Exploration and Reflection on SPOC Flipped Classroom Teaching Model Based on Vocational Practical Courses

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Abstract: The ideal practice class should be that students master the relevant skills in advance of the class. The teachers and students interact with each other to discuss difficulties, problems and solutions, and stimulate students' interest in learning and project participation. The reform of using SPOC as a technical solution and flipped course as a teaching model is a beneficial attempt to achieve the teaching objectives of practical courses in higher vocational colleges.

Keywords: SPOC; Flipped Classroom; Teaching Model.

1. The Realistic Background and Significance of the Project

1.1 MOOC and Its Problems
Massive open online course moocs is an emerging online course format based on curriculum and teaching theory and web and mobile intelligence technologies. After the opening of the first year of MOOC in 2012, MOOC quickly developed in the global warming platform. First, the top universities in the United States and their professors have successively established several MOOC platforms, such as udacity, coursera, edx, to become the leaders of MOOC, attracting top universities in many countries. Then there are countries in Europe, Asia and Australia scrambling to create their own MOOC. The high-profile wave of MOOC is also creating new fusion in China. Tsinghua University has launched a large-scale open online course platform, “School Online”, and providing online courses for the world will become the world's leading large-scale online education platform for Chinese to seize the opportunities of online education development.

With the construction of the platform, the number of online courses and users has also increased by leaps and bounds. udacity started a total of 33 courses in 5 disciplines, with a million users. Coursera has 557 online courses covering 25 subjects, bringing together 12 languages, including English, Chinese, French, Russian and French, with
more than 5.8 million registered students. edx offers a total of 125 courses in English, covering 25 subjects and a million users.

The massive adoption of MOOC means it has the opportunity to create a new, fairer education model. Through the MOOC platform course video, embedded course test and evaluation, online interaction between teachers and students, teaching and learning can happen anywhere, anytime, teachers can teach the talents all over the world and students get famous teachers all over the world. Traditionally, the meaning of "teacher" and "student" and the "teacher-student relationship" have undergone unprecedented changes. The concepts of "school" and "classroom" have also been redefined. For thousands of years, we have been dreaming of education form, and it seems that the education ideal of the educator Confucius saying 'anyone can get education' is about to be realized due to the transfer of education technology. For example, Harvard University's one-year MOOC student registration has exceeded the total number of previous students in its 377-year history. In 2012, 10,000 students from 113 countries received a certificate of completion from the University of California at Berkeley.

However, with the huge growth of MOOC platform, on-line courses and student enrollment, there are also the following problems:

A. registration rate is high and the completion rate is low.
B. teacher's teaching idea has not been updated, and can not adapt to the new learning behavior.
C. does not have a good model to solve the problem of "how to embed the daily teaching process of full-time universities?" This problem;
D. is dominated by top universities, and it is difficult for higher vocational colleges to participate.

1.2 SPOC

SPOC (Small private online course), It is interpreted literally as "restricted online courses". It is generally believed that this concept was first used by Professor Fawkes, in which small and private are relative to massive and open in MOOC, and small refers to the size of the students from dozens to hundreds, and private is a restriction on students. Applicants can only be included in the SPOC course if they meet the requirements.

SPOC redefines the role of teachers and innovates the teaching mode. With MOOC, teachers have the opportunity to serve the world in the professional field. SPOC lets teachers return to campus more, return to small online classes, and become the real master of the curriculum. Pre class teachers are the learners and integrators of the curriculum resources. They do not have to be the main characters in the lecture video
and do not have to prepare each section of the lecture lecture, but they should be able to integrate all kinds of online and physical resources according to the needs of the students. In the classroom, teachers are instructors and facilitators. They organize students to discuss in groups, and provide individualized guidance to them at any time to solve problems. SPOC has innovated classroom teaching mode, which has stimulated teachers' teaching enthusiasm and classroom vitality.

2. Flipped Classroom
This is a term translated from English "FlippedClass Model", commonly known as the "reverse classroom teaching mode". The traditional teaching mode is to give lectures in class, arrange homework and let students go home to practice. Different from the traditional classroom teaching mode, under the "flipping classroom teaching mode", students complete knowledge learning at home, and the classroom becomes the place where teachers and students interact with students and students, including answering doubts, using knowledge and so on, so as to achieve better educational effect. The popularization of the Internet and the application of computer technology in the educational field make the "flip classroom" teaching mode feasible and realistic. Students can use high quality educational resources through the Internet instead of relying solely on teachers to teach knowledge. The role of the class and the teacher has changed. Teachers have more responsibility to understand students' problems and guide students to apply knowledge.

3. The reform of practical courses in Higher Vocational Education
Vocational students' learning initiative is not strong, their learning efficiency is low, and they are not good at using after-school time. The practice course of higher vocational school is usually taught by teachers in 40-50%, and the students do the project to 60-50%. There is little time for the project discussion and the individual problem solving. The students do not take active initiative to complete the practical training content in the class after class, which has caused the low efficiency of the class class course and the completion rate of the students' project. Low.

4. A review of the same kind of research
4.1 The SPOC experiment of Harvard University
In 2013, SPOC experiments were conducted in three courses at Harvard University. The first is the Copyright course of copyright law, which lasted for 12 weeks and was opened by law school on the edX platform. This course requires applicants to submit their personal demographic information and write a small paper explaining why and what efforts can be made. They have to make sure that they learn less than 8 hours a
week and take part in 80 minutes of online discussions each week. Finally, Professor William Fisher and others choose 500 students from 4100 of the world's 4100 applicants to attend the Harvard University online class (Harvard Online Classroom). The course, which mimics the traditional Harvard law class, divides students into a group of less than 25 people, with a former or current student of Professor Fisher as a teaching assistant, and organizes discussions among the members of the various project groups. At the end of the course, online students will take the three-hour test like the traditional Harvard University law school students, and the passing of the students will get the certificate and a written evaluation. Due to good response, the course will be launched again next year.

The second SPOC course is the "national security strategy of the United States and the major challenges facing the media" opened by Kennedy Institute of political science. This introductory course is provided in SPOC form to students and 500 online students in Harvard University campus. Online students need to submit written assignments and academic certificates about the US government's response to the topic of conflict in Syria. The students who are finally enrolled have both the Harvard University students who can not be able to get to the school or the home learners or on the job. They read about 75 pages of literature every week after extracurricular watching video, complete all the homework and participate in the topic discussion of the teaching organization, the discussion on the online students, and the discussion of the students of the Harvard University. At the end of the course, students who met the requirements of the course were awarded HarvardX certificates.

The third door is the architecture imaginary (The Architectural Imaginary) SPOC course designed by the Institute of design for its new enrolment. It is expected to open to more people in the future.

4.2 SPOC experiment and promotion of University of California at Berkeley
Software engineering is the University of California at Berkeley brand course by Professor Fawkes on the edX platform to offer students to the Berkeley campus, which is also provided in the SPOC model. The students both inside and outside the school need to complete the same tasks online, but the students inside the school must produce software for real customers. The key feature of this SPOC course is its automatic scoring function. Students submit complete programming assignments, or complete applications in the cloud, and get detailed scoring results and finer feedback information, far more detailed than the feedback obtained from traditional teaching assistants, because they are going to go. Stay for only a few minutes on each assignment. In addition, the automatic scoring function allows students to submit their homework many times, while improving their knowledge and skills.
As the Fawkes team moved its SPOC model to four other universities in spring, a survey of four teachers showed that all teachers watched Berkeley's MOOC video before class, three teachers used MOOC test questions, and two teachers used MOOC automatic scoring. Homework, a teacher flipped the class to let students watch MOOC video class. After one semester, the SPOC courses at four universities have achieved remarkable results: 1. automatic scoring functions reduce the burden on teachers and strengthen the concept of test driven development in software engineering courses; the 2. course video is rich in information, and students can suspend a review of any one knowledge point, so it is a very efficient way of transmitting information; 3. students are excited about the latest technology and the most advanced development methods that they can reach in software engineering; 4. the course brings outstanding students the challenge of other classes; 5. students receive first-rate teaching in the world through lecture video and welcome the top class from Berkeley. The challenges of the same curriculum offered by the computer science program.

5. The content and expected goal of the research
5.1 Research contents
1) how to apply the flipped classroom mode to practical courses in higher vocational colleges, thus forming a teaching mode that is worth promoting, reusable and efficient.
2) How to transform practical courses into SPOC courses, and form a recommended task decomposition and process.
3) cooperate with Shanghai blue Zhuo education Mdt InfoTech Ltd to study how to build MOOC and SPOC platform suitable for higher vocational education.

5.2 expected target
1) In the 2014-2015 academic year, one to two software development practice courses were transformed into SPOC, and SPOC and flipped classroom teaching mode were applied in practical teaching.
2) Compiling a guide to apply the teaching mode of flipped classroom to SPOC in practical courses.
3) reconstructing the original micro class platform to join the functions required by SPOC.

6. The initial results, operational measures and practices of the study
6.1 Initial results
At present, the software development and project management specialty of our hospital has three theory courses already in the "micro class" line, 13 classes of 2 classes of 80 students have been on this platform to learn, the accumulation of certain
application experience.

6.2 operation measures and practices
1) Transform the micro classroom to enhance the function of WEB platform.
2) The practice course of mobile application development project was made into SPOC in summer 2014 and released to the micro classroom platform.
3) In the first semester of the 2014-2015 teaching practice: no longer arranges the content of the specific technology in the class, and the students use the micro class platform to study by themselves; in the class arrangement of the project discussion, the analysis of the technical difficulties and the solution of the personality problems;
4) Summarized and analyzed the reform practice in 2015, and formed a guide for the application of teaching mode. And aiming at the problems of micro classroom in the use of SPOC mode, technical platform transformation is carried out.

7. Step design
1) Transform the micro classroom to enhance the function of WEB platform.
2) Make the practical curriculum of mobile application development project into SPOC, and release it to the micro classroom platform; complete the project progress training operation manual;
3) The first term to carry out the teaching practice;
4) Summarize the first round of teaching reform and complete the first draft of the teaching mode.
5) Aiming at the problems of micro classroom in the use of SPOC mode, technical platform transformation is carried out.

8. Epilogue
SPOC assessment and a variety of functions and the evaluation of class teachers, peer and selfmake students clearly understand the state of their own learning, motivation, attitude, effect, etc., to help students in their learning process, adjust their own learning situation; secondly, the in-depth teaching of the teacher allows the students to experience a complete and rich curriculum history. When the students review and reflect on the whole learning process, they reorganize the knowledge of their own processing and classify and correlate the new knowledge with the original knowledge to construct their own "individual knowledge." The construction of "individual knowledge" is students' unique understanding and personalized expression of knowledge, and it is students' deep understanding and grasp of the essence of knowledge through the phenomenon and various forms and representations of knowledge. Finally, students recruit, transfer and use "individual knowledge" to creatively solve real-world problems and achieve the ability to gain and improve.
In the presentation of teaching content, micro-video can be adopted in the form of
introduction, application, lecturing and summary. When teaching content is processed, it is possible to design teaching videos by means of stories, such as Storyline, Prezi, Flash, etc., which are interspersed with various elements and different playback forms, so that students can change from “skipping classes” to “enjoying classes”.

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