
RESEARCH AND EXPLORATION ON SPOC TEACHING MODE DURING COVID-2019 PREVENTION AND CONTROL

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ABSTRACT

In the context of the sudden impact of COVID-2019, which hindered the offline teaching. SPOC is an online education form with scale limitation and access threshold rising in recent years. Its characteristic is that it organically combines SPOC online learning with offline classroom learning based on the technical support of the Internet. By giving full play to the advantages of the two teaching modes, it can effectively solve the problems of tight number of class hours and single teaching form in traditional teaching. Through the analysis of SPOC research background and application cases, this paper defines the advantages of SPOC teaching practice compared with traditional teaching practice, and analyzes the design process of SPOC mixed teaching mode in the Application Advanced of Office Software.

Key Words: SPOC; COVID-2019; Online and offline; Advanced Application of Office Software.

1. INTRODUCTION

1.1. Background of SPOC research

《13th Five-Year Plan of National Education Development》 pointed out that the teaching of universities should use the information technology of big data and cloud computing to promote the development of Internet plus Education, and promote the co construction and sharing of high-quality educational resources. Under the background of "Internet plus Education", the new teaching mode that combines new technologies and developing online and offline teaching has become the focus of in Colleges and universities [1]. Online education has been developing rapidly in the context of the sudden impact of COVID-2019, which has led to the obstruction of offline teaching. MOOC (massive open online courses, also known as MOOC), born in 2012, has set off a new upsurge of online education. The emerging technology represented by MOOC is gradually applied to education and teaching, which provides a new driving force for the reform of teaching methods and teaching modes to a certain extent. However, due to its disadvantages such as high cost, high registration rate and low pass rate, a small private online course (SPOC) based on MOOC platform came into being. SPOC is deeply concerned by the educational and academic circles and is considered to be a typical new form of online learning. SPOC online learning teaching mode is suitable for small-scale user groups such as a single school and class. It is more suitable for the relatively closed educational environment in the school.

It is integrated with offline classroom learning, which is convenient for teachers teaching management and students learning evaluation, and helps to improve class completion rate and

learning achievement. Therefore, using SPOC to make up for the shortcomings of traditional classroom teaching and change the traditional classroom teaching mode is a problem worthy of research. This paper constructs the mixed teaching mode of advanced application of office software course through SPOC, which provides a new idea to deal with the classroom teaching reform in Colleges and Universities.

1. 2.SPOC and application cases

SPOC (Small Private Online Course) was first proposed by Professor Armand Fox. Among them, "small scale" refers to the limited scale of students, generally about dozens of students, while "restrictive" refers to the fact that the classroom has a certain access threshold and can enter the online course after passing the examination. Compared with the large-scale and open MOOC, the SPOC model has strict restrictions on the size and access threshold of students, which can effectively improve the flexibility of online teaching [3].

Many universities at home and abroad have carried out different forms of SPOC teaching practice while carrying out MOOC teaching. Harvard University tried to teach some MOOC courses in small classes. In 2013, Harvard University conducted SPOC experiments on three courses, namely "copyright law", "major challenges faced by American national security strategy and media" and "architectural imagination". Students study on MOOC after class, and then the teaching assistant organizes students to discuss in groups and take the exam after learning. The "software engineering" video and other course materials offered by Professor Armand Fox on the EDX platform are applied to the traditional classroom, allowing students to self-study before class, and teachers answer students' questions in class to test students' mastery [4]. After one semester of SPOC course, the enrollment of the course has increased nearly fourfold, and the teaching effect is also very good. Fox team also provided the SPOC course of "software engineering" to four other universities in the form of elective courses and compulsory courses, and achieved remarkable results.

Since 2013, many domestic universities have also carried out SPOC experiments. Tsinghua University introduced the "cloud computing and software engineering" course of the University of California, Berkeley in 2013. This course is the first batch of SPOC mixed teaching model pilot courses of Tsinghua University, which is opened for 30 computer science experimental students. The course videos are all original English videos. Students need to watch the course videos on the platform before class. In the classroom teaching of each three study hours, during one class hour, teachers and students discuss the key and difficult problems of the course content and analyze the code together. Students show the experimental design ideas through slides or present the experimental results on site, and teachers elaborate and broadcast the key knowledge points and key concepts on demand;

In the remaining two class hours, students complete their learning tasks by pair programming. The platform system corrects the submitted programming questions in real time and automatically provides feedback. At the end of this course, the average score of 30 students in

Tsinghua University was basically the same as that of students studying this course at Berkeley, which improved the teaching effect of this course. In addition, the "circuit principle" course, "data structure" course, "C + Programming" course and "Chinese architectural history" course of Tsinghua University also carried out SPOC course experiments in the University. Since 2014, "school online" has successively built SPOC platforms for Tsinghua University, Fudan University, University of science and technology of China and nearly 100 domestic universities and institutions. SPOC in domestic universities are developing rapidly. By 2018, "school online" had more than 1800 mixed learning courses, covering 44000 students, and built more than 460 SPOC platforms for schools and institutions across the country.

Based on the above analysis of SPOC teaching practice at home and abroad, relying on MOOC course to carry out flipped classroom teaching, SPOC teaching has the following advantages compared with the traditional teaching mode. Firstly, high-quality teaching resources have been fully shared and utilized. Teachers can integrate excellent teaching videos and other materials and expand teaching ideas through MOOC platform; Through MOOC platform, students can obtain high-quality learning materials and accept world-class teaching. Secondly, SPOC redefines the role of teachers and provides personalized teaching. MOOC courses are more suitable for general courses. The main role of teachers is to provide resources for global learners. SPOC allows teachers to return to the campus and their own classroom. Therefore, compared with MOOC, SPOC redefines the role of teachers and stimulates teachers' enthusiasm and classroom activities. Thirdly, SPOC gives full play to the advantages of blended learning. SPOC mode is essentially a mixed learning mode. Its biggest advantage is that through the introduction of MOOC resources, it greatly reduces the difficulty of carrying out mixed learning, but can enjoy many benefits brought by mixed learning, such as convenient platform use and course customization, which liberates teachers from teaching repeatedly in the classroom, Thus, the saved time is used to understand the learning state of students and give individual guidance; By releasing the learning content in advance and helping students, we can narrow the differences between students. In short, in the SPOC model, teachers are responsible for the integration and management of teaching resources. They can integrate offline physical education resources and online education resources according to the limited students' learning ability, learning progress, learning objectives and learning foundation. Through the data provided by SPOC platform, teachers can fully grasp students' learning situation and shortcomings, and guide students in class according to the problems in students' learning process. This learning method can effectively stimulate students' learning motivation, cultivate students' learning ability, and then improve the quality of classroom teaching [5].

2. SPOC MIXED TEACHING PROCESS DESIGN DURING EPIDEMIC PREVENTION AND CONTROL: TAKING 《ADVANCED APPLICATION OF OFFICE SOFTWARE》 AS AN EXAMPLE

Preparation: The preparations before the class mainly include: revising the syllabus, writing the teaching calendar, starting SPOC courses based on online open courses, commissioning and testing SPOC courses, investigating students' home learning conditions, etc.

Classroom teaching: Classroom teaching mainly includes: guiding students' pre class preview, classroom live broadcast, teacher-student interaction, student-student interaction, publishing learning tasks, arranging and feeding back the completion of homework, student learning process monitoring and effect evaluation.

SPOC hybrid teaching process design

As a compulsory public basic course in Colleges and universities, 《Advanced Application of Office Software》 aims to cultivate students' computer quality and the ability to think and solve problems using computer technology and methods. At the same time, it can also use computational thinking to learn other subjects. The purpose of this course is to enhance the students' literacy in the computer operation aspects, and train students' ability to experience in using OFFICE software. Through the explanation to the advanced application skill and actual application of OFFICE software, enables students to process the Word document, Excel electronic form, PPT document, Access database, Visio software nimbly according to the actual need.

According to the characteristics of the course, SPOC online learning and offline classroom learning are adopted (as shown in Figure 1). Both links make full use of SPOC online course resources, follow the double master principle of "students as the main body and teachers as the leading", integrate the advantages of online and offline teaching, and promote the personalized development of students. The common subject of the teaching process is teachers and students, and the object is the project task. The teaching subject carries out activities for the object through SPOC online platform and offline classroom environment. In the activity, teachers act as resource designers, task organizers, instructors and promoters, and use the respective advantages of online platform and offline classroom environment to design elements such as situation, cooperation, communication, operation and detection; Students complete project tasks through independent and cooperative learning of individual or group members [6].

2. 1. SPOC online learning-the process of knowledge acquisition and construction

This link is completed before class. Teachers and students use SPOC online course to interact. Teacher complete unit content preview and guidance, and student complete unit content autonomous learning and leading task learning. The specific links are as follows: students watch videos, test themselves, participate in forum discussions, etc. on the SPOC platform according to the learning task list, and fill in the task list according to their own learning situation. The main responsibilities of teachers are as follows: (1)Recycle students' task list. (2) According to the feedback results of students' learning task list, new videos, tests or forums are designed to solve students' problems, which is just different from MOOC. Specifically, teachers need to push corresponding resources according to students' feedback, so that the design of curriculum resources has been in dynamic change, Teachers can also incorporate more concentrated problems in the class into offline classroom learning to complete difficult explanations. (3) Teachers need to regularly participate in students' discussion and interaction to guide students to in-depth discussion. (4) Teachers can check the students' learning progress at any time in the background of SPOC platform, and know whether each student is fully prepared before class

through the completion of students' leading tasks, small tests and topics. If the progress is different from expectations, they can send reminders to students online to urge students to learn. Teachers' understanding of students' learning situation provides a basis for the design and adjustment of classroom teaching scheme, makes classroom teaching more targeted, ensures the learning effect of all students, and completes the first step of in-depth learning - knowledge construction.

2. 2. Offline classroom learning-the process of knowledge transfer and reflection

After completing the first step of SPOC online learning, students must participate in offline classroom learning to complete the second step of in-depth learning-knowledge transfer and reflection. This session focuses on problem solving. Students' learning is divided into the following four steps: (1) Ask questions according to their own learning situation. The "questions" mentioned here can be difficult knowledge points encountered in learning, or practical tasks that need to be solved with the learned knowledge. (2) Under the guidance of teachers, students carry out group cooperation to explore and get the solution to the problem. This requires students to clarify the problems to be solved, and extract the learned knowledge for new situations according to the requirements. (3) Students display the final solutions and ideas through platform or on-site demonstration.(4) Students evaluate the results of other groups, and modify and optimize the original works according to the evaluation and feedback of teachers and students.

The main work of teachers is as follows: First of all, teachers need to summarize the problems that put forward by students, and give targeted and selective secondary explanation and troubleshooting for the difficult points that fed back by students. Secondly, according to the practical problems put forward by students, teachers should summarize, and select valuable and meaningful problems to carry out in-depth exploration. Teachers guide the students to discuss according to the groups in the early stage. Since these practical activities may be new and difficult for students, the role of teachers is to reduce existing difficulties through individual guidance, provide necessary help to students when students "get stuck", and supervise all students to actively participate in exploration. Third, teachers need to verify students' solutions. After the inquiry activity, the students will show their own scheme. Teachers need to verify the students' scheme, give students clear right and wrong standards, and ensure that the errors can be corrected in time. In completing the evaluation of each group solution, teachers need to summarize the results of self-evaluation, mutual evaluation and teacher evaluation, guide students to reflect on the exploration results and critically accept, transfer and apply knowledge. At the same time, record the difficulties encountered by students in the learning process, and push new SPOC online learning resources on this basis.

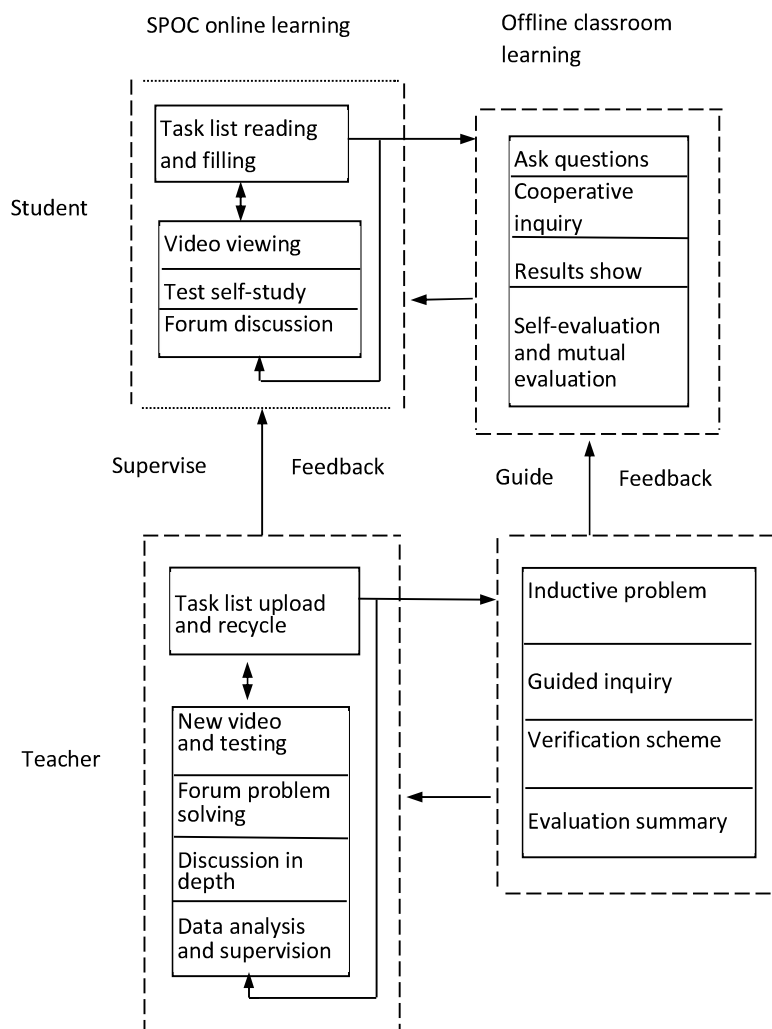


Figure 1 .Design of online and offline hybrid teaching process based on SPOC

3. SUMMARY AND PROSPECT

Through the investigation and feedback of the course, SPOC mixed teaching mode makes the course content richer and the course system more complete; The combination of SPOC online learning and offline classroom learning makes students have higher utilization rate of fragmented time, stronger interest in learning in class, improved theoretical level and practical ability at the same time, and more efficient learning efficiency; The combination of online and offline assessment makes students' learning enthusiasm higher and the assessment form more fair. The online survey after class shows that SPOC teaching is also insufficient at this stage. Teaching

resources such as animation and micro courses need to be further enriched, and the coverage of online test topics is not comprehensive enough and needs to be further improved [7]. The application practice shows that the development of SPOC conforms to the teaching law, which brings hope to improve the teaching effect and education quality. However, the development of MOOC and SPOC still needs to be explored to find a development path more suitable for the actual situation. The implementation of MOOC and SPOC is not the ultimate goal of teaching, but a teaching means. The purpose of any teaching method is to improve students' learning interest, make full use of the strong practical characteristics of computer courses, and combine online and offline teaching, so as to better promote the teaching development of computer courses in Colleges and Universities [8].

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