

Discussion on Improving Students' Engineering Skills in the Curriculum Design of Single Chip Microcomputer

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Abstract

Single chip microcomputer is a combination of theory and practice. In recent years, more and more attention is put into the cultivation of students' practical ability in higher education, This paper analyzes the problems existing in the traditional single chip microcomputer curriculum design, combined with teaching experience, the research attempts to explore the reform of teaching method, puts forward teaching reform measures how to improve the students' engineering practical ability. The practice shows that the effect is very good.

Keywords

Single Chip Microcomputer, Curriculum design, Teaching reform.

1. Introduction

Single chip microcomputer course is a strong curriculum collection of electronics, computer and other technical application [1]. In the student studies, under the premise of basic theory and basic knowledge, in order to deepen the understanding of the overall structure of the single chip microcomputer and to raise the students' ability of single-chip computer system application software design and development, the colleges and universities usually arrange course design of comprehensive practice course. And its purpose is to make the students understand SCM theory and advanced language programming thought through combining the practice and the high level language program design course experiment. On the basis of practical development of a practical application system, it strengthens the students' practice awareness, cultivates the students' concepts about project engineering thinking and improves their ability of engineering practice to lay a solid foundation for adapting to the current enterprise for talents demand.

2. The existing problems among traditional single chip microcomputer curriculum design

2.1 Single style of course design content and format.

In the traditional single chip microcomputer curriculum design, it is often that the teacher designates design content. And because of the limitations of the experimental equipment, the less topic number, the single content and even many years of design problems, the curriculum design the students can try is very limited. This leads that the students' interest is not strong, the initiative lacks, not to mention creativity; it is more likely to lead to the phenomenon referring to the others' design during the students' curriculum design, which cannot achieve the real purpose of curriculum design.

2.2 Unreasonable time arrangement.

Although before the single chip microcomputer course design, the experimental teaching has been arranged, but it usually is the verification experiment, external expansion circuit of single-chip processor is less, and the students' comprehensive ability is poor including hardware development and programming of peripheral interface circuit design; And the content of the course design is usually issued within 2 ~ 3 weeks before course design, even 1 week before the course design. In this way, because of the limit of the course design time, and the students' limited ability in the application of single-chip microcomputer hardware development and the peripheral interface circuit

programming, it inevitably causes students to elaborate course design, refer to others' program and not to understand the implementation process of program.

2.3 Not-scientific assessment method.

The traditional single chip microcomputer curriculum design assessment method is to write the curriculum design report and submit the program. As long as the report content is correct and is in accordance with the specification and has right results after the program design, it can achieve excellent results. But in fact, this does not truly reflect students' comprehensive application ability of the single chip microcomputer, because some students skimp on the course design task and refer to the other students' program, or even copy, and even if they don't know how to achieve the program function, they also can get good grades.

3. Teaching reform on the curriculum design of single chip microcomputer

3.1 Combination with specific subject design and independent questions choice.

Teachers provide some curriculum design topic for students to choose, and can also encourage students to get out of the campus. Through the investigation visit, the students understand the status of the domestic microcomputer application development, combining the reality of social demand from project, make the students become passive learning to active learning, so as to arouse the enthusiasm of students' autonomous learning. But the choice of subject asks for the approval and review of the teachers, in this way, in the process of development of a real project, students bring the driving force of knowledge, stimulate students' learning desire and creative, for virtual topic, students are required to do practical demand, can solve a certain of application problem, and has certain application value.

3.2 Reasonable time allocation and task force members.

In order that the students have sufficient time to prepare for curriculum design, in the half of the SCM theory teaching, the task of curriculum design requirements is given, at the same time, the students are divided into groups, each group for 3 ~ 4 people, each group containing 1 ~ 2 students with more interest and stronger learning ability. When issuing subject, it only explains the mission requirements, the rest of the design process is design by each team. Within a week before debugging in the lab, the teacher checks the design of the students and guides, and then enters the lab test. Since the single chip microcomputer laboratory is opening in the absence of teaching task, therefore, early issuing curriculum design tasks and early preparing by students. According to their own in a timely manner to the laboratory and laboratory opening time of debugging, purposeful and active learning, to achieve a good result for curriculum design [2].

3.3 Encourage and guide students to do their own practice.

To encourage and guide the students with strong learning interest, basic skills and innovative ability, not to provide laboratory equipment, but to choose the relevant circuit components from the market to guide the teacher to give the necessary technical support. This will allow students to understand the market situation and the development of current components. It is natural for students to take into account the problem, which they can quickly adapt to the actual requirements of the enterprise in the environment of the market economy in the future to play a very positive role. Practice has proved that this is an effective way to motivate some students to study more deeply, but also to mobilize the enthusiasm of all the students.

3.4 Reform assessment methods and guide students to focus on engineering practice ability and innovation ability training.

The way of the single chip microcomputer course design is changed from the original submission procedure to the reply and writing report. Students in accordance with the assessment requirements, the production of PPT, in reply process, students should clearly express their design ideas and process, and through the PPT complete demonstration works of design and debugging process, the teacher according to the effect of the work and report to complete the quality of the performance, this assessment method can not only reflect the students on the application of knowledge, innovation

ability and engineering practice ability, but also for students in the future engaged in technical work exchange provides a certain exercise[3].

4. Conclusion

Computer technology and electronic technology develop very fast and new technology, hardware and software constantly appear. The teaching reform should adapt to the new era demand for talent training. The feature of the course is to combine closely with the theory and practice, practice is particularly important. Learning microcontroller ultimately is that the students can use the knowledge to develop the product with the requirements of in the later work. Therefore, the teaching method of SCM course design is continuously to explore and reform. The purpose of teaching reform is to create a more appropriate learning environment for students, students must constantly progress, constantly motivate students to explore innovative, raise students' interest in learning professional courses, improving the students' engineering practical ability, improve the students' innovative practice ability, truly to achieve the effect of exercise students through the course design steps[4].

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