Research on SPOC-based Teaching Model for University Course

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Abstract. With the development of pervasive computing and mobile learning technology, it is an inevitable trend for the teaching and learning to extend out of the classroom. MOOC is the research hotspot in the field of online education, and it is difficult to avoid cheating in online examinations. The SPOC from MOOC is a kind of new force, which is easy to realize the integration with traditional university course, and cultivate new capacity which is necessary for college students in the "Internet +" era. Therefore, the SPOC-based university course teaching model is proposed, finally, the specific application examples and application results are presented. Practice shows that SPOC-based teaching model for university course has been praised by the majority of students, while maintain the teaching effect of traditional university courses, and cultivate the capacity needed by the college students in the "Internet +" era.

Introduction

The integration of the advanced information technology into college classrooms has become a trend of current teaching in college. The multimedia classroom is the mainstream teaching environment in the university classroom. With the development of pervasive computing, smart classrooms, Virtual Reality technology, the classroom teaching environment will be further improved and enhanced [1]. With the development of Internet technology, the persons in the 21st century should have the abilities such as learning by Internet, information discovery, information recognition and independent learning, time management [2]. However, it is difficult for these abilities to be developed in the classroom.

The Massive Open Online Courses is a typical representative of the current online education platform [3], and is a hotspot of online education research field in recent years. It has carried on the preliminary union with the university education, receives the widespread attention and the research, but widely criticized for that MOOC’s most participating organization doesn’t do the credit attestation for the curriculum, and the dropout rate is high, and the online examination is difficult to avoid cheating [4]. University is the main place of formal education so that its reform has always been cautious. Therefore, the researcher intends to use SPOC (Small Private Online Course) [5] to solve the problem of MOOC, extend the teaching boundary to extracurricular. The students can study by SPOC, anytime and anywhere, and many new teaching research achievements formed, such as: Lin Xiaofan [6] proposed a SPOC-based innovational ability training model, which is applied to one of the top 500 domestic companies in China. Zeng [7] proposed a SPOC-based deep learning model; He[8] proposed a MOOC-based SPOC innovational process; Wang Pengjiao[9] studied the SPOC-based flip classroom teaching design model, which is applied in The Open University; Liu Chunyan[10] applied SPOC to primary and secondary education; Chen Ran [11] proposed SPOC-based mixed learning model, which is applied to C language courses in the university; Liu Hong-Jing [12] use student groups to promote the deep learning in the SPOC. In order to adapt to the general university teaching, and make college students own the skills in the "Internet +" era, this paper puts forward a kind of SPOC-based teaching model, so as to realize the teaching reform’s smooth transition from shallow level to deep level.
Teaching Model of SPOC-based University Course

The SPOC-based university course teaching model is a flexible framework of teaching activities, including on-line teaching, preparation before class, classroom teaching and post tests (as shown in Figure 1). Including online learning is the primary feature of this model. The learning activities in each stage can be adjusted dynamically according to the needs of teachers.

In the online teaching stage, the primary task of the teacher is the online teaching design, including the selection and tailoring of teaching content, the distribution of micro-courses and online assignments, and the corresponding learning tasks are released every week at regular intervals. After the teaching contents are distributed, the teacher will irregularly analyze the students' online learning behavior, actively guide the students' learning process, and actively communicate with the students in the forum.

After the teacher distributes the learning materials, the students begin to study according to the tasks that the teacher arranges. Micro-course learning is the first learning activity that students should carry out. In the process of micro-course learning, self-regulated exploration and forum discussion are encouraged. The knowledge tools such as Wikipedia, search engines, digital libraries and so on, are used, which can improve the learning ability of students in the era of ‘Internet +’. When these tools are not available to resolve problems or the students have discussion preferences, forums can be used for discussion. Discussions and speeches are major weaknesses of Chinese students, and online discussions offer a more relaxed discussion environment for learners. Teachers in the forum should encourage students to discuss and answer questions and establish more understanding dimensions, so as to promote students to master the knowledge, enhance mutual understanding and communication between students, at the same time, to provide teaching materials for class activities.

As a means for teachers to check students' learning results and a tool helping the learners to find their own problems, homework and mutual evaluation is carried out after the micro-course learning, which not only trains students' evaluation ability, but also reduce the workload of teachers' checking students' assignment.

The stage of preparation for class is important for teachers and students. Teachers collect the difficult topics which cannot be understood in the forum and the questions in the assignment. Then, two lists form. One is a list of simple questions, answers are given and published in the forum area. And the other list is a list of problematic issues that are arranged for class learning activities. At this stage, students should positively think about the problems that not be understood, and use self-summary, spontaneous discussion, independent inquiry, self-reflection and other means to...
continue to induce, abstract, and even solve their own encountered problems, so as to prepare for the deep learning in the classroom.

The stage of classroom activity is the stage in which teachers and students rethink the puzzled questions and finally solve these questions. Teachers can use the report and explanation, dialogue between teacher and student, group report, group discussion and teacher's comments and other forms of activities to fully explore the intrinsic motivation of students so as to facilitate the deep learning. In order to ensure the full preparation of students before class, teachers should inform the contents of the class in advance. Students may choose to participate according to their own needs, so as to ensure the full use of their own learning time, and also to facilitate the teachers to arrange classrooms and participated teachers. Before each class, students should submit the information about whether or not to participate in the class, the topic which they interest, so as to facilitate the group discussion, teachers' preparation for the class.

On-line testing is an important means for teachers to understand the effect of learning after a teaching period, lay a foundation for recommending review content and learning materials, and by combining class and online learning analysis, to provide guidance for the next cycle of online instructional design in terms of progress and difficulty. If the online test and online learning activities are counted into the course score, it will increase the students' daily learning motivation and avoid to occur the phenomenon of only learning at the end of the semester in the traditional university course.

Application Cases and Its Analysis

The university general course Game Theory is a course which is based on mathematical model to explain and predict conflict and cooperation phenomenon in society, and has a strong application value. In the university teaching, too many students want to attend this course, so we choose this course as an example, and describe the practice process of SPOC-based course teaching model, and then analyze the statistics data from this course.

Application Cases

In order to show the advantage of the model, Game Theory uses two weeks as a learning cycle, that is, within two weeks, students and teachers communicate only once in the class. The first class is set up in the first week of the new semester, mainly to explain the registration methods, operating methods, learning processes and assessment mechanisms of the online learning platform, and release the micro-courses and assignments that the first cycle needs to learn, confirming that students can begin to study online. Then, the class can be dismissed, and students can begin online learning.

Generally, the students firstly watch micro-course. At the same time of watching the micro-course, students can also read reference books, or use Wikipedia, search engines and discussions area to solve the doubts. Although there is no limit to the order among the watching micro-course, self-regulated exploration, assignments and discussions, it requires that the assignment be submitted at 24:00 which is four days before the next class study. Then, it enters the phase of assignments evaluation which will be completed within two days. The evaluation of assignment can not only reduce the burden of teachers, but also cultivate students' evaluation ability. In the Game Theory's teaching, each person randomly handed out 5 assignments which also mean each assignment has 5 scores, and finally takes the average score as the final performance.

After the evaluation of the assignments, the teacher starts to the preparation for the class. Class teaching is not an orderly lecture, usually more flexible, and the class content also depends on the online learning situation. According to online discussion, online assignments and online video learning, teachers make two questions lists: a simple question list and a complex question list. The simple questions and its answers are documented and published in the online forum community, the complex and meaningful issues will be teach, or discuss, or learn with group.

In order to give students freedom of time management and arrangement, the test is allowed to be completed within two days after class Based on the test results, teachers adjust a new round teaching
content, release the new micro-course videos and assignment, and then come into the next cycle of learning.

The Analysis and Discussion

After the implementation of the teaching model, according to forum feedback, random interview, questionnaire survey and practice process analysis, the following analysis results are obtained:

(1) The majority of students think that the teaching model is good although there are some deficiencies.

At the end of the semester, a questionnaire about the course are distributed the students who attend the course. 163 questionnaires are distributed, and then 160 effective questionnaires are collected. The statistics results are: The 73.75% of the students thought the model was very good, 18.125% of the students think it is the general, 8.125% of the students think it is bad. From its advantage, 94.375% of the students think that this course gives students the autonomy of time management; 83.125% of students believe that this model fosters autonomous learning ability; 98.125% of students think that course video can be repeated watching is also an important advantage; 71.875% of students believe that the application of this model can help improve the utilization of learning time and promote the use of fragmentation time. In the survey of disadvantages, it was found that 91.975% of students think the forum is low efficiency, 84.375% of the students think that online watching video can't be timely interaction with the teacher to clarify doubts; 35.625% of students think that online learning process is monitored too much; 23.125% of students believe that online learning lacks a real class feeling is also one of its weaknesses.

(2) College students are very concerned about the time they will spend for the course learning.

When applying this model to the Game Theory course of our university, we draw the conclusion from the research results of 2-6 hours which the learners of MOOC are willing to devote to their study every week [13]. But when the curriculum are given to the third week, a lot of students began to express their dissatisfaction in the forum, claiming that the course took up too much of their spare time, and even some students asked if they could retreat. After that, we constantly adjust the expected learning time of students, found that the expected learning time of students is set within the 1.2 to 1.5 times of course's time, which will make both teachers and students are satisfied.

(3) This model will gradually reduce the burden of teaching.

When this mode is used for the first time in the course, it involves a lot of work such as modular segmentation of knowledge, script making, and video recording and so on. When the next round of the course is opened, it only needs to improve the existing course materials. This will save a lot of time, and can gradually evolve into a fine course, even can be used in layered teaching, which makes teaching won't be affected by the teacher's psychological and physiological states, so as to improve teaching quality. When the common problems are made into micro-courses or written in the documents, the burden of teaching will be lessened, and then the discussion in the forum, the guide of online learning and the analysis of online learning become the main workload of teachers.

(4) The dropout rate in this model is low, and credits are the main motivation of attending the class.

Studies have shown that the MOOC's dropout rate is high, and the worldwide rate of obtaining certificates is 4.3% [14]. The dropout rate of students for credits in this project is 0. However, there are 85 students who don't apply for credits, and only 2 people complete study. This kind of study result is even worse than MOOC. It also can explain reason from the other side why MOOC dropout rate is high, and this model's low dropout rate, which is because the credits give students a strong learning motivation. This suggests that, when there is no real pressing need, online learning may be terminated by other more important external factors, which is same with the general time management strategy. It also shows that the certificate provided by MOOC can't arouse the interest and enthusiasm of the university learners. The credit is the priority demand and their main power source of the students. Whether students willing to participate in the discussion, which depends entirely on the course examination mechanism.
Conclusion
There are many restrictions on developing the work and life skills in "Internet +" era in the existing university class. Because MOOC is too open to college students, this paper combines SPOC with traditional university education, puts forward the teaching model for SPOC-based university courses, and finally gives the practical case and application result. The application results show that the SPOC-based university course teaching model has been accepted by the majority of students, which have the same teaching effect with traditional university courses, at the same time, the new ability of college students for the "Internet +"era has been promoted.

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References
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