The PLC Course Practice Teaching Reform to Explore

Hua Liang and Jing-Heng Zhang

Abstract: PLC technology plays a very important role in the field of manufacturing control. With the rapid development of microelectronics and computer technology, PLC technology has a very wide range of applications in the field of manufacturing control, thus promoting the rapid development of the manufacturing industry. The practicality of PLC technology in the manufacturing industry also determines the direction of the development of electronic specialty in Colleges and universities. Now China's major colleges and universities are mostly electronic professional courses have opened PLC, but because of the shackles of traditional teaching concepts, making the teacher stay at the stage to lead students to eat textbooks. But PLC is a very strong operational course, increasing the students' practical ability is the ultimate goal of teaching.

In this paper, the PLC course practice and exploration on the teaching reform, from the experimental teaching, simulation teaching, project teaching and university-enterprise cooperation analysis in three aspects: the PLC course teaching reform and teaching effect. Ultimate purpose is to guide the students learning interest, improve the students' practical level.

Key words: PLC teaching, reform, project

Introduction

Course is a course of electrical control of PLC, has the very strong technical and operational, electrical control of PLC technology in the manufacturing or other industry play a pivotal role. Enterprise in the process of hiring workers pay more attention to the work experience, and because of that, truly understand the technical personnel of PLC control technology is very scarce. Universities related courses in PLC teaching, but limited to the traditional teaching idea, the teaching of this course mostly stay in the textbooks on stage, the teacher teaching the width on textbook, involved with textbooks and students' understanding of the level of content. Graduates to understand only the general theory and instruction to independent to undertake on-site control programming tasks. Therefore, the PLC course teaching reform is imminent.

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This paper introduced the experimental teaching, simulation teaching, project scholarship and university-enterprise cooperation in the new era for the importance of PLC teaching, aims to improve students' ability of practice and the effectiveness of the practice.

**First, the experimental teaching**

Experimental teaching is an important link of PLC teaching, most colleges and universities have conducted related experiment courses, but many schools just confirmatory experiment course, mainly for one type of instruction or a knowledge to verify operation, for students to understand textbook content has some auxiliary function.

But we must stress that the PLC course is a practical strong discipline, the content includes the basic principle, basic instructions, and basic application and the basic operation, etc., technical stronger, students can not through a few simple verification experiment can distinguish clear understanding and meaning and application of various kinds of instructions. Wait until after graduation to real use of PLC technology, and must relearn, efficiency is very low, influence the progress of the work. We found that the foundation of the verification experiment to learn complex skills, just tour, student's impression is not deep, easy to forget, the teaching effect is not good.

Developmental experiment suggested by class proportion in colleges, developmental experiment can effectively improve the students' ability of independent thinking, compared with the passive to observe the verification of experimental results, open experiment guide students to think about the result of the experiment, and experimental results in order to achieve the ideal and to carry on the design and study, from the duck textbooks teaching to the student active learning, improve the students' interest in learning, to improve students' thinking ability of the application of more effectively.

**Second, simulation teaching**

In the difficulty of the experimental teaching in colleges and universities is the incompleteness of experimental equipment, lead to many teachers hope can open experiment doesn't project smoothly. For textbook textual content, only hard eating raw, and for the process is always unable to accurately grasp. This time, the students understanding of the knowledge points usually only an ambiguous state and some time will be completely back to the teacher, learning efficiency is low.

We know for engineering course of study, it is very important to understand. Engineering courses, especially in high technical content of courses, such as the PLC must make clear the process of programming operation, such ability can deep understanding and mastery. In the face of hardware experiment under the condition of insufficient equipment, can use computer to simulate the teaching activities.

Teachers can be done through the computer simulation, observation of PLC control every step of the process, through the dynamic process of dynamic operation,
lets the student in learning in the deep memory, clear understanding. But this requires teachers to have relevant teaching level, to be familiar with computer simulation teaching method, should be through the computer simulation platform structures, a simulation experiment environment. Simulation teaching through an ordinary computer to demonstrate the control process of PLC, instead of the lack of relevant hardware equipment in the school, breakthrough the limitation of teaching conditions, strengthen the understanding of textbook knowledge.

Three, project teaching

Project teaching task is to through the design of site operation course, lets the student independently, to cultivate the students' ability of independent innovation. Project teaching and developmental experiment the distinction that having essence, development relying on experimental equipment to accomplish the experiment project, is static and predictable; And project teaching are open to the final product as the guidance, students from the scheme design, the choice of the device, to the arrangement and the electrical control of circuit implementation, similar to the enterprise need new development projects, while students of R&D project management roles in the process of time, to have the courage to take responsibility independently and scholarship.

Through the project of teaching can promote the students more serious and careful treatment of PLC course, for the completion of the problems encountered in the course of the project, will take the initiative to access data, try to do more, unriddling for yourself. Project oriented teaching also allows students to have a sense of learning, a profound understanding of the project teaching assessment is to demonstrate the final completion of the project products, there is no shortcut.

But in the process of project teaching, teachers need to strictly control the project, need to put the teaching content of the layers of decomposition, design reasonable easy steps, to give students the proper guidance of science, so that students will be motivated in the project teaching, and can make the PLC control program, greatly improve the students' study enthusiasm and confidence.

Fourth, university-enterprise cooperation teaching

University-enterprise cooperation is the development trend of the current college education, the students sent to the enterprise practice, so that students can feel the working atmosphere of the enterprise before graduation, and understand and learn the skills required by the enterprise. But the school enterprise cooperation teaching in this paper is not only aimed at the students, but also the teachers. Most of the teachers in Colleges and universities have a high degree, but there are also problems to solve practical problems, the knowledge and the actual production line. At this time, the alternative school enterprise cooperation will play an important role. The university-enterprise cooperation is to use the summer and winter vacation or weekend time, sent teachers to the enterprise to study and exercise, temporary teachers actual position in the enterprise, manage company's actual business. For
teachers to understand a line of research and development personnel and staff to master the skills it takes to make teachers understand enterprise company, a line of research and development personnel to complete the project process. Through the way of cooperation between colleges and cultivating double teachers, improve teachers' practical ability and the ability of project development. Only in this way, can the better docking enterprise, the reform of PLC teaching method, make students really learn to adapt to enterprise production of professional skills.

Summary

All in all, universities should also think about PLC teaching how to better adapt to the development of the manufacturing industry in the new era. Only improve actual operation level and research level of teachers, to the enterprise production line have very clear understanding, know the enterprise operation process of a production line, to know what kind of talent, enterprises need to know how to have more purposeful and targeted the development of teaching course. That is to say, only to have enterprise actual work experience of the teachers, is likely to PLC practical courses for specific detailed reform, make can make the PLC curriculum reform to achieve the desired effect. Production can not behind closed doors, teaching can not behind closed doors, to improve their teacher to go out. And students in the learning process must according to the teacher's guidance, step by step, it can better exploration of the PLC control of the world; Students to design and thinking, it is only through debugging repeatedly, to complete the project in the process, can improve the learning interest, improve the ability of hands-on conforming to the requirements of the society, improve the learning efficiency.

references


