

Exploration of Cross-University Teaching Mode of College Physics Course

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Abstract: Based on the cross-University study resource platform, the system of cross-University study and credit recognition is implemented in the sharing of teaching resources. Taking the cross-University study of college physics as an example, Build based on Asynchronous sharing of teaching resources SPOC + classroom live broadcast mixed teaching mode, in which students learn independently online through SPOC, and build a platform for answering questions, communicating and discussing, and expanding through online live broadcast classroom. Mixing the teaching mode has achieved certain results in the aspects of students' learning effect and teachers' teaching ability improvement. At the same time, aiming at the existing specific problems and teaching practice, this paper puts forward some solutions to the problems.

1. Introduction

Online teaching mode is widely used in the post-epidemic era, and cross-school credits provide us with a broad platform. Cross-school study and credit mutual recognition mode can improve the utilization rate of teaching resources in colleges and universities, and is an important measure to balance teaching resources in colleges and universities, reduce school costs and promote the sharing of teaching resources. At the same time, we should break the traditional teaching mode in colleges and universities, innovate the talent training mechanism, provide students with more and better teaching resources and more novel teaching mode means and methods, greatly enhance students' autonomy and flexibility in learning, thus promoting the reform of teaching mode in colleges and universities to improve the quality of talent training[1].

On the MOOC platform of Chinese universities, national-level MOOCs College Physics of Northeastern University is selected, and the asynchronous SPOC online resources are constructed and improved in combination with the training plan, curriculum objectives and academic situation of our university. Adopt the mixed teaching mode to improve the quality of education, analyse students' learning behaviour through educational big data, realize accurate investment in teaching content and realize students' individualized development. According to the requirements of cross-school credits, teachers of course users should study courses in advance, and teachers of course

builders and course users should set up course teams to clarify their respective rights and responsibilities. Teachers from both sides jointly agree on the curriculum outline, teaching progress arrangement, teaching methods, assessment methods and other contents related to the curriculum, and communicate continuously during the credit period, which makes it possible to prepare lessons and teach and research across schools. These preliminary works have laid a solid foundation for the smooth implementation of the follow-up online teaching, and the mixed teaching of "MOOC + SPOC + classroom live broadcast" is carried out by using MOOC + SPOC resources. Before the class starts, each class is divided into groups in Mu class, so as to grasp the students' online learning status and achievements in time. Live broadcast through Tencent member platform in the way of "face-to-face teaching", so that students can feel like attending classes in the classroom, shorten the sense of distance with students, and improve the teaching effect of flipping classes.

2. Significance of project implementation

The implementation of cross-school credit program not only provides students with more learning resources and ways, but also creates powerful conditions for teachers to improve their teaching level and innovate teaching strategies and methods. From the perspective of students, on the one hand, we can use the implementation of this project to obtain more learning resources from other colleges and universities free of charge. On the other hand, online teaching also saves students more study time, and students can use the remaining study time to get extra credits, which is of great significance to students' efficient learning. From the perspective of teachers, the implementation of the project is also of great significance. At present, the teaching strategies and teaching methods of Financial Analysis course are established on the basis of classroom teaching. Due to the change of teaching methods, that is, teaching by online platform across schools, the existing teaching strategies and teaching methods can not completely adapt to the new teaching methods. Therefore, the establishment of a set of relatively perfect teaching strategies and methods for online cross-school courses, especially for the course Financial Analysis, has also become an important part of the implementation of the cross-school online credit program in our school. At the same time, a large number of external teaching resources have laid a solid foundation for improving the teaching level of teachers in our school[2].

Realization of asynchronous SPOC: Copy the semester content of a completed MOOC course, modify the original content of the source course, design it according to the teaching content and schedule of its own course, and organize the students in the teaching class of our school to discuss and answer questions online, so as to answer students' questions in the process of autonomous learning in time. During the period of epidemic prevention and control, teachers can design the publishing content and progress of teaching resources according to the schedule, which is relatively most suitable for most colleges and universities to carry out teaching according to the original teaching calendar.

3. Teaching organization and implementation under mixed teaching mode of asynchronous SPOC + classroom live broadcast of teaching resources sharing.

3.1. Overall design.

In order to cultivate creative talent education under the cross-school mode, we must speed up the construction of Internet courses in colleges and universities. We should innovate the cross-school study mode, adopt different online teaching in the past, and change to Internet teaching in line with the times to produce a new teaching mode, online and offline mixed courses, innovation and practice. After colleges and universities determine the credits for cross-school courses, the courses

of cross-school elective mode need the teaching team of the school, and finally, the tutors give the credits for cross-school elective mode of the school. The online teaching of College Physics adopts the above design concept, and through the implementation of course content and task-based teaching, it can accurately train students to establish a correct scientific view, train logical thinking ability and improve their application ability. Correct scientific thinking and scientific literacy run through the whole teaching implementation process. The overall design. The online teaching of College Physics effectively incorporates the basic connotation of socialist core values into the curriculum teaching design and curriculum activities[3].

3.2. Teaching organization and implementation.

Use the mixed teaching mode of love course MOOC + asynchronous SPOC. When the organization and design of the credit model project for cross-school study are implemented. A large number of high-quality teaching resources are quoted to further enhance the teaching effect and students' learning ability in colleges and universities. Colleges and universities, as the course builders of this project, have also given a lot of guidance and help. This time, an exchange meeting on the credit model of cross-school study has also been set up, so that the problems existing in the implementation of this project and the planning of the next round of teaching practice can be discussed in depth, so as to make preparations for universities to promote the fast campus and fast model of universities. At the same time, the teachers who build courses also play an active role in teaching, and implement Internet class teaching.

Cognition of knowledge points before class. Publish study guides in advance, and upload courseware, lesson plans and core videos to SPOC to guide students to accept learning tasks. Under the guidance of the study guide, students combine MOOC and SPOC to learn on the front line according to their own learning conditions, and complete the experiential learning of basic knowledge points and skill points.

Application of knowledge points in class. On the basis of MOOC learning, asynchronous SPOC teaching is used to establish a question bank. The basic knowledge points are taken as the unit to publish tasks for students, which reflect differences in the same task and meet the needs of students at different levels. In the process of implementation, asynchronous SPOC flexibly uses a variety of classroom interactions such as display, voting, brainstorming, answering questions first, and answering questions online to activate the classroom atmosphere, and the formed classroom records provide data support for the process assessment[4].

Expand knowledge points after class. By arranging test and expansion tasks, teachers and students can learn and communicate online to further consolidate the early teaching effect.

3.3. Teaching evaluation.

Teaching evaluation refers to students' academic evaluation, including learning process assessment and result assessment. Students' academic evaluation under the mixed teaching mode mainly consists of three parts: online process evaluation, live discussion process evaluation and final exam. Evaluation methods mainly include teaching test, research topic, and examination analysis and so on.

The online process evaluation based on the mixed teaching mode data of love course MOOC + asynchronous SPOC, on the one hand, is MOOC unit test, course question and answer and discussion, course examination, on the other hand, SPOC resource learning, classroom online test, classroom attendance, classroom activity participation and so on. The data track of online learning process is clear, and the evaluation data is true and reliable, which reflects the complete learning track and learning process of students; Live discussion process evaluation; Through task discussion

and task display, students' ability to apply knowledge points is assessed, and course learning is evaluated summative; The final exam not only examines students' mastery of basic knowledge points, but also pays attention to the examination of students' ability to analyze and understand practical problems and the formation of logical thinking the Figure 1.

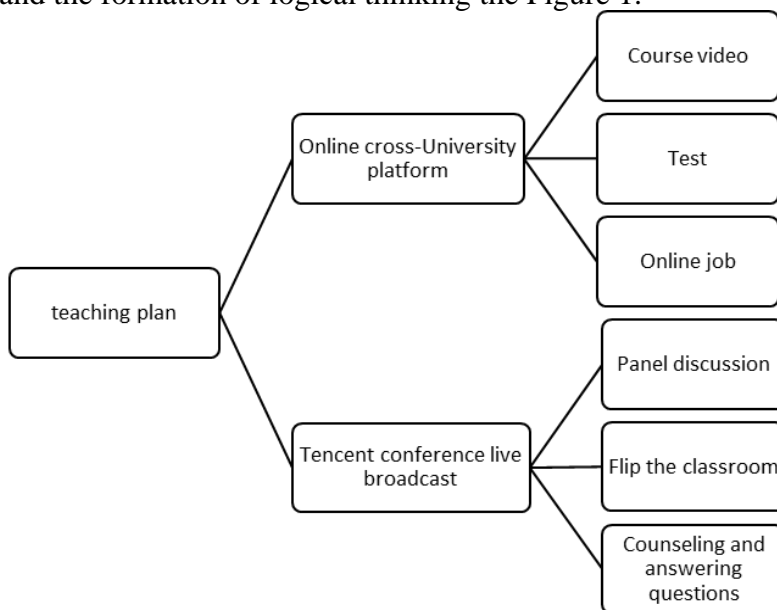


Figure 1: Cross-University credit implementation plan

3.4. The implementation effect of mixed teaching mode.

Curriculum content reform. Through high-quality and standardized MOOC, the cognitive learning of basic knowledge points and their application is completed. The application of knowledge points is realized through personalized SPOC for students of different majors, and the action-oriented learning theory guides MOOC + SPOC integration task-driven teaching to expand the course depth. Students in offline classroom mainly complete the course tasks. Compared with the traditional teaching mode, it expands the course depth, truly breaks through the limitation of "instrumental theory", and the course content is more pragmatic and closer to students' majors. Students pay more attention to the cultivation of scientific literacy, logical thinking and college physics application ability in the learning process.

Students' learning effect. Data feedback such as MOOC platform big data learning situation analysis and SPOC classroom report analysis show that students have a good grasp of basic knowledge points and a high degree of participation in classroom activities. The completion of students' tasks and tests show that students' application ability has been improved obviously, the ideological and political courses and majors have achieved remarkable results, and the teaching effect has achieved expectations, which has promoted students' individualized growth.

Teachers' teaching ability has been improved as a whole. The teaching level of curriculum teaching teachers has been consolidated and improved, and the common growth of teachers and students has been realized. It provides teachers' guarantee for mixed teaching, promotes the good development of the course teaching team, and plays a good role in demonstrating and leading the school[5].

4. Existing problems and challenges

The problems in the construction of MOOC + SPOC mixed teaching mode are as follows: First,

how to integrate the introduced teaching resources with the actual learning situation. The introduced curriculum content is different from the content stipulated in the syllabus of our school, the teaching content section is inconsistent, and the actual learning situation of our students is not fully considered, which is not conducive to teaching students in accordance with their aptitude. After carrying out asynchronous SPOC in our school, the course team selectively selects some online resources according to the content stipulated in the syllabus and the difficulty of teaching content, and independently builds relevant course resources according to the actual learning situation of our school, including courseware, lesson plan, question bank, homework bank, case bank, etc. Second, how to combine process evaluation with result evaluation. Traditional curriculum evaluation focuses too much on results and lacks process evaluation. The model of "MOOC + SPOC + flip classroom" should be closely combined, and the process evaluation should be combined with the result evaluation. The usual grades are evaluated by process. According to the characteristics of mixed teaching, the examination contents include online autonomous learning, communication and interaction, live example analysis and report discussion, etc. Results the final examination was selected to comprehensively examine students' mastery of basic knowledge points and practical application ability. Third, how to realize the coupling between learning initiative and discussion teaching method. Traditional classroom teaching mode lacks effective interaction, emphasizes theoretical study too much, and lacks the cultivation of practical application ability. Teaching should be carried out according to the logic of "learning first online → teaching after teachers' → example analysis → group discussion → teaching interaction → evaluation and examination". There are lead-in tests in each chapter, and there are also a large number of examples in teaching, which enrich teaching methods, arouse students' learning initiative, turn over the classroom, and arouse students' independent thinking and interest in learning.

5. Conclusions

Facing the opportunities and challenges of mixed teaching, the mixed teaching mode based on cross-school learning platform provides students with a better learning platform, enhances the teaching interaction between teachers and students, and can effectively improve students' learning enthusiasm. Providing rich teaching resources for students, making students change from passive learning to active learning, is conducive to cultivating students' habit of active learning and thinking, improving students' interest in learning, cultivating students' innovative consciousness, and further

Improving teaching quality and teaching effect. At the same time, the cross-school credit model integrates the high-quality resource teaching system and teachers' teaching resources. It is the inevitable trend of the development of teaching management to promote the sharing of higher education resources and achieve the purpose of mutual benefit and complementarity among colleges and universities.

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