Teaching Design of Electronic Technology Course based on Project Teaching Method

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Abstract

Electronic technology course is an important professional basic course for electrical majors, which has strong theoretical, practical and engineering practicality. Project teaching method can organically integrate theory and practice. This article introduces the project teaching method into the teaching process of electronic technology courses in higher vocational education. According to the general principles followed by the project teaching method, some specific projects have been developed, combined with actual research, and explored how to organically combine theory and practice to increase students' interest in learning and Operating skills, so as to effectively improve the teaching effect.

Keywords

Project Teaching Method; Project Development; Electronic Technology.

1. Introduction

In recent years, the project teaching method has been widely promoted in some higher vocational colleges in our country because its good teaching effect is better. The project teaching method mainly emphasizes student autonomy, teacher-student interaction, and application of results, fully embodies the importance and practicality of "integration of teaching, learning, and doing" in vocational education and teaching, and focuses on improving students' interest in learning and operation Skills, comprehensively cultivate students' professional qualities and professional skills.

2. Develop Specific Projects

1. Project-based teaching design based on the course content

According to the knowledge objectives and mastery requirements of the electronic technology course, the development of the teaching project of this course takes the traditional knowledge transformation as the main design line, and completes the following knowledge points: identification of common electrical components, how to use common electronic testing equipment Correctly, analysis and design of main electronic circuit principles, basic application of common electronic circuits, design and development of practical circuits, etc.

The following projects can be developed for electronic technology courses:

(1) Identification and testing of common electronic components;

(2) Design, installation and debugging of DC stabilized power supply;

(3) Installation and debugging of RC oscillator circuit;

(4) Installation and debugging of audio power amplifier;

(5) Installation and debugging of the FM radio;

(6) Installation and debugging of multi-channel competition answering device;

(7) Installation and debugging of RC bridge audio sine wave signal generator;

(8) Installation and debugging of digital frequency meter;

(9) Design and Installation of digital electronic clocks;

(10) Use 555 timer to make the doorbell circuit.

2. Establish specific project objectives

The project objectives can basically be established from the following three aspects:

(1)Knowledge and skills objectives: through project teaching activities, students can naturally understand electrical components; familiar with common electrical equipment and tools; easily understand various abstract circuit principles; actively master the application of specific circuits; learn to find and analyze data and develop Some practical electronic circuits.

(2)Ability objectives: Through project teaching activities, cultivate students' ability to collect and analyze data and information, analyze and solve actual electronic technology problems, and the ability to unite, cooperate, and integrate.

(3)Emotional objectives: Through the implementation of project teaching method, it can help students establish self-confident and self-improving outlook on life, encourage students to practice and explore the learning spirit, and cultivate a rigorous, meticulous, truth-seeking and pragmatic work attitude.

3. The Implementation Process of Project Teaching Method

Take the "Design and installation of Digital Clock" project as an example, the specific implementation steps are as follows:

1. Determine project tasks

Usually, the teacher proposes a task idea, and then discusses it with the students to finally determine the project task. For example, when the content of the digital electronic technology course is basically coming to an end, we can carry out such a project-" Design and installation of Digital Clock ". When implementing the project, teaching can be guided by the following questions to determine the task of the project:

(1) Questions are asked and the students should answer: What is the most commonly used in our daily life-"Time countering"; what is the most important small electrical component used for Time countering -"Digital clock".

(2) Knowledge and technical guidance: What circuits should we use in addition to counters if we want to perform timing? If you want to see the time, you need to display the numbers, and if you want to display the numbers, you need a display decoder. This leads to the display decoder and the digital display, and allows students to clearly understand the connection relationship of the three integrated chips; at the same time ask questions --- What signal should be used as the reference input signal for digital clock timing? Which digits need to be displayed in general digital clocks? How do we adjust the timing when the timing starts or when there is an error in the timing? From this series of questions, the second pulse generating circuit, counting and decoding circuit, proofreading circuit, etc. are drawn, and students are gradually guided to outline a block diagram of a digital clock with basic functions in their minds.

2. Collecting information

Divide students into groups. For example, a class of 40 students can be divided into 8 project groups, each with 5 people (the number of people should not be too large), and each group determines a project leader. In order to complete the project tasks, students must collect information through various channels, systematically study the knowledge and content involved, the teacher will provide necessary guidance, and assist in providing corresponding books, manuals, materials, etc. The student team works by themselves, looking for answers to questions in the information, and figuring out what unknown knowledge and skills they should learn.

3. Develop work plan

Each group develops a set of work plans based on their own understanding and mutual discussion. The plan should reflect that the work should be carried out in several steps, how to complete it step by step, which links are the key, how to link each link, and which tools and equipment are needed. Based on the particularity of electronic technology courses, in order to ensure the safety of people and equipment, safety protection measures and precautions should be formulated at the same time.

4. Group Implementation plan

Group implementation can enable students to learn actively and construct knowledge and skills autonomously. Under the command of the project leader, each team shall reasonably divide the work of each member.

In the specific implementation process, teachers generally need to lead the project, and require completing project tasks within a specified time. The design and installation of digital clock can refer to the following steps:

Step 1: Each group should draw a block diagram of the digital clock clearly and reasonably according to the plan;

Step 2: According to the needs, search for information and manuals, select various electrical components, wire materials and tools, and list a detailed list;

Step 3: Clarify the function of each unit circuit and the structure and working principle of the integrated chip;

Step 4: Complete the design of each unit circuit, write out the working principle and function analysis of each part;

Step 5: Combine each unit circuit together, design and complete the logic circuit diagram of the digital clock circuit;

Step 6: Draw the layout of the whole machine and the wiring diagram of the whole machine;

Step 7: Weld and install the whole machine circuit;

Step 8: Debugging and fault analysis and troubleshooting are carried out at different levels.

5. Check and evaluate

After the task is completed, the students must carefully check all the work, and the teacher must promptly guide the students to analyze and correct the error. Then organize group and individual self-evaluation, and let each group take the stage to publicize the self-evaluation results. In particular, it is necessary to communicate the most impressive and harvested experience of each group in design and installation, whether they can be achievements and experience, or mistakes and lessons, Let students conduct self-anatomy. Finally, the teacher conducts inspection and scoring, and the teachers and students discuss and judge the problems that arise in the project work, as well as the methods for students to solve the problems. Grading can be conducted in a manner of self-evaluation, group evaluation, and teacher evaluation each accounting for a certain proportion.

When discussing, the teacher should listen patiently to the evaluation of each student, encourage and guide the students, help them build confidence, and gradually learn to complete each project independently.

6. Teacher's summary feedback

The teacher's final summary and feedback is very important. It is not only conducive to grasping the students' learning situation in time, but also help students to identify, analyze and solve problems; it is necessary to fully affirm the efforts of each student and point out the Insufficiency and direction to be worked on.

4. Summary and Reflection

In short, because of its strong practicality, electronic technology courses are more suitable for project teaching methods. The knowledge points are run through with "projects" to enable students to form a systematic knowledge structure and clear course goals. In the process of teaching implementation, the traditional "indoctrination" teaching is abolished, students' dominant position is highlighted, students' interest in learning is stimulated, and students are pushed into project activities. Teachers only provide a well-designed teaching situation, and act as a problem-guided organizer, guide students to seek project solutions, ideas and final solutions in the discussion, and build a teaching model of "integration of teaching and doing". However, as a new teaching method, it still needs continuous improvement and innovation in practice.

References

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