Research and Practice on Integrated Online and Offline Deep Group Cooperative Learning Mode Oriented Towards the Learning Process of Students

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Abstract: *With the continuous progress of China's education informatization process, the information teaching infrastructure in major universities has become increasingly complete. Multimedia classrooms, smart classrooms, and 10 Gigabit optic fiber networks have entered the campus, and network teaching resources are getting increasingly abundant. The drawbacks of traditional teaching modes are becoming prominent, while online teaching modes such as online classrooms are gradually being applied in university teaching. The "integration of online and offline teaching" mechanism which promoting the reform and innovation of classroom teaching modes will be a new trend in the development of higher education teaching modes. Compared to the limitations and closure of traditional offline teaching modes, online teaching based on educational platform support fully utilizes information technology, integrates a great quantity of online teaching media and information resources, and constructs an interactive learning environment, creating conditions for the carry out of group cooperative learning modes.*

Keywords: educational informatization, smart classrooms, online classrooms, integration of online and offline teaching mechanism, group collaborative learning model

1. Introduction

The traditional teaching mode centered around the classroom, textbooks, and teachers ignores the individual differences of students, resulting in students get low attention, low effective participation in the classroom, and low interest in learning. Although students all pass the course final examination, the teaching quality evaluation of a course is not solely based on the passing rate of final examination. There is still a significant gap between traditional teaching modes and educational goals consist of "Five Education" and "three comprehensive education", and the actual teaching effect of the curriculum turns out to be frustrating.

Compared to traditional teaching modes, group cooperative learning has strong goal-oriented and organizational characteristics properties. The center of the classroom turns into student. The transformation of the central role can better stimulate students' subjective initiative in learning, improve their course participation, and improve their learning efficiency. Due to the achievements of classroom reform and innovation and educational informatization construction in major universities across the country, smart classrooms have gradually been integrated into traditional classrooms. The online and offline teaching modes has been implemented in majority universities. The blended learning makes students have fun in the learning process and focus their energy on learning activities. Therefore, the group cooperative learning mode based on the integration of online and offline teaching has become the direction of classroom reform in many universities.

2. Group Cooperative Learning

Group cooperative learning has broken the traditional three-center teaching mode which centered around the classroom, textbooks, and teachers. It is a brand new three-center teaching mode centered around students, experiences, and activities. The old three-center placed teachers in a dominant position, emphasizing the one-way transmission of knowledge in the classroom through indoctrination, with students passively learning. The new three-center has corrected the relationship between teacher leadership and student subjectivity, emphasizing that knowledge is actively constructed based on students' existing experiences, and teaching methods are autonomous, cooperative, and exploratory.

In the initial implementation of group cooperative learning, there are usually three problems to face. One is the lack of subject awareness in group cooperative learning. In the early stages of educational reform, due to the influence of traditional teaching modes, students' subjective consciousness was not stimulated, and the concept of teachers taking the lead in the classroom was ineradicable. Students did not recognize the dominant position of themselves in group cooperative learning. The second problem is that group cooperative learning is result oriented. Nowadays, most course evaluations are based on students' final grades, neglecting their learning process, resulting in students only focusing on the outcomes, their cooperative consciousness are faint. In this scenario, group cooperative learning loses its innate purpose. Thirdly, there is a lack of relevant experience in group cooperative learning. Group cooperative learning is different from traditional knowledge learning. It is a relatively complex process. The design of teaching strategies for deep cooperative learning in groups

that are suitable for the current teaching environment is influenced by various factors, such as the individual characteristics of group members, learning content, exploration forms, and various learning modes.

Face up to the problem of weak students' subjectivity consciousness in group cooperative learning, teachers need to guide students in the classroom, stimulate their subjectivity, and encourage them to think actively and explore problems by themselves. Provide guidance to students, promote cooperation and communication with members within or between groups, and strengthen students' autonomy in conducting deep cooperative learning. In response to the problem of learning oriented towards results, the learning process can be phased, and the teaching tasks at each stage can be targeted dynamic adjust. It is possible to achieve these goals by constructing a process-oriented group cooperative learning system. Confront with the lack of experience in group learning, cooperative learning groups can be reasonably constructed based on individual differences of students. Learning tasks and goals are scientifically formulated based on learning content. The cooperative learning methods are enriching and diversifying. Enhancing students' enthusiasm for participating in deep cooperative learning in the classroom, and constructing an evaluation systems framework for oriented towards the learning process.

3. Integrated Online and Offline Teaching

With the advancement of informatization in higher education, smart classrooms and internetcourses have provided convenient conditions for online teaching. And the integrated online and offline teaching mode has gradually become the new normal. Facing the students' learning process, the integrated online and offline teaching is divided into three stages: pre-class, during class, and after class. In the first stage, students independently conduct pre-class self-tests relying on online classrooms before class. They need to watch online teaching videos, complete self-study teaching courseware, and note down key and difficult questions. During class, students propose key and difficult issues in group discussion. The teacher outlines the basic knowledge, explains the key and difficult questions students prepared in pre-class. Then, students review and summarize the key and difficult points once again. At the last stage, students complete online assignments after class, teachers conduct online Q & A, students consolidate their knowledge points and make a self-evaluate for further improvement.

By scientifically establishing an integrated online and offline teaching mode, encourage students to actively learn. Design a three-stage teaching goal strategy based on students' learning process and utilize online course resources to stimulate students' sense of protagonist. Drive by problems, merge knowledge into the problem-solving process, enhance students' classroom participation rate, and integrate problem-based learning throughout the entire teaching process. During the online and offline teaching process, teachers can use the online classroom platform to follow up on students' learning on knowledge points after class and adjust teaching strategies during class in time.

4. Integrated Online and Offline Deep Group Cooperative Learning Mode Oriented Towards the Learning Process of Students

Our project set core competencies as teaching objective, adopts online and offline deep group collaboration as learning method, takes chapter units as the teaching design, utilizes resource sharing, group learning, collaborative exploration, and sharing display as four steps teaching process, finishes the teaching evaluation based on new information technology such as big data.

4.1 Basic Concept

Under the requirements of the new era and new situation, guided by the new engineering education and teaching philosophy, facing the learning process of students, by building a "11151" problem-based teaching system. In this teaching system, it set core competencies as teaching objective, adopts online and offline deep group collaboration as learning method, takes chapter units as the teaching design, exploits a five-step teaching process includes online knowledge cognition, pre-class questions driven teaching and learning, deep group cooperation exploration, group achievements sharing, internalization and extension after class, finishes the teaching evaluation based on new information technology such as big data. Integrating traditional teaching with modern technological measures, optimizing online course resources, and comprehensively promoting the construction of online and offline deep cooperative learning in groups, optimize online and offline teaching methods, reshape teaching processes, and focus on teacher evaluation during students' learning process.

4.2 Teaching System

With core competencies as the teaching goal, online and offline deep collaboration learning in groups as the learning method, and chapter unit problem-oriented as teaching design. A five-step teaching process includes online knowledge cognition, pre-class questions driven teaching and learning, deep group cooperation exploration, group sharing display, internalization and extension after class. The teaching evaluation based on new information technology such as big data. Five in one, comprehensively construct a "11151" problem-based teaching system for online and offline group cooperative learning oriented towards the learning process of students. "11151" problem-based teaching system as shown in Figure 1.
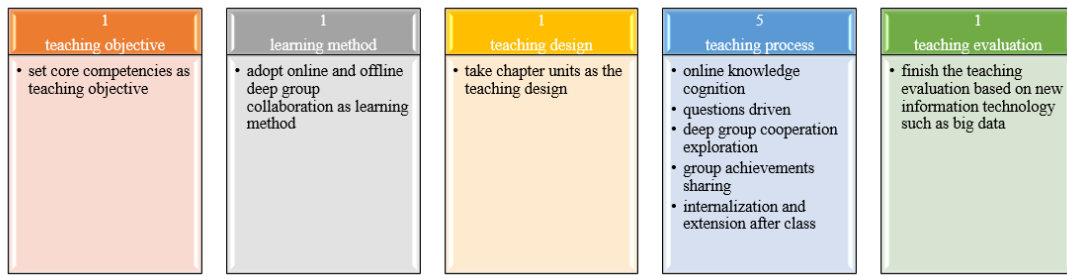
Figure 1: The"11151" problem-based teaching system.

4.3 Teaching Mode

Online and offline group cooperative learning takes the cooperative learning groups as basic form. Under the guidance of teachers and through group members' cooperation, the collective power and enthusiasm are exerted to improve students individual learning motivation and ability, and to complete specific teaching tasks. After dividing the students into each group reasonably. Facing the student learning process, our project designs a three-phased teaching strategy for the pre-class, during class, and post class, and construct a teaching mode of "student grouping, online preview, SPOCS classroom, extension after class" for online and offline group cooperative learning oriented towards the student learning process. The outline of this teaching mode is present in Figure 2.
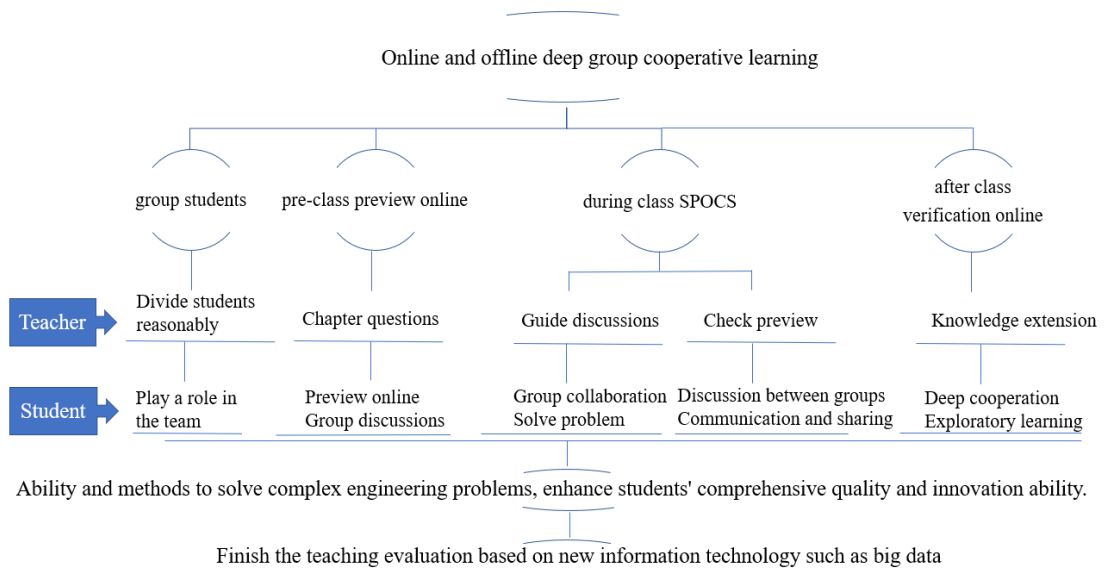

Figure 2: The outlines of our online and offline group cooperative learning.

The internal composition of cooperative learning groups is one of the key points for the success of student cooperative learning method. When grouping students, it is necessary for teachers to divide them reasonably. Teachers should conduct a survey of students' basic situation in advance. They can conduct an online questionnaire survey before starting this course, taking consideration of factors such as students' learning situation, personality preferences, and family background, and then group students according to the principle of "homogeneity between groups, heterogeneity within groups". After grouping, teachers assign different roles such as team leader, recorder, and reporter to the members of each group, and students can choose the role they need to play according to their own situation.

Pre-class is the first stage of online and offline group collaborative learning, which mainly involves completing pre-class preview tasks online. The teacher first provides the key and difficult points, as well as questions in chapter. Students watch online course videos and related learning courseware with questions teacher given, conduct group online discussions, and note down unresolved key and difficult problems. The second stage is during class, mainly conducted offline and in the form of a SPOCS classroom, with students taking the lead in the classroom. Through group collaboration, the teacher guides and deals with the unresolved problems in the pre-class preview, followed by discussion between groups to provide opportunities and platforms for communication and sharing for each student, creating a strong classroom learning atmosphere. Last but not the least, after class as the final stage, complete the verification of the classroom teaching results online. Students engage in deep cooperation, exploratory learning, and complete online assignments together. Teachers answer questions online through cloud platform, further strengthening students' understanding of course knowledge and achieving knowledge extension.

4.4 Teaching Practice

Based on the basic idea of online and offline groups deep collaborative learning facing with students' learning process, combined with its teaching system and teaching mode, fully utilizing informatization teaching auxiliary applications, conducting "theme discussions" and using "word-cloud analysis" to test the effectiveness of classroom learning. Utilize the "group management" function to implement "encouraging bonus points" for classroom active participation, questioning, and other course participation behaviors. During the teaching implementation process, through methods such as "questionnaire, answering, and voting" to verify the knowledge degree in course. Utilize "online tests and discussions" to achieve a long-term monitoring mechanism for ubiquitous learning. Implement teaching process record from online to offline classrooms and experimental courses through informatization teaching auxiliary tools.

4.5 Teaching Evaluation

Although teaching evaluation is not included in the online and offline group cooperative learning mode, it can affect the detailed design of the teaching mode. Teaching evaluation is an important indicator for evaluating the quality of teachers' teaching, which can greatly reflect a teacher's course teaching quality and provide direction for improvement in their teaching work. The quality of teaching includes the teaching level of teachers and the quality of teaching outcomes, which is closely related to the development of teachers and students both equally.

There are many indicators for teaching evaluation, such as student performance, student evaluation, teaching efficiency, teaching methods, classroom atmosphere, and teaching attitude. These teaching evaluation indicator data can be collected by using online information teaching auxiliary platforms, and data analysis and teaching quality evaluation can be carried out through the use of cutting-edge information technologies such as big data, data mining, and deep learning. Based on the evaluation results, the architecture and specific content of teaching mode can be continuous optimize and flexible adjust.

5. Conclusion

Group cooperative learning, as a new form of classroom organization, has begun to be widely applied in current teaching reform practice. Meantime, with the rapid development of information technology and the continuous advancement of informatization in higher education, online classrooms, online media resources, and information-based teaching platforms have opened up the "online" path for traditional offline group cooperative learning. Through the analysis and research of integrated online and offline group cooperative learning, this paper designs a phased online and offline group cooperative learning model of "student grouping, online preview, SPOCS classroom, and after-school extension", which is oriented towards the learning process of students. Exploration of group cooperative learning mode has been complete and teaching practice has been carried out using informatization auxiliary teaching platform. The group cooperative learning mode has been continuously optimized and improved based on the teaching evaluation results.

Through deep cooperative learning in groups, students' awareness of competition and cooperation in learning and communication within and between groups has been strengthened, and students' classroom participation and enthusiasm have been enhanced at the same time. This is conducive to the comprehensive cultivation of students' knowledge, abilities, and emotional attitudes. Online and offline integrated teaching enables teachers to track the entire teaching process, making it easier for teachers to better grasp students' situation and clarify the improvement points of teaching mode.

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