The Online Teaching Practice of Flip Classroom

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Abstract. After the Western flipped classroom concept was introduced into higher education, how to effectively carry out the reform of information education has been plagued by many educators. Taking the college network course as an example, this paper analyzes the problems existing in the process of information teaching, and probes into the new ideas of the future information teaching reform from the perspective of the combination of network teaching and flipped classroom teaching.

Keywords: Flipped classroom · Classroom design

1 Introduction

The outbreak of the novel coronavirus pneumonia has led to the separation between teachers and schools, students and schools, students and teachers, students and students in education. In response to the call of "stopping courses but not stopping studying, learning not delay", the Ministry of Education emphasizes the need to guide teachers to select suitable MOOC, SPOC and campus online curriculum resources, to carry out online teaching, make full use of learning behavior analysis data, and understand the students' online learning [1]. During the epidemic, teachers are the key for education to take a turn to be out of danger, so they should optimize the teaching mode, make good use of the teaching platform to cultivate students' ability of self-learning, critical thinking, communication and cooperation, and at the same time, achieve the effect of integrating "quality, depth and temperature" in the online classroom. Therefore, this study proposes the online teaching mode of flipping classroom based on "SPOC + MOOC Class + Tencent Meeting", which provides a reference for the research of online teaching mode in the post-epidemic era through the practice in "Information Technology course Teaching Theory".

2 Preparation of Teaching Practices

"China University on the MOOC" platform selected Nanjing Normal University Zhu Cailan's "Information Technology Teaching Method" curriculum resources as the master version for secondary editing, the chapter order was adjusted, the teaching content was screened, the teaching resources was increased (such as 8 multimedia coursewares,

2 microlectures, 12 topic discussions, 6 chapter tests, 10 chapter assignments, 12 questions from MOOC Class practice library, etc.), and the asynchronous SPOC courses was created according to the syllabus. Students need to log in the iCourse, and "student certification" through the "School Cloud". After successful certification, students can "sign up" for the course [2–4]. Thus, teachers can control the students' learning progress and learning quality through the following links: ①In the "Announcement" and "Scoring standards" section issues the curriculum dynamics, curriculum examination and the schedule arrangement and other content. In the "Courseware" and "Quizzes and assignments" sections upload units PPT, microlecture, chapter tests and assignments. ③In the "discussion area" section, teachers actively participate in the discussion, timely response to the questions raised by students, give responses to students' feedback and Suggestions, and think about improvement measures.

The teaching object of this teaching practice is the 2018 undergraduate students majoring in Educational Technology of X normal University (48 students). The class hours are arranged for 2 class hours per week, a total of 32 class hours.

3   The Process of Teaching Practice

3.1   SPOC + MOOC Class "pre-Learning"

"SPOC + MOOC Classroom" is the first step to implement flipped classroom. First, a QQ group will be established to share the teaching arrangement, online learning notice and requirements, Tencent conference number, two-dimensional code in the classroom. Secondly, related and created MOOC Class on the SPOC platform (input class name, class year, semester time, class time, etc.), and the classes were prepared online according to teachers' own teaching time, and relevant teaching activities was added based on teaching design, such as setting in-class exercises, questionnaires, class announcements, topic discussion, etc. [5, 6]. Finally, PPT, video and other teaching resources will be released on SPOC platform for students to learn independently online. Students are required to watch the teaching resources on time on the SPOC platform. If they have any doubts when learning, they can ask questions in the discussion area of the SPOC platform. Teachers will give timely replies.

We use the function of "random grouping" of MOOC Class to divide the students into 8 groups and use group cooperation and task-driven form to guide the students to complete their autonomous learning before class. As shown in Fig. 1. According to the teaching plan of each class, make detailed guidance arrangement, and publish it to MOOC Class. The before-class guidance mainly consists of four sections: Learning goal: help students to clarify the learning goal of each class. Guide tasks: Make a list of tasks for students to learn independently, so that students can quickly locate teaching resources to improve learning efficiency. Live teaching plan: let students understand the next live teaching process in advance and prepare for class. ④Thinking before class: ask enlightening questions to stimulate students' interest in learning.

3.2   Mutual Assistance in the "MOOC Class + Tencent Meeting" Class

In order to ensure that "teaching standards are not reduced", to create a "face-to-face" classroom atmosphere for students and to meet the needs of real-time interaction between
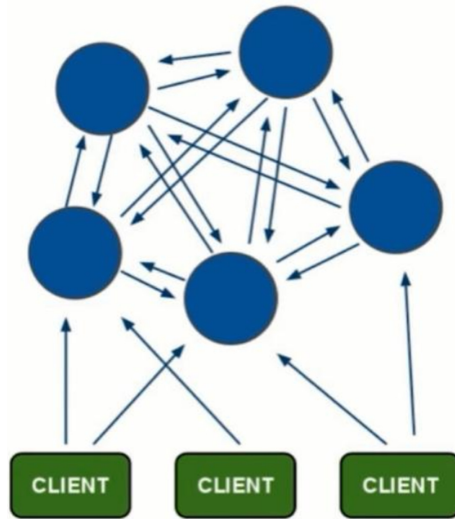
Fig. 1. MOOC class + tent meeting "class"

teachers and students, we choose MOOC Class and Tencent Meeting to complete the control and guidance of students' online learning [7]. During the live broadcast classroom of Tencent Meeting, The basic content that has been explained on SPOC platform will not be repeated by teachers, but focus on the key and difficult points of knowledge, the students' doubts and the evaluation of the students' group homework. This teaching process can not only check and consolidate students' online learning situation before class, but also improve students' ability to analyze and evaluate problems and cultivate their higher-order thinking.

"MOOC Class + Tencent Meeting" helping students during class is the second step in the implementation of the flipping classroom, which achieve online live broadcast from "indoctrination classroom" to "dialogue classroom ". As follows: ①The first 10 min of the first class, Teachers and students enter the Tencent Meeting, Teachers open "check-in" and issue pre-class tests in the MOOC Class, and through Tencent Meeting video and audio or chat area text function to remind students to complete check-in and testing in the MOOC Class, Teachers check students' attendance rate and autonomous learning in the MOOC Class. ②In the last 30 min after the first class, teacher first explained the pre-class test, then use the "roll call" function of MOOC class to randomly select 4 groups to let them share the gains of pre-class learning and answer "thinking before class" questions. Group representatives can display learning results through Tencent Meeting "shared screen" function.

3.3 SPOC + MOOC Class "after-School Inspector"

After class supervision of "SPOC + MOOC Class" is the third step to implement flipping classroom. After class, the teacher publishes the chapter test and the discussion question through the SPOC platform, the student needs to complete the test within the specified

time and participate in the discussion by consulting the data. Besides, students can watch the teaching resources on the SPOC platform repeatedly after class to consolidate knowledge. Teachers promote students' thinking and help students to internalize and absorb knowledge by supervising student learning [8, 9]. The relevancy between SPOC and MOOC class can count the number, frequency, duration, document browsing, class answering, in-class discussion, chapter test and so on of each student's video viewing. Teachers can master the learning situation of each student at any time on the computer terminal of the MOOC class and analyze the students individually according to the statistical data of the learning situation. They can not only urge the backward students, but also provide the advanced learning materials for the students who have spare time during their learning to truly achieve precision teaching.

4   Practical Results and Reflections

4.1   Results of Practice

Learning effect is an important basis for testing the effectiveness of teaching mode. We use the Classroom Real-time Observation Scale to record the learning situation of each lesson before, during and after class in detail. After the course, summarize and analyze the records. First of all, about 88% of the students can complete the task of autonomous learning before class, 63% of the students can participate in the topic discussion, indicating that most of the students have high initiative and enthusiasm for learning, and can reconstruct the new knowledge from the existing knowledge and experience [10–12]. Secondly, the interaction between teachers and students, and among students is generally active, and through classroom observation, it is found that the number of students participating in discussion and communication or class summary increases with the advancement of class hours. Finally, although 96% of the students can complete the chapter test on time, only 21% of the students can put forward more depth or breadth of views, which shows that most students only master the basic knowledge of the classroom, but do not pay much attention to the understanding and transfer of knowledge.

Learning effect also needs to stand in the perspective of students to experience and feel, so that teachers can easily ask questions to guide students to think, to improve the quality of teaching to a greater extent. To this end, we distributed the Learning Feedback Questionnaire to understand the impact of the flipped classroom teaching model based on "SPOC + MOOC Class + Tencent Meeting" on students' learning effect. According to the survey data, 90% of the students indicates that they were adapted to the application of this model in "Information Technology Curriculum Teaching Theory"; 75% said that the use of the SPOC platform is very convenient and the teaching resources are rich and diverse, which can stimulate learning enthusiasm and improve learning efficiency to a certain extent; 79% of students believe that the SPOC platform helps to review and consolidate what they have learned; As shown in Fig. 2 believe that the model can improve their autonomous learning ability and group cooperation ability, and better solve the problem of not grasping the key points of learning [13–18]. 85% say that flipping the classroom enhances the sense of learning participation, and the interactive communication between teachers and students, and among students can promote the

internalization and absorption of knowledge, achieving the effect of drawing inferences from one to the other; 62% of the students said that they could communicate with teachers and classmates in time and have a sense of belonging in the.
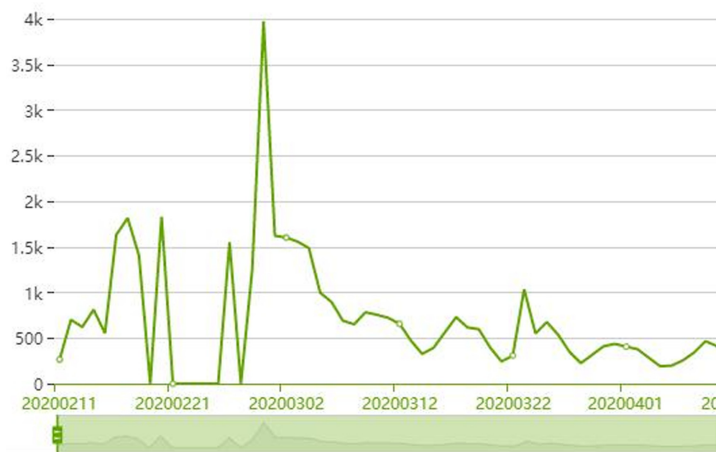

Fig. 2. Data chart of online course selection

In addition, 44% of students think that the model requires a high degree of autonomous learning ability. As shown in Fig. 3. Although it is more likely for students with poor self-control to affect their learning progress, it can also play an encouraging role to some extent; 25% of students want group reporting section to be more interesting, most groups are mainly lecturing, lack of interaction and attraction; and 10% of students show that they are difficult to adapt to the model because of their lack of ability to accept new technologies. Overall, the flipping classroom, which based on "SPOC + MOOC Class + Tencent Meeting" transformed "online closed classroom" into "face-to-face open classroom" during the epidemic period, promotes teachers' supervision of students and students' thinking and learning of knowledge, realizing that teaching and learning benefit each other.

4.2 Reflection

4.2.1 Can Improve Learning Efficiency, and Enhance Autonomous Learning Ability

The flipping classroom teaching mode based on "SPOC + MOOC Class + Tencent Meeting" can give full play to the main position of students' learning, improve their ability of autonomous learning and increase the opportunity of self-thinking. Since teacher will provide the task list to guide the students' self-study direction before class, students with weak learning ability can also finish the learning task on time, which improve the learning efficiency. In addition, teachers do not need to repeat the content of knowledge in the live classroom, but only need to answer the students' questions, which not only lightens the burden of teachers, but also cultivates the students' critical thinking.
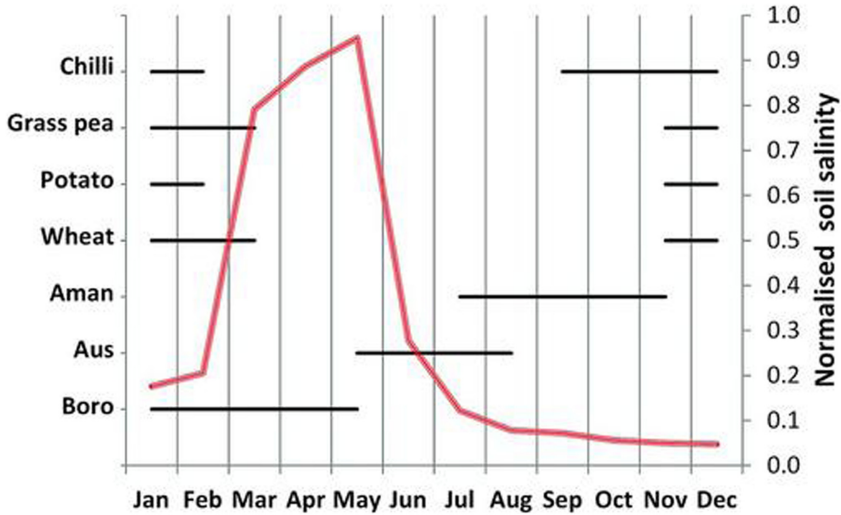
Fig. 3. Detrended graph of main calculation results.

4.2.2 Can Activate Classroom Atmosphere, Strengthen Communication and Expression Ability

Although college students are independent in mind, they need an active and free atmosphere in their study. By SPOC platform the independent learning of the platform before class, students already have a certain knowledge base, and have more time to express their opinions, ask questions, participate in the discussion in the live class, which can maximize the sense of classroom participation and learning identity. Moreover, the flipping classroom teaching mode based on "SPOC + MOOC Class + Tencent Meeting" provides an opportunity for discussion and communication, and students can exercise their language expression ability, which is helpful for enriching the teaching content, helping students enlighten their wisdom and consolidating their knowledge in the collision of thinking between teachers and student, and among students.

4.2.3 Should Advance with the Epidemic and Change the Teaching Concept

In the face of the changes in learning situation caused by the epidemic, teachers should actively change their teaching concepts. They should not only give full play to their leading role, be good guides and participants in students' learning, but also help students play the main role of learning [19–22]. Through appropriate teaching methods and teaching design in line with distance education, the students' learning enthusiasm, initiative and creativity can be fully aroused and the role of students from passive knowledge receiver to active learning participant can be transformed. Enable students to "learn at home with mind" and realize the substantive equivalent of teaching quality between online learning and offline classroom.

5   Conclusion

The flipping classroom based on "SPOC + MOOC Class + Tencent Meeting" is an innovative practice of curriculum teaching reform in the era of "Internet +" and during the epidemic situation, which enables teachers and students to form an organic whole of co-learning, co-research and co-progress before, during and after class. SPOC can bring students a fine, interactive, seminar-oriented and professional learning experience; MOOC Class can objectively and truly integrate all the data of classroom teaching, make the learning effect digital and visual, and help teachers to manage and evaluate students efficiently [23, 24]. Tencent Meeting live teaching can strengthen teachers and students' online classroom participation and teaching identity; flipping classroom can increase teachers and students' communication and interaction, making students broaden the depth and breadth of knowledge in the class. The four teaching methods complement each other to ensure the quality of online teaching.

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