

Practical Research of Online Teaching Platform on Reform of Computer Network with Flipped Classroom



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ABSTRACT

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Flipped classroom is a new teaching method used in most colleges and universities to carry on the reform of curriculum teaching. In practical reforming of computer network with flipped classroom, online teaching platform plays an important role. In this paper, two popular online platforms of flipped classroom are introduced. The specific functions are expounded and the advantages and disadvantages are compared.

1. INTRODUCTION

In order to meet the policy requirements of the Ministry of Education of the People's Republic of China for undergraduate education, increase the effective learning effect, enhance the degree of academic challenge of college students and reasonably increase the difficulty of curriculum, expand the depth of curriculum, flipped classroom is used in most colleges and universities to carry on the reform of curriculum teaching. flipped classroom is a new teaching method originated in the United States. The flipped class starts with students watching the video of the curriculum at home, which was prepared by the teacher or others [1]. When they come to school, the students and the teacher finish their homework together, discuss about the questions and problems. Because the roles of students and teachers are intertwined, and learning at home, while completing homework in school, the way is different from traditional teaching, so it is called "Flipped Classroom".

Flipped classroom has improved the disadvantages of traditional teaching, students have changed from passive learner to active inquirer. This teaching model not only makes the traditional silent college classroom become active, but also greatly increases the students' learning interest. In the practical reforming withing flipping classroom, if the flipping classroom was combined with SPOC, which means Small Private On-line Course, will make full use of online teaching platform, manage and control the learning process of students effectively, and exert the advantage of flipping classroom to the maximum extent [2].

Computer network is an interdisciplinary course, which integrates computer technology and communication technology. It is also the core course in specialty of computer science. The teaching content of computer network involves a wide range of abstract knowledge and variety of principle. From the point of view of teaching requirements, the course helps students to have the ability to understand the theoretical knowledge and to combine the theoretical knowledge with practice and the technical ability to apply. The course is usually set up as a combination of theoretical and experimental

courses. In the course of theoretical teaching, teachers adopt the traditional teaching methods in classroom and give exercises after class. Students learn theoretical knowledge after learning in classroom, lack of innovative thinking, and lack of the ability to learn independently. In addition, the cultivation of students' practical ability depends entirely on the practice course. The students can understand the knowledge of the theory course in the experiment class, but the experiment doesn't embody the application practice content of the computer network in the theory course. Therefore, from 2016 to 2018, our school has carried out the reform of the teaching mode of computer network in two classes for two semesters, in the experimental exploration, and the design of the scheme, besides the trial of the platform. The practical research has carried on the reform in many aspects and gained more experience. It has made full use of many network online platforms, and has gained experience of using each platform's function, the superiority and the weakness. The experience is helpful for the future teaching reform and for the exchange with others.

2. AFFECTION OF ONLINE TEACHING PLATFORM ON FLIPPED CLASSROOM

The features of the flipped classroom teaching model are mainly reflected in the construction of the teaching model and the effect of using of the network platform. In the traditional teaching mode, when teachers carry out three stages of teaching activities before, in class and after class, they will only explain the knowledge points in the classroom, and there will be few teaching activities before and after class. For students, there is lack motivation to learn. The flipped classroom teaching mode subverts the learning mode of students' learning in class and rest after class, and runs through the three stages of pre-class, in-class and after-class, which raises the students' learning requirements and increases the students' active initiative in learning.

Because classroom teaching and after-class learning are reversed in flipped classroom, it is no longer for teachers to

give lectures in front of students, but to record videos in front of teaching platforms or to communicate with students on the network; For students, it is no longer to meet the teacher in class, but to communicate with the teacher on the Online platform all the time, so the platform has become the vital link between teachers and students. On the other hand, all the teaching contents and resources are no longer owned by teachers in private, but shared by all students, so the online teaching platform plays an important role in the whole teaching process [3]. From the view of teaching process of flipped classroom, the use of online teaching platform by teachers and students is mainly reflected in the following several aspects of Table 1.

Table 1. Activities of flipped classroom

Person	Teacher	Student
Activity	Upload Resource	Watch Video
	Give Assignment	Finish Assignment
	Check up Learning	Report Status
	Answer Questions	Ask Questions
	Specify a Exam	Complete Exam

The students' learning and review process depends on the online teaching platform, and the teacher's preparation and answering process is also assisted by the online teaching platform, so the requirement for the online teaching platform is higher. In addition to the standardization, stability, extensibility, security and openness required for general network software systems, the requirements for online teaching platforms are as follows:

A. Functions

As can be seen in Table 1, teachers and students have a teaching process, a discussion process and a test process on the online teaching platform. In the teaching process, uploading video, editing video, downloading video, converting video format and so on, will be necessary for online platform. In the process of discussion, chat function, file transfer function, roll call and answer function, and statistics of students' active function will all become the important functions of convenient teaching. In the course of test, making test bank, designing item type, generating test paper, automatically correcting and producing results, these functions will greatly save teachers' time and let teachers devote more energy to the design and communication of teaching activities.

B. Interface

Since there are many functional requirements, how to facilitate teachers and students, so that everyone can easily find the required functions, and easy to use, this is a requirement for all functional settings and interface design.

C. Storage Capacity

The video that the teacher shows to the student, the designed exercise, the student's problem, the chat record and the file, all need to store in the network equipment, so the system needs to run on the server which has strong storage and processing ability.

A good online teaching platform will bring great convenience to teachers' teaching process, improve teaching quality and effect, and bring happiness and interest to students at the same time.

3. INTRODUCTION OF TWO ONLINE TEACHING PLATFORMS

At present, the popular online Teaching Platform is basically in the form of web site on PC or applications on handy. Each online teaching platform has its own features and functions. Here, we introduce two online teaching platforms, Moocunion Site and Chaoxing Xuexi Tong.

A. Moocunion Site

Moocunion Site is a web site which supply different online services for online teaching and learning. The complete address of this web site is: www.moocunion.com.

The online services provided on the website can be divided into different section. In the flipped classroom section, if a user was registered as teacher, he has the following permissions functions.

- 1) **Class Management.** Class management. In this module, users can create classes as instructors to teach. In order to avoid the random establishment of the class by others, an application must be made before the class is established and approved by the administrator to establish the class. When the audit passes, the teacher can write class data to facilitate students to find the class and join the class. Because the flipping classroom teaching is different from the large-scale teaching, it is necessary to carry out a lot of teaching activities in the class scope, so the teachers' administrative authority to the class is very important. In the class management module provided by Moocunion, class announcements can also be issued to facilitate the release of class notices. You can also look at class students and learn about each student's learning status. At the same time, teachers can also join other classes as students to learn other courses.
- 2) **Video Management.** In this module, the instructor can upload his own recorded teaching video to the web server, the format of the video can be flv, mp4 and wmv. When you publish a video, you need to fill in a brief introduction to the video, put the video into a classification directory, and select the class to which the video was posted. After the video release is completed, all videos are stored in categories and can be edited or modified again in the video directory. You can also see how many times the video has been viewed and what the video has been commented on. Users can also collect other people's videos into their own video records, and their own watched videos are automatically recorded in the history.
- 3) **My Interaction.** Among the teaching procedure, teachers and students interact with each other with questions and answers. This module provides users with note information function, diary function, question function and answer function.
- 4) **My Course.** This module of my course mainly shows the related courses, instead of related classes. Show the videos which the user is currently studying, and recommend videos according to my hobbies with big data statistic.

B. Chaoxing Xuexi Tong

This software includes website page client and mobile phone app client. Any changes made by one client are automatically synchronized with another client. This feature greatly facilitates the use of teachers and students, all users can

do any operation at any time, anywhere. For flipped classroom, which includes complex teaching activities, it provides a great convenience. Compared to moocunion, Chaoxing offers nearly 10, 000 undergraduate courses in various disciplines, besides interest courses and public curriculum. All the functions are supplied on online teaching platform based on the school, which needs to be purchased at the school's expense [4].

After purchasing the using of online teaching platform for the school, all the teachers and students do not need to register the accounts, the user information will be transferred from the school to the online teaching platform. When teachers carry out flipped classroom for a course, they can set up a course under their user function after logging in. Once the course is offered, it will automatically produce a curriculum code, through which students can join the class with this code and set up the study of flipping classes [5]. There are lots of functions of Chaoxing online platform. The different modules will be introduced as following.

- 5) Home page. On the home page of the course, the teacher should create a catalog of the contents of the course at first, and then select the sections where the video needs to be uploaded according to the directory. When uploading the video, one can insert a question at any time point in the video, to ensure the students watches the video carefully. Only after answering the question correctly, the student can continue to watch the video. The watching progress of the video is automatically recorded in the student's learning process, resulting in scores.
- 6) Activities. This feature includes several small functions. Teachers can set the check-in function so that students can click on the mobile phone to attend the course at a fixed time. In addition, students can also be asked to answer in class, or to vote questionnaire after class.
- 7) Statistics. Since self-learning effect is important of flipped classroom during the semester, it is necessary to record and evaluate the students' self-learning process. The statistical function can count the teachers' knowledge points in the curriculum contents catalog, record the number of times and duration when students watch the video, count the scores of after-school assignments and tests, count the students who fail to complete their tasks, and remind the teachers to pay attention to them.
- 8) Information. All after-class exercises and assignments are stored in this module as materials for this course. In addition, teachers can upload extra-curricular materials and learning content here to help students learn autonomously.
- 9) Management. Because of the heavy workload of the online teaching platform, teachers can set up one or two students as assistant tutor to help complete the teaching process. Such as homework correction, data uploading and so on.
- 10) Operations. Teachers can assign assignments to online platform in a variety of question types, and each will set scores and answers in advance. The system can automatically score according to the objective questions, subjective questions need teachers to check the answers and then give the scores.
- 11) Examinations. The test questions can be generated automatically according to the difficulty of homework

and the chapter, which greatly reduces the workload of the teacher designing the test paper.

- 12) Discussion. Teachers and students can ask any question here and get answer in time.
- 13) Notification. Once the teacher sends out the homework or has the temporary message, can issue the notice to remind the student to finish in time. Because the software can be installed on the mobile phone client, so the effect of reminders will be much better than the web-side software.

All of the above functions can be completed on the mobile phone side or on the web site. For users who are accustomed to carrying mobile phones, it's a good tool for saving time and improving efficiency.

4. COMPARISON OF ONLINE TEACHING PLATFORMS

Because all teaching activities in flipped classroom are online, the functions of online teaching platform provide abundant support and convenience for teaching process. The two platforms described above have their own advantages. Compared to specific functions, Chaoxing is more comprehensive, but the cost is not low. The specific functions of the two platforms are compared in the table below.

Table 2. Specific functions of two online teaching platforms

Platform	Moocunion	Chaoxing
Functions	Web site	Web site & Mobile App
	Aim at Class	Aim at Course
	Browse record statistic	Learning process statistic
	Upload video	Upload and edit video
	No online exam	Online exam
	Free	For value

5. CONCLUSION

The online teaching platform of flipped classroom not only brings the greatest advantage to the new teaching mode, but also brings about the effect of teaching reform to a certain extent. To choose a fully functional, affordable online teaching platform is important decision for each teacher and school. This paper compares the two online teaching platforms used in the reform of flipping classroom teaching, expounds their main functions, and compares their advantages and disadvantages. For the other courses to select online platform, the content is a helpful reference for those who want to make appropriate choices.

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