Discussion On Online And Offline Mixed Teaching Mode In Digital Logic Teaching

Liwen Dong

Liaoning University of Science and Technology, Liaoning, China.

Abstract

With the development of mobile communication technology and information technology and the popularization of various mobile terminals, the reform and exploration of students' learning methods and teachers' teaching modes have been promoted. In addition to micro-lesson, massive open online course and flip classroom teaching mode, the mixed teaching mode of online resources and traditional teaching has been accepted and recognized by most university teachers.In order to study the depth and breadth of medical students in time walk in a limited way, the school's Digital Logic takes Superstar network teaching platform as the carrier, and implements the online and offline hybrid teaching mode. This mode is superior to the traditional teaching mode of "giving priority to teachers", which not only promotes the interaction between teachers and students in class, but also improves the teaching efficiency.But also can encourage students to study independently. This paper comprehensively analyzes the advantages of online and offline mixed teaching from the aspects of teaching preparation, teaching implementation and teaching effect evaluation, so as to provide practical experience for continuously building, perfecting and optimizing diversified teaching modules, improving teachers' teaching quality and promoting curriculum teaching reform.

Keywords

Mixed teaching mode; superstar network teaching platform; digital logic; ability training; teaching evaluation; teaching practice.

1. Introduction

In 2020, novel coronavirus will spread from Wuhan to all parts of the country, and tens of thousands of people will be infected with the disease, and everyone will be scared. In order to effectively control the epidemic, the state calls on everyone to stay at home and not go out in disorder. In order to ensure the safety and health of teachers and students, the Ministry of Education has to delay the start of school and put forward the call of "stopping classes and not stopping school". In response to the Ministry of Education's call for "suspension of classes and non-stop study",Schools actively promote online teaching, and the college officially started online teaching from February 17th. Teachers actively participate in and constantly explore, and some teachers adopt the teaching method of live webcasting. After implementation, they encounter some difficulties: First, the network is congested and often stuck, which brings great bad experiences to teachers and students; Second,Live teaching requires teachers from all subjects to agree on the class time. As each teacher may teach multiple classes, the teaching time is almost difficult to mobilize and can only be completed according to the class schedule. The teaching time is fixed and the duration is fixed. For students, long-term study on computers or mobile phones will bring great damage to their eyesight. Therefore,Live webcast is not a good online teaching method. Then, under the situation that all kinds of students across the country adopt online teaching on a large scale, what form should the online teaching in universities take in order to solve the above problems? Taking the course of digital logic as an example, the author briefly introduces a kind of online teaching of digital logic based on flip classroom.

With the rapid development of computer industry and Internet technology, information network has driven fundamental changes in all walks of life around the world. The combination of information and education impels the reform of traditional single teaching mode, and information explodes. The way to obtain knowledge and information is not limited to textbooks and classrooms.With the

introduction of online teaching network platforms, such as Wisdom Tree, Cloud Class and Superstar, into the teaching reform system, the traditional classroom model of "focusing on teachers and giving priority to teachers" shows that it cannot meet students' multi-dimensional learning needs. The intelligent teaching platform is used to provide online teaching resources and improve the quality of offline classroom teaching.It has been applied to all fields of university teaching. Although Digital Logic is an old subject, it still occupies a leading position in the computer field, and it is a basic science supporting the development of biotechnology. It recognizes the phenomena and laws of computers, explores the origin and evolution of computers, and explores the mechanisms and methods of treating diseases and saving people.In the final analysis, we must look for answers in cells. Digital Logic is the first professional basic course of computer learning. It is particularly important to lay a solid foundation and cultivate good study habits. This requires our teachers to constantly explore ways to ensure that students can master basic theoretical knowledge,It can also train students to acquire cutting-edge information in multiple dimensions, broaden their horizons and innovate their thinking. The "Digital Logic" course in our school has always selected Superstar network teaching platform to carry out online and offline mixed teaching, which is obviously superior to the traditional "lecture-based" teaching mode, and fully arouses students' learning enthusiasm and initiative.Effectively improve the depth and breadth of most students' learning; Teachers use the big data provided by the platform to analyze the learning situation and gradually optimize the curriculum system, so that teachers' teaching ability can be continuously improved. This paper summarizes the experience of online and offline hybrid teaching,It provides practical basis for exploring the new direction of education reform, which is "student-centered and ability-oriented".

2. Teaching Preparation

Superstar network teaching platform provides a multi-module fast building mode for online teaching resources construction, and teachers can select suitable content sections for course construction according to course characteristics. We chose the following aspects to construct the course of Digital Logic:

2.1 Teaching resources.

Including teaching ppt, video of knowledge points produced by textbook publishing house, research progress at home and abroad, digital logic micro-course recommended by Superstar platform, and massive open online course. Task points are set in each teaching module, and students can complete after-school exercises and periodic tests only after completing the corresponding tasks as required.

2.2 Classroom activities.

Relying on the powerful questions set in this course, the question types can be single-choice, multiple-choice, judgment, short answer, discussion, etc., and the answer questions are transmitted to Superstar online teaching and learning platform. According to the teaching progress, the questions are released one by one in class, and the students can receive and answer the questions synchronously on the mobile app. According to the actual teaching situation, the topics are updated year by year.The retention degree is good, which causes students to think actively. The design problems keep up with the new research trends at home and abroad, and cultivate students' creative thinking of using theory to solve practical problems.

2.3 Question bank construction.

All the teachers in the teaching and research section participate in writing, reviewing and uploading the questions in the question bank to the Superstar network teaching platform, providing resources for assigning homework and combining test papers. According to the academic conditions and the analysis data of the final exam papers, the structure of the examination question bank should be adjusted appropriately, and the questions with good discrimination and moderate difficulty ratio should be retained, and the questions with poor discrimination or no discrimination should be eliminated.

2.4 Assignment.

According to the degree of students' mastery of knowledge in class, the proportion of easy, moderate and difficult projects is reasonably distributed, and the questions consistent with the course progress are selected from the question bank to form the after-school test, which helps students consolidate their review and enhance their self-confidence in learning.

2.5 Formative examination.

As a part of the discipline assessment, the Superstar network teaching platform is used to conduct two periodic tests of Digital Logic every semester. The test contents are randomly selected and combined from the question bank according to the proportion of chapters and the degree of difficulty to form 20 sets of test papers. The papers received by each student are random, with out-of-order questions and out-of-order answers, thus avoiding plagiarism or similarity of paper papers.

2.6 Maintenance of discussion forum.

Large class system (100 ~ 200 students) has limited offline teaching time, which makes it impossible to carry out efficient communication and discussion between teachers and students. In the construction of the discussion area, 3 ~ 5 students can be selected as teachers' teaching assistants by means of self-recommendation and teacher review, so as to assist teachers in screening and allowing positive energy content related to Digital Logic to be released.Words that block negative and negative emotions appear in the discussion section. The discussion area publishes common and error-prone questions raised by students, and answers and discusses them, allowing students to answer each other and brainstorm ideas. Students can help each other through free discussion and improve their ability to analyze and solve problems.Students will also discuss the foreword news in the field of computer science obtained through various information media in the discussion area. Teachers will play the role of leaders and arouse students' enthusiasm and initiative in exploring unknown fields.

2.7 Class management.

After receiving the teaching task, each teacher manages the administrative classes he undertakes. You can import the student list with one click through the student library provided by the Academic Affairs Office, or provide students with two-dimensional codes after establishing classes, and tell students to scan the class two-dimensional codes to enter the class group.Teachers can use class groups to call names, ask questions, answer questions raised by students, and issue temporary notices for their classes, so as to keep in touch with students at any time, help students solve problems at the first time, and eliminate anxiety caused by time and space gap.

3. Digital Logic Flip Classroom Online Teaching Implementation Process

3.1 Preliminary preparation.

Before conducting online teaching, teachers need to select an online teaching platform, and on the selected platform, build their own courses according to the course teaching objectives. In response to the national call of "stopping classes and learning", many online teaching platforms are open free of charge at present, among which Love Courses and Superstar Fanya are the two platforms most used by teachers in Xiangnan University.The two platforms are not only rich in resources, fully functional and easy to operate, but also have corresponding apps (MOOC and Learning Pass of Chinese University). Students can download and install these two apps on their smart phones to learn.

The first step of curriculum construction is to introduce the curriculum. Importing courses mainly involves uploading documents, such as basic information of courses, teaching weekly calendar, syllabus, experimental syllabus, assessment syllabus, electronic teaching materials and courseware selected by teachers for students, etc.The purpose is to let students have a comprehensive understanding of the learning objectives, learning content framework, learning progress, learning achievements and evaluation of this course before class, and to help students make the most suitable learning plan according to their own needs and abilities, so as to smoothly enter self-study in the future.

The second step of curriculum construction is instructional design. Teaching should follow the principle of "goal-activity-evaluation", that is, according to the basic requirements of the syllabus and the learning situation, further refine the specific learning objectives of each module (or chapter), and then design the learning content and corresponding learning activities according to the objective requirements.Test and evaluate the achievement of objectives with the results of learning activities. At the same time, we should follow the students' cognitive rules and fully consider the characteristics of online teaching, that is, we should sort out the knowledge points according to the requirements of micro-courses, so as to select or make teaching videos.

For example, the key knowledge in Chapter 4 of Digital Logic Course-the design of combinational logic circuit, the teaching goal is to require students to master the design steps of combinational logic circuit, and to design the required combinational logic circuit correctly. In order to achieve this goal, this section can be divided into four knowledge points: the general steps of combinational logic circuit design;Design of multi-output combinational logic circuit: Combinatorial logic circuit design with irrelevant conditions: Design of combinational logic circuit without anti-variable provision. Each knowledge point is illustrated by one or two concrete examples. This method of "breaking up the whole into parts" divides the content of a section into several knowledge points from easy to difficult,Each knowledge point has its own emphasis and corresponding learning results, which makes students feel suddenly enlightened in each study and gain great sense of accomplishment and self-confidence.

After the knowledge points are divided, it is necessary to find or record corresponding small videos for each knowledge point. Affected by the epidemic, teachers can only work from home, and the equipment is simple. The recording effect is not as good as that recorded in schools or professional companies before. Therefore, everyone can search and use other people's original videos as much as possible.There are many teaching videos on MOOC and Learning Pass in Chinese universities. If there are any videos that meet their own needs, they can borrow other videos directly. If it does not meet the requirements, you can only record relevant videos by yourself, and each video will explain a complete knowledge point, and the duration will be controlled within 15-20 minutes to meet the students' fragmented learning time. The recording tool can adopt EV screen recording, which is easy to operate.The recording effect can also meet the requirements.

3.2 Organization and guidance in class

In order to facilitate the organization of teaching, teachers should design their own curriculum teaching, formulate a learning task list according to the teaching plan and students' learning situation, and publish the learning tasks of this week at a fixed time every week, so that students can receive the learning tasks in time and complete them within the specified time (such as three or five days after receiving the tasks). The arrangement of learning tasks should reflect the important and difficult points as far as possible,Assignments should reflect hierarchical and different levels of learning results, which will not only burden students with weak foundation, but also enable students with outstanding achievements to "eat well", such as the learning task of combinational logic circuit design. They are the executors of the students' flipping class and the real "protagonists". After receiving the learning tasks, students can log on to the platform to watch the corresponding videos or courseware.In order to avoid network congestion, students can make corresponding study plans according to their own situation, study at different peaks, complete their studies within the specified time, participate in relevant discussions and submit assignments.

In order to achieve good teaching effect, online flip classroom must give full play to students' subjective initiative, so that students are willing to learn, like to learn and take the initiative to learn. Therefore, teachers should try every means to improve students' interest in learning in the process of instructional design and instruction. For example, in the teaching process of digital logic line, teachers embody hierarchy in homework arrangement,Students choose to complete according to their own abilities, so as not to cause heavy learning burden for students with weak foundation, but to keep students interested in learning courses. For students with spare capacity, teachers encourage them to

use simulation software such as Multisim to realize the circuit after designing the circuit diagram. Digital logic originally belongs to a highly practical professional basic course, which is affected by the epidemic situation.Students can't go to the school laboratory to carry out experiments, and they can't experience the fun of successful experiments. At this time, using simulation software to experiment is a good way to improve students' interest and self-confidence in learning. As long as students are interested in learning, the learning effect will naturally get better and better.

It is a difficult process to flip the interaction between teachers and students online. Only a few students will take the initiative to communicate and discuss with teachers when they encounter problems in the learning process. However, most students are unwilling to take the initiative to communicate with teachers because of shyness and other reasons, and some students will think that they know everything, but in fact they have little knowledge.In this case, students will not actively seek help from teachers. Without teacher-student interaction, it is difficult for teachers to grasp the students' learning situation. Therefore, teachers should pay special attention to publishing relevant discussions on some important concepts in the discussion area of the teaching platform. For example, in this class of combinational logic circuit design, discussions on irrelevant items can be published.Let students tell themselves what irrelevant items are and when there will be irrelevant items in circuit design. Of course, teachers can also make an appointment with students for online communication and discussion, and strengthen the interaction between teachers and students through discussion, which can not only help students find and solve problems in time, but also enhance the feelings between teachers and students.

3.3 After-school learning achievement evaluation.

The evaluation of online teaching adopts the "formative evaluation" method guided by learning achievements. The evaluation content consists of two parts: the completion of learning tasks and learning achievements. The evaluation results are released on the teaching platform in time to encourage students to learn online.

Teachers publish videos and courseware in the form of task points while publishing task lists, so that the completion of tasks can be counted by the teaching platform. Teachers can directly see whether students have completed relevant learning after logging in to the platform.

In order to avoid some opportunistic behaviors of students, teachers' evaluation of students' learning achievements focuses on the completion of homework. By reviewing the homework, the teacher can see each student's understanding and application of knowledge, and answer questions individually. For some common problems encountered by students, online guidance can be given to these problems again.Or summarize this part of the knowledge points, and publish it again on the teaching platform for students to digest and consolidate. The grades are divided into five grades: failing, passing, medium, good and excellent, and the corresponding grades are evaluated according to the quantity and quality of the learning achievements submitted by the students. Excellent achievements with innovative thinking in improving circuits should be reviewed and affirmed in time.And published on the teaching platform, consciously cultivate students' innovative ability.

4. Teaching Evaluation.

4.1 Evaluation of students.

Big data statistics provided by Superstar online teaching platform include classroom activities, course scores, homework statistics, exam statistics, teaching early warning, video scores, test scores, learning times, homework scores, exam scores, comprehensive scores, task completion, etc. According to the data, students' learning dynamics can be grasped, and students' Digital Logic course can be comprehensively evaluated.The evaluation result is included in the total score of the discipline by 20%.

4.2 Evaluation of curriculum and teachers.

Traditional teaching evaluation is often distributed to students by printing questionnaires, and teachers collect the survey results manually. This method takes more time and even causes students'

rejection psychology. Through the electronic questionnaire released by Superstar online teaching platform, students answered according to their own schedule, which embodies the teaching philosophy of "student-centered".Students can objectively evaluate the curriculum design, content difficulty and teacher satisfaction of Digital Logic in the form of anonymity, and put forward pertinent opinions and suggestions on the teacher's teaching situation. The evaluation results will play a role in supervising and guiding the future teaching improvement of the teachers' team.

5. Teaching Practice Experience

Online and offline mixed teaching is a new educational model adapting to global informationization, which is more and more widely used in the teaching process of colleges and universities across the country. In traditional teaching, the shortcomings of teachers' teaching methods focus on less interaction between teachers and students, and students' ability to use knowledge flexibly is relatively weak, mainly focusing on exam-oriented education and sea tactics.The new teaching mode is based on the Superstar network teaching platform for online and offline hybrid teaching. Teachers need to establish a "student-oriented" educational philosophy, take all medical students' needs as the starting point, and integrate online education technology and resources, providing students with a platform for presentation and discussion, and promoting the all-round development of students' autonomous learning and teamwork.Online and offline mixed teaching mode breaks the time limit of class, and online learning resources have the characteristics of high repeatability, which is more advantageous for students with poor foundation and weak ability to accept knowledge, and meets the needs of students' diversified learning methods. The course of Digital Logic is mainly based on micro-morphological functions. Students have no intuitive feelings and it is difficult to accept knowledge.Moreover, this discipline has always been a discipline that keeps pace with the times. Information related to research at home and abroad can be shared online at any time, and students can receive the most cutting-edge discipline trends. The online and offline hybrid teaching mode of Digital Logic based on Superstar network teaching platform is in line with the wishes of most students. Students use fragmented online resources.Preview, consolidate and expand the knowledge taught by offline teachers, and the learning efficiency will get twice the result with half the effort. The combination of online and offline teaching mode breaks through the limitation of time and space, makes teaching and learning more flexible, and effectively improves teaching efficiency and effect.

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