

Study on Golden Course of University Computer Based on Online and Offline Hybrid Mode

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ABSTRACT. This paper introduces the curriculum reform and teaching practice based on the online and offline hybrid model. A comparative teaching study was conducted on the students of class 2019. By comparison, it was found that it has obvious advantages to improve students' computational thinking based on the online and offline hybrid model, which can effectively promote students' learning initiative and improve their computational thinking ability to solve professional problems.

KEYWORDS: Online and offline hybrid mode, Medical students, University computer, Golden course

1. INTRODUCTION

“Deepening education reform and promoting quality-oriented education” is the clear requirement of comrade Jinping Xi on education and the fundamental way to improve the quality of talent training. The educational concept changes from teacher-centered to student-centered; from teacher knowledge transfer to ability training; Students from passive learning to active learning, fully respect the law of education

In June 2018, the ministry of education held a new era national undergraduate education work conference for institutions of higher learning. Minister of education Baosheng Chen put forward the concept of “golden course” for the first time, requiring reasonable increase of course difficulty, expansion of course depth and expansion of course selection. In August of the same year, “golden course” was written into a document of the ministry of education for the first time, requiring all colleges and universities to comprehensively sort out the teaching content of each course, eliminate “water course”, create “golden course” and improve the teaching quality[1].

PITAC (President's Information Technology Advisory Committee) states in its report computer science. The most important and economically promising frontier research in the 21st century can be solved by mastering advanced computing technologies and applying computing science, which plays an important role in promoting the development of other disciplines. “Computational thinking” aims to enable all people to think like computer scientists, and to make computational thinking, like reading, writing and calculating, a basic ability of everyone. The general thinking of computational science is an important part of the cultivation of students' creative thinking.

In the era of global network information, education methods and modes are constantly updated with the development of technology, and education modes such as Massive Open courseware, micro-course and flipped classroom are flourishing. However, with the development of the research and application of MOOC in recent years, its problems have gradually emerged. For example, teaching methods and evaluation are not of high quality; High drop-out rate; The production of MOOC takes a huge amount of manpower and resources. With the integration of other educational methods and methods, these problems can be gradually solved by coordinating and learning from each other. MOOC is no longer the MOOC at the beginning, it is no longer a single mode of education method, but a variety of forms, really in line with the reality, has a broader meaning of education model[2].

Online hybrid course, develop to a certain extent, is the fuzzy boundary of mixed class, teacher speak it overturns the traditional classroom teaching the students listen to the model, based on students as the center of revolution in the way of learning and teaching, to explore a variety of application mode of online “gold course”, create suitable for the needs of training students characteristics and “gold course”. This paper, based on the practical and realistic attitude of university computer, takes students as the core, creates SPOC in line with the learning situation of the university on the

general knowledge platform of super star, integrates various teaching methods, and adopts the online and offline hybrid model course practice ideas to cultivate students' "computational thinking".

"Golden course" can be summed up as "one degree": advancement, creativity and challenge. the higher order, is the organic integration of knowledge, ability, quality, training students to solve complex problems of comprehensive ability and advanced thinking. Teaching is not simply knowledge imparting, is the combination of knowledge, and not just the combination of simple knowledge, but ability, quality. This course pays attention to the organic combination of knowledge, ability and quality, and carries out the reform in the teaching content. It is not a simple explanation of knowledge points and software exercises, but the cultivation of "computational thinking" as the teaching goal.

The innovation is reflected in three aspects. First, the content of the course is cutting-edge and contemporary. "computational thinking" means that students' thinking moves forward with the development of The Times and will not be eliminated with the update of the software. Second, the teaching form reflects the advanced nature and the interactivity, the classroom teaching takes the student as the main body, the teacher guidance is auxiliary; Third, the learning results are exploratory and personalized. After class discussion, students are no longer given correct or wrong simple answers, but are trained to explore, so as to give play to their personality characteristics. The course has certain difficulty, needs the student and the teacher together, jumps to be able to get, the student must have more study time and thinks after the class.

2. Computational Thinking

In 2006, YiZhen Zhou, head of the department of computer science at Carnegie Mellon university, defined Computational Thinking as a series of Thinking activities that cover the breadth of computer science, including problem solving, system design, and human behavior understanding, using the basic concepts of computer science[3]. Computational thinking has become the third big thinking besides theoretical thinking and experimental thinking. In the era of big data in today's society, the massive data generated by theoretical derivation and experimental means inevitably need to use computational means to realize collaborative innovation. In the practice of cultivating "computational thinking" in colleges and universities in China, many beneficial explorations have been made, and a series of problems still exist. Therefore, it is of great significance to innovate and upgrade the teaching mode of "computational thinking" in colleges and universities in China, to train students to solve problems and improve their innovation ability by using the knowledge they have learned[4].

Over the years since the development of basic computer education in China[5], the basic knowledge of computer science has been popularized. The teaching of basic computer science in the "narrow sense of instrumentalism" turns the computer into a tool for students to use, which weakens students' knowledge of computing science and is not conducive to mastering the core ideas and methods of computer technology. The educational model of "computational thinking" has attracted the attention of researchers and educators. How to cultivate students' computational thinking ability has become an important task for local universities.

3. Online and Offline Blended Teaching Practice

This paper takes 186 students of grade 2018 as the experimental group, and adopts the online and offline hybrid model for research-based teaching. 216 patients in the clinical specialty were taken as the control group, and the traditional teaching method was adopted.

3.1 The Teaching Design

In the teaching, students are trained to "understand the machine", know how to use the basic concepts and tools of computer science to solve problems, and flexibly use computer system to solve medical problems. In the teaching, teachers pay more attention to the comprehensive explanation of knowledge, so as to promote students' association and innovation in the level of thinking. The online video adopts the national excellent course "university computer", which makes the teaching content reflect The Times. In this course, the general knowledge platform of chaoxing is used to carry out online and offline hybrid teaching, so as to cultivate students' "computational thinking". Erya platform construction includes: 136 videos, a total of 25 hours and 30 minutes, 761 questions in the question bank, four types of questions (choice, fill in the blanks, judgment and procedure fill in the blanks), each type of questions is divided into easy and difficult three levels.

The classroom teaching makes the classroom active through the students' questioning and the teachers' answering questions and resolving doubts, develops the students' critical thinking, and changes the traditional teaching form of

teacher's speaking and student's listening.

Combining theory and experiment, there are 12 experimental items in the experimental class. It includes 8 progressive training sets of computational thinking based on basic problem solving algorithms. 4 training contents designed for the combination of computational thinking and professional quality.

Make full use of the platform data to fine-tune the teaching emphasis. Through the pre-class test results, teachers can understand the students' grasp of knowledge, the classroom can generally grasp the weak part, focus on the explanation.

3.2 The Teaching Process

Offline classroom learning: the main task of teachers is to guide and control the progress and content of classroom teaching accuracy, the existence of problems in time to find and explain. Students' learning process is divergent, vast, will put forward a variety of problems, which puts forward higher requirements for teachers. For students, the classroom is a stage for students to show their own, students can be a person up, can be more than one person up at the same time, everyone has a specific division of labor, there is the main lecture, there is the operation of the demonstration, there is a blackboard writing... The classroom atmosphere is active and the students' interest is increased. The phenomenon of sleeping and playing with mobile phones is also significantly reduced. After each group's explanation, other groups can discuss and supplement, and the teacher will make comments and summaries at the end.

After the course, teachers can choose some appropriate and some difficulty slightly larger operations, let the students after class to complete alone, the problems existing in the process of preparation and what problems encountered in the process of doing my homework, how to solve, can be initiated in the platform of discussion, students can exchange learning experience, through the platform of teachers know about each students learning situation can be clear, as shown in figure 1.



Fig.1 Statistics of Students' Learning in Spoc

3.3 Course Assessment

Online score (30 %) = watching video (10%) + pre-class test (5 %) + homework (%) + online discussion (5%) + unit test (5%).

Offline score (70%) = class activity (10 %) + experiment report (20 %) + final exam (40%). The assessment includes two parts: basic knowledge and comprehensive ability. In the total score of 100 points, the students in the experimental group had higher scores (50%) and comprehensive ability (50 %) than those in the control group. As shown in table 1, P<0.05 showed statistically significant differences in test scores.

Table 1 Comparison of Students' Scores (Scores, $\bar{x} \pm s$)

group	number	Basic knowledge	Comprehensive ability
experimental	186	43.76+4.74	44.61+3.22
control	216	36.71+6.82	31.98+ 4.05
P		0.000	0.000

4. Conclusion

By completing the experimental training in the experimental class, the pre-class test and homework in the theoretical class, the students' ability to analyze and solve problems was improved, and the ability of collective cooperation and language expression was improved through the flipped class. Through teaching interaction (teachers and students, students) so that the classroom is no longer silent, coruscate vitality; Innovation of teaching methods by means of knowledge collation and case teaching; By means of guidance, inspiration, interaction, multiple assessment programs, participation in online discussion, etc., to tap students' learning potential and play the main role of classroom learning and teaching.

However, integrate the suggestions and problems in the course implementation. In the future teaching can be improved in the following aspects: on the one hand, optimize the reconstruction of teaching content, increase cases, appropriate selection of medical cases; On the other hand, according to the situation of students of different majors, the teaching is designed at different levels to ensure the personalized learning of students.

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