pace of teaching reform. Internet technology plays a vital role in promoting teaching reform during the epidemic period. The large-scale online teaching experience during the epidemic control period makes people realise they need to change education in the post-epidemic era. The new normality of education should be a blended teaching model, the critical point and breakthrough of PE specialized courses reform. This study takes blended learning as the primary research object and puts forward the design strategies for the blended teaching of PE majors from five aspects: the principles of teaching design, teaching methods, teaching resources, teaching process and learning evaluation. Then we select the football specialized course of the Physical Education Department of Handan University as an example to perform the teaching practice and effect analysis. Practical research shows that the teaching of this study can effectively promote students' learning.

Keywords Blended Teaching, Specialized Course, Physical Education

1. Introduction

The surface learning of simple mechanical memory and reciting knowledge of college students can no longer meet

the requirements of talent training in the new era. They should develop their core competence through understanding, analysis, application, evaluation and other in-depth learning in the classroom to gain a foothold in the future intelligent and innovative social environment. To meet college students' new learning needs, there is an urgent need to develop high-quality teaching resources and explore suitable teaching models. In the new teaching environment, optimising teaching strategies and providing adequate support for college students' classroom learning needs to be studied continuously and deeply.

The professional course of physical education is a professional promotion course for undergraduate students majoring in physical education, with the primary goal of training physical education teachers. Through the participation of these courses these courses, students can understand the laws of sports, master the knowledge and ability and become comprehensive physical education teachers [1, 2]. At present, the teaching of physical education courses in colleges and universities in China pursues the cultivation of sports skills too much, neglecting the disconnection between students' knowledge structure and social needs, and the innovation of teaching methods has become a weak link [3, 4]. Finally, it will lead to problems in physical education courses, such as students' poor pertinence, poor effectiveness, incomplete professional knowledge, and poor comprehensive ability.

With the support of information technology, significant changes have taken place in the learning style of college students. Students can have immediate and easy access to many high-quality multimedia teaching resources through

the Internet, and the source of learning information is no longer fixed and single [5]. Therefore, teaching should gradually shift from teachers' declarative and procedural knowledge to students' exploration and discovery of new knowledge and deal with problems in complex situations [6]. In this context, new connotations will endow the behaviour of teachers and students in teaching and learning in the classroom.

Blended Learning, based on fully designing students' face-to-face teaching activities, combined with the mode of online learning, is the most appropriate choice. Online learning has its advantages, of rich teaching resources. Time and place do not limit learning, with which traditional face-to-face classrooms can not compare [7]. On the other hand, traditional classroom teaching has the advantages of more direct communication and multi-person interaction [8]. Blended teaching aims to give full play to their respective advantages and complement each other to create a coherent, flexible and rich learning experience for learners to achieve high efficiency and high-quality learning effect [9].

Blended teaching embodies the development of educational technology theory, which accords with the learning characteristics of the information age and returns to the origin of learning, accords with the teaching law, and is of practical significance to today's educational information construction and deepening reform. At present, educational informatisation in China has changed from the initial stage of the construction of software and hardware infrastructure to the in-depth development stage of emphasising application, especially in the teaching process. Blended teaching is the in-depth application of information technology and the product of the deep integration of information technology and curriculum [10, 11].

2. Materials and Methods

This paper adopts the research method based on design. Design-based research is a formative research process, and comprehensive application of various research methods to solve practical educational problems, managers, researchers, practitioners, and designers make joint efforts in an authentic and natural situation. According to the feedback from practice, we continue to improve and eliminate all defects, form a reliable and practical design, and then realize the dual development of theory and practice. The core elements of its research are the design, implementation, evaluation and improvement of educational intervention. Educational intervention refers to the artificial systems such as environment, curriculum, tools and models designed and developed to optimize teaching and promote learning. The research method based on design emphasizes different situations or backgrounds, forms a situational application theory, and provides a reference for the development of blended teaching. This kind of research connects theory and practice and builds a

bridge between theory and practice.

This study puts forward the curriculum teaching design for physical education majors based on the blended teaching model from five aspects: teaching design principles, teaching methods, teaching resources, teaching process and learning evaluation. The software and platform used in these designs are based on the "FANYA" platform and "Superstar Learning" APP.

The empirical research method is also used in this study. Combining theory with practice, combining theoretical research with specific curriculum implementation, carrying out empirical research, enriching and perfecting in practice, and producing scientific and practical results.

3. Results

3.1. Instructional Design

3.1.1 Principles of instructional design

After investigating the students' learning situation, the researchers made a comprehensive analysis of the overall teaching situation. To better carry out teaching practice, improve teaching effect, improve learning efficiency and learning quality, the researchers believe that the teaching design of blended learning should follow the following basic principles:

- (1) The teaching principle of teachers as the leading role and students as the main body.

In the traditional classroom, teachers master the pace of the classroom; learners live in passive listening, which is complicated to cultivate students' learning ability. Today, when new technology promotes the development of teaching, the new teaching concept has brought us a new relationship between teachers and students [12]. In the new relationship, students are the main body and have a say in learning activities, and all teaching is carried out around students, while teachers, as instructors and participants, should understand their needs from the students' perspective [13]. The process of classroom learning should be the organic integration of teachers' and students' bilateral activities. Teachers should guide students to diverge their thinking and think about problems and actively participate in classroom discussions and learning activities. In online learning, teachers organize learners' autonomous learning, guide learners to choose learning resources, participate in online discussions, and achieve learning goals. In face-to-face classroom, under the guidance of teachers students actively complete the learning tasks successfully through learning activities arranged in advance.

- (2) The diversity of resources and the principle of co-construction and sharing

In blended learning, curriculum resources are an essential part of curriculum learning. Learners with

different learning styles have different needs for resources. Some students like video materials, some like text materials, and some like courseware, so teachers should try their best to meet the needs of different learners for resources. When providing resources for learners, teachers should select resources carefully, covering various forms of resources for learners with different learning styles and screening and classifying the contents of resources. Therefore, those learners at different levels can get help in curriculum learning, making it convenient for learners to learn.

In today's network environment, learners can choose more and more learning platforms, among a variety of learning resources. Each learner is not only the acquirer of learning but also the processor of learning [14]. Therefore, in the blended teaching model, learners should follow the principle of co-construction and sharing of learning resources. In terms of access to resources, students can share the knowledge they have acquired in various forms and expand their understanding of the extra knowledge of textbooks among students; in terms of processing resources, teachers can guide students to diverge their thinking to create and design their works. By showing and sharing, learn from each other to make up for your weaknesses. Under the guidance of the co-construction and sharing of resources, students can share the resources created by themselves in class and the resources of students' extracurricular learning.

(3) The principle of communication and interaction

Communication and interaction play an essential role in the whole activity. What promotes the orderly progress of the whole teaching model is establishing a good relationship between teachers and students, students and resources [15]. In blended teaching, teachers answer questions and guide ideas by explaining knowledge; students realize the collision and transmission of ideas through cooperation and discussion to form a positive learning atmosphere; teachers design learning resources suitable for students' development. To promote the effective interaction between students and the acquisition of resources and maximize the effect of learning resources. In constructing this model, we should also combine online and offline, break through the boundaries of time and space, and make the communication between teachers and students smooth [16].

When designing learning activities, teachers should increase the interest in learning activities and the divergence of problems to be solved and design learning activities suitable for teamwork. Through group cooperation, inter-group competitions, debate competitions, brainstorming and other forms, let learners learn knowledge in practical activities and cultivate team spirit.

(4) Principles of multimedia classroom teaching design

RE [17] based on the cognitive theory of multimedia learning, through a large number of empirical studies,

summed up some effective instructional design principles, including focused theme, marker structure, spatial proximity, time proximity, block display, preparation in advance, humanization and so on, so that teaching information can be presented more effectively and reasonably in the classroom.

RE also pointed out that in teaching design, it is necessary to stimulate students' learning motivation and promote students' participation in the classroom. In teaching design, teachers should pay attention to step-by-step practice, real-time feedback, inference and fine processing, guide students to sort out their own views according to the learning content, put forward more deep-seated problems related to learning content and try to solve them.

The cognitive theory of multimedia learning holds that learning needs to go through three critical cognitive processes: selection, organization, and integration to produce meaningful learning. RE summarizes various effective teaching strategies around optimizing these three cognitive processing methods: a. Clear goals: state what students will learn in class. b. Pre-questions: set some questions that students need to answer before learning each part of the learning content. c. Post-questions: set some questions that need to be answered after students learn each part of the learning content. d. Emphasize the key points: the use of particular marks to arouse students' attention to critical information.

(5) The principle of balance between challenge and satisfaction

The balance between satisfaction and challenge can maintain the critical reference principle of students' learning motivation and enable them to finish their homework in the relatively unsupervised online learning situation.

Dirksen and Julie [18] use the metaphor of climbing by bike to compare the balance between challenges and satisfaction students encountered in their learning process. When students have been exposed to new information that they have never been exposed to in their previous life and production practice, if they do not have the opportunity to stop and think about absorbing this new information, the learning effect of students will not be guaranteed and may not even learn anything.

In addition, the construction model has the following characteristics in enabling students to achieve a successful learning experience. First, focus on learning activities; second, clear learning goals; third, frequent use of feedback to shape behaviour; fourth, there is a time gap between learning tasks to provide learners with opportunities to rest; fifth, evaluate students' performance. Let students perform actual tasks as much as possible.

3.1.2. Teaching method design

The overall idea of teaching design based on a blended learning platform is to cultivate students' autonomy,

enthusiasm and creativity. Therefore, blended learning teaching methods should emphasize the cultivation of autonomous learning and team collaborative learning. Blended learning is a learner-centred educational paradigm that requires students to pay attention to self-learning, encourage independent thinking, and advocate theme-centered and task-centred learning. The design of teaching methods can be divided into three stages: before class, during class and after class. Through three stages of learning, students can achieve the teaching goal from knowledge cognition to application practice, and finally, improve students' core competence.

(1) Pre-class design

Before class, teachers need to analyse learner and teaching goals to narrow the gap between learners' initial ability and teaching goals. In the pre-class stage, the most critical task is to clarify the teaching content, and then make a clear division of the knowledge level of the teaching content, and then according to the cognitive goals of different levels, determine whether the relevant teaching content is put on the online teaching before class or the classroom discussion in class. After the classification of knowledge, explicit online teaching content and offline teaching content are formed.

When designing online teaching content, teachers

should prepare teaching resources before class and provide some reference books, electronic courseware and lesson plans, micro-video tutorials, related special learning websites, and other materials. We generally divide resources into two levels: basic and extended resources, which are prepared for learners with different bases. After the resources are prepared, the teacher should inform the learners of the pre-class learning tasks. Students should fully define the tasks assigned by teachers, learn the resources prepared by teachers, and capable students can browse learning expansion resources. The most significant advantage of this approach is the realization of personalized learning. Students can choose learning resources and self-defined learning time according to their situation. After autonomous learning, students should summarize the knowledge they have learned and the existing doubts and feedback the problems to the teacher. Teachers learn about students' autonomous learning through feedback results and then conduct targeted classroom teaching. The teacher designs the classroom teaching according to the content and the student's online learning. In the classroom inquiry activities, define the objectives, tasks and evaluation methods of the activities, take the task as the mainline, problem-driven, and carry out classroom teaching activities. The pre-class teaching design is shown in figure 1.

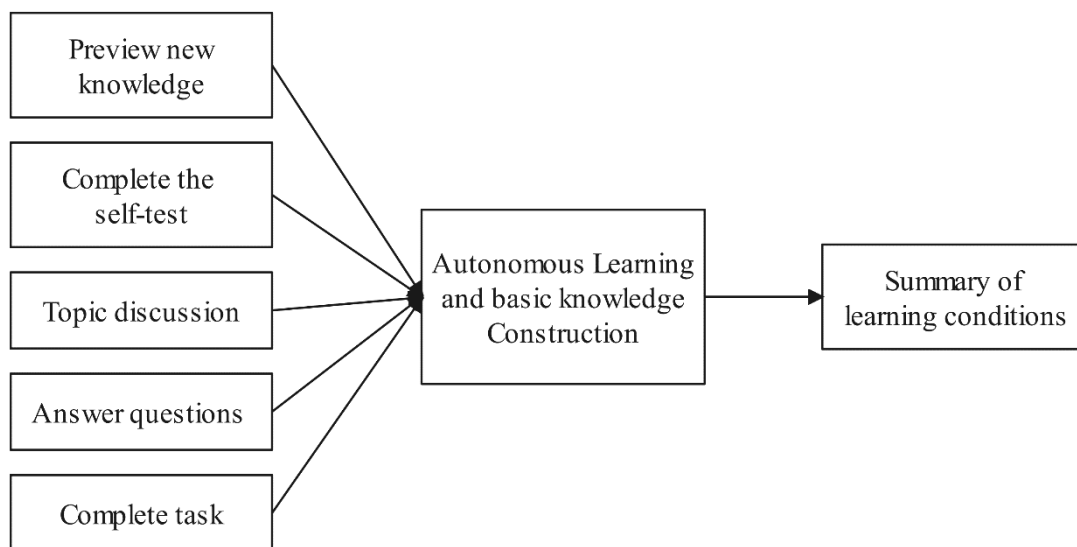


Figure 1. The Pre-class design of blended learning

(2) In-class design

The in-class design can be divided into four stages: cooperative exploration stage, personalized guidance stage, presentation sharing or competition stage, and summary and evaluation stage.

Teachers should first introduce classroom learning resources to connect students' old knowledge and new knowledge to facilitate students' self-construction in the existing cognitive structure; at the same time, teachers should elaborate on the critical and challenging problems encountered by students in the process of autonomous learning before class and give critical guidance. After that, teachers organize students to carry out inquiry activities. In this link, teachers should clarify the task and take the problem as a clue to help students achieve high-level cognitive goals step by step. In the activities process, teachers often need to group students into groups, and students solve one problem after another through cooperation within the group.

When grouping, teachers should pay attention to dividing heterogeneous students into groups so that different students can achieve expected growth through complementary cooperation. In the cooperative inquiry stage, the teachers assign tasks or ask related questions, and the group of students cooperate to complete the task. Students can use this time to discuss the problems encountered in autonomous learning with their learning

partners or express their views according to the teacher's task. The personalized guidance stage is the process for teachers to answer questions for each group. Each group will encounter different problems in the cooperative exploration stage, so teachers carry out personalized guidance according to students' different questions, answer questions for each group, and teach students by their aptitude.

Inquiry activities also need to monitor the teaching effect, so teachers observe the students' inquiry and make a summary evaluation to let students report the inquiry results. To avoid the "one-person-led" completion of the task in the group, teachers need to conduct random checks during the report so that every student in the group can effectively participate in learning activities. After the end of the activity, the teacher must comment on the students' participation in the activity, comment on the students' performance in the activity, and the problems and solutions in the activity. The comment is not to distinguish the advantages and disadvantages of students; its primary purpose is to let students further clarify their level of knowledge and ability achieved through inquiry learning activities. According to the teaching content, teachers can also set up competitions to examine the proficiency and depth of students' mastery of knowledge, such as knowledge competitions and debate competitions.

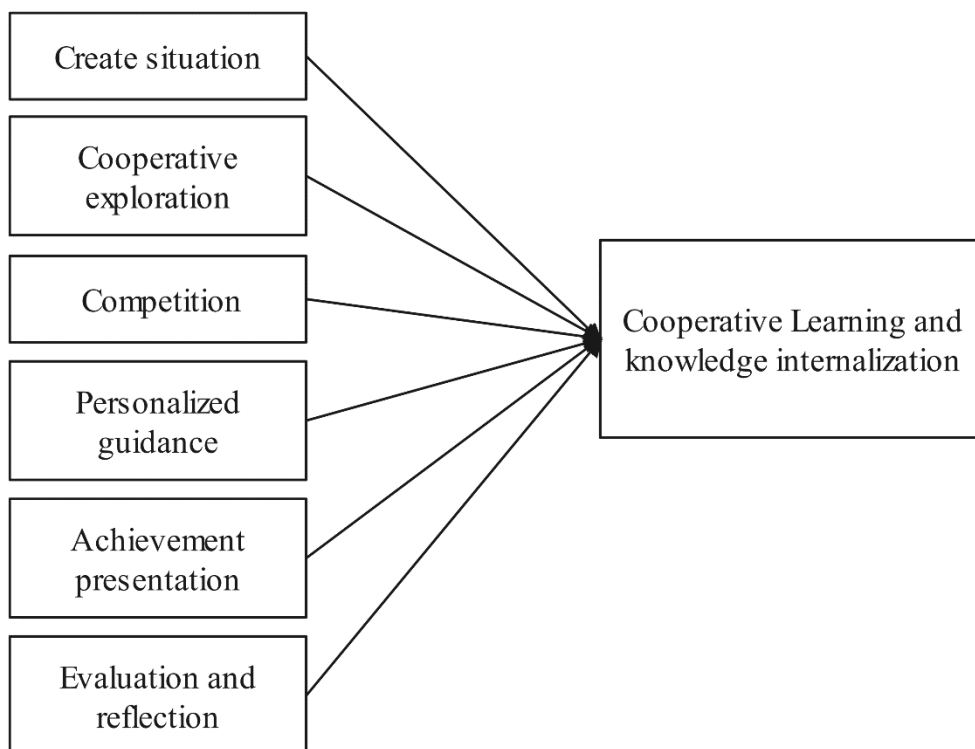


Figure 2. The In-class design of blended learning

In the summary stage, the student representatives of several groups first summarize the harvest and difficulties of this course, and then the teacher explains the fundamental problems and critical knowledge according to the problems of each group. Systematically sort out the knowledge of the whole class, attract students' attention, and summarize the learning process of the course. The evaluation stage is the last link of the curriculum. Teachers should evaluate the curriculum as a whole from the perspective of individual students, each group and the whole, attach importance to the diversity and fairness of the evaluation, and give priority to motivation. Teachers can guide students to review after class. At the same time, they should pay attention to guiding students to actively explore and cultivate the spirit of communication and cooperation to improve students' self-study and problem-solving ability imperceptibly. The In-class design is shown in figure 2.

(3) After-class design

The after-class design aims to consolidate students' mastery of knowledge further and put it into practice. In

addition to uploading their homework, students can also share their learning achievements, experiences and additional learning materials on the platform. In the after-class task, teachers need to provide students with ways to ask for help in the process of homework. For example, students can publish their help-seeking information on the learning platform and inquire about their confusion in learning or homework. The teacher responds in time, and other students can also give help and answers. Teachers should always pay attention to the messages of the learning platform and nail groups to help students in time. Teachers can also presuppose the problems students may encounter in doing homework in advance to set questions in advance in the forum to guide everyone to discuss. We must set up an evaluation for the homework link to test the students' learning effect. In addition, we need to pay attention to the acquisition of non-knowledge learning ability in the evaluation, such as the improvement of learning efficiency, learning interest, knowledge transfer, language expression, group cooperation, independent thinking, etc. The after-class design procedure is shown in figure 3.

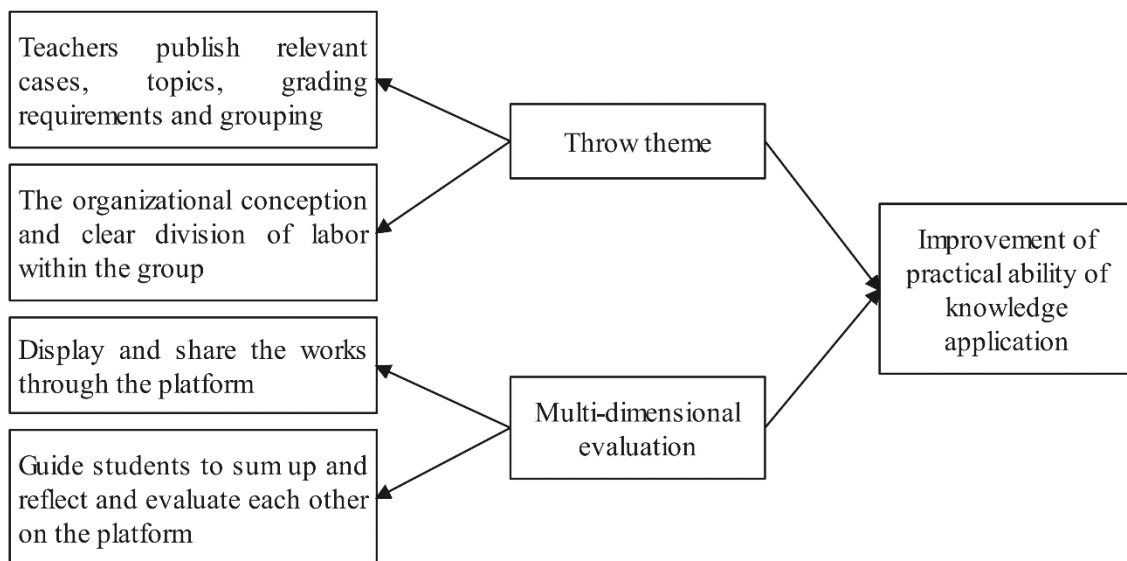


Figure 3. The After-class design of blended learning

3.1.3. Teaching resources design

Teaching resources are materials and other conditions that can be used for the effective development of teaching, including teaching materials, cases, films, pictures, courseware, etc. and teacher resources, teaching aids, infrastructure, etc. In a broad sense, teaching resources can refer to all the elements teachers use in the teaching process, including people who support teaching, people who serve the teaching, money, material, information, etc. In a narrow sense, teaching resources mainly include teaching materials, a teaching environment and a teaching backup system. The teaching resource design discussed in this paper mainly aims at the narrow sense of teaching resources, divided into online teaching resources design and face-to-face classroom teaching resources design.

(1) The online teaching resources design

Aiming at the online learning situation, this study selects high-quality resources from the existing resources, edits them appropriately according to the teaching content, and uploads them to the platform or APP together with other supplementary illustrative document teaching resources. First of all, teachers have to select quality resources. Resources include videos of lectures on learning knowledge and exercises, tests, and learning tasks that match the videos. This study carefully selects several excellent alternative resources from the two aspects of video and its supporting exercises and learning tasks and pushes them to the students according to the teaching needs. Students can choose freely according to their own learning needs, or they can collect materials on their own. Secondly, teachers should edit and integrate resources. These resources are edited twice in this study to make the selected resources better match the teaching content and teaching objectives. It includes deletion, translation and annotation through video editing software to ensure the continuity of the whole video as far as possible in the editing process. At the same time, the exercises and learning tasks in the teaching video are appropriately revised according to the teaching objectives and contents. The edited resources are integrated to develop and supplement the resources because the content does not cover the teaching objectives.

(2) The offline teaching resources design

After completing online autonomous learning, students will guide further study in the traditional face-to-face offline situation because of the problems encountered in autonomous learning. The topics discussed in traditional face-to-face offline learning and online learning content take care of each other. The presentation in the offline learning situation helps students sort out the relevance of new knowledge and awaken their autonomous learning and memory. In the process of core new knowledge presentation, using micro-video teaching resources can appropriately change the teaching rhythm, make full use of students' cognitive visual and auditory channels, and quickly stimulate students' interest in learning important

new concepts and new concepts knowledge. On the other hand, interactive voting systems and information transmission systems can support face-to-face interaction between teachers and students and give full play to the advantages of the face-to-face teaching mode.

Teacher-student interaction system. After each part of the study, teachers and students will have in-depth discussions and interactions. Teachers collect students' views or opinions on a specific issue by posting exercises or voting. If we interact with each other in the form of multiple-choice questions, teachers can get students' choice options in real-time and conduct more targeted discussions according to the statistical results chosen by students. Each student can also learn about the views of the whole class on this issue and the differences between their views and the mainstream views of the class.

When there is a need for interaction through open questions or knowledge construction, teachers can publish online collaborative documents or multi-person collaborative brain maps, and students can build knowledge together. This process can also be done in the classroom, except that the online document is replaced with a small whiteboard. Teachers communicate with students to discuss the final results and inspire more ideas and ideas. In the discussion process, students can also communicate their views with the whole class and teachers.

(3) The teaching resource management design

Online and face-to-face classroom learning resources need to be reasonably allocated and provided to learners within a preset period. The teacher creates the curriculum through FANYA platform and also sets up a class on the nail. Teachers and all students join in it through the client, thus realizing the mapping and transformation from the physical classroom to the virtual classroom in the actual situation. The virtual classroom is equivalent to a digital learning space in the online learning situation. Through the virtual classroom, teachers and students can share learning resources, share learning experiences and interact with each other. Teachers send information reminders for all or individual students by way of announcement, reminding the beginning and end of each teaching link, and announcing the tasks that students need to complete in each teaching link. Teachers can also upload the design and learning resources described above to the platform to facilitate students to watch videos and complete learning tasks for autonomous learning. Students can interact with classmates and teachers by posting messages. After the end of online learning, teachers count the problems encountered in online learning, browse learning resources, timely grasp the situation in that students have achieved various teaching goals, and timely adjust the teaching content focus and teaching strategies of the face-to-face classroom.

3.1.4. Teaching process design

Blended learning teaching design refers to a relatively

stable teaching activity framework established by the organic combination of online learning and traditional classroom teaching under the guidance of modern education and teaching theory and drawing lessons from and making use of the advantages and characteristics of the network platform. The blended learning design should follow the principles of clear orientation, easy operation, good integrity and stability. In the instructional design of blended learning, students and their learning evaluation have always been in the core position, which plays a decisive role in other factors in the teaching process. In other words, blended learning instructional design is different from the traditional teaching model with teachers as the core, and it is different from the online learning

model with Internet curriculum resources as the core. It is student-centred. All curriculum arrangements, teaching methods, discussion, practice, testing, and evaluation are consistent with the teaching goal of optimizing students' learning effect and efficiency and have a solid inherent unity. In the instructional design of blended learning, the role of teachers has changed. Teachers' primary role is no longer the instiller or imparter of knowledge, but the combiner of knowledge and learning guide. Students' curriculum learning is mainly on the blended learning platform, students master the learning process independently, and teachers grasp learning progress and examination evaluation. The instructional design structure of blended learning is shown in figure 4.

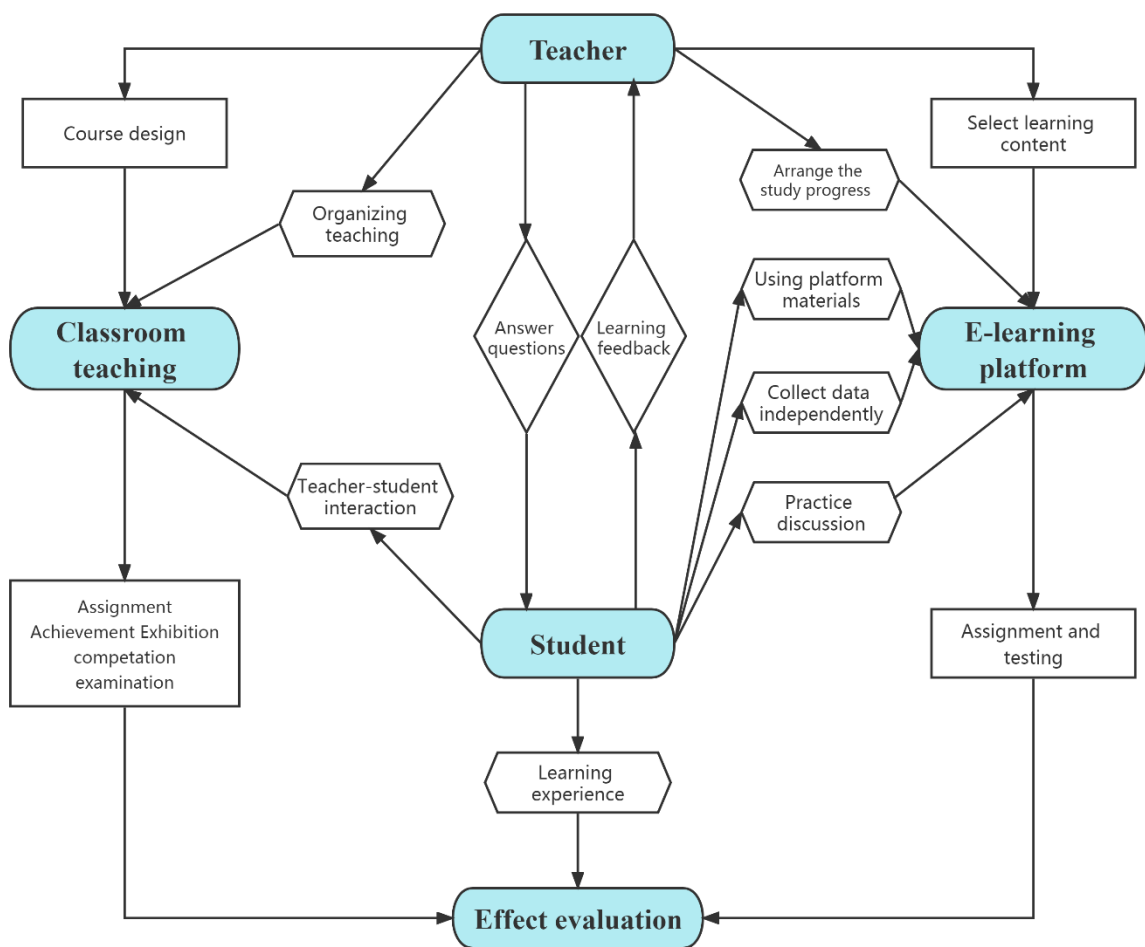


Figure 4. Blended learning teaching process design

The teaching design of blended learning pays full attention to the central role of teachers in teaching. Teachers select online courses for students and specify the corresponding online learning time and learning progress. Students use the teaching resources on the online learning platform to complete tasks and conduct online exercises, tests and learning exchanges according to teachers' requirements. Teachers lead the discussion of questions, curriculum practice, knowledge sublimation, practice tests and examination evaluation in class. Under the guidance of teachers, blended learning teaching design combines traditional classroom face-to-face learning with online learning, which optimizes a single learning environment, enriches learning content and improves learning quality. The blended learning platform's automatic grading and monitoring function can objectively, fairly and timely evaluate students' learning effects and has insurmountable advantages in improving students' learning efficiency and enthusiasm. Blended learning instructional design is a brand-new teaching mode, an organic combination of online learning and traditional classroom teaching, and a joyous exploration for instructional design to actively adapt to the reform of learning methods in the Internet era.

3.1.5. Learning evaluation design

(1) Pay attention to the cultivation of comprehensive ability and promote all-round development

The traditional PE teaching examination pays attention to investigating students' technical levels. It lacks the cultivation and test of teachers' academic ability, which makes many students not pay enough attention to improving their teachers' academic ability. As a result, it

is impossible to enter the working state quickly after graduation, which fundamentally alleviates the pressure of the lack of high-quality PE teachers at the grassroots level. Therefore, it is necessary to make efforts in curriculum design, and teachers should focus on the goal of ability training and quality improvement in the curriculum. The best test is to record the results of the comprehensive ability examination in the final grade, so this examination reform mainly increases the weight ratio of students' comprehensive ability test to make students pay more attention to the improvement of teachers' academic ability. It is also convenient for teachers to understand and evaluate students from multiple dimensions, optimize teaching design in continuous running-in and testing, and promote the overall development of students.

(2) Refine the process evaluation so that there is evidence to check.

This examination reform is based on the "blended teaching mode". It makes full use of the data generated in students' learning as different criteria for evaluating students and adopts the form of online and offline multi-dimensional and multi-channel assessment. Students' grades mainly come from online grades provided by the network teaching platform and scores produced by classroom learning. Combined with the characteristics of physical education, the tests of skills, theory, practical ability and teachers' educational ability run through the classroom as a whole. The final assessment is divided into five parts: attendance, stage assessment, in-class practice, learning platform and final skills assessment (as shown in Table 1).

Table 1. Academic achievement composition

Evaluation index	1.Attendance	2.Stage assessment results		3.Classroom practice achievement			
Evaluation content	Attendance rate	Special technical assessment in the 4th week	Special technical assessment in the 8th week	Teaching practice		Cooperative learning achievement	
Percentage	5%	20%		20%			
Specific standard	Attendance in class, out of 100 points multiplied by 5%	Two phased achievements (A+B) /2×20%		After the students have completed the practice according to the above contents in class, the teacher will give the score in class, with a full score of 100, multiplied by 20%.			
Evaluation index	4.Learning platform performance					5.Final skill examination	
Evaluation content	Material learning	Original teaching plan	assignments	Online examination	Times to participate in the discussion	Technical action evaluation	Technical quantification standard
Percentage	35%					20%	
Specific standard	The total score of the platform is 100. Through the daily completion of the tasks such as material learning, original teaching plan, homework, online examination, and participation in discussion, calculated by the weight setting of the platform, it is multiplied by 35%.					The total score is 100, multiplied by 20%, divided into two parts: technical action evaluation and technical quantification.	

The setting of these assessments mainly considers the following purposes: a. Dilute attendance restriction on students. b. Strengthen the cultivation of students' ability by practice in class. c. Highlight the process test of the students in the stage examination. d. Give full play to the online platform's role in students' digital management.

(3) online and offline final assessment, objective and comprehensive evaluation

In this examination reform, the final examination is divided into online and offline. The technical assessment is based on the technical action evaluation and the technical, quantitative standard to determine the final technical mastery. The theoretical assessment is carried out using the Fanya network teaching platform to realize the actual "paperless" examination.

- a. Theoretical assessment-network platform online. The application of information technology in education is the key to realising modern education. The theoretical examination breaks the traditional realm of pen and paper and carries out the "paperless examination". Before the examination, teachers work out questions through the online platform, requiring students to answer questions within a specified period. To prevent cheating, teachers set the number of questions, the time of answering questions, the times of answering questions, whether to paste, whether to withdraw, etc., and randomly set each student's papers so that each student's paper is entirely different. It improves the teacher's work efficiency, saves time, and saves a lot of financial and material resources.
- b. Skill assessment-refinement criteria are strictly completed. The technical test is to complete the professional action, which is divided into two parts: the technical action evaluation and the technical, quantitative standard. Refine the skill test, refine each score index, have the quantity to reach the standard, and have the high-quality technical action skill evaluation. On the one hand, students have the goal of hard work, improving their interest in learning, and students will not flinch from meeting too high

standards. On the other hand, to refine the standards, students will listen carefully and practice in each class, requiring themselves to do their best at every stage to improve students learning process and no longer blindly think about how to do the final test. But in the process of strict requirements to learn every detail.

The setting of the above examination standards mainly reflects the supervision and inspection of students' process learning, with such a detailed process evaluation to supervise students' every step of learning so that students' every point has evidence to follow and evidence to check. Whether it is the maintenance of students' learning enthusiasm and persistence or promoting learning comprehensiveness has been dramatically improved.

3.2. Applied Research

Based on the specialized football course of physical education majors, this study selects two classes to carry out the blended teaching practice and the comparative analysis of the teaching effect. One of the classes is the control group, adopting the traditional classroom teaching model and the other class is the experimental group, adopting the blended teaching based on the above design. After eight weeks of 32 class hours of teaching practice, the comprehensive academic achievements of the two classes were compared. Two group data were compared using independent sample T-test via the software SPSS25.0 with the same conditions of teachers and evaluation methods.

The results show that mean scores of pre-test of the experimental and control groups are respectively 72.6/68.767. (see Table 2) The P-value is 0.113 > 0.05, so the statistical result is not significant, indicating that there is no significant difference between the Experimental group and the Control group, so the interference of this variable on the data of the two groups can be excluded, and the grouping is effective.

Table 2. Comparison of the exam scores of the two groups in the previous semester (pre-test)

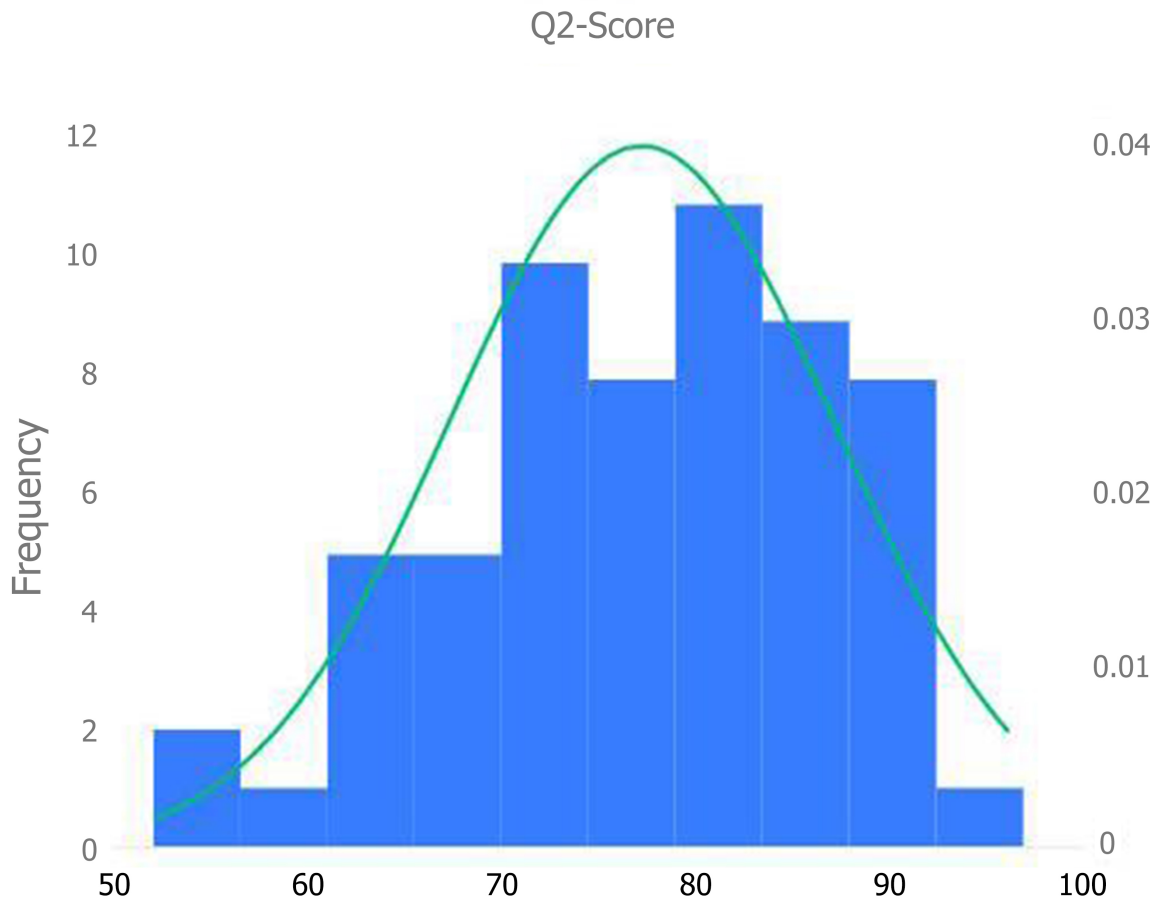
Variable	Variable value	Sample size	Mean	SD	t-value	p-value (Double tail)	Mean deviation	Cohen's d
Pre-test score	Experimental group	30	72.6	8.552	1.609	0.113	3.833	0.415
	Control group	30	68.767	9.86				
	Total	60	70.683	9.353				

Note:***, **, * represent the significance levels of 1%, 5% and 10%, respectively.

Table 3. Normality test results

Variable	Sample size	Median	Mean	SD	Skewness	Kurtosis	S-W Test	K-S Test
Score	60	77.5	77.267	9.974	-0.485	-0.144	0.975(0.247)	0.099(0.563)

Note:***、**、* represent the significance levels of 1%, 5% and 10%, respectively.

**Figure 5.** The Normality test histogram

The total number of subjects in this study is 60; 30 are learning by blended learning model and 30 by traditional teaching model. The data after the teaching experiment are analyzed in table 3.

The table 3 shows the results of Score descriptive statistics and normality test of quantitative variables, including median, average, etc., used to test the normality of data.

(1) There are usually two test methods for normal distribution; one is the Shapiro-Wilk test, which is suitable for small sample data (sample size ≤ 5000), and the other is the Kolmogorov-Smirnov test, which is suitable for large sample data (sample size ≥ 5000).

(2) If it is significant ($p < 0.05$ or 0.01), the original hypothesis is rejected (the data conforms to the normal distribution), and the data does not satisfy the normal distribution; otherwise, the data satisfy the normal distribution.

Table 3 shows that the score adopts the S-W test, and the significance P-value is 0.247, which does not present significance at the level and cannot reject the null hypothesis, so the data meet the normal distribution.

Figure 5 shows the normality test results of variable Score data, and the normal graph shows a bell shape (high in the middle and low at both ends), indicating that although the data is not absolutely normal, it is acceptable as a normal distribution.

Table 4. Test for homogeneity of variance

	Group (SD)		F	P
	Experimental group(n=30)	Control group(n=30)		
Score	8.361	9.857	0.465	0.498

Note:***, **, * represent the significance levels of 1%, 5% and 10%, respectively.

Table 5. Results of T-test analysis of independent samples of two groups of scores

Variable	value	Sample size	Mean	SD	t-value	P-value (double tail)	Mean deviation	Cohen's d
Score	Experimental group	30	81.4	8.361	3.503	0.001***	8.267	0.905
	Control group	30	73.133	9.857				
	Total	60	77.267	9.974				

Note:***, **, * represent the significance levels of 1%, 5% and 10%, respectively.

Table 4 shows the results of homogeneity of variance, including the significance P-value of standard deviation F test results:

- (1) Analyze whether each analysis item is less than 0.05 or 0.01 (use 0.01 strictly according to the inspection standard)
- (2) If it is significant and rejects the original hypothesis (original hypothesis: satisfying the homogeneity of variance), it means that the fluctuation of the data is inconsistent, that is, the variance is uneven; on the contrary, it means that the fluctuation of the data is consistent, indicating that the data satisfy the homogeneity of variance.

The results of the variance homogeneity test show that for the score, the significant P-value is 0.498, which is not significant at the level, and the original hypothesis can not be rejected, so the data satisfy the homogeneity of variance.

The above table (table 5) shows the results of the independent sample T-test of the two groups after the experiment, including the results of mean \pm standard deviation, t-test, significant P-value and Cohen's D value.

- (1) Analyze whether each analysis item is less than 0.05 or 0.01 (use 0.01 strictly according to the inspection standard)
- (2) If it is significant, it rejects the original hypothesis, which shows a significant difference between the two groups of data, and the difference can be analyzed according to the mean \pm standard deviation; otherwise, it shows that there is no difference in the data.

The mean values of the experimental and control groups on the score are 81.4/73.133. The P-value of the F test was $0.001^{***} < 0.05$, so the statistical result is significant, indicating a significant difference in score between the Experimental group and Control group; Cohen's D value is 0.905, and the range of difference is very large (0.20, 0.50 and 0.80 correspond to small, medium large critical points respectively).

4. Discussion

In the blended teaching of physical education courses, there is a robust logical relationship between online courses and offline courses. Online courses focus on realising low-level cognitive goals, while offline courses focus on the realization of high-level cognitive goals and the application and practice of knowledge. The combination of the two to achieve more effective teaching. By reflecting on the specific practice of specialized football courses, this study summarizes three critical points of blended teaching design:

- The design of the blended teaching method in this study is learner-centred, with more emphasis on autonomous learning and team collaborative learning. The training goal of these students is to be physical education teachers in the future, so they are required to learn knowledge and pay attention to learning teaching methods. Encourage students to think independently and advocate theme-and task-centred teaching.
- The development of face-to-face classroom inquiry activities requires teachers to make targeted designs based on the online learning situation of students before class. However, in general, online learning is challenging to obtain synchronous feedback from teachers, so we should pay special attention to online learning in the pre-class stage, carefully arrange teaching content, and set up teaching videos and other resources accompanied by quizzes so that students can constantly get feedback and test their learning.
- In blended teaching design, the evaluation design is a vital link. Students' final exam scores are not the only evaluation criteria, and we need to pay attention to students' multi-dimensional performance to evaluate students' learning effect comprehensively. Learning assessment corresponds to the assessment of knowledge mastery, including what you

remember, what you understand, what you will apply, what you will analyze, and the corresponding assessment of comprehensive ability. It involves language expression ability, group cooperation ability, interpersonal communication ability, independent thinking ability, autonomous learning ability, time management ability, organization and management ability, pioneering and innovative ability and so on.

Blended teaching is an effective integration of traditional teaching and information-based teaching, which is not a random addition, but an online and offline integration design based on the optimal allocation of resources. Blended teaching realizes the allocation of new resources that cannot be achieved by traditional teaching, the new teaching space and new teaching environment give teaching a new time and space, and the classroom is no longer the only place to preach, receive jobs, and solve problems doubts. Modern hybrid teaching emphasises the organic integration of online and offline learning and emphasizes the respective functions of online and offline learning to achieve maximum teaching effectiveness.

In-depth analysis of blended teaching and clarifying the nature of blended teaching is bound to help us provide students with more accurate ways to understand the world to promote students' lifelong learning and sustainable development. It should be noted that the development of blended teaching should not only focus on teaching itself but also promote the reform and innovation of educational organization and management mode and work together to create an excellent ecological and social atmosphere for educational reform and development. We will jointly create a new ecology for the construction of educational modernization in the new era.

5. Conclusions

Based on summarizing the principles of blended teaching design, this study makes unified planning and design of online and offline teaching according to the characteristics of physical education courses. This study designs the teaching methods, resources, teaching process, and evaluation of blended learning, which expresses a richer, three-dimensional and multi-dimensional teaching connotation.

This study relies on the specialized football course, carries on the teaching experiment according to the designed teaching model, and verifies the model's effectiveness according to the performance of students' comprehensive academic achievement. Blended teaching significantly improves the students' ability to master football skills and teaching ability. The final comprehensive test scores of the two groups of students under the blended teaching mode and the traditional teaching model are compared and analyzed. The data

show that the blended teaching effect is compared with the traditional one. The blended teaching model can effectively improve the classroom teaching effect.

Blended learning improves the teaching effect of teachers and can reasonably achieve the teaching goal of football specialized courses. Compared with the traditional classroom teaching model, the teachers in the blended teaching mode are more likely to reflect the leading role, link up in and out of class, reduce the time of demonstration and explanation in class, and solve more critical and challenging technical problems of students. The online grading of students' homework makes teachers' offices more convenient, reduces teachers' workload, and indirectly improves teachers' teaching effect.

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