



The Application Research of SPOC Mode in Mobile Terminal Application Development Course Teaching

Hongfang Cheng^(✉)

Wuhu Institute of Technology, Wuhu, China
403242688@qq.com

Abstract. SPOC, “MOOC + CLASSROOM”, is a kind of teaching solution that uses MOOC resources for small-scale and specific groups. It can combine the advantage of face-to-face classroom teaching in traditional class with the advantage of on-line communication. Taking APP Inventor programming teaching reform as an example, the teaching mode of SPOC was constructed from four aspects of pre-class analysis, resources design, learning environment and activities design on SPOC platform. It can be seen that SPOC platform has changed the traditional teaching mode and teaching method, integrated the network video resources, realized the online and offline teaching.

Keywords: SPOC · Online · Teaching mode · Teaching method
Courses resources

1 Introduction

With the development of a new generation of information technology represented by mobile Internet, Internet of things and cloud computing, huge changes of teaching philosophy, teaching objectives, teaching objects, teaching mode, teaching methods, teaching process, teaching media, etc. in college education have taken place in many ways under the impetus of information technology. Traditional classroom teaching can't meet the needs of students' teaching. SPOC is an innovative teaching theory in the information environment, which subverts the traditional teaching process.

2 SPOC

SPOC (small private online course), “MOOC + CLASSROOM”, is a kind of teaching solution that uses MOOC resources for small-scale and specific groups [1]. The basic form of SPOC is to use MOOC lecture video or on-line evaluation to assist classroom teaching in traditional campus classes, which uses mixed teaching to combine MOOC and traditional campus classroom teaching. The core philosophy of SPOC is that to tell me, I will forget; to show me, I may remember; to involve me, I can understand. SPOC applies MOOC's teaching resources online to students on a small scale, making up for

the shortcomings of MOOC effectively, such as videos, materials, quizzes, online assignments, forums, etc. [2]. As you can see, SPOC is the blended learning, combining On-line learning and offline-line learning.

3 The Characteristics of Mobile Terminal Application Development Course

Mobile terminal application development courses include JAVA programming, Android applications and development, mobile terminal system development, APP Inventor programming courses. It has the following characteristics: the more content, the less time, the abstract theories, the strong practicality. The traditional teaching focuses on explaining the theory, unifying teaching content, the uniforming teaching method, the light practice. The student has the low enthusiasm and the poor practical ability. When SPOC is applied in the teaching of mobile terminal application development, students can self-learn before class, discuss with teachers and classmates in class and after class, or discuss online according to their own actual situation. Thus students' initiative and practical ability, creativity are improved greatly.

4 The Application Research of SPOC Mode in Mobile Terminal Application Development Course Teaching

(1) *Pre-class preview*

Pre-class video learning is the basis of SPOC teaching mode. Video knowledge provides the basic knowledge for classroom teaching, and the quality of learning impacts on classroom training directly. First of all, according to the characteristics of this course, teaching objectives and knowledge, the teacher arranges teaching activities, designs each class of basic theoretical knowledge points and training exercises.

Then, the teacher makes the theoretical knowledge into a streamlined video and uploads it to the cloud computing network teaching platform, arranges the students to watch the teaching videos and complete the training and quiz of the knowledge points. in accordance with the teacher's learning tasks, combining with individual needs, the student can learn selfly [3]. Good foundation students can speed up learning, poor foundation students can slow down or watch video learning repeatedly.

(2) *Classroom teaching*

In SPOC teaching design, the leading and the organization is the teacher, the main is the student. Teachers should guide students to think about the problem divergently, and participate in class discussions and learning activities actively. In teaching, teachers should pre-arranged learning activities to guide students and complete their learning tasks actively. In the process, teachers should add some interesting learning activities, divergent problems, and teamwork learning activities. Through group discussions, group competitions, debating competitions, brainstorming and other forms, the learners learn knowledge in practical activities and cultivate team spirit.

(3) *Consolidating after-school*

Strengthen exercises after-class are a continuation of classroom teaching. The students mainly complete homework assignments after the traditional teaching. However, after-classroom teaching methods based on the SPOC platform have various means to increase the interaction between teachers and students, and among students [4]. For example, when students can't understand the knowledge point after learning a knowledge unit, you can watch the video repeatedly. Online testing after-class can consolidate the knowledge learned, and have played a very good effect on consolidating knowledge.

5 Taking «APP Inventor Programming» as an Example to Design a Case

This research takes the mobile communication specialty of a university in Wuhu as an example. It applies the SPOC mode under the mixed learning environment. There are 60 students in this major. the teaching time of «APP Inventor programming» is 16

Table 1. «Designing the User Interface.» course learning activity design form

Credit hours	Learning content	Learning target	Activity form	Learning activities design	Main body	Activity level	Activity evaluation
6 h, a total of 270 min	Chapter III: Designing the User Interface. There are seven sections of this chapter: Declarative Design, Create Startup Interface, Use alternative resources, Implement dialogs, Apply themes, Add menus, Add settings	(1) To master the various steps of the user interface design (2) To master the use of log messages debugger (3) To master the use of debugger to debug programs (4) Students report, exercise their expression skills and teaching ability	Pre-class: E-learning platform and activities after class	The students browse the video resources on the learning platform and the expanding information to complete the test questions	The students	To understand; To apply	The students design the user interface, report team performance, and complete testing online
			Classing: Teachers teach and organize group work in multimedia classrooms	The teachers use examples to explain declarative design, create startup interfaces, use alternative resources, implement dialogs, apply topics, add menus, and add settings. Students practice operation, discuss in group	The teachers and the students	To understand; To apply; To Evaluate To anti-think	
			After class: online learning platform	The students complete unit test online, discuss the difficult points in the ion area online	The students	To understand; To apply; To anti-think	

weeks. This study selected the third chapter “design user interface” for teaching design is shown in Table 1.

(1) *Pre-class analysis*

The students are in the next semester, with the basic skills of computer. The students also have greater interest and confidence in learning online. Before the class, The students browse the video platform and expanding resources pre-class to complete the relevant tasks. In class, the teacher will explain and organize reports in group.

(2) *Learning Resources*

The online learning resources include MOOC videos, 《the APP Inventor Programming》 video course produced by the faculty team from xuetang X and electronic materials.

(3) *Learning environment*

The course is conducted in a multi-purpose classroom, while students have computers, notebook PC and mobile phones to complete the operation.

(4) *Learning activities design*

The third chapter of this course is mainly conducted in the form of works submitted by students. The students design different interface contains what he learned in group, and then report the class works. And finally, the teacher comment, sum up and explain the emphases and difficulties. After class the students complete the test online. Teachers complete the evaluation of students based on platform information.

6 Summary

The main body of the classroom has changed. In traditional classrooms, the teachers are the disseminators of knowledge, and students are often in a position of passive acceptance. In SPOC classroom teaching, the teacher’s role is transformed into a “director” of teaching activities and a “coach” of students, and the role of students is transformed into a proactive participant in teaching activities.

Teaching methods have changed. Traditional higher education teaching method is mainly teaching law, focusing on explaining, reading, and talking and discussing teaching method is very few, such as self-learning method is rarely used [5]. This teaching model leaves many students feeling dull and thus losing their interest. This kind of interactive learning by SPOC not only enables to explain students’ incomprehensible knowledge, promotes the exchange of teachers and students, but also improves students’ learning efficiency.

Teaching resources have changed. The traditional teaching resources are mainly teaching materials and teaching references, while SPOC is mainly based on the short and pithy teaching videos. Teaching videos are usually targeted at a specific topic, which the time is 5–10 min [6]. Through the media player, you can pause, playback and other functions, to facilitate students to take notes in the learning process and thinking, which is beneficial for student to self-learn, review and consolidate. When problems arise, students can also communicate with teachers and peers for help online.

Teaching environment has changed. The traditional classroom teaching is based in classroom, and the SPOC classroom is a combination of online and offline. The interaction in the classroom can be expanded to cyberspace [7]. The time and effect of interaction between teachers and students are greatly increased.

In general, the flipping classroom teaching mode based on SPOC not only has the successful place, providing the reference for the reform of the university curriculum, but also it has deficiencies, stimulating the researchers to explore in depth and improve the teaching mode of the university further.

Acknowledgment. This work was supported by the research on teaching reform of higher education revitalization plan project of Anhui high school grant No. 2015zdjy171, high school provincial quality engineering project of Anhui grant No. 2015mooc109 and No. 2016ckjh224, the excellent top talent cultivation project of Anhui high school grant No. gxyqZD2017141, Nature science research project of Anhui high school grant No. KJ2017A560, and school level scientific and technological innovation team grant No. Whzykj2018A02.

References

1. Yang, L., Zhang, L.: Study on the application mode of SPOC in traditional college teaching SPOC. *Mod. Educ. Technol.* **26**(5), 56–62 (2016)
2. Liao, H., Hu, Y., Cai, Z.: Development and application of school-based SPOC—taking “life and death” course for example. *Mod. Educ. Technol.* **26**(10), 93–99 (2016)
3. Gao, L., Jiang, K., Shao, F., Jin, G.: Teaching reform of steel structure curriculum basing on SPOC platform. *J. High. Educ. Res.* **39**(1), 101–105 (2016)
4. Guo, F., Huang, Y., Tang, Y., Zhai, X., Liu, R.: Construction and practice of mixed mode based on SPOC in teaching computer basic course. *Educ. Chin. Med.* **36**(1), 46–53 (2017)
5. Shuang, Z., Qinghe, H., Yifei, Z.: Research and practice of MOOC/SPOC construction and flipped classroom of course software engineering. 12th China-Eur. Int. Symp. Softw. Eng. *Educ.* **8**(8), 14–18 (2016)
6. Fang, X., Gao, R.: The teaching application of flipped classroom based on the SPOC—taking “introduction to performance technology” course for example. *Mod. Educ. Technol.* **26**(9), 86–92 (2016)
7. Wang, P., Duan, T., Cai, Y., Zeng, X.: The applied research of SPOC-based teaching design pattern in flipped classroom in open university. *China Educ. Technol.* **345**, 79–86 (2015)