

Application of Cooperative Learning and Flipped Classrooms in University Basketball Courses in China

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Abstract: This study investigates the application of the teaching model combining cooperative learning and flipped classrooms in university basketball courses in China. By analyzing the advantages and disadvantages of the traditional basketball teaching model and students' satisfaction with the course, the necessity of implementing cooperative learning and flipped classrooms is proposed. The study planned in detail the implementation strategies before class, in the classroom, and after class, and compared them with the control group through an experimental design. The experimental results showed that the new teaching mode demonstrated significant advantages in terms of learning outcomes, student satisfaction, and teacher evaluation. This study provides a valuable reference for the future reform of the physical education curriculum.

Keywords: Cooperative learning; Flipped classroom; Teaching reform; Basketball course

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1. Introduction

With the deepening of educational reform, the traditional teaching mode is facing many challenges. Especially in the field of physical education, how to innovate teaching methods to improve students' learning interests and skill levels has become an urgent problem to be solved. As an important part of physical education, the Chinese university basketball program also needs to adapt to this trend of change and explore a more efficient and interesting teaching mode^[1].

Cooperative learning and flipped classrooms, as teaching concepts that have attracted much attention in recent years, have emerged in the field of education with their unique advantages. Cooperative learning emphasizes mutual cooperation among students and stimulates students' interest and initiative in learning through group discussion and role-playing; while flipped classrooms advocate flipping the process of knowledge transfer and internalization in the traditional classroom so that students can master the basic

knowledge through independent learning before class, and focus on in-depth discussion and practical operation in the classroom.

This study aims to explore the effectiveness of the teaching model combining cooperative learning and flipped classrooms in Chinese university basketball courses. By comparing and analyzing the differences between the traditional and the new teaching modes, as well as experimentally verifying the actual effects of cooperative learning and flipped classrooms in basketball teaching, we hope to provide useful references and lessons for the teaching reform of university basketball courses. We believe that this innovative teaching mode will help to improve students' basketball skill levels and cultivate their teamwork, as well as provide a novel and effective teaching method for physical education teachers ^[2].

2. Theoretical foundations of cooperative learning and flipped classrooms

2.1. Definition of cooperative learning

Cooperative learning is a student-centered learning style in which the group is the basic form of organization, and tasks or problems are accomplished together through mutual assistance and cooperation among group members. This way of learning focuses on students' subjectivity and participation and emphasizes interaction and communication between students in order to achieve the purpose of promoting students' cognitive, emotional, and social skills development. In cooperative learning, students are divided into groups and each group member collaborates with each other to complete learning tasks ^[3]. This type of learning encourages communication and discussion among students, so that in the process of exploring problems and solving them together, they not only improve their knowledge and skills but also develop teamwork, communication, and problem-solving skills. At the same time, cooperative learning also emphasizes the guiding and supporting role of teachers, who need to create a good cooperative learning environment for students and provide the necessary guidance and support to help students better complete their learning tasks ^[4]. The theoretical basis of cooperative learning mainly comes from social interdependence theory, choice theory, pedagogical engineering theory, motivation theory, cohesion theory, and development theory. Together, these theories constitute the theoretical foundation of cooperative learning and provide strong support for the practice of cooperative learning. Through cooperative learning, students can understand knowledge more deeply, improve their thinking skills and innovation ability, and at the same time can better adapt to the development needs of the future society ^[5].

Cooperative learning is a kind of student-centered learning method with groups as the basic form of organization, focusing on mutual cooperation among students and the guiding role of teachers. It aims to improve students' knowledge and skills, teamwork, and problem-solving skills through communication and discussion among students and to complete learning tasks together, laying a solid foundation for students' overall development. This learning style has a wide range of application prospects in the field of education and is worthy of in-depth study and exploration by educators ^[6].

2.2. Teaching philosophy of flipped classrooms

The teaching concept of flipped classrooms fundamentally breaks the teaching sequence and mode of traditional classrooms. Under this novel teaching concept, knowledge transfer is no longer limited to face-to-face lectures in the classroom, but most of the basic knowledge is moved to the front of the classroom and is completed by students on their own. In the classroom, the teacher assumes more of a guiding and counseling role to help students deepen their understanding and answer questions. Flipped classrooms emphasize students' initiative and encourage students to make use of their time after class to do pre-study by watching video tutorials, online courses, or other multimedia teaching resources, so that students can already have a preliminary understanding

of and think about the new knowledge before entering the classroom. Such a pre-study process not only exercises students' independent learning ability but also reserves more time for in-depth discussion and practical operation in class. In the classroom, the teacher is no longer a mere instigator of knowledge but becomes a partner and guide in the students' learning process ^[7]. Teachers can guide students to apply the knowledge they have studied in advance to practical problems by organizing group discussions, case studies, experimental operations, and other activities, so as to cultivate students' problem-solving skills and innovative thinking. At the same time, the interaction and discussion in the classroom can also help students find and solve the problems encountered in the preliminaries in a timely manner, making learning more efficient and interesting. The teaching concept of flipped classrooms also reflects the respect for students' individual differences. Each student can arrange the preparation time according to his/her own learning progress and comprehension ability and can choose to participate in discussions and practices of different levels of difficulty in class according to his/her own needs ^[8]. This personalized learning approach helps to stimulate students' interest and motivation in learning, so that every student can find a suitable learning path in the flipped classroom teaching mode.

2.3. Theoretical basis for combining cooperative learning and flipped classrooms

The theoretical basis for the combination of cooperative learning and flipped classrooms is mainly based on the constructivist learning theory and the concept of differentiated instruction. Constructivism believes that knowledge is not passively received, but actively constructed by learners through interaction with the environment. Flipped classrooms enable students to participate in discussions with questions and thoughts through independent learning before class, and this mode of "learning before teaching" is the practical application of constructivist learning theory. Students learn independently through videos and materials before class to form a preliminary understanding of knowledge and problems, and then deepen their understanding and solve problems through communication and collaboration with teachers and classmates in class to complete the construction of knowledge. The concept of differentiated teaching emphasizes respecting students' individual differences and tailoring teaching to students' needs ^[9]. The combination of cooperative learning and flipped classrooms makes teaching more personalized. Before class, students can learn at their own pace and in their own way, while teachers can provide targeted guidance in the classroom according to the students' learning situation and problems to meet the learning needs of different students. At the same time, activities such as group discussions and role-playing in cooperative learning can also give each student the opportunity to develop his or her strengths and enhance motivation and initiative in learning. This combination also reflects the concept of "student-centered" teaching. Flipped classrooms shift the traditional classroom lecture time to the front of the class, so that students have more active learning and exploration time in the classroom. Cooperative learning further stimulates students' interest and creativity through group work and interactive communication and develops their teamwork and problem-solving skills. This change in teaching mode not only improves the learning effect of students but also promotes the overall improvement of students' comprehensive quality ^[10]. The theoretical basis for the combination of cooperative learning and flipped classrooms not only reflects the direction of the development of modern education theory but also meets the requirements of talent training in the new era. Through the practical application of this teaching mode, we can better cultivate students' independent learning, teamwork, and innovative thinking, and lay a solid foundation for their comprehensive development.

3. Implementation strategies of cooperative learning and flipped classrooms in basketball courses

3.1. Pre-class preparation stage

The pre-class preparation stage is a crucial part of the flipped classroom teaching model. In this stage, teachers

need to carefully create and publish teaching resources, as well as set clear learning objectives to ensure that students have already understood and prepared for the new knowledge before entering the classroom ^[11].

The production of teaching resources is one of the core tasks of pre-class preparation. These resources include not only traditional courseware and lesson plans but more importantly, a series of high-quality teaching videos, online courses, and other multimedia content. These teaching resources need to be closely integrated with the content of the course, not only to ensure the accuracy and completeness of the knowledge points but also to focus on the fun, in order to stimulate students' interest in learning. At the same time, teachers also need to take into account the learning styles and needs of different students and produce diversified teaching resources to meet the learning requirements of all types of students ^[12].

In addition to teaching resources, the setting of learning objectives is also a part of the pre-course preparation stage that cannot be ignored. Clear and specific learning objectives can help students better understand the course content and grasp the key learning points. When setting learning objectives, teachers should take into full consideration the actual situation of students and the requirements of the curriculum and set out challenging and practical objectives. These objectives should not only cover the mastery of knowledge and skills but also focus on the development of students' problem-solving skills, innovative thinking, and other comprehensive qualities. Teachers also need to release these teaching resources and learning objectives in a timely manner during the pre-class preparation stage to ensure that students are exposed to the new knowledge in advance and have adequate time to study and prepare. The teaching resources and learning objectives can be released through the school's internal teaching platform, or other online platforms suitable for student learning ^[13]. At the same time, teachers also need to pay close attention to students' learning dynamics and answer students' problems encountered in the process of pre-preparation promptly, so as to lay a solid foundation for in-depth learning and discussion in the classroom. Through careful pre-class preparation, teachers can help students better understand and master new knowledge, improve the efficiency of classroom teaching, and at the same time cultivate students' independent learning and innovative thinking, realizing the teaching concept of flipped classrooms ^[14].

3.2. Classroom learning stage

The classroom learning stage is a key part of the flipped classroom teaching model, and group cooperative inquiry and teacher-led doubt-solving are important components of this stage. In the group cooperation and exploration section, students are divided into several groups to discuss the topic or problem set by the teacher in depth. Group members share their views and work together to find solutions to problems. This cooperative learning approach not only stimulates students' interest in learning but also develops their teamwork, communication skills, and critical thinking. By inspiring and complementing each other in group work, students can gain a deeper understanding of the course content, and at the same time learn how to work effectively with others ^[15]. In the process of cooperative group inquiry, teachers play an important role in guiding and answering doubts. Teachers need to pay close attention to the discussion of each group and give timely guidance and help. When the group encounters problems that are difficult to solve, the teacher needs to provide appropriate guidance to help students find ideas and methods to solve the problems. Teachers also need to provide timely answers to the questions raised by students in the discussion process to ensure that students can correctly understand the course content. Teachers also need to focus on cultivating students' innovative consciousness and critical thinking in the classroom learning stage. Teachers can stimulate students' innovative thinking and cultivate their independent thinking by asking open questions and guiding students to reflect. At the same time, teachers also need to pay attention to students' learning emotions and attitudes, give timely encouragement and support, and help them build learning confidence ^[16].

Through the learning mode of group cooperation and exploration and teacher guidance to answer questions, students can understand and master the content of the course in a deeper way, and improve their learning effect and quality. At the same time, this way of learning also helps to cultivate students' teamwork, innovative awareness, and critical thinking, laying a solid foundation for their all-round development.

3.3. Post-class consolidation stage

The post-class consolidation stage is an indispensable part of the flipped classroom teaching model, and it plays a crucial role in enabling students to truly master and internalize what they have learned ^[17].

Post-class consolidation does not mean simple repetition of learning but requires students to truly integrate new knowledge into their knowledge system through practice, reflection, and summarization on the basis of classroom learning. Students need to use the time after class to review and revise what they have learned in class to ensure that they can accurately understand and apply their knowledge. At this stage, students can test their learning by completing the after-class assignments set by the teacher. These assignments include not only traditional written exercises but also practical tasks, such as experimental operations, social surveys, etc., which are designed to help students apply their theoretical knowledge to real-world situations. By completing the assignments, students can discover their learning deficiencies in time, so as to make up for them in a targeted manner. In addition, the post-course consolidation stage is also a key period for students to improve their independent learning ability and develop good learning habits. Students can make use of this stage to reflect on and adjust their own learning methods, and find the most suitable learning methods for themselves. At the same time, students can also make use of a variety of learning resources, such as online courses, teaching videos, etc., to expand their learning to enrich their knowledge base. Teachers also play an important role in the post-class consolidation stage. Teachers need to correct students' homework and provide timely feedback and guidance on the problems encountered by students in their homework. At the same time, teachers can also provide students with personalized learning support through online communication platforms or after-school tutorials to help them better master what they have learned ^[18].

The post-class consolidation stage is an important process for students to internalize what they have learned in the classroom, which requires students to have the awareness and ability to learn independently and also requires teachers to provide the necessary guidance and support. Through effective post-class consolidation, students can grasp knowledge more firmly and improve their learning efficiency and comprehensive quality.

4. Practice and effectiveness evaluation of cooperative learning and flipped classrooms in basketball courses

4.1. Experimental design and implementation

The experimental design and implementation of cooperative learning and flipped classroom practice and effect evaluation in basketball courses is a systematic educational activity, whose core goal is to improve students' basketball skills, teamwork, and understanding and love of basketball through innovative teaching methods. In the experimental design, we chose two parallel classes, one class as the experimental group, adopting the teaching mode of cooperative learning and flipped classrooms, and the other class as the control group, following the traditional teaching methods. In the teaching activities of the experimental group, the teacher first released learning materials and videos in advance, so that students could learn the basic rules, skills, and tactics of basketball independently before class. In the classroom, the teacher organized group cooperation and exploration for students so that they could consolidate and deepen what they had learned before class through practical exercises. The control group was taught according to the conventional process of explanation,

demonstration, and practice. In the implementation process, cooperative learning is the key. The teacher divided the students in the experimental group into several groups, and members within each group collaborated with each other to learn and make progress together. In the classroom, the teacher no longer simply instills knowledge but plays the role of a guide, responsible for answering the problems encountered by the students in the process of independent learning, and guiding them to explore the essence of basketball in depth. Through group discussion, role-playing, battle simulation, and other methods, students learn basketball skills through interaction, while cultivating their teamwork and communication skills. The flipped classroom teaching mode, on the other hand, requires students to have a preliminary understanding and thinking of what they are about to learn through online videos, teaching materials, and interactive discussions before class. In the classroom, teachers then use more time for practical exercises and problem-solving, making learning more efficient and in-depth. This teaching mode not only improves classroom efficiency but also develops students' independent learning and problem-solving skills. In the implementation of the experiment, we also pay special attention to the collection and analysis of data. We assessed the actual effect of cooperative learning and flipped classrooms in the basketball course by comparing the differences between the experimental group and the control group in terms of learning achievement, skill mastery, learning attitude, and so on. At the same time, we also collect feedback and suggestions from students and teachers on this new teaching mode through questionnaires and interviews in order to further improve the teaching methods. The entire experimental design and implementation process is a dynamic adjustment process. We constantly optimize the teaching content and teaching methods according to students' learning progress and feedback to ensure the effectiveness and scientificity of the experiment. Through the practice of cooperative learning and flipped classrooms in basketball courses, we expect to explore a teaching mode that is more in line with modern education concepts and can effectively improve students' basketball skills and comprehensive quality. This not only helps to improve students' athletic ability but also is of great significance to cultivate their teamwork spirit and independent learning.

4.2. Effect assessment and result analysis

The effect assessment and result analysis is an objective measure and in-depth analysis of the practical effect of cooperative learning and flipped classrooms in basketball courses. By comparing the learning outcomes of the experimental group and the control group, we find that the teaching mode of cooperative learning and flipped classrooms shows significant advantages in several aspects. Firstly, in terms of learning achievement, students in the experimental group generally achieved higher scores. This was due to the fact that under the flipped classroom model, students were able to pre-study through videos and teaching materials before class, thus gaining a deeper understanding and mastery of basketball skills and tactics in class. Meanwhile, the cooperative learning approach promotes communication and cooperation among students, so that problems encountered in the learning process can be identified and solved in time. Secondly, in terms of skill mastery, students in the experimental group showed stronger practical skills. The teaching mode of the flipped classroom allows students to have more time for practical exercises in the classroom, and through group cooperation and interaction, they are able to use basketball skills more skillfully and improve continuously in basketball practice. In contrast, although the students in the control group also had practical exercises, their skill mastery was relatively low due to the limited classroom time. In addition, in terms of learning attitudes, students in the experimental group showed higher enthusiasm and motivation for learning. The teaching mode of flipped classrooms empowers students to learn more independently, and they can personalize their learning according to their own learning progress and interests. At the same time, the cooperative learning method also enhances teamwork consciousness among students, making the learning atmosphere more intense. The students in the

experimental group also showed significant improvement in the spirit of cooperation and communication skills. Through group cooperative learning and discussion, they learned how to communicate effectively with others and solve problems together. The improvement of this ability is not only helpful to their basketball learning but also has a far-reaching impact on their future development and social skills. In addition to the remarkable results in the above aspects, we also noticed that the students in the experimental group also showed significant improvement in self-management ability, innovative thinking, and critical thinking. The enhancement of these abilities is difficult to achieve in the traditional teaching mode, which fully reflects the unique value and significance of cooperative learning and flipped classrooms in basketball courses.

5. Conclusion

This paper discussed in depth the practice and effect evaluation of cooperative learning and flipped classrooms in basketball courses. Through the experimental design and implementation, we found that the teaching mode of cooperative learning and flipped classrooms showed significant advantages in improving students' basketball skills, teamwork, learning attitude, and independent learning compared with the traditional teaching mode. The combination of this teaching mode not only improves students' learning effect and skill mastery but also positively affects students' learning attitude, cooperation spirit, communication skills, and self-management. At the same time, we also analyzed the theoretical basis for the combination of cooperative learning and flipped classrooms, which is mainly based on the constructivist learning theory and the concept of differentiated teaching, and this combination reflects the teaching concept of "student-centered," which is in line with the direction of the development of modern education theory and also meets the requirements of the training of talents in the new era. To sum up, the practice of cooperative learning and flipped classroom teaching mode in basketball courses is successful, which not only improves students' learning effectiveness but also promotes the overall improvement of students' comprehensive quality. This teaching mode is worth promoting and applying in a wider range of educational fields.

Disclosure statement

The authors declare no conflict of interest.

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