Innovative Exploration and Practice of the Single-chip Hybrid Teaching Model

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Abstract：The course of "single-chip microcomputer principles and applications" in the automation majors of colleges and universities involves many teaching and learning problems such as high content and high difficulty, high requirements for students' comprehensive quality and high requirements for students' practical operation ability[1]. The first point is that single-chip teaching adopts a comprehensive hybrid teaching mode of online network teaching and offline practical teaching, so that students can learn and absorb the content of this course in their spare time. The second point is the detailed breakdown of the teaching content of the single-chip learning course, and the task-driven teaching method is used in it to realize the mutual promotion of teaching and learning, so that students can fully grasp the understanding and use of the single-chip computer[2]. The third point is to make the assessment and evaluation system the key content that supports the teaching concept in the teaching process. Timely assessment, timely discovery of problems and timely correction of problems arising in the teaching process. The realization of the innovative exploration and practice of the single-chip hybrid teaching through the above three aspects is a qualitative improvement of the teaching results and quality of the single-chip microcomputer.

Keywords：SCM Teaching Reform, Mixed Teaching, Task-Driven, Scm Courses, Online and Offline, Mixed Teaching Mode

With the development of network information technology and people's continuous reform and innovation of education, a large number of teaching courses have gradually entered a hybrid teaching mode combining online and offline. In automation majors, the course "principles and applications of single chip microcomputers" played a very important role. This course has higher requirements for students' theoretical and practical abilities and plays an excessive role in the training of students' vocational ability. The move to achieve high-quality teaching content of single-chip microcomputers can effectively improve students' practical application ability of professional knowledge and theory. To a certain extent, it can promote students to join the upsurge of innovation and entrepreneurship, and enable students to develop a good teamwork spirit and practical work ability in future employment and entrepreneurship. The mixed teaching mode is a correct and effective teaching mode exploration for the single-chip microcomputer course teaching, which requires high practice and theory and needs to be fully integrated.

1. Teaching issues

The single-chip teaching course occupies a higher position in the automation major. However, only increasing the setting of course hours and credits is not enough to effectively improve students' mastery of this subject[3]. The teaching methods and curriculum arrangements of single-chip microcomputer teaching need to be improved in more or less parts, which are embodied in the following three parts.

1.1 Difficulty in getting started with MCU

Analog electronic technology, digital electronic technology, computer C language and other content with higher professional level and greater difficulty in learning are all foreshadowing content of the MCU course[4]. In the practical course, students also need

to understand the development environment of the microcontroller and the programming and software involved. Because of the more background knowledge of single-chip microcomputer, theoretical study is relatively monotonous. Therefore, this course is more difficult and less attractive for students who lack basic professional knowledge. As a result, students have difficulty in getting started in the MCU course.

1.2 Low efficiency of single-chip teaching practice courses

The single-chip microcomputer course requires students to have a high level of practical operation ability, and the students need to prepare the program in advance; but most college students studying automation majors lack the programming technology they have mastered, they only use offline classroom learning. Experience development background, so the teaching effect gained is far from reaching expectations. Enhancing the students' attention to the MCU course in their spare time away from the classroom and improving the learning efficiency of the teaching content in the classroom are all problems that need to be overcome by the effect of the MCU teaching[5].

2. Teaching improvement measures

Through the research and analysis of the actual teaching problems of single-chip teaching. Although students' independent learning ability and learning interest are key issues that need to be improved urgently, the realization of the innovation and development of the single-chip teaching model is also particularly important for students' learning and the improvement of teaching effects[6]. Especially nowadays, online teaching is developing rapidly. Online learning can use big data to integrate educational resources, and use these educational value-rich online knowledge resources into MCU learning. How to make students fully master the single-chip learning, instead of just taking the single-chip course content as a task of college learning and perfunctory[7]. In response to this teaching phenomenon, educators need to improve the single-chip teaching mode in terms of teaching mode, teaching content and assessment system.

2.1 Improvement of teaching mode

In the actual teaching environment, the online learning method is introduced, the two effective teaching modes of online and offline are fully mixed and integrated. In a purely offline education environment, there are some learning problems. With the promotion of the trend of the Internet age, this traditional education model is gradually not suitable for the current education atmosphere and there is a problem of insufficient effect in actual knowledge learning[8]. Advanced online education methods can make up for the shortcomings of offline learning, break the boundaries of time and space and make the learning environment more diversified. For example, in rigid course hours, students may not fully grasp the course content in time for various reasons. In this case, students can learn and absorb what they have learned through online learning [9]. Compared with the previous pure offline classroom teaching, the online and offline hybrid teaching mode can make learning enter the students' after-school life and also allow students to master the learning content through interaction [10].

2.2 Teaching content improvement

The single-chip microcomputer teaching course has higher requirements on the professional level of the students, so the difficulty of learning increases the challenge of students' learning. In response to this problem, the single-chip teaching curriculum can be divided into three specific learning stages from easy to difficult, specifically divided into primary stage, intermediate stage and advanced stage[11]. In the primary stage of learning, educators focus on the improvement of students' interest in learning. Due to the high professional content of single-chip learning, students have not been exposed to such courses in the previous learning process. The first physical examination of learning is extremely important for students, a good start is the focus of effectively completing the teaching task [12]. In the intermediate stage of learning, students are required to fully grasp the theoretical content of the single-chip teaching. The learning of this knowledge is not limited to memorization, but to upgrade the level to understanding and absorption, paving the way for the third stage of learning. In the advanced stage of learning, since the students have fully mastered the theoretical knowledge of the MCU course in the previous stage, what the students need is to use the knowledge they have learned in the actual operating environment and use the knowledge again in practice. So that students can fully master the MCU teaching.

2.3 Improvement of assessment and evaluation

Whether it is online or offline learning, assessment and evaluation will always be an intuitive way of showing students' mastery of the knowledge learned in this course. Due to the innovation of the hybrid teaching model, in order to adapt to the teaching model and achieve good teaching results, the reform of the assessment system is also urgent[13]. Therefore, it is possible to use the

characteristics of fast online speed and high accuracy to evaluate students' daily homework, so that students can detect their learning achievements in time and find learning problems in time; at the same time, it also reduces the burden of educators. Work load. After completing a semester of learning tasks, educators conduct assessments on students' practical operation and conduct face-to-face comments and guidance on students' practical ability. Enable students to improve in both theoretical study and practical operation.

3. Conclusion

After investigation, research and analysis, we can intuitively conclude that the mixed teaching model has a significant effect on the educational results of the MCU teaching curriculum. Applying this learning model to the actual teaching environment will truly and effectively improve teaching quality and efficiency.

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