Exploration and practice of project-based flipped classroom teaching mode

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Abstract: *This research is based on the basic courses of distance education, and implements the projects related to the course content through the flipped classroom teaching mode. The research was carried out in the teaching class, and the students' participation in learning was used to reflect the teaching effect of the course. Through recommending learning content, optimizing learning, targeted exercises and reforming assessment methods, to understand in detail whether the teaching mode can improve students' deep understanding of learning, and explore the extent to which project-based flipped classroom teaching mode can improve students' learning initiative, so as to provide practical reference for flipped classroom teaching.*

Keywords: *flipped classroom; teaching mode; project-based; practice*

1. Flipped classroom teaching mode

The traditional teaching process is to study the theory in the classroom, and then let students complete the experiment designed by the teacher. In this teaching mode, students are basically passive participants, and the course experiment is only to verify the theory in the early stage, while students' ability and autonomy to actively explore unknown problems have not been developed. If our teaching process design puts the task before classroom teaching, let students practice, find problems and verify theories in the process of practice, so as to drive students to explore theoretical knowledge independently, and leave classroom time for teachers and students to communicate and solve problems.

The flipped classroom teaching mode is a kind of "students learn first, teachers teach later", that is, teachers release online learning videos, learning tasks and other auxiliary learning materials online to help students learn before class. In class, teachers and students deepen the course content and expand knowledge together. After class, students review and consolidate, teachers evaluate and prepare for new classes.[1] This teaching mode rearranges the students' classroom learning time, pays attention to students' knowledge internalization and ability expansion, constantly strengthens students' learning interest, and cultivates their thinking ability, autonomous learning, collaborative learning ability, etc. In short, the main function of flipped classroom is to guide students to achieve autonomous learning and communication and discussion, so as to achieve the purpose of internalizing knowledge. [2]The flipped classroom teaching mode requires students to have the motivation of active learning and high ability of autonomous learning.

The most important significance of flipped classroom is to bring practice into theoretical study and improve thinking ability and practical ability. Only by "grasping both theory and practice, both hands should be hard" can students be diversified. Students in local application-oriented colleges have relatively weak initiative in learning theory, but their curiosity and practical ability are strong, and their initiative in participating in practice is very high. In the traditional classroom teaching mode, when the teacher imparts knowledge unilaterally, the students' interest cannot be stimulated, their practical ability cannot be exerted, and theory and practice cannot be effectively integrated, students are more confused about what they have learned, which aggravates their frustration in learning. The forms of knowledge presentation of flipped classroom teaching mode are diversified. First, "anchoring" before class leads students into learning state. Second, teachers should design task according to students' basic differences to effectively alleviate students' anxiety and sense of urgency.[3] Third, students can learn by themselves, test and self-evaluate in the digital resource environment, which can clarify their learning interests and knowledge mastery, and constantly adjust their learning methods to strengthen the practicability of knowledge.

2. Course introduction

The basic course of distance education, as a professional compulsory course for college students majoring in educational technology, mainly explores the development laws and practice methods of distance education.This course focuses on training students to master distance theoretical knowledge and practical skills of distance education, and to develop students' ability to find problems, analyze problems, solve problems and comprehensive innovation.[4] The distance education curriculum is composed of a large number of definitions, profound theoretical knowledge and practical operations. Combining it with the characteristics of flipped classroom can not only increase students' interest in learning, but also lay a solid foundation for students in the process of learning professional courses.

Usually, when teachers implement curriculum teaching, there are many curriculum contents and insufficient class hours. There are even cases where teaching tasks cannot be completed within the prescribed teaching time. Sometimes, even if the teacher has completed the teaching task, the students' learning effect is unsatisfactory.Therefore, it is urgent to explore a practical teaching mode, and the flipped classroom mode just meets the needs of teachers for teaching.

3. Analysis before implementation

3.1. Teachers should strengthen the organic combination of case teaching and flipped classroom

First of all, the teaching materials of distance education courses are updated slowly, and the existing teaching materials cannot cover all problems encountered in the process of distance education teaching.In the teaching process, teachers will also encounter many thorny problems that cannot be touched in textbooks.The case has the characteristics of situational, enlightening and practical.Teachers can combine the case teaching method and flipped classroom into the teaching of distance education courses.

Secondly, teachers can choose targeted cases and design them according to the training objectives of professional talents. When assigning students' autonomous learning tasks, teachers should assign cases to students in groups according to the knowledge points that they should learn. This will deepen students' understanding of knowledge and improve their ability to think and solve problems.[5] In the classroom, the teacher makes an in-depth analysis of the assigned teaching cases to deepen the students' deep understanding of knowledge.

Finally, teachers can use the flipped classroom teaching mode when assigning students' learning tasks. Abundant teaching resources can optimize students' learning after class and avoid students' incomplete understanding of knowledge points due to the abstruse and cumbersome content of the course. It also avoids the phenomenon that there is a gap between teachers and students in imparting and receiving knowledge in classroom teaching due to the unscientific arrangement of class hours.

3.2. Teachers should use curriculum management software to improve classroom efficiency

As the main body of learning, the level of self-study of students before class determines the completion of the flipped classroom. There are differences in the degree of self-study of students themselves. Some students have a deep degree of self-study, while others cannot, which is the problem of personal ability. But this problem is not inevitable. Teachers can balance and manage students' self-study through curriculum management software.Teachers can know whether the students have effectively previewed and whether the students' preview effect is up to the standard through the teaching classroom management software such as Rain Class and Learning Pass.If students have left problems, teachers can give students timely help.[6]With the help of curriculum management software, teachers can eliminate the differences of students' self-study to a certain extent, improve the efficiency of students' self-study, and use the time saved to achieve higher-level learning goals. With the improvement of students' self-learning efficiency, their self-learning ability will be improved. In the long run, the ability of autonomous learning will become a habit, and students can complete learning tasks efficiently without supervision.

3.3. Teachers should complete the lesson preparation plan in advance

The teacher should make a teaching plan for this lesson before class, and avoid only summarizing the knowledge that students have said.Teachers should select the difficulties in knowledge, analyze the

focus of each lesson, and conduct multi-dimensional and in-depth analysis of the curriculum. Only when students and teachers perform their respective duties, we achieve the efficient classroom rhythm brought by the flipped classroom.

3.4. Teachers should change the course assessment requirements

As the foundation of distance education is a course of both professional theoretical knowledge and professional practical operation skills, both theoretical and practical aspects should be taken into account in the assessment.

First of all, case analysis should be included in the final written examination, which not only inspects the students' mastery of theoretical knowledge, but also assesses the their ability to analyze and solve problems, so that students will be more proficient in professional work in the future.

Secondly, students can be divided into several groups by taking one or two separate classes as examination courses. The teacher will put forward practical cases of distance education, and students will be grouped to solve them, so that students will become the protagonist of the class, and the degree of completion of the case practical operation of students will be included in the final examination scores.[7] In this way, students can learn to coordinate, communicate and cooperation in team cooperation, and enhance their ability of team cooperation.

Finally, in the process of flipped classroom, teachers should check the learning content completed by students' self-study and include it into the regular performance assessment, so as to ensure that students can complete high-quality self-study before class and enhance their ability to learn independently. In the future study, teachers can complete autonomous learning tasks with high quality without urging students.[8]This way can avoid the phenomenon that students cope with errands, resulting in the low effect of flipped classroom.

4. Teaching practice

The basic course of distance education pays attention to the application of knowledge, with practice teaching ahead and theory teaching behind. Drive students to practice and complete project tasks as required. The whole class is divided into several groups.Each group has no more than 6 people.Each group has a specific project task, which runs through the whole semester. The task requirements of each class will change as the course progresses.

4.1. Teaching process

The complete teaching practice process of a theme is as follows, as shown in the following figure1:
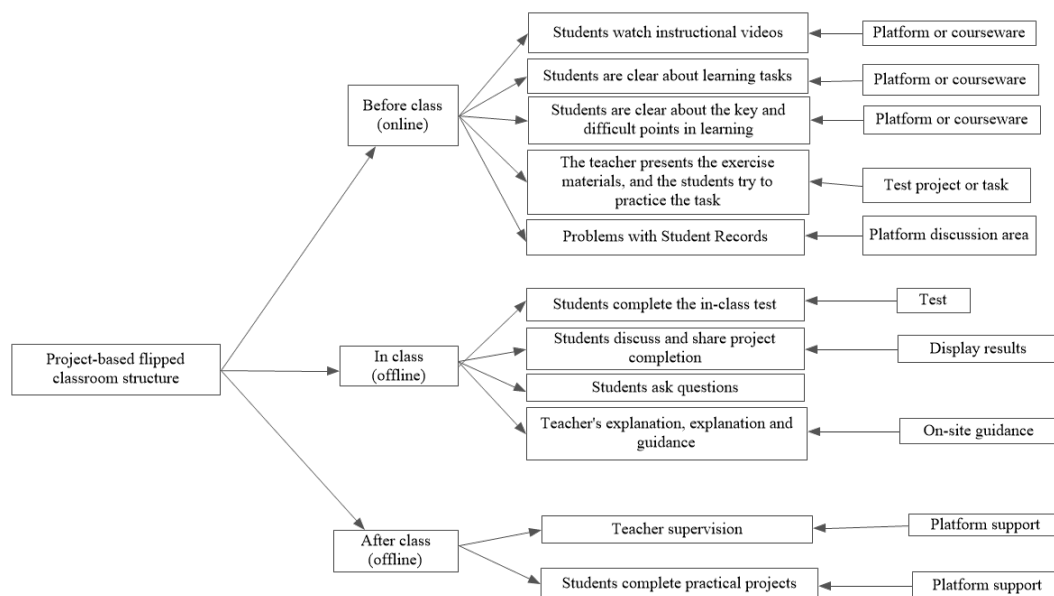

Figure 1: Implementation steps of flipped classroom teaching mode

First, teachers prepare online course resources. Teachers will prepare online course resources for each topic one week in advance.Before class, The teacher posted the teaching video of the project task objectives and requirements and practice demonstration on the "Rain Class" platform,and students will complete the practical tasks in groups.This requires the teacher to decompose and integrate the curriculum content with strong execution, easy operation and easy evaluation, inform the students of the corresponding basic knowledge, learning tasks, key and difficult points, problems to be discussed, and make   records.

Second, students log in "Rain class". Before class, students watch micro-class videos, complete in-class quizzes, unit assignments and mutual evaluation, unit quizzes and other online   independent learning, and participate in online collaborative learning such as theme discussion, information sharing, opinion exchange, question answering and mutual assistance.

Third, students enter the class with the knowledge acquired from online learning and participate in the tasks related to the topic. Each group displays their project completion in the mode of sharing, discussing, and explaining, and discusses the problems encountered in the implementation of the task.The teacher gives evaluation and explanation, and solves the problems with students.[9] At the same time, teachers assign practical deepening projects related to the theme, and provide necessary explanations, explanations and guidance for the implementation of the projects, so that students can internalize their knowledge.

Fourthly, students complete the tasks assigned by teachers as the output of theme learning. Teachers' effective supervision of students' online learning behavior and learning process is the key link of orderly online learning. With the help of relevant functions of "Rain Class", teachers record, track and supervise students' online learning behaviors and results, so as to ensure that students' online learning is implemented.The teacher releases the practice content and requirements of the next stage, and the students complete the project report of the previous stage.

4.2. Mobile micro-learning

In order to expand the learning achievements of "online learning" (including students' autonomous learning and students' collaborative learning through online learning) and "offline practice", teachers also set up a special WeChat subscription account to regularly push notifications and task reminders related to course learning for students, such as distance education learning micro-resources and student learning results display, etc.

4.3. Course assessment

Under the project-based flipped classroom teaching mode, teachers adopt a combination of "process evaluation" and "summary evaluation" for the assessment of students' curriculum achievements.All learning projects, including online learning and offline practice, are reflected in the course assessment, as shown in the following figure2:
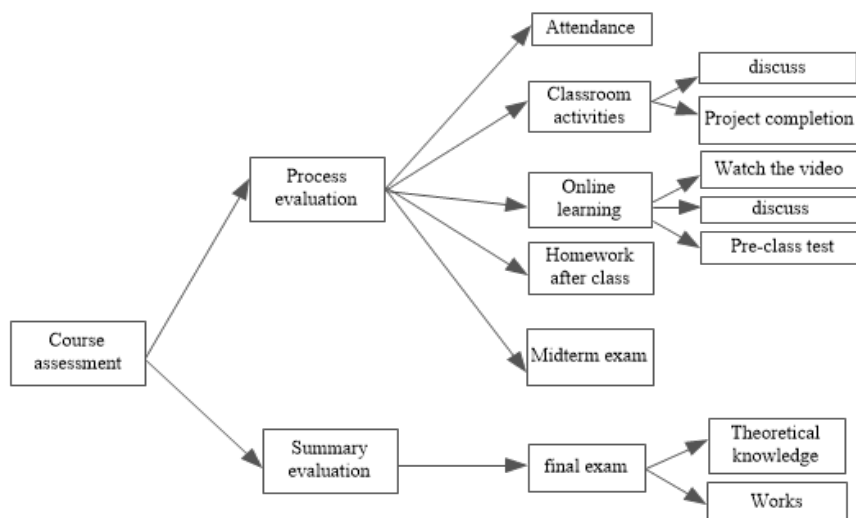

Figure 2: Flipped classroom Teaching Mode-Course Assessment

4.4 Analysis of course assessment results

From the course assessment results, it is found that compared with traditional classroom teaching, the learning efficiency of flipped classroom has indeed improved, and students' learning enthusiasm is also increased.Many students said that although the learning task was increased and the learning time was extended, they have a better understanding of the significance of learning this course.The content of students' learning is more specific.they are full of sense of achievement when they apply what they have learned.At the same time, this teaching mode also helps to improve students' personalized learning. Each student can choose expanding learning content according to their own ability and time.The process learning is included in the course assessment, which strengthens the students' attention to learning at ordinary times, changes the past status of "temporary cramming", and enables students to develop a good learning attitude and obtain better learning results.

4.5. Reflection

After a semester of teaching practice, both teaching and learning have experienced great changes.

4.5.1. Change of learning

For students, significant changes have taken place in their study before, during and after class.

First of all, there has been a great change in students' learning before class. Pre-class learning resources for students have become three-dimensional and diversified. They are no longer limited to a single paper textbook, but more abundant online resources supporting independent learning and collaborative learning. The way of pre-class learning has become more interactive, autonomous and interactive. The learning process is more interesting, challenging, systematic and adaptive.

Secondly, students' learning in the classroom has also changed. Students' learning has changed from traditional receptive learning to inquiry learning. Students use the theoretical knowledge to analyze problems, obtain information, discuss and explore, design schemes, implement schemes, solve problems, etc., so that students can actually feel the comprehensive application process of knowledge.[10]

Finally, students' learning after class has changed significantly. Under the flipped classroom teaching mode, classroom teaching effectively expands learning to after-class through project practice, which not only cultivates students' thinking ability, but also cultivates their ability to solve problems.

4.5.2. Transformation of teaching

For teachers, the big change brought about by flipped classroom teaching model lies in the change of roles.

Teachers have changed from knowledge lecturers to classroom teaching resource developers, online learning community participants, maintainers, and guides; From "performers" in the classroom to designers, participants, guides and evaluators of classroom application activities; From the "authority" on the platform to the server, supporter and manager of effective learning; From a "teacher" to a teaching researcher, explorer and innovator. With the continuous improvement of the teaching model, the role of teachers will continue to change in the direction of more effective promotion of learning. Teachers will pay more attention to the cultivation of students' thinking ability and practical ability, and pay more attention to the extension and application of knowledge.

5. Conclusion

Flipped classroom can solve students' problems in the learning process in a timely and targeted manner. Students can seek help from teachers for any problems they do not understand in the learning process, but this puts forward more requirements for teachers. This requires teachers to pay more time and energy, constantly answer questions to students, and teachers need to have a high sense of responsibility. Only in this way, we stimulate the enthusiasm of students to participate in flipped classroom and improve the learning effect. At the same time, in the process of flipped classroom learning, we should also pay attention to analyzing and summarizing students' behavior characteristics, revealing students' behavior and how to promote their learning progress, and knowing the specific learning gains of students. In short, the design and practice of flipped classroom teaching mode is an effective exploration of college teaching reform in the information age. Specific performance in the

following aspects:

First, the combination of online teaching and offline classroom teaching has better operability. This teaching mode integrates online learning resources into classroom teaching, integrates online learning resources into classroom teaching process, releases classroom teaching time and space, expands knowledge learning, and supporting the occurrence of effective learning.

Second, online learning has formed an online learning community while supporting autonomous learning, which helps promote effective learning and application of knowledge.

Thirdly, online courses provide powerful support of technology, resources and content for the implementation of flipped classroom teaching in universities, so that flipped classroom teaching practice can be carried out orderly and effectively.

Fourth, the new teaching model has a certain degree of challenge for both teachers and students. From the perspective of students, there is a high demand for their autonomous learning ability. From the perspective of teachers, there is a higher requirement for them to use modern information technology to optimize their classroom teaching ability, which is what both teachers and students need to improve and develop.

Acknowledgements

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