Research on SPOC Online and Offline Blended Teaching Mode Based on Artificial Intelligence

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Abstract: With rapid development of information technology in the network, the combination of online and offline teaching is more and more popular, SPOC blended classroom design is mainly divided into o three modes including online classes design and offline class design and evaluation system design. Online teaching is the basis of offline teaching, and offline is the consolidation and extension of the online teaching. The deep fusion of online and offline teaching provides SPOC blended classroom teaching with a stereo, multi-dimensional learning environment. Curriculum evaluation system guarantees the smooth development of online and offline teaching mode, providing a favorable support for students to effective learning.

1. Introduction

SPOC (Small Private Online Course) is a small-scale and restrictive blended teaching mode that integrates online course and offline course. In 2013, it was first proposed by Armando Fox, a professor from University of California Berkeley, who hoped to introduce high-quality MOOC resources into classrooms to expand classroom knowledge capacity and deepen face-to-face communication between teachers and students, so as to improve teaching quality [1].Compared with MOOC, SPOC has the characteristics of small scale and restriction. Small-scale refers to the limited size of students, generally ranging from dozens to hundreds of students. The restriction is to set admission conditions for students who apply for joining the course. Soon, this online and offline blended teaching mode was introduced into China. Tsinghua University, Zhejiang University, and other famous universities successively launched SPOC platform online teaching, which started the exploration and practice of online and offline blended teaching mode. SPOC is the real value of online education in university campus, which promotes teaching reform and improves teaching quality, and is pursued by top universities. It is predicted that by 2020, around half of university courses will combine offline and online learning, mainly because students now prefer efficient and convenient online learning [2].With the rapid development of network information technology, blended teaching methods combining online and offline are becoming more and more popular.

2. Characteristics of SPOC

2.1. Small-Scale Restriction

Through qualified students scale and the course requirements, SPOC require that the students who have a certain foundation and professional level are eligible to apply for courses, avoiding the high drop-out rates and low completion rates in the MOOC teaching, and ensuring the students' deep learning experience of the course, and helping teachers provide students with more targeted and more comprehensive professional guidance. Compared with MOOC teaching, SPOC's limitation and small scale guarantee the effect of classroom teaching, which makes online learning beyond the stage of copying classroom teaching and produces better teaching effect. Strong appealing and wide coverage of teaching videos in SPOC teaching mode can attract students to participate, arouse their interest in

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learning. Automatic grading will inform students result quickly, make scarce resources maximize the effectiveness. SPOC also effectively improve the passing rate of the curriculum through a full range of comprehensive evaluation mechanism [3].

2.2. Fragmentation of Resources

SPOC platform breaks through the traditional concept of resource database, fragment teaching materials, courseware, video, exercises, cases and other teaching resources, to form micro-textbooks, micro-courseware and micro-video based on knowledge points[4]. Through the SPOC platform, some Chinese well-known universities launched a series of distinctive SPOC courses, course syllabuses and videos made and designed by first-line experienced teacher teams, to integrate the fragmented resources, form the fine course package, provide university students with high quality online courses.

2.3. Contextualization of Learning Experience

SPOC platform creates a new teaching ecological environment, realizes the seamless connection between online teaching and offline classes, integrates interactive discussion into the whole teaching process, and gives students a complete learning experience. It is the best online environment for students to learn independently, and an ideal tool for teachers to realize flipped classroom teaching mode[5]. Students can complete independent learning with SPOC platform before class, complete after-class exercises online, and discuss, explore and communicate the problems they do not understand in offline class. Teachers can answer questions in time, help students analyze problems from multiple angles, improve students' awareness of independent learning, and cultivate their innovation ability.

2.4. Full Support of the Learning Process

SPOC platform uses learning theory and intelligent data technology to provide online assessment, learning progress statistics, tracking students' learning process, making personalized learning plans for students, providing teachers with learning trends and data statistics of students and classes, keeping abreast of students' learning situation and adjusting teaching plans in time. For example, the statistical function of SPOC platform can help teachers find a section of video with a large amount of repeated reading or a high error rate of after-class exercises of a section, so as to judge whether the knowledge structure of this part is difficult or not. Therefore, the teaching plan should be adjusted to adapt the teaching content to students' learning situation.

3. Design of SPOC Blended Classroom

Design of SPOC blended class mainly can be divided into three modules: online class design, offline class design and evaluation system design. Based on the development of network technology and big data platform, online class provides students with abundant teaching resources. Offline class focuses on the classroom activities, and students digest learning content with teachers' guidance and help. Evaluation system provide a complete set objective supervision mechanism of learning and curriculum evaluation system. Online learning is the basis of offline learning, and offline is the consolidation and extension of the online learning. The deep fusion of online and offline teaching provides SPOC blended classroom teaching with a stereo, multi-dimensional learning environment. Curriculum evaluation system guarantees the smooth development of online and offline teaching mode, providing a favorable support for students to effective learning.

3.1. Design of Online Course

The online learning resources are developed and designed by the teaching team of SPOC courses, which consists of teaching teachers, network technicians, teaching assistants, etc. At present, there are three developing modes of SPOC curriculum resources in China: introduction, self-construction and transformation. The self-construction mode takes advantage of existing advantages to establish

SPOC course resources. The transformation mode is to combine the former two modes and transform the open high-quality courses in the school into SPOC courses. Online learning resources include syllabus, courseware, teaching video, chapter testing, extended reading and other contents, among which video production is the most difficult. SPOC teaching video should reflect the characteristics of hierarchical and thematic courses, highlight the key points and difficulties of teaching, meet the teaching objectives, and have some appeal, which requires SPOC teachers to have rich teaching experience and high professional level[6]. Teachers release course information in advance, and upload the course outline, teaching calendar and other information, including teaching objectives, teaching contents, teaching progress and teaching methods, etc. Students who choose the course register in the online class. Teachers can combine different teaching contents with different teaching methods. Students can log on to the online class in advance to read and discuss, so as to plan their own learning plans and carry out group learning.

3.2. Setting up Discussion Groups of Online Learning

The important link of blended teaching mode is that students independently complete the learning tasks of teaching modules, and teachers provide students with various forms of guidance. Tutoring is divided into online and offline tutoring. Online tutoring is achieved through the teacher learning discussion groups of WeChat or QQ platform, and its members are composed of teachers, students, teaching assistants. Students who encounter any difficulties in the learning process can rise online questions through the discussion group, and teachers can solve any problems for students in time, and students can communicate with each other through the online platform, exchange learning experience. Learning discussion group turns entity classroom into mobile classroom, and teaching is no longer restricted by space and time. It completes the transformation from entity classroom to virtual classroom, and realizes mobile learning and deep learning of courses. In this way, flipped classroom is implemented, and the initiative is given to students. Group members' mutual supervision is used to improve the frequency and duration of online learning.

3.3. Design of Offline Classroom

3.3.1. Setting up class discussion groups

In the classroom teaching, teachers firstly sort out and review the knowledge points of a certain topic, and make detailed explanations and comments on the problems in students' online homework. Then, according to different teaching contents, they design modules such as practical teaching, case teaching and situational teaching to improve student' ability to apply knowledge points. In SPOC blended classroom, teachers are the designer of the class teaching and guidance, not using all the energy in classroom teaching. The teachers' teaching in the offline classroom focus transforms from imparting knowledge to the attention whether students can apply the knowledge points[7]. Teachers organize students to establish classroom discussion groups, give students design task, and arrange classroom discussion. In order to improve the efficiency of classroom discussion, the number of students in each class should not exceed 40, and the number of discussion groups should be 4. Students should summarize and report the results of the discussion, and teachers should participate, observe and record the whole class discussion, and give guidance and evaluation.

3.3.2. Classroom presentation

In SPOC offline classroom teaching mode, the classroom presentation is an important part of the measuring student learning outcomes. Teachers design project requirements, assignments, online message specification. After receiving the task, students discuss, distribute the task and cooperate to complete the task, give the presentation in class, and accept the evaluation of teachers and students. The class presentation includes work demonstration, on-site questions, group mutual evaluation, etc. Finally, teachers give comprehensive evaluation and suggestions according to the results and answers. In the whole classroom teaching, according to the students' presentation and comment on the interaction of each other, teachers conduct a comprehensive combing knowledge points, form a

knowledge bank and case bank, which benefit students' knowledge internalization and provide important resources for future teaching and improving. In this mode, flipped classroom is adopted. The classroom is handed over to students, and teachers help students to complete class presentation, which reflects the dominant position of students in the classroom. It not only improves students' practical application ability of knowledge, but also improves their teamwork ability.

4. Design of Evaluation System

4.1. Design of online evaluation system

The establishment of curriculum evaluation system is an important link in SPOC teaching, which plays a powerful role in guaranteeing the development of teaching plan, the implementation of teaching content and the realization of training objectives. Based on the characteristics of SPOC blended teaching mode, the evaluation system is divided into online and offline evaluation systems, forming a multi-dimensional evaluation system combining process evaluation and effect evaluation, student evaluation and teacher evaluation. The online evaluation system includes two aspects: one is the SPOC online learning record evaluation, namely the statistical analysis of online learning time and activity of the course. Another is SPOC online learning effect evaluation, that is, the statistical analysis of students' online unit exercises and tests. Relying on the advantages of the Internet and big data, the online evaluation system makes statistical analysis on students' online learning time, online questions, active participation in question discussion, and online completion of unit exercises, and gives objective evaluation.

4.2. Design of Offline Evaluation System

The offline evaluation system includes three aspects: first, students' self-evaluation. Students make self-evaluation by comparing their achievement of personal goals. It also includes students' mutual evaluation and inter-group mutual evaluation in the classroom presentation. Second, teachers' comprehensive evaluation of students. Third, mid-term and final examination paper scores. The evaluation criteria of classroom presentation are the participation of group members, the sense of teamwork, the relevance and organization of the content, the persuasion of arguments and other indicators. According to actual teaching conditions, teachers select the evaluating way to avoid students' absent-minded situation. Teachers use technical means to urge students to accumulate knowledge, attach great importance to the study, help students to test the learning results in time, make the evaluating way and the result more objective and fair.

5. Summary

The combination of online and offline teaching mode not only expands the teaching space and time, but also contributes to the formation of a good atmosphere of interaction and inquiry, which is a good supplement to university teaching. However, based on the current application of network mobile terminal in campus, there are many problems in the actual operation process. If students are lack of self-control and guidance, learning may become an accessory of network leisure. Without the guidance and supervision of teachers in cyberspace, the discussion among students becomes a mere formality. These problems need a whole set of teaching rules to ensure that online and offline teaching mode really play a role, to achieve a real sense of combination of online and offline teaching.

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