The Practice Research of Flipped Classroom Based on Micro Course

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Abstract. This paper mainly discussed the problems exists in practice courses of colleges and universities, to combine micro course with flipped classroom teaching model, put forward to a new teaching model based on micro course, and applied it to the Program Designing course. This paper aimed at three aspects in the process of research, include learning resources organization, learning support platform construction, teachers activity design, by this three aspects, we designed an online platform for supporting teaching activities and evaluation mechanism. In order to deepen the teaching activity and the resources interaction, this paper also provides some new ideas in the practice courses reform in colleges and universities.

Introduction

At present, the practice courses teaching reform are widely emphasized in colleges and universities, various forms of teaching methods are applied in the classroom, but the quality of teaching is yet to be promoted. The development of education reforms requires us to change the traditional teaching model, and apply the new teaching model. The flipped classroom emerging in recent years has become the focus of researching about the innovative teaching model. [1]While flipped classroom have proven to be effective in secondary schools for quite some time, recent work has shown that flipped methods could be equally effective in improving student learning at the colleges and universities level as well. The flipped classroom model allows teachers to engage students in innovative ways, both inside and outside the classroom, and to employ a range of modern teaching tools and approaches. This proves advantageous for diverse classroom environments with students who have different learning preferences.

In 2014, MEF University, a non-profit private university located in Istanbul, Turkey, admitted its first students. MEF University is the first university in the world that has adopted the flipped classroom educational model university-wide. MEF is a university that keeps entrepreneurship, innovative thinking and creativity in the foreground and has the ability to create global and local value-added with its distinct educational model. In 2016, Emerald published "The Flipped Approach to Higher Education: Designing Universities for Today's Knowledge Economies and Societies".[2]

The main task of this paper is to promote students' learning attitude and learning behaviors, to develop the students ability of self-learning and collaborative learning ability, to improve the capacity of teachers' course development, personalized guidance, the ability of teaching organization, and make up for the defects existing in the traditional teaching model; to improve the quality of teaching, combined with the teacher in Program Designing course teaching experience.

The Present States of Flipped Classroom and Micro Course

The Flipped classroom is an instructional strategy and a type of blended learning that reverses the traditional learning environment by delivering instructional content, often online, outside of the classroom. It moves activities, including those that may have traditionally been considered homework, into the classroom. In a flipped classroom, students watch online lectures, collaborate in online discussions, or carry out research at home and engage in concepts in the classroom with the guidance of a mentor.
This kind of teaching model has many successful cases in education practice in the United States, but there are lots of problems in the actual teaching practice. Critics argue that the flipped classroom model has some drawbacks for both students and teachers. Some students may struggle due to their developing personal responsibility. In a home learning environment students who are not at the developmental stage required to keep on-task with independent learning may fall rapidly behind their peers. Others argue that the flipped classroom leads to increased computer time in an era where adolescents already spend too much time in front of computer screens. Inverted models that rely on computerized videos do contribute to this challenge, particularly if videos are long. Additionally, flipped classrooms that rely on videos to deliver instruction suffer some of the same challenges as traditional classrooms. Students may not learn best by listening to a lecture, and watching instructional videos at home is still representative of a more traditional form of teaching. Critics also argue that a constructivist approach would be more beneficial. [3]

Micro course refers to a small course which content is short and has a clear teaching goal, the course is concentrated on illustrates only one topics and the time is less than 10 minutes. Micro course also refers to the teaching video which teach some knowledge points, video content focus on one or two knowledge points, teaching time is generally not more than 15 minutes and is mainly used for helping students to complete a certain understanding and constructing of the concept of knowledge.

The occurrence and development of micro course provides a new way for solving the problems exist in flipped classroom. Micro course uses micro teaching video and a variety of learning support services such as testing practice, students' feedback, teachers' comments, and combine the video resources, courseware with discussion, exchange, share and evaluation process together so as to support the students' autonomous learning and classroom activities better.

At present, the application of flipped classroom are mainly concentrated in a particular course in colleges and universities. Liu Xiao-jing discussed flipped classroom model applied in Data Structure teaching, explored how flipped classroom teaching model is implemented effectively in university, he points out the following four key problems need to be solved, micro teaching video recording, setting up learning support system, learning evaluation mechanism and teacher's activities. [4]

**The Problems Exists in Program Designing Course**

**Program Designing** course is an important basic course of computer majors, it plays an important role in cultivating students' computer programming ability and computational thinking ability. But At present, most of the colleges and universities still adopt traditional teaching model, that is lectures as the main type of teaching methods, which is teaching knowledge in the classroom, and students internalize knowledge outside the classroom. This kind of traditional teaching model has the following deficiencies in the process of implementing.

1. In traditional teaching model, teachers adopted the unified teaching contents, the unified teaching methods and the teaching time and place are also unified, it is hard to meet the needs of different levels of learners, it also affects learners' interest and enthusiasm, affects the implementation of the teaching goal. (2) Traditional classroom lack of students' activities, limit the students' ability to question and criticize, limit the development of exploration and innovation. In the current teaching model, students are only passive knowledge recipients. The arrangement of teaching content and the organization of teaching activities are lack of students' activities, which can lead to the dependence of students' thinking, and inhibit the development of the students' ability and critical. In addition, traditional classroom teaching time usually 45 minutes, which is too long for students to focus on the content, this could easily lead to cognitive overload, so to affect the improvement of learners' learning effect. (3) The combination of technology and the teaching subject to the conditions of teachers' ideas, failed to effectively promote the students as the main body of the individualized teaching.

To sum up, the current teaching model hinder the improvement of the teaching effect, limit the development of the learners' personality, which is also not conducive to the common development of teachers and students. According to the course characteristics, we adopt the flipped classroom model,
which is today's hottest global education innovation ideas, to further innovation of teaching model so as to decrease the deficiency of the current teaching model has become our concerns.

The Flipped Classroom Teaching Model Based On Micro Course

After studying the actual situation at home and abroad about flipped classroom, we can see that flipped classroom teaching based on micro course should take the network learning as an important supplementary style of the university classroom, take the communication and practice as the important teaching contents, emphasize the students' inquiry learning and self-reflection, to improve classroom teaching efficiency maximally. Therefore, the goal of this research is on the basis of the practice of flipped classroom teaching, to design a new teaching model based on flipped classroom and micro course. In this new teaching model, the classroom teaching can be divided into two parts: inside of the classroom and outside of the classroom, and apply this model in Program Designing course.

The Activity Outside of the Classroom

The activity outside the classroom includes preview of the new knowledge before class and to review the contents after class. Preview before class contains watching the micro video of related knowledge, and then to test students' mastery of knowledge by doing the quizzes corresponding with the micro video, and through the feedback result and evaluation watching video once again, the final assessment test this process, in order to improve the students' knowledge. If still exist problems, students can also ask questions online. Teachers can analysis student's learning progress, difficult points, error points, collaboration in time by using network learning platform, and to adjust the key point in classroom teaching in time. At review stage after class, the teacher should assign some homework and project task for students to expand their knowledge.

The Activity Inside of the Classroom

The activity inside the classroom includes the teacher statistics student task completion through the platform, and according to the different situation of students create feedback problems such as interpretation, independent inquiry, group collaboration, etc., and give students the necessary personal guidance. Students by answering questions, autonomous, team cooperation, share the results of the problem resolved, so as to achieve the purpose of the internalization of knowledge.

The Contents Construction and Implementation of Flipped Classroom Based On Micro Course

The core of the curriculum reform lies in the innovation of teaching model. And the teaching model includes all the design of teaching content and organization of activity, it is the important guide to the implementation process. The concrete implementation of the flipped classroom should be refined in resources organization, platform support and activity design three aspects.

The Organization of Learning Resources

The learning resources organization based on micro course is the prerequisite to ensure the flipped classroom successfully, and the most basic and the most important stage is the design of the micro course video. Micro video divided one class or one knowledge point into several parts, each part contains a short contents, has a clear teaching goal, and focus on a single problem. So in the design must be connected to the teaching goal and the corresponding knowledge, and equipped with corresponding test questions, makes students have a learning experience, to combine visual thinking with practice.

The Construction of Micro Video Support Platform

Micro video is not just a series of video resources, which must combine the test evaluation, exploration activities and other activities, it should be a complete micro course. This combination need the support of learning platform. Traditional network teaching platform only record the count of
click number, the new type of support platform based on micro course should record the user learning activity in more detail, such as clicks, the average time learning one knowledge point, the number of resources to download, the number of ask and reply questions, the average response time, etc.

**The Activity Design of Teachers**

The organization of teachers' activities is very important in flipped classroom based on micro course. Before class, the teacher should release all the teaching task and teaching resources. For *Program Designing* course, it is a kind of practice courses, teaching task is generally divided into two parts: one part is the basic theoretical knowledge learning, students can learn this part by using micro video of related knowledge and resources mainly, supplemented by practice and test, and realize self learning, self-improvement. The other part is the practice, we can use the task driven methods, and we should consider the teaching goal and students' cognitive load, the task should not be too difficult or too much, each task must have detailed steps, so as to avoid frustration.

**Conclusion**

To combine micro course with the flipped classroom is an exploration to deepen the current teaching reform. After more than two years of practice and the continuous improvement of the supporting resources, it proved that the flipped classroom teaching model based on micro courses is an effective teaching method. When we applied this model in *Program Designing* course, we got a higher praise from students. In the future, we will evaluate the teaching effect of this model from different angles and different ways, we will further improve the teaching process. The result of this research will provide the beneficial reference for the flipped classroom teaching model for innovation and reform.

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**References**


