

On-line and Off-line Hybrid Teaching based on SPOC: A Case Study of “Network Attack and Defense” Course

Lei Zhang

Taishan University, Tai'an 271000, Shandong, China.

Abstract : Based on the online-online-offline mixed mode of teaching reform, the teaching objective of “Network attack and defense” course is redefined, and the teaching reform and exploration are carried out from the aspects of teaching content, teaching methods and examination methods. Through the implementation of the scheme, the hybrid teaching reform mode has greatly enhanced the students’ initiative in learning, improved the teaching effect, and improved the students’ environmental quality and comprehensive quality. Combined with the characteristics of “Network attack and defense” course and the current situation of teaching, the online and offline hybrid teaching reform is carried out by using SPOC platform. On-line and off-line mixed teaching can arouse students’ study enthusiasm and autonomy, give full play to students’ main body status, help to improve the teaching quality of courses, and break the traditional teaching mode.

Keywords : SPOC; Hybrid Teaching; Network Attack and Defense; Teaching Reform

In the long history of teaching development, the traditional face-to-face teaching has always occupied the absolute dominant position, and it is the only teaching method in the school for a long time. With the development of information technology, traditional teaching methods have been broken. The use of information technology to enrich teaching methods, improve teaching efficiency, improve teaching quality, reasonable allocation of teaching resources has been widely recognized by the world, especially in the developed countries. “Network attack and defense” is a major basic course for computer science and technology, software engineering, network engineering, engineering and digital media technology, students will be able to fully understand and master the basic theories, principles and implementation strategies of the computer “Network attack and defense” management and control system, including computer operations, the history of the system, classification, basic functional composition (process management, processor, management, memory management, file system, etc.), as well as the implementation of the functions of the strategy and methods, it is necessary to deepen students’ understanding of the theory through the network attack and defense experiment. The traditional offline teaching mode is more inclined to “Cramming” teaching, which can not fully arouse students’ learning enthusiasm, lack of interaction in class and single teaching mode. In order to avoid the drawbacks of completely offline teaching model, this paper explores the reform of online offline mixed teaching, taking the course of “Network attack and defense” as an example.

1. The characteristics of the course “Network attack and defense” and the current teaching situation

“Network attack and defense” this course is characterized by more theoretical content, concepts, relatively abstract, more difficult for students to understand, not easy to grasp; At the same time, the course covers a lot of experimental content. Therefore, “Network attack and defense” is both theoretical and practical, with closely related to a professional basic courses.

There are some deficiencies in traditional offline teaching mode:

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(1) In the traditional offline teaching mode, most students do not prepare for the lecture and have no idea of the content of the lecture. The passive learning of students also affects the quality of teaching and is not conducive to the development of students' autonomous learning ability and thinking ability.

(2) The traditional offline teaching time is limited, the teacher's knowledge teaching, the teaching process can not be replayed, some students can not digest the classroom knowledge in time, some knowledge points are not fully grasped and so on.

(3) The traditional offline teaching is relatively simple, and the composition of scores mainly includes classroom performance, homework completion and final examination results. It is not possible to pay much attention to the process assessment, it is impossible to establish a comprehensive evaluation system of curriculum achievements.

2. On-line, on-line and off-line hybrid teaching reform measures

In order to solve the problems of the above-mentioned traditional offline teaching mode, this paper explores the online-offline hybrid teaching reform of "Operation and system" course based on SPOC platform.

2.1 Construction of online teaching platform

Using Chinese University MOOC platform to construct asynchronous SPOC course of "Network attack and defense". Asynchronous SPOC is a resource that can be added or deleted according to the course schedule of the instructor. According to the teaching, syllabus and teaching plan of the "Network attack and defense" course, the "Network attack and defense" course group determines the asynchronous SPOC matching course resources through many discussions, and according to the sections of the school teaching materials, set the content of the adjustment, while setting up online discussion area, background monitoring students, online learning.

2.2 Online and offline blended learning process

Taking Taishan University as an example, this paper introduces the online and offline hybrid teaching process based on SPOC.

(1) Preparation before class. The teachers set up QQ group of "Network attack and defense" course, which is convenient for the sharing of course materials and real-time communication of course questions. Teachers and students complete the MOOC registration certification in Chinese universities, teachers go into the course management background, complete the high-quality course copy, release the announcement, release the teaching unit content and so on. Teachers who teach based on asynchronous SPOC can adjust the order, release time and add or delete the content of the course according to the syllabus, teaching plan and teaching material. In a Chinese University MOOC, instructors can create lesson preparation zones and add classroom related teaching and learning activities such as exercises, questionnaires, announcements, and discussions. In the preparation area, teachers can also add lesson plans to facilitate better teaching activities. The MOOC platform also offers an offline teaching aid, a Wechat app called MOOC classroom, where teachers can create classes, add check-ins, in-class exercises, discussions and other teaching activities. Students learn on their own according to the learning videos released by the teachers, who monitor the learning progress through the background.

(2) Instructional design in class. First of all, the use of "MU class" Wechat applet, the procedure check-in, statistics of student attendance. Secondly, taking students as the main body, the class will be handed back to the students, and the students will take the initiative to raise the existing problems through video learning before class. The teachers will organize students into sub-groups to discuss and analyze the problems, and then the groups, ask each other questions, teachers in this process to each group, each group, members score, as one of the process assessment indicators. Teachers can also make use of class hair, set time-limited in-class topics. Finally, the teacher summarizes the content of this lesson, points out the key points and difficulties, and shows the learning situation based on SPOC platform, so as to improve students' learning enthusiasm and autonomy.

(3) Consolidation of knowledge after class. After class, students can review the content of last class online through SPOC, and finish the post-class exercises published in SPOC within a specified time. This can help students consolidate and deepen their knowledge. After students submit their assignments, the objective questions can be graded automatically by the system, the subjective questions can be graded online by the teacher, and the teacher can analyze and evaluate the students' homework through the online platform.

2.3 Advantages of blended learning

Compared with the traditional offline teaching mode, the online-offline hybrid teaching mode has more obvious advantages. The online-offline hybrid teaching based on SPOC enables students to preview and understand classroom knowledge by watching video resources, thus effectively improving students' learning autonomy and stimulating their interest in learning. With the help of the online platform, students' learning is not limited by time and space, students can make full use of time and improve learning

efficiency. The discussion class breaks the traditional classroom “Indoctrination” teaching, fully arouses the student’s study enthusiasm, trains the student’s language expression ability, the ability and the team cooperation ability. In addition, on-line and off-line mixed teaching based on SPOC makes the assessment mode no longer single, adds the process assessment and the attitude assessment, further consummates the “Network attack and defense” curriculum achievement appraisal system, make the course evaluation more reasonable and fair.

3. Conclusion

On-line and off-line mixed teaching based on Spoc breaks the traditional teaching mode and combines the on-line and off-line effectively, which is an important reform of “Network attack and defense” course. Through practice, the hybrid teaching of “Network attack and defense” course can improve students’ learning enthusiasm and autonomy, and can deepen students’ understanding of “Network attack and defense” knowledge. Blended learning has also been well received by students, and has helped to improve the quality of teaching. To do a good job of blended teaching, we need to reform and innovate every teaching link before class, in class and after class, and we still need to keep exploring.

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