Discussion on the Online Teaching Method Reform of "Embedded System And Application" under the Background of Epidemic Situation

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Abstract: In the context of novel coronavirus background, this paper focuses on various problems about "embedded system and application" encountered in the teaching process, discusses the three aspects of curriculum construction methods, teaching methods and assessment methods, and put forward the improvement solution. The teaching practice shows that online teaching task of this semester going well, realizing the goal of " class-suspended but still teaching, class-suspended but still learning" during the epidemic situation period, and effectively ensuring the teaching quality.

Keywords: Epidemic Situation Background; Embedded System; Teaching Methods; Online Teaching

1. Introduction

"Embedded system and application" is the core course of computer science and technology and software engineering in our university, with strong applicability. In the past, teaching was conducted offline. Students can communicate with teachers face to face, and teachers can also supervise students. Due to the impact of the COVID-19 epidemic, colleges and universities delayed the start of school. In order to ensure the smooth implementation of the policy of "non-stop teaching, non-stop teaching", our school adopts online teaching to ensure the smooth completion of teaching tasks, which is a huge challenge for teachers and students . Since the beginning of the course, the specific problems encountered in the actual teaching process are as follows:

First, the content of the textbooks used in the past is a little outdated, with emphasis on theoretical learning and insufficient application content, which is not suitable to be directly used as the teaching materials of the "embedded system and application" course for private college undergraduates. At the same time, due to the rapid updating of professional technology, teachers' curriculum frontier knowledge reserves are slightly insufficient.

Second, due to time and space constraints, the effect of online teaching is difficult to reach the same level offline, especially in the experimental link, and online demonstration is slightly weak.

Third, the existing student evaluation system pays too much attention to the test results, and the assessment method is single.

Fourth, how to integrate ideological and political education into the teaching of professional courses is also a problem that needs to be discussed.

Based on the above questions and my own thinking, I will try the following in actual teaching.

2. Course construction method

2.1 Select course materials to ensure the rationality of content

The textbook is an important reference material for students to learn the course. Choosing a textbook suitable for the course "Embedded System and Application" is the primary task of the course construction. The selected textbooks should not only be novel

in content, but also meet the needs of students.

Based on the actual situation, our school selected the book "Principles and Applications of Embedded Systems", edited by Meng Xianglian and published by Tsinghua University Press, as the teaching material. This book focuses on "application" and "engineering development", taking into account both basic and practical aspects. The content of the textbook systematically introduces the use and debugging methods of the software development environment, and explains the architecture and programming methods of ARM9 in detail. Among them, the instruction set in the instruction system and the mixed programming of assembly language and C language are particularly described thoroughly, and the combination of theory with practice is easy for students to understand.

2.2 Enrich the teaching content of the course and keep the forefront of the content

The course content of "Embedded System and Application" mainly includes the concept of embedded system, ARM9 architecture and instruction system, assembly language programming and mixed programming with C language, the structural principle of S3C2440A chip and the design method of peripheral circuits, and ADS1.2 integrated development environment.

In order to ensure the novelty of teaching content, teachers should always pay attention to well-known forums at home and abroad, understand the latest progress of embedded technology, and pay attention to the accumulation of relevant knowledge. At the same time, teachers should add new and relevant professional knowledge to expand the teaching content when preparing lessons to ensure the novelty and cutting-edge of the curriculum.

3. Teaching methods

"Embedded system and application" focuses on cultivating application-oriented talents with solid theoretical knowledge and can work together. In this training mode, teachers should help students learn the ability to solve problems by combining theory and practice, guide students to master the relevant theoretical knowledge of embedded system development and the use of ADS integrated development environment. Finally, make students have the ability to solve practical problems.

3.1 Standardize discipline requirements and strengthen classroom management

Five minutes before the class, the teacher initiated a sign-in on the Superstar Learning Connect platform, and informed the students to enter the nailing class in WeChat group to prepare for class. The teacher can use the "person selection" function of Superstar Learning to ask students random questions, and ask students to answer questions directly on the public screen of the nail live broadcast room as a supplement to attendance. In order to check the online learning effect of students, the teacher will release the homework on Superstar Learning after each stage of learning is completed. After the students have completed and submitted, the teacher will review online to understand the students' mastery of knowledge points and explain common problems in class.

3.2 Enriching the experiment

For some highly theoretical content, the teacher recorded relevant embedded application videos in advance and shared them before class, so that students can have an intuitive and clear understanding of what they have learned, so as to stimulate students' interest in learning.

3.3 Strengthen interaction and optimize teaching process

The interaction in the teaching process can enable teachers to better obtain the students' listening status and understand the students' grasp of the teaching content. In the online teaching process, teachers use live broadcast to teach, and interact with students through the functions of Super Star Learning, such as voting, selection, topic discussion and testing, to activate the classroom atmosphere; Students are encouraged to ask questions about the knowledge points they don't understand in time. Considering the network delay and stagnation, teachers do not interact with students through live broadcast.

3.4 Integration of ideological and political elements in course teaching

As a college teacher, in the teaching process, we should not only impart professional knowledge to students, but also pay attention to the cultivation of students' comprehensive ability. Especially for science and engineering students, we should not only emphasize professional knowledge and skills, but also help young people establish ideals and beliefs, so that they have a correct world outlook, outlook on life and values. Therefore, teachers should reasonably sort out the course content and properly integrate ideological and political elements in the teaching process. We should not only plant the responsibility field of curriculum teaching, but also keep the channel of ideological and political education, realize the perfect integration of curriculum construction and ideological and political education, and cultivate students' patriotism.

4. Assessment method

Course assessment is one of the important means to urge students to learn. By adopting flexible and diverse assessment methods, we can more comprehensively understand students' learning situation and arrange future teaching plans accordingly. The assessment method of this course is as follows: the final total score consists of two parts: the usual score and the final score, each accounting for 50%.

5. Analysis of teaching effect at this stage

The course of "Embedded System and Application" was taught according to the teaching plan of our school, and it went smoothly. Most students can watch the course video on time and complete the pre-class preview.

Most students can attend classes on time, and some students are absent due to force majeure such as power failure and power failure, but they can watch the playback in time after class.

The online classroom atmosphere is more active because of the live teaching by the teachers. Teachers and students can communicate in real time through the public screen, and teachers can get feedback from students in time, which simulates offline teaching to the greatest extent. Students have a good grasp of the teacher's teaching content. All students can complete the homework as required, and the completion of the homework is good.

6. Summary

This paper discusses the course construction method, teaching method and assessment method of the course "Embedded System and Application". From the students' preview, attendance, classroom performance and homework at this stage, online teaching has broken through the time and space constraints of teaching and basically reached the level of offline teaching as usual.

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