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Research on the Application of Project-driven and Competition-based Training Mode in Single-chip Microcomputer Teaching Reform

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Abstract: Nowadays, with the continuous deepening of education and teaching reform in China, a new situation has emerged in the development of higher education. In order to meet the requirements of the current curriculum teaching content, the project-driven training model and competition-based training model in the teaching reform of single-chip microcomputers have been carried out. In view of the diversity and practicality of single-chip curriculum teaching, in order to improve the quality of single-chip teaching, teachers should not only start with the characteristics of students' learning and actual teaching content, but also reasonably apply project-driven teaching methods and competition-based training models. Reasonable use of teaching methods may yield more fruitful teaching and learning outcomes in higher education in the future.

Keywords: SCM teaching reform; project-driven; competition-based training mode; application research

In the past, there were many problems in the teaching of single-chip microcomputers, such as "emphasis on theory and neglect of practice", students' unclear learning goals, and insufficient learning motivation. In the single-chip teaching reform, many teachers have proposed different effective teaching methods, among which project-driven teaching and competition-based teaching methods have been widely used. These two teaching methods use practice to promote theory and competitions instead of regular exercises, which greatly improves the teaching effect of single-chip microcomputers. Based on this, this article studies the application measures of project-driven and competition-based training in the teaching reform of single-chip microcomputers, hoping to provide reference value for related scholars.

1. Analysis of powering by competition

In the context of the new era, traditional teaching models can no longer meet the requirements of the single-chip teaching reform. On this basis, it is necessary to transform the center of the "textbook" into a teaching method centered on "projects and tasks", and actively guide students to play their guiding role in actual teaching. This kind of teaching method can also take students as the center and subject of practical operation, and actively establish teaching activities with students as the main body. Because the teaching method of the competition-based training mode mainly emphasizes strengthening the students' theoretical knowledge and practical operation skills in the competition, this teaching method can improve the comprehensive quality of the students and enhance

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their comprehensive application ability^[1].

Strong SCM application ability can not only improve the quality of teaching, but also promote the stable development of students in society. When implementing the competition training method, in addition to analyzing the characteristics of student development, it is also necessary to strengthen the perspective of training. The “match” referred to here mainly refers to various forms of competition. In this process, it is possible to combine the nature of the game, divide it reasonably, master the method of the game, and strengthen the students’ single-chip application ability through the development of simulated competitions and adaptive competitions to ensure the effectiveness of the teaching reform of the single-chip microcomputer.

2. The current situation of the application of the competition-based training method

In the process of education and teaching in our country, in order to improve learning efficiency, it is generally based on theoretical teaching knowledge. Teachers occupy a dominant position in the actual teaching process. Students only passively accept knowledge. If it continues for a long time, students will lose their interest. Especially in the teaching of single-chip microcomputer, because the theoretical knowledge is more complicated and experimental, if the teacher does not innovate the teaching mode, it will seriously affect the teaching effect, and it will also affect the rationality of the teaching reform of the single-chip microcomputer. The effective application of the match-based training method in this process mainly adopts the way of competition to strengthen the effective combination of theoretical knowledge and practical knowledge. It has the advantages of long cycle and strong training pertinence. Students can gain more in the specific competition process. With more operating skills, the students learn more operating experience, master the operating principle of the single-chip microcomputer, and apply it reasonably.

However, some teachers do not have a comprehensive understanding of this method, which will cause the students to communicate less in the specific competition process and fail to discover their problems in the operation process in time. When analyzing the factors that caused the above problems, it was found that students did not have strong practical skills in the learning

process, they lacked spiritual motive, and could not bear large and frequent competitions, and their psychological quality was very low.

Therefore, in the process of applying the competition-based training method, it is necessary to not only strengthen students’ theoretical knowledge and improve their practical ability, but also exercise their experience and endurance, strengthen their psychological quality, and can adjust to the best state to achieve the best results. Competition is a training method, it can be said that it is a basic training method. The effective application of this teaching method in the teaching reform of the single-chip microcomputer has broken the previous training method, and proposed that students should improve their innovation ability, cultivate their own practical operation ability, obtain more single-chip operating experience, and strengthen the reasonable application of relevant knowledge during the long-term competition^[2].

Especially in the case of competition experience and confrontation, it is necessary to make reasonable application of technology, improve one’s mental quality, and find out the mistakes that often occur in the training process in time, mainly to provide reference value for future training and competition. In addition, teachers can also take the form of training camps to innovate the content of competitions and training, strengthen the training of students’ psychological quality, so that students can acquire all aspects of the teaching knowledge of single-chip microcomputer, so as to provide guarantee for the smooth progress of the teaching reform of single-chip microcomputer.

3. Training method based on competition

The single-chip teaching and training process is a relatively complex and systematic training process. It not only requires operators to have a certain theoretical knowledge, but also requires them to have relatively strong operational capabilities. Operators and coaches must have strong theoretical knowledge and operational abilities during this process. The result of the competition is the ultimate goal of training. Therefore, operators and coaches must take a variety of methods to train. On the basis of the operation method, strengthen one’s own operation ability, and then realize the real training purpose.

The previous training theories mainly met the requirements

of student development in terms of technical quality, innovated the teaching method of single-chip microcomputer, and realized the importance of training by competition. At the same time, the previous training methods neglected psychological training, and only involved theoretical and technical training, which would greatly affect the effect of the game. In the process of teaching reforms on the microcontroller, it is necessary to improve the overall quality of the operators, not only to strengthen their skills, but also strengthen the training of the psychological quality of the operators [3].

The effective application of "Training with Competition" in the actual operation process just solved the above-mentioned problems. Using this method, the operators participate in some inspection and teaching competitions to strengthen their psychological quality and improve their professional skills. According to the theoretical knowledge, they can play a role with a good competitive ability during the game, and inject interesting vitality into the boring training. Therefore, in the MCU teaching reform, it is necessary to incorporate some advanced and inspection competitions. Competition guarantees the effectiveness of the training process, stimulates the learning interest of the operators, and allows them to master more MCU operation knowledge during the competition, and then continuously improve their overall quality.

4. Project-driven teaching method

Affected by previous teaching methods, the single-chip teaching method is mainly based on theoretical teaching, supplemented by experimental teaching. The actual teaching process is also explained in accordance with the book and the syllabus. After the staged teaching, some teachers have carried out a small amount of verification and experiments, which to a certain extent seriously affects the effectiveness of the SCM teaching reform. At the same time, in the previous classroom teaching, students cannot play their core role. They passively accept knowledge points in the learning process. However, the monolithic courses have more knowledge points, are more comprehensive, and the theoretical knowledge is more complicated. Adopting previous teaching methods will lead to a serious decline in students' learning enthusiasm [4].

However, the effective application of the project-driven teaching method in this process not only created the teaching method, but also played the role of the student body. The teacher is the guide in this process and mainly focuses on engineering practice as the fundamental goal and combines the single-chip curriculum. According to the distribution of knowledge points in the article, rationally design the project, enrich the teaching content around the specific project, and build a complete teaching system. In this process, students can complete related projects under the guidance of teachers and integrate the knowledge points in them. This teaching method also focuses on the cultivation of students' practical ability, allowing students to learn the corresponding according to the needs of the project. In the process of participating in the project, more theoretical knowledge should be mastered, and then students' problem-solving and analytical skills should be continuously improved.

5. the characteristics of the single-chip project teaching method

In order to stimulate students' independent learning ability and strengthen students' integration of key knowledge in SCM project teaching, some teachers analyzed the characteristics of project teaching methods and strengthened its effective application in SCM related competitions. Actively carrying out competition activities can not only improve students' comprehensive skills in single-chip microcomputers, but also strengthen their thinking skills and examine students' mastery of the relevant knowledge of single-chip microcomputers. This requires teachers in the actual teaching process to take the MCU competition as a comprehensive project and actively encourage students to participate in it. This is not only the main way to cultivate students' comprehensive ability, but also an important assessment method for the course [5].

In addition, actively organizing outstanding students to participate in project competitions can also exercise their comprehensive abilities, integrate the knowledge points in basic projects, so that students can practice with competitions, and through subject competitions, stimulate students to learn about single-chip microcomputer, motivate their sense of innovation, and strengthen the ability of cooperation between students.

Therefore, when teaching single-chip microcomputers, project

teaching methods should be integrated into it, breaking the previous teaching framework, mainly based on project development, enriching teaching content, perfecting teaching procedures, and effectively decomposing the knowledge points in the course. For a series of small projects, teachers should arrange the content of the project reasonably during this process, and must play the role of the link between the previous and the next. At the same time, it is necessary to decompose the background and characters of the project, and then integrate the important knowledge points in the teaching of the single-chip microcomputer, and finally integrate the various knowledge and principles of the single-chip microcomputer through practical activities.

The single-chip microcomputer course is a key course and a compulsory course for engineering majors. This course is mainly based on assembly language, digital circuits and basic computer theory. It is a comprehensive course with strong application and innovation. For students who are just starting to learn this course, the theoretical knowledge of single-chip microcomputer is more complicated, and it is difficult for students to grasp the key points in specific learning, which is not conducive to the integration of theoretical knowledge^[6].

Therefore, relevant teachers should analyze the single-chip teaching reform method, combine their own years of teaching experience, innovate the teaching mode, apply the project to teaching effectively, stimulate students' interest in learning, and let students learn in the subject competition. With more knowledge, the theory and practice are combined to continuously exercise the students' engineering practice ability and further improve the teaching effect of the single-chip microcomputer.

Conclusion

Under the background of the new era, the effective use of project-based teaching and the teaching method of competition training in the single-chip curriculum has strengthened the comprehensive ability of students, innovated the previous teaching methods, and played the main role of students in the teaching process. In order to improve overall quality of students and ensure the effectiveness and rationality of the SCM teaching reform, teachers should start from the students' learning situation and

development characteristics, rationally apply these two methods to promote the effective progress of training and competition, and help students find themselves in the process of SCM operation. In the process of solving practical problems, they will gain more experience and learn to use different training methods to carry out project activities, which will further improve the teaching effect.

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Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

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