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A probe into the basic computer Teaching Model of Applied undergraduates based on mixed Teaching

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ABSTRACT
Taking the basic computer courses in universities as a starting point, this paper analyzes some common problems encountered in the basic computer teaching in applied colleges and universities in Inner Mongolia. This paper puts forward a flipped classroom model based on "SPOC+ micro-class + online examination" and its application strategy. In this strategy, the course introduction uses micro-video preview, the theory class uses rain class preview courseware, and the practical operation guides the students' case operation through screencap. The mixed teaching meets the needs of the university computer basic curriculum reform, and the flipped classroom provides a new teaching model for the realization of mixed learning. Finally, several ways of computer basic "golden course" with high-order, innovation and challenge are put forward before, during and after class.
Keywords: *hybrid, university computer foundation, rain classroom, microclass, SPOC, encyclopedia*

1. INTRODUCTION

Information technology has been integrated into all aspects of social production and life, and is profoundly changing the way of human thinking and learning. The outline of the National medium-and long-term Education Reform and Development Plan (2010-2020) points out that "strengthen the application of information technology, improve teachers' application of information technology, update teaching concepts, improve teaching methods, improve teaching results, and encourage students to study actively and independently by means of information." Enhance the ability to use information technology to analyze and solve problems "[1]. University computer Foundation is a public compulsory course for freshmen in ordinary colleges and universities, which plays a basic and leading role in cultivating college students' knowledge, ability and literacy of information technology. The traditional college computer basic teaching method has obvious deficiencies in cultivating students' information ability.

Educational informationization is an important way to reform traditional education. Blended learning, which has been concerned by the Horizon report of the New Media Alliance for five consecutive years, is becoming more and more popular in higher education. Its flexibility and convenience and the integration of multimedia and network technology meet the needs of university computer basic curriculum reform. 2012 "large-scale open online courses" (Massive OpenOnline Course. MOOC) provides us with an online learning model that we have never had before. Considering the advantages of traditional campus teaching courses, SPOC (Small Private Online Course) arises at the historic moment. It is a more refined and niche type of online open courses than MOOC. It not only combines the advantages of large-scale online open courses, but also can make up for the shortcomings of traditional classroom teaching [3]. Because this paper considers the combination of SPOC and micro-courses to carry out online curriculum reform, and considering the backwardness of university computer basic examination methods, the online examination system is introduced into the curriculum reform to construct a flipped classroom model of "SPOC+ micro-classes + online examinations" as shown in figure 1 [4].

2. PROBLEMS IN TEACHING

At present, there are mainly five problems in the teaching of "University computer Foundation" for application-oriented undergraduates:

2.1. The Students' learning Enthusiasm Is Not High, And The Teaching Is Difficult

College computer foundation generally adopts co-class teaching, and most teachers undertake multiple teaching class tasks, and the daily tasks of correcting homework and final examination are heavy, so it is impossible to assign enough homework, let alone teach students in accordance with their aptitude. When teachers teach the basic courses of computer application, they mainly give priority to the teaching method, followed by the project teaching method. In the process of teaching, students only accept knowledge passively and do not give full play to the teaching plan which is supplemented by teachers'

guidance and students' learning. In addition, the implementation of information technology courses in different regions and different schools and the situation of students themselves lead to great differences in information technology-related knowledge mastered by students before entering the university. Very few children from pastoral areas have come into contact with computers, do not know how to type on computers, and have a poor computer foundation, which is also the reason why they are not enthusiastic about learning.

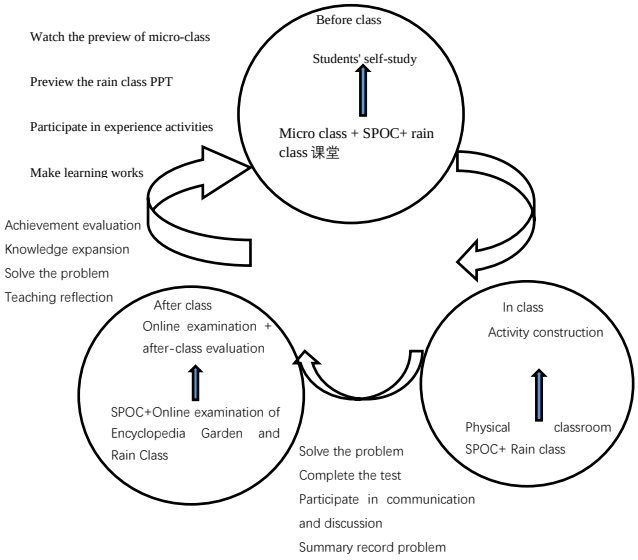

Figure 1 reversal classroom model of "SPOC+ micro-class + online examination"

2.2. The Teaching Content Is Not Updated In Time, And The Teaching Means Are Traditional

The rapid development of information technology has brought a lot of new domain knowledge to university teaching, but the university computer foundation has not introduced new ideas, new knowledge and new technologies into the classroom in time. At the same time, the course hours of basic computer teaching in many colleges and universities have been shortened, and the teaching content is impossible and unnecessary to involve all the knowledge and technology in the computer field, but to form a relatively stable one. It can reflect the essential characteristics, basic methods and core ideas of computer science. At present, the common problems in the teaching content of college computer basic courses are as follows: first, the knowledge of teaching content is aging. The content of teaching knowledge is too dependent on teaching materials, and the new ideas, new knowledge and new technologies in the field of computer are not introduced into the classroom in time; the second is the isolation of teaching content. Computer basic teaching is simply to let students master basic computer knowledge and operation skills, the teaching content is separated from students' professional learning; third, the structure of teaching content is unreasonable. The update of the textbook version is slow, and some materials are no longer suitable for learning. The teaching content lacks the systematicness and connectivity among computer knowledge, ability and literacy, and does not make full use of computational thinking to reorganize the teaching content of the course.

2.3. The Interaction In Classroom Teaching Is Insufficient, And The Degree Of Students' participation Is Not High

Learning is a process in which individuals construct the meaning of knowledge in the interaction with the situation. Effective teaching essentially depends on the relationship between people and the relationship between cognition and life. The interaction in the teaching process is the main link to stimulate students' interest in learning, arouse deep thinking and improve the quality of teaching.The teaching interaction with the involvement of information technology expands the interactive channels, creates a variety of interactive environments, enhances the timeliness of interactive feedback, and changes the existing evaluation methods of interactive effects. However, at present, the computer basic courses in most colleges and universities basically follow the traditional teaching mode of classroom teaching, which generally has a large number of students, limited class hours and insufficient interaction in classroom teaching. the problem of students' participation in the teaching process is not high. The main reasons are: first, the classroom teaching only pays attention to the presentation and explanation of the content, and the performance of the content is mainly static, neglecting the creation of

interactive learning environment and interactive activities; second, the interaction between teachers and students is dominant in the teaching process. the incidence of other interactions (student-student interaction, human-resource interaction) is relatively low, and there is an obvious imbalance in the participation of teachers and students in the process of interaction. Third, a variety of interactions supported by information technology are not fully used in teaching practice, even if some classes use WeChat group, QQ group, e-Mail and other ways to expand interaction, but these interactions are scattered, interactive topics are disorganized, and the interaction process is easy to break away from classroom teaching.

3. MIXED TEACHING AND ITS KEY TECHNOLOGIES

3.1. SPOC

The whole process of teaching includes three links: before class, during class and after class. Before class, during class and after class.

SPOC is the abbreviation of English Small Private Online Course, that is, small-scale restricted online courses. The student size of SPOC courses generally ranges from tens to hundreds, with specific entry conditions. The SPOC discussed here is aimed at college students within the fence, that is, on-campus classes, which is a hybrid learning model that combines physical classroom teaching with online learning. In the university campus classroom, teachers first assign the lecture video as homework for the students to watch and learn, and then answer the students' questions in the physical classroom teaching. The author believes that although domestic and foreign scholars have different expressions of the flipped classroom, the essence remains the same: that is, in the modern information technology environment, students learn the targeted videos provided by teachers before class, electronic textbooks and other resources to learn independently, in class through independent exploration or cooperative exploration, completing projects and solving problems to complete knowledge internalization [5]. One of the advantages of SPOC is the use of fragmentation time, seamless convergence, flexibility and convenience, thus improving efficiency. At present, the practice of using SPOC to implement teaching has been widely recognized in colleges and universities all over the world. SPOC connects mobile devices with learning, realizes seamless and continuous learning under situational activities on multiple occasions, enriches information-based teaching activities, is conducive to the deep integration of information technology and curriculum, and facilitates independent exploration, discussion and cooperation. 50% of freshmen do not have computers, SPOC can be very convenient to learn through mobile phones.

3.2. Micro Class

With regard to micro-courses, from the initial prototype to the later emergence of a more mature definition, a number of scholars have defined it. In 1998, Nanyang University of Technology considered that in order to achieve the teaching goal, the micro-course was applied to teaching projects or teaching units with a duration of 1-2 class hours. Jianlin and Hu Tiesheng pointed out that the micro-course is a short video made to explain a certain knowledge point, which is the representative of the new web-based learning resources. Li Jiahou believes that micro-courses refer to courses with clear teaching objectives, concise teaching contents, certain knowledge points and less than 10 minutes of time. The definition adopted in this paper is Professor Li Jiahou's definition, that is, micro-class is an online teaching video with the goal of explaining a certain knowledge point, in the form of short online video, for the purpose of learning or teaching application [6]. The author thinks that the definition describes several elements of micro-class, and the carrier based on video is the common form of micro-class, including effective classroom organization and assessment feedback functions such as advanced exercises, etc., as well as learning units. to solve the problem of what to learn and how to learn in micro-class. Table 1 shows the specific arrangement of content micro-courses with typical knowledge points in the basic part of university computer.

Table 1 arrangement of knowledge points of computer basic microcourses in universities

The Foundation of computer Application in University			
Serial number	Chapter name	Number of knowledge points (unit)	Total video duration (minutes)
Chapter 1	Basic computer knowledge	three	thirty-one
Chapter 2	Computer data representation	three	twenty-nine
Chapter 3	Office software	ten	ninety-eight
Chapter 4	Basic knowledge of computer network	three	thirty-two
Chapter 5	Basic knowledge of multimedia technology	two	twenty-seven
Chapter 6	Algorithm basis	two	twenty-eight
Chapter 7	Computer information security knowledge	two	twenty-seven
Total		twenty-seven	two hundred and seventy two

3.3. Rain Class

Rain classroom, jointly launched by Tsinghua University and School online, as a free wisdom teaching solution, provides a good wisdom teaching environment for wisdom teaching. Although the smart classroom which has not spent a lot of money to build is fully functional, it has the advantages of low investment, good effect and simple operation, which makes it a lightweight smart classroom.Teachers use rain classroom tools to enrich teaching methods, optimize teaching methods, improve classroom efficiency, and control from the "pre-class-in-class-after-class" learning process [7], and push the preview courseware through the rain classroom before class. In the course, students can scan the code to check in, take quizzes in class, and discuss on-screen comments through their smartphones.Rain classroom automatically collects a series of data of students in the learning process, and gives a learning report according to the results of data analysis, which can monitor the learning process and guide teaching and learning more effectively.

3.4. Encyclopedia Online Examination

In the encyclopedia, there are nearly 1000 multiple choice questions, fill in the blanks, and nearly 100 Office practical questions. The question bank is updated every year, so that the examination questions keep pace with the times. When the students usually take the examination, when the students submit the papers, the examination system is set up to directly display the scores of various body types, and immediately display the correct answers of the students' answers and test questions, which can facilitate the students to understand the loopholes and deficiencies of their own knowledge in time, and help them to master the basic theoretical knowledge and Office practice in a down-to-earth manner. Students' examinations are objective and flexible. The online examination of the Encyclopedia Park lays a solid foundation for students to participate in the National Office II examination.

Starting from the students of grade 2017, the mid-term and final grades of the basic course of computer application in our college are examined by computer paperless examination, and the examination questions are randomly selected from the examination questions database of the encyclopedia examination system. and there are very strict proportion requirements for different difficult and key knowledge points, and strive to objectively and comprehensively reflect students' understanding of knowledge points with the combination of practical operation ability and theoretical basic knowledge. Students must take a unified examination at a specified time and place, and then be judged automatically by the computer examination system. The paperless examination realizes the docking between the students and the national Office II examination, which frees the teachers from the heavy task of judging papers.

4. REVERSAL CLASSROOM TEACHING MODE BASED ON "SPOC+ MICRO-COURSE + ONLINE EXAMINATION"

4.1. Reversal Classroom Teaching Mode Based On "SPOC+ Micro-Course + Online Examination"

Before class, we mainly rely on the SPOC platform to complete the effective learning of system knowledge. The teacher presents all kinds of learning resources in the SPOC platform in advance. According to the learning task list and question guidance issued by the teacher in advance, the students watch the micro-class video independently before class to learn the relevant knowledge, and complete the training and testing according to the specific learning requirements. Figure 2 shows the students completing the works submitted by the greeting card after self-preparation. Under this learning mode, students can flexibly arrange the time and place of learning, make full use of the fragmented time in daily life, and can also study the learning content repeatedly according to their own situation. At the same time, students can also communicate and discuss through the SPOC platform, summarize and record the difficult problems in self-study and feedback to teachers, so that teachers can answer questions pertinently in class. Of course, through the communication between teachers and students and between students on the SPOC platform, some difficult problems can also be solved directly before class.

Figure 2 display of student works

4.2. Construction Of Teacher-student Activities In Class

The imparting of knowledge is completed before class, which mainly relies on the physical classroom teaching environment and after-class autonomous learning to enable students to complete knowledge internalization by participating in a variety of activities. Teachers organize

students to carry out learning activities such as problem inquiry, task-driven, project learning, game-based learning, group collaborative learning and case learning, and choose the corresponding learning methods according to different types of teaching content and students' specific conditions. The teacher mainly carries on the demonstration, the question and answer interaction, organizes the student to carry on the discussion debate, assists the student to produce the work, acts as the good activity "director". On the other hand, students devote themselves to learning, actively participate in various activities, carry out cooperative research, solve problems, and submit learning results. With a certain knowledge base, students explore and study related problems more smoothly.Evaluation and expansion of teachers and students after class. After class, relying on the encyclopedia examination system, rain classroom for learning effect testing, learning achievement improvement and mutual evaluation exchange, students' self-evaluation, student-student mutual evaluation and teacher evaluation can be combined.

In addition to the evaluation and exchange of students' learning works, it is also necessary to evaluate students' participation in various activities (including watching microclass resources, asking learning questions, participating in exchanges and discussions, uploading learning resources, evaluating learning achievements and sharing learning experiences, etc.). Students should summarize and reflect on their learning, sort out the excellent performance and existing problems in the learning process, in order to adjust the learning rhythm and strategies, and expand and improve the knowledge they have learned. Teachers should summarize and optimize the contents, means and methods of each link according to the problems in the teaching process, so as to further improve teaching, enhance teaching effect and promote teachers' self-development.

4.3. Build A Diversified Examination Question Bank

The effective use of the encyclopedia "autonomous learning, independent evaluation" platform system serves the teaching and practice of computer foundation, and the primary task is to build a diversified examination question bank. The examination questions for theoretical content mainly appear in the form of multiple choice questions and fill in the blank questions. For practical content, the test question database mainly appears in the form of cases, which mainly come from real life and work. For example, word cases include the production and typesetting of general word tabloids, the production of invitation letters, and so on. The case covers most of the knowledge points of word, such as font formatting settings, paragraph formatting settings, image-text mixing, directory generation, links, search and replacement, headers and footers, style use, page setup, footnote covers, insert tables, pictures, charts and SmartArtl diagrams, etc. A wealth of cases can create a professional environment for students, stimulate students' interest and motivation in learning, and meet the needs of autonomous learning, self-evaluation and final examination. In order to successfully complete the construction of the test question bank, the corresponding teachers are assigned according to the syllabus, and the construction schedule of the test question bank is worked out.

4.4. Establish multiple schemes

According to the syllabus, teaching schedule and professional characteristics, teachers set up a variety of learning programs. The plan mainly includes four kinds: one is the practice plan of the teacher guiding the practice class, the other is the practice plan of the students' independent practice, the other is the peacetime practice plan, and the other is the final examination plan. First of all, teachers should formulate various practical teaching and learning programs according to the syllabus and schedule. The teacher guides the practice plan in the practice class, the teacher should explain the case, analyze the case method, introduce the knowledge points and key points and difficulties used, construct the case situation, organize learning resources, guide the students to think and discuss the completion of the case, and evaluate it. The practical scheme of students' independent practice requires students to complete independently after class, expand knowledge to improve students' ability to analyze and solve problems independently, this scheme can be evaluated automatically, and students can see the evaluation results. and according to the evaluation results to find operational errors or deficiencies, and correct them until they are completely correct. The final examination plan is to conduct a comprehensive examination of the theoretical and practical contents of the syllabus. Once the students have completed the operation, the examination will be over, unlike the independent practice plan, which can find errors repeatedly and correct them until they are completely correct.

5. Conclusion

This paper analyzes some problems existing in the teaching of the basic course of computer application in application-oriented universities in Inner Mongolia, and puts forward some improvement strategies. The flipped classroom based on "SPOC+ micro courses + online courses" can well connect physical classroom teaching and online learning, make up for each other's deficiencies, and effectively solve the problems in the current college computer basic course teaching. in the future teaching practice, we should attract more teachers and students to try to experience the new teaching model, discuss and solve the existing problems together. Let the flipped classroom under the information environment achieve greater results. In short, flipping also puts forward higher

requirements for teachers' teaching design ability and information level. Under the flip mode, the workload of teachers increases exponentially, and at the same time, the role of teachers becomes more and more important. The new teaching model requires us to constantly practice and accumulate experience in order to build a flipping model suitable for students in applied colleges and universities. Flipping the classroom requires the joint efforts of teachers and students, coupled with the full cooperation of the school, to carry out more practice and research, in order to achieve the reform of teaching methods under the support of new technologies and new ideas, and truly reflect the value of educational informatization.

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