

Construction and practice of a blended teaching model based on MOOC+SPOC+Flipped classroom

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Abstract. With the rapid development of Internet technology, MOOC has played a certain role in promoting the realization of education equity in China. In order to further improve the quality of teaching, educators are constantly exploring better teaching models. This article aims to optimize the blended learning model by constructing a blended learning model of MOOC+SPOC+flipped classroom in the course of database principles and applications. To enhance the influence of classroom teaching, stimulate and enhance students' interest in learning, and provide reference for the improvement and development of the current blended learning model. At the same time, the specific strategies and practical experience used in the design and practice of MOOC+SPOC+flipped classroom provide valuable references for other teaching practices.

Keywords: Blended teaching mode, online and offline, flipped classroom.

1 Introduction

The cultivation of large-scale personalized and innovative talents guided by sustainable competitiveness is the trend of future education development and will also become the most basic form of higher education. This requires cultivating innovative engineering talents with new ideas, models, and methods, strengthening the interaction between teachers and students in the teaching process, and promoting the rapid alternation, link iteration, and precise collaboration optimization of teaching content through fast and flexible organization of teaching resources, in order to achieve personalized cultivation of innovative talents. Advanced information technologies such as network platforms and intelligent technologies will be used to integrate various high-quality cross disciplinary, cross regional, and cross campus teaching resources. Through interactive cooperation among campus teaching teams, collaborative education among university students, and deep integration between universities and society, the collaborative teaching and training process will be optimized, ultimately improving students' ability to actively explore and gradually learn.

Therefore, under the guidance of relevant concepts, this project is based on "MOOC+SPOC+Flipped Classroom", uses the current in-depth integration technology of

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information technology and education, applies "Internet plus+education" and "intelligence+education" to carry out curriculum reform and innovation, and constructs a mixed teaching mode of "MOOC+SPOC+Flipped Classroom", which provides some reference for colleges and universities to cultivate innovative talents.

2 The significance of constructing a blended online and offline teaching model

The MOOC+flipped classroom teaching model has rapidly developed in China, providing a development path for the informatization and internationalization of Chinese universities. However, for university education, MOOC that is open to society is not entirely suitable for the teaching activities of college students. There are certain differences between social students and students, and teachers have certain limitations in management. Therefore, a new teaching model of "SPOC+flipped classroom" has emerged.

The teaching model of SPOC+flipped classroom has achieved good results and has been recognized by students. SPOC+flipped classroom is a manifestation of the value of online education in Chinese universities. The audience of MOOC is mainly social learners, emphasizing the sharing of high-quality resources, while SPOC is mainly open to students on campus, emphasizing student management. By combining the advantages of MOOC and SPOC, differentiated teaching for students at different levels and foundations can be addressed. The teaching model of "MOOC+SPOC+Flipped Classroom" combines the advantages of MOOC and SPOC to solve differentiated teaching for students at different levels and foundations. In 2018, the university computer teaching team of Xi'an University of Posts and Telecommunications conducted a teaching reform pilot using "MOOC+SPOC+Flipped Classroom", and found that this model cultivated students' abilities in cooperative learning and deep learning, while significantly improving their learning enthusiasm and initiative.

To sum up, the development of "Internet plus" technology has promoted the promotion of the "MOOC+SPOC+Flipped Classroom" teaching model. More and more domestic and foreign universities have begun to use this teaching model for practical research, with a view to improving teaching quality and promoting education development.

3 Design of blended online and offline teaching mode based on "MOOC+SPOC+flipped classroom"

In the context of the new engineering discipline, guided by job requirements, student-centered, and teacher led, with the help of "learning communication", knowledge is project-based and task-based, and real work tasks are used as carriers to reconstruct the knowledge system. Ideological and political education is integrated into the entire teaching process, and professional education is organically combined with ideological and political education to cultivate students' ability to solve practical problems.

(1) Rapid Construction of SPOC Learning Resources Based on MOOC Resource Reuse and Fast Course Technology

Reforming the original classroom teaching mode, making good use of high-quality MOOC resources, and establishing customized SPOCs are the prerequisites and key factors for implementing flipped classroom teaching. Based on the teaching characteristics of new courses, analyzing the similarity and overlap with the corresponding course knowledge points in MOOC resources, evaluating and effectively restructuring the reusability of MOOC resources; In response to the shortcomings of reusable MOOC resources, we fully utilize fast course technology to supplement and optimize course learning resources

through self-service recording of micro course short videos, in order to achieve the rapid construction of online course learning resources.

(2) Flipped classroom teaching process based on SPOC

① Course preparation

In the blended education model, pre class preparation must analyze three elements: learning objects, educational content, and learning environment. The analysis of learning objects should be based on the students' majors, grades, and learning abilities; The analysis of teaching content focuses on curriculum design and planning, learning difficulties and common problems, and educational objectives; The analysis of the learning environment is divided into physical classrooms and online online classrooms. For the systems used in online classrooms, teachers should timely guide students to familiarize themselves with platform related operations to avoid affecting course progress and teaching effectiveness.

② Design of online teaching activities

For teaching units, teachers need to create or find suitable micro course resources, usually including micro videos, micro tutorials, micro teaching plans, and auxiliary learning materials, through which students can preview online. Firstly, it is necessary to understand the tasks and learning outline of this learning session, then complete the pre class tasks assigned by the teacher, and then conduct pre class knowledge discussions and problem organization in groups to prepare for class presentations. The main task of teachers in flipped classrooms is no longer to directly impart knowledge to students, but to guide students in discussions, identify problems, raise questions, and solve them. Teachers should create a good learning atmosphere in specific online teaching based on specific situations, such as designing quiz sessions, brainstorming and discussion sessions, interactive evaluation sessions, etc. Specific activities can be designed according to the actual situation.

③ Design of offline teaching activities

Pre class preview: Before the course starts, students will learn online short films, tutorials, teaching plans, and auxiliary resources based on the pre designed content positioning requirements by the teacher, and build their personal knowledge system and emotional value on this basis.

After class testing: Testing is a means to test the learning effectiveness of students. Teachers can call corresponding test questions based on different knowledge points and difficulty levels to test students. They can search for them from the question bank resources or edit the test questions themselves.

Group activities: Group cooperation activities can not only enhance students' cohesion, but also enhance their enthusiasm for learning. Teachers can organize group cooperation to complete assignments, and students can continuously improve their overall quality through teamwork.

Mutual evaluation activity: Mutual evaluation can encourage students to learn from each other and examine their own shortcomings and understanding through the homework of others. After students take notes in class, they upload the notes to the platform and rate each other, which will be included in the grade range.

(3) After class summary and evaluation

The after-school grades mainly include four parts: online learning participation assessment, online test assessment, in class discussion assessment, and after-school report assessment.

Online learning participation assessment accounts for 30%. Mainly tests the duration of students watching videos and the quantity and quality of online interactive questioning.

Online testing and assessment account for 20%. This includes online course quizzes and online unit assignment grading.

In class discussion and assessment account for 35%. In class discussion grade=inter group grade of the whole class+intra group grade of the group. The grades within the

student group are determined using the "forced distribution method within the group", and are assigned points within the group based on the individual's contribution to the group discussion, with a maximum score of 10 points.

(4) After class summary report assessment accounts for 15%. Teachers conduct comprehensive evaluations based on the quality of reports written by students and the degree of comprehensive internalization of knowledge. They also recommend relevant learning resources to students who have incomplete internalization of knowledge, and conduct interviews if necessary.

4 Teaching feedback design

Online grade analysis: Based on platform data, analyze students' homework scores, test scores, attendance rates, exam scores, etc., combined with their performance in SPOC classrooms, to explore the impact of "MOOC+SPOC+flipped classroom" on student grades and actual teaching effects.

Quality inspection of offline activities: Based on the analysis of the quality of notes taken by students in peer evaluation activities, the results of after-school tests, and the presentation of group activities, the quality of students completing teaching tasks can reflect whether the learning effect of students in blended learning mode has improved compared to pure offline teaching.

Based on the joint evaluation of teachers and students, the "process + end" assessment is combined online and offline. Increase the proportion of process assessment, not only pay attention to online learning and classroom interactive performance, but also increase project stage and innovation assessment. Online learning (10%), project stage assessment and acceptance assessment based on teacher-student evaluation (20%), offline classroom performance and interaction (5%), innovative assessment of the integration of course competition and certificate (5%), course design and defense to test students' independent development ability (20%), and written examination (40%).

The teaching team was organized to prepare course resources and manage the platform, and a total of 100 teaching videos and course PPTs, test questions, and exams were prepared online resources such as test questions. The offline resources are the textbook "Computer Basics" and a dedicated workbook.

Determine the online class schedule and teach in strict accordance with the teaching calendar. Students are required to complete the learning and tasks of the online video in advance, for students

The questions raised are summarized and given timely feedback, and the teacher team conducts special design for offline teaching for common problems to improve student learning

Efficiency. After class, students are guided to review and review in a timely manner, and use offline interaction to organize and review knowledge.

At the end of the course, a sample questionnaire was distributed and statistics were collected to analyze and evaluate the educational effect, reflect on the results, and propose improvements opinion.

5 Optimization of blended online and offline teaching mode based on "MOOC+SPOC+flipped classroom"

(1) Optimization of teaching content and teaching environment

In MOOC+SPOC+flipped classroom, students first engage in self-directed learning, consolidate the content they have already mastered based on their actual situation, and

spend more time on problems they do not understand, thereby improving learning efficiency. Through the design of online and offline teaching activities, teachers will continue to enrich teaching content, enabling students to acquire more systematic and in-depth knowledge, stimulate their desire to discover problems, and improve their problem-solving abilities. In the hybrid teaching mode of "MOOC+SPOC+flipped classroom", students can participate in learning independently before and after class. Teachers provide students with rich online learning materials and an open learning environment, breaking the limitations of time and space and increasing opportunities for independent learning. If students encounter complex problems, they can also directly seek help in online discussion areas, and teachers or other students can promptly answer the questions, further improving their learning efficiency.

(2) Optimization of teaching course design features

When designing unit learning content in teaching courses, it is necessary to analyze the teaching content and strive for the completeness of teaching knowledge. When designing courses for each unit, attention should be paid to the rationality and logicity of the knowledge framework to stimulate students' interest in learning. Curriculum design should focus on the key and difficult points of course learning, provide detailed explanations for problems that students find difficult to master, design questions based on the characteristics of knowledge points, and incorporate them into the classroom.

(3) Highlighting the teaching subject and teaching focus

The main body of any teaching mode is the students, and compared to traditional teaching modes, blended learning mode emphasizes the degree of personalization for students. Each student has their own unique personality and learning system. In this blended learning mode, students can be classified and grouped, and students who have spare time can strengthen their after-school expansion for multi-dimensional learning. For example, serving as a team leader, leading the group in learning activities to exercise one's abilities and engage in deep learning. Students who have difficulties in learning can also gain a deeper understanding of the problem and master the learning content with the help of the group leader.

(4)SPOC learning resources based on MOOC resource reuse and fast course technology are quickly established

Reform the original classroom teaching mode, make good use of high-quality MOOC resources, Combined with the teaching characteristics of the new course, the similarity and overlap with the corresponding course knowledge points in the MOOC resources are analyzed, and the reusability of the MOOC resources is evaluated and effectively reorganized.

(5)Reflection on teaching

Based on the blended teaching mode of "MOOC + SPOC + flipped classroom", it is found that the learning effect and learning motivation of students have been significantly improved through investigation and analysis, which can better impart knowledge to students, enable students to develop good independent learning habits, and comprehensively improve their personal quality. However, there are some issues that need to be further improved.

First of all, some students are not suitable for this new blended teaching model. It is mainly manifested in the fact that some students are not active in the learning of flipped classrooms, there is zero interaction in online classes, and some students always wait for motivated students to ask questions and wait for teachers to answer.

In response to this situation, teachers can link the speaking rate of online classes to assessment results to promote student participation and interaction and strengthen self-directed learning.

Secondly, the online course resources are not rich enough. It is manifested in the lack of MOOCs and micro-videos in some colleges and universities, which is due to the limitations of hardware facilities and faculty, and the limitations of students' learning resources. In response to this problem, colleges and universities can expand the literature reference database, purchase high-quality course resources, or organize their own teachers to record relevant videos to meet students' requirements for subject knowledge resources.

Finally, the teaching process needs to be diversified. There is no doubt that the blended teaching model of "MOOC + SPOC + flipped classroom" has a certain impact on students' learning behavior, and the design of its teaching methods needs more practice and exploration to continuously stimulate students' enthusiasm and initiative. Teachers need to design flexible and practical interactive sessions, and they need more practice and research.

6 Summary

Whether it is MOOC, SPOC, or flipped classroom, they are all teaching models that have completed the transition from "teaching centered" to "learning centered". Regarding learning methods, the above models provide possibilities for students to maximize their learning autonomy and opportunities for choice. The blended teaching model of MOOC+SPOC+flipped classroom is a breakthrough innovation in the transformation of teaching mode. By integrating this model into the database principles and applications course, course sharing has been further developed, while also localizing the course and providing students with more personalized learning plans to promote effective self-directed learning. Under this new teaching model, cultivating students' good computer thinking and innovative abilities, realizing the transformation of knowledge, and playing a positive role in their further development.

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