

Research on the Problem Solving of Implementation for the Flipping Classroom Model Based on SPOC

—Taking Computer Network Course as an Example

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Abstract: In order to achieve a comprehensive "deeper integration" of information technology and education, to realize the change of the teaching paradigm which "taking students as the center", to further explore the new teaching model. This paper first analyzes the connotation and advantage of "SPOC", thinks that SPOC is more suitable for the centralized management model in China's colleges and universities, and from the angle of application to combine with the construction implementation of computer network course based on SPOC model, discusses the solution in the implementation.

1. Introduction

Flipping classroom is one of the teaching modes that the educators at home and abroad have paid more attention in recent years, the basic idea is to overturn the traditional teaching process of "teaching knowledge in class and completing homework after class" in the environment of information technology. This new form of education and teaching subverts the traditional classroom teaching mode. SPOC (Small Private Online Course), first carried out by the director Armand Fawkes who was responsible for MOOC in university of California at Berkeley, the main purpose is to make up the deficiency of MOOC in the school teaching, so that MOOC resources can be applied to small groups of users, and even can be used in a school or a class. SPOC combines online learning with offline teaching, that is, "SPOC=Classroom+MOOC".

Therefore, this paper focuses on the analysis from the angle of problem solving in the concrete implementation of flipping class based on SPOC, and has no more details about the positive effects of the implementation for computer network SPOC course, the purpose is to put it on the application.

2. The concept and characteristics of SPOC

The focus of this paper is to explore the specific implementation process of SPOC course teaching, so that only makes a brief introduction to SPOC.

2.1 The concept of SPOC

SPOC (Small Private Online Course, abbreviated as SPOC), the means in Chinese is "small private online courses". SPOC is a new development in the teaching of course teaching in colleges and universities, is online courses specially designed for college students, adopts the blended learning model of classroom teaching and online teaching.

2.2 The characteristics of the SPOC

(1) The model is free. SPOC teaching content can be a superset of MOOC, through the blended learning of online discussion and offline class (including flipping classroom) to achieve SPOC model, so SPOC= MOOC + the model of supplementary communication.

(2) Reflect the whole process of learning.

(3) The attendance rate will be increased.

(4) Ensure the progress is consistent.

(5) Embody the self-construction process of knowledge, embody the constructivism principle of learning.

(6) Teach students in accordance with their aptitude.

(7) Responsibility and honor.

(8) The right to choose the course.

(9) SPOC more emphasizes to give personalized, complete and deep learning experience to students, making students more rigorous certification and evaluation to make course certificate more effective, to improve the completion rate and learning quality of courses.

(10) The cost of SPOC is relatively low

3. Problems and solutions in the teaching practice of computer network SPOC model

There is more consensus on the concept of SPOC and the advantages reflected in the teaching. At present, the key problem is more application phase and how to solve the problems encountered in the process of practice, which may be more practical significance for later implementation.

3.1 Get support

The SPOC course consists of two inseparable parts of the online and offline (classroom). Therefore, to carry out the teaching of the SPOC course must be supported by the two big environment of online and offline, the external support need to be obtained is mainly shown in the following aspects.

(1) Get support from the school.

(2) Get support from the secondary school or department

(3) Get support from the companies who engaged in educational resources and software development.

(4) Rent the existing SPOC online platform.

(5) Get support from the offline environment. The offline environment is solved by the school, the teaching of SPOC's offline classroom can not be completely out of line, teachers will also use the online platform at any time in the classroom offline. Therefore, in addition to the basic conditions of the classroom, the offline environment can also be used to connect to the school's LAN or Internet.

3.2 The implementation of computer network SPOC course

Only in the case of online and offline and resource construction, then we can start the lesson smoothly.

(1) Determine the problem for the construction of the SPOC online platform for computer network. In order to enable the teachers to focus more energy on the design of the SPOC course and the construction of the related resources which can truly reflect the construction of the SPOC quality, should choose to cooperate with the company, the company offers SPOC online platform, and is responsible for the tasks, such as courses videoing, video making and so on.

(2) Computer network course itself is to teach about computer network theory, and online learning platform itself is based on computer network technology, online learning can directly feel the network function.

3.3 The processing of teaching relationship online and offline

SPOC course is a complete course teaching system, how to grasp the teaching relationship between online and offline is particularly critical in SPOC teaching. Therefore, we mainly consider it from the following aspects.

(1) The content of online teaching is based on "important and difficult knowledge". The characteristic of this method is to let students learn important and difficult contents online first, and then teachers explain and discuss the contents that students do not understand online learning, that is to focus on teaching important and difficult contents. The disadvantage is that students will have the fear of emotions when they learn the difficult points directly online, is not conducive to

mobilize the enthusiasm of active learning.

(2) Online courses are based on the basic concepts of basic knowledge. It is suitable for the beginners' psychology, which is helpful to mobilize the enthusiasm for the students to learn online, and meet the knowledge structure level and cognitive process for the students, to explain some difficult and important knowledge offline, to give full play to the advantages between the teachers and students in the face to face communication, so that the offline classroom is more attractive.

3.4 Focus on building an offline discussion environment

In the teaching process of computer network SPOC course, according to the different requirements of SPOC classroom teaching and regular classroom teaching on teaching environment, in addition to teachers focus on explaining important and difficult points, should let every student have every opportunity to express or be forced to speak.

Comprehensively consider the overall design of online and offline teaching, which is also the requirement of the SPOC teaching model, to grasp the emphasis and balance relationship between online and offline.

(1) Grasp the design of online teaching. Mastering the online learning well is mainly to grasp the content of the difficulty which is the obvious characteristic of students themselves learning. In setting Online homework problems, thinking questions, extension exercises, test content, topic discussion and other aspects, the students can complete the standard through a little effort. Because computer network is a highly applied course, integrating theory, technology and industry, in order to expand students' knowledge, link to many famous IT software and hardware companies, so that students can understand the frontier technology and products of computer network.

(2) Grasp the teaching design offline. The offline classroom teaching of SPOC is separated from the traditional classroom teaching design, the difficulties and key points in designing lectures should be clear and concise. At the same time, we should carefully design the topics and contents discussed in the offline classroom as an indispensable part.

4. Evaluate problem

Evaluation is very important in the teaching of SPOC model. In the examination of teaching in colleges and universities, the evaluation plays a role of the baton for the students. The SPOC course is composed of two parts of online and offline, so it is obviously different from the traditional evaluation. The assessment is carried out in the following aspects.

4.1 Assessment to teachers

Teachers are the leading and concrete implementers of the course, and play the important roles in the realization of the SPOC teaching process. Evaluation and assessment should be carried out mainly in the following aspects.

(1) Whether the assessment has carried out the teaching standards of SPOC course. This point is very important, and it is the key to ensure that the big direction is not out of shape.

(2) To highlight the evaluation and inspection of updating and construction for various online resource. Because online teaching is an integral part of SPOC, there is a clear proportion and time node requirement for improvement and updating of online resource, this requirement is strictly implemented in computer network SPOC course.

(3) To develop computer network teaching and experimental syllabus suitable for SPOC model. Modify the previous teaching and experimental syllabus and teaching schedule, adjust the class hours, rewrite the script and teaching contents of computer network course according to the requirements of SPOC course, to complete two syllabuses are completed online and offline.

4.2 Evaluation and assessment to students

Whether the assessment to the students is scientific and reasonable is directly related to the success or failure of the computer network SPOC course. How to achieve the effect of mutual promotion, mainly from the following aspects to achieve.

(1) The form of assessment is approved by the academic affairs office of the school. For the assessment for one course, generally has two ways for the test and examination, most schools require that the test scores should be made up of a certain percentage of grades and test scores, therefore, we communicated with the academic affairs department in advance and explained to the students after obtaining the agreement, to attract the attention of students.

(2) The composition of students' grades should be in the best proportion. The results of the computer network SPOC course are mainly composed of three parts, one is the comprehensive scores of online learning, is mainly to give the evaluation and achievement of each student by the examination and analysis function of the online platform. The two is offline classroom discussion, interactive performance evaluation score, attendance and so on, and the three is the examination results. Because the teaching method of SPOC is still at the stage of practice development, in order to arouse students' equal attention to online and offline learning, to allocate the proportion that the test paper accounts for 60%, the offline class discussion performance accounts for 20%, and online learning evaluation accounts for 20%.

(3) Teacher plays a major role on the assessment of SPOC course. Students' online assessment can be basically given by online platform function, but for the overall performance of offline classroom for students, especially is students' performance in topic discussion and interaction, teachers should not only guide students, but also need to evaluate students' performance.

(4) The phased tests use a flexible and diverse way. The purpose of the phased tests should be clear, and the form and content should be flexible. Not just limited to conventional written form, can also let the students write the phased summary for personal learning courses, such as when learn network layer concept of knowledge learning, to let the students write a report on the performance level of the router product merchants and their routers corresponding to this layer, to enhance students' knowledge from the principle to technology and finally to the product understanding, to strengthen students' engineering thinking.

(5) Make a phased summary of students' performance. This is an important way to enhance learning process, need to take time to communicate with students in class face to face, so as to remind students for next learning behavior.

In conclusion, the teaching mode of SPOC course is to emphasize students' self-construction of knowledge and reflect the constructivist cognitive principle. Therefore, the examination and evaluation of students should also embody this kind of thinking.

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