

Application and practice of project teaching method in electrical control teaching

Zhenlong Sun

Liaoning Institute of Science and Technology, Benxi, Liaoning 117004

Abstract: electrical control highlights the characteristics of practicality and precision. Under the background of vigorously promoting teaching reform, teachers are gradually exploring diversified teaching methods of electrical control, so as to continuously adapt to the needs of enterprise talents and promote the long-term development of undergraduate education. Project teaching method is a new type of comprehensive teaching activity in the form of teacher-student team cooperation to complete the overall project. In the whole teaching activity, it can not only highlight the subjectivity of students, but also give full play to the guidance and auxiliary role of teachers, which is conducive to the comprehensive improvement of students' comprehensive ability. Based on the brief description of the differences between project teaching method and traditional teaching method, this paper focuses on the implementation steps of project teaching method and its specific application in electrical control teaching, in order to enhance the application effect of project teaching method and provide beneficial inspiration and reference for front-line education workers.

Key words: project teaching method; Electrical control; application

Introduction

At present, many schools still use the traditional cramming teaching method in the process of electrical control teaching. Not only the teaching effect is not satisfactory, but also the learning quality and efficiency of students are relatively low, which seriously restricts the development of students' practical ability and the improvement of professional quality. From this point of view, in order to obtain satisfactory teaching effect, electrical control must be integrated and innovated in teaching methods. The research shows that the project teaching method is very suitable for the characteristics of electrical control teaching and undergraduate students. If teachers can flexibly and reasonably apply it, it will not only help to strengthen students' theoretical basis, improve their practical skills, but also promote the development of their comprehensive professional quality, which is convenient for students to grow into high-quality skilled talents more needed by the society.

-
- [3] Haijun Chen Reflections on integrating craftsman spirit into higher vocational mathematics teaching [j]Journal of Huanggang Polytechnic, 2018,20 (02): 40-42
- [4] Huifang Shi Integrating "craftsman spirit" into higher vocational mathematics teaching reform [j]Mathematics learning and research, 2020 (11): 20-21
- [5] Jianqing Lin Research on the method of integrating craftsman spirit into higher vocational mathematics teaching [j]Chinese Journal of multimedia and network teaching (zhongxunjian), 2020 (05): 62-63
- [6] Li Wang,Hao Luo On the path of cultivating students' craftsman spirit in the process of higher vocational mathematics teaching [j]Shanxi youth, 2019 (06): 207
- [7] Xiuyan Jin On the position and role of Higher Vocational Mathematics Course in cultivating students' craftsman spirit [j]Journal of higher education, 2018 (22): 178-180
- [8] Lihong Wei Discussion on integrating craftsman spirit into applied mathematics teaching [j]Chinese and foreign entrepreneurs, 2019 (18): 164
- [9] Sumei Liu,Xuegang Fan Mathematics classroom teaching based on craftsman spirit [j]Occupation, 2021 (19): 61-62
- [10] Cuncheng Yin Strategies of infiltrating craftsman spirit in secondary vocational mathematics teaching [j]High school mathematics and chemistry, 2020 (16): 26-27
- [11] Fengxia Li Practical exploration of integrating craftsman spirit into higher vocational mathematics classroom [j]Encyclopedia forum e-magazine, 2020 (10): 327
- [12] Renjun Yang Reflections on integrating craftsman spirit into higher vocational mathematics education [j]Wen Yuan (Senior High School Edition), 2020 (5): 294
- [13] Wenyu Li Exploration of integrating "craftsman spirit" into higher vocational mathematics teaching reform [j]Boutique, 2021 (18): 71,75
- [14] An Lei Research on secondary vocational mathematics teaching strategy guided by "craftsman spirit" [j]Xueyuan education, 2020 (30): 43-44
- [15] Tiantian Zhu Practical analysis of integrating craftsman spirit into higher vocational mathematics teaching [j]New generation (theoretical Edition), 2020 (7): 29

Fund support: Analysis on the cultivation path of craftsman spirit in Vocational Colleges from the perspective of "higher mathematics". No. 2022WH05

1. Differences between project teaching method and traditional teaching method

The traditional teaching method generally refers to that students accept the knowledge actively imparted by teachers in a fixed classroom. The teaching object of teachers is all students. The main source of teaching content is textbooks. The main form of teaching is teachers' active teaching and demonstration, while students' passive understanding, memory and skill imitation practice of knowledge. The most prominent advantage of traditional teaching method is that it is easy to manage students, the teaching content is highly targeted and the teaching plan is easy to control, but the disadvantage is that it is not conducive to the long-term development of students, and if teachers have been in the position of actively imparting knowledge, it will directly restrict the cultivation and development of students' active learning ability and independent thinking ability, which is not conducive to the personalized growth of students. The advantages of the project teaching method can make up for the shortcomings of the traditional teaching method. The differences between the two are described in detail from the aspects of teaching purpose, teaching form, evaluation method and method characteristics.

Teaching purpose: the traditional teaching method pays more attention to teachers' knowledge and skills through active teaching and demonstration, while the project teaching method advocates that students should combine the knowledge they have learned, give full play to their imagination and innovation, and complete the project in the form of individual + group.

Teaching form: the traditional teaching method is mainly dominated by teachers, while in the project teaching method, teachers gradually change from the dominant position to the guiding direction, and advocate the student-centered teaching concept.

Evaluation method: the main evaluation method of the traditional teaching method is various examinations, large and small. The project teaching method advocates formative evaluation + result evaluation, and advocates immediate evaluation of students while teaching, so as to truly ensure the fairness and impartiality of the evaluation.

Method characteristics: the traditional teaching method is characterized by the closed learning of knowledge and skills, while the project teaching method advocates the expanding learning of personal practice. The project teaching method is mainly employment oriented, and its work position is based on the actual situation of the position as a reference, so as to guide students to truly contact the actual work position during school, and improve their adaptability to professional related positions in advance, so as to better assist students' employment.

2. Specific implementation steps of project teaching method

The project teaching method generally includes four stages, namely, the project approval stage, the planning stage, the implementation stage and the display and evaluation stage. Before starting the project, teachers need to make a series of preparations, such as knowing students' knowledge and ability level, experience level, specific teaching conditions, etc. in detail, and deepening students' understanding and cognition of the project teaching method, guiding them to understand the significance of the implementation of the project teaching method to the development of professional courses and students themselves, introduce the specific operation process of the project teaching method to the students, fully mobilize their enthusiasm to participate in the activities, and strive to urge the students to complete the work tasks by themselves or the strength of the group. The specific operation steps are as follows:

2.1 Proposal stage

As the saying goes, "a good start is half the success", project is the basis and key for the smooth implementation of project teaching method. At the initial stage, teachers should work with students to determine a good project. Generally speaking, the specific activities in the project approval stage mainly include putting forward project initiatives, collecting the ideas of the participants on the project, determining the project theme and task, and determining the project objectives. Among them, there are various forms of project initiatives, which can be directly proposed by students, or teachers can put forward the overall planning and set the specific scope of project activities according to the teaching content. The most obvious advantage of students' direct proposal is that it ensures their initiative to participate in activities. The advantage of teachers as the main proponent of the project is that it is feasible, more consistent with the syllabus, and conducive to laying a solid foundation for the realization of teaching objectives. After the project theme is basically determined, teachers can collect the suggestions and ideas of the participants on the project. In this process, the most commonly used methods are brainstorming and cluster Association. When the project theme and main content are determined, the final is to determine the project objectives, such as knowledge and skills objectives, quality and ability objectives, project achievement objectives, etc.

2.2 Planning phase

At this stage, teachers should first plan students' next project activities in advance, and on this basis guide students to complete self-planning, such as task allocation for team members, determining the methods of project activities, and formulating activity steps.

2.3 implementation phase

According to the planned project implementation plan, students implement the project in groups. In the specific implementation process, students' activities are diverse, such as experimental design, practical activities, investigation and exploration, etc. In the project implementation stage, the main roles of teachers are guides and supervisors. They stay behind the scenes and always pay attention to the students' every move, and give guidance and help in appropriate places to ensure the smooth completion of project activities.

2.4 Display and evaluation stage

Project teaching requires students to show their activity process and results to other personnel after completing the project works, and promote students' mutual learning in the process of communication. Finally, through objective and fair evaluation, students and teachers

can reflect and summarize their experience in time, so as to continuously enhance students' learning self-confidence and fully stimulate their learning enthusiasm. The usual evaluation methods include self-evaluation, mutual evaluation, and other evaluation.

3. Practical application of project teaching method in electrical control teaching

3.1 Selection of items

The core of the successful implementation of project teaching method is the project, so the selection of project is the primary task of electrical control teaching, and it is also the key to students' successful learning. In general, the following requirements shall be met when selecting projects:

First of all, the knowledge and skills involved in the project should not exceed the scope required by the syllabus. On the one hand, it needs to be closely combined with the electrical control textbook, and on the other hand, it should leave enough space and dimensions for students' imagination and thinking. Only in this way can students' awareness of independent innovation be brought into full play and their active learning ability be promoted. Secondly, the content, knowledge and skills involved in the project should have obvious characteristics of the times and should be consistent with modern society. It is best to meet the specific needs of the new era for electrical control talents, and be consistent with the basic level of most students. The difficulty of the project should be moderate. Finally, the scientific application of project teaching method in electrical control teaching is best conducive to the education of students' emotions, attitudes and values, and lays a good foundation for their long-term development.

For example, after learning the relevant contents of "electrical control of low-voltage apparatus and three-phase asynchronous motor in forward and reverse directions", the teacher can timely design the electrical control project with the theme of "reciprocating motion of the trolley". The control circuit design of this project is very flexible and diverse, which is conducive to helping students learn new knowledge, use new skills, guide them to actively use old and new knowledge to solve a series of problems encountered in the implementation of the project, and significantly improve students' ability to think and solve problems.

3.2 Project design

After the project theme and content are basically determined, the next thing to do is to design the task and the teacher should reasonably group the students. After that, the teacher assigned specific project tasks for each group, guided the students to consult relevant materials through various channels, made clear the specific problems to be solved in the project, and what was the key to completing the project, and encouraged the students to design tasks independently in the form of groups. Slowly, students have become the core of the project teaching method, while teachers have changed their roles as guides and servers for students. Although there are many loopholes in the circuit designed by students from practical problems, sometimes it is not completely reasonable, but students enjoy it. Teachers should take advantage of the situation, constantly encourage students to find problems, correct deficiencies, and realize the comprehensive improvement of ability in self-strengthening.

Taking the delay circuit design of the electrical control project of "the reciprocating motion of the material transport trolley" as an example, some teams use two time relays to design, while others use one. After the project design is completed, the groups will evaluate each other. Mutual help and mutual learning will not only help improve the relationship between teachers and students, but also cultivate students' ability to analyze and solve problems.

3.3 Implementation of the project

The smooth implementation of the project is conducive to the cultivation of students' ability and quality. Students are the main body in the whole process of project implementation, which is conducive to fully mobilize their initiative in learning. Teachers need to focus on "guidance". First of all, teachers should create a good cooperative learning atmosphere for students and enhance their learning motivation. Specifically, in the process of implementing the project teaching method, teachers should pay attention to team or group construction and actively guide students to carry out team cooperation, exchange and learning, guide students to solve practical problems together, so that they can truly experience the strength of collective strength through team cooperative learning and work, and enhance each student's sense of team honor. Secondly, the focus of teachers should slowly change from teaching to learning, and teachers should be good at guiding and helping students effectively at the right time. At the same time, teachers should optimize and improve the overall project according to the actual situation, so as to create favorable conditions for better completing the teaching objectives. The full combination of project teaching method and electrical control teaching is conducive to teachers' dynamic management of the teaching process. Teachers can timely understand the progress of each group and the main problems, and provide centralized guidance for many problems, so as to give full play to the role of teachers' supervision and encouragement.

3.4 Project evaluation

Evaluation is the last link in the implementation of project teaching method. According to the time of evaluation, it can be divided into process evaluation and result evaluation. According to the evaluation object, it can be divided into student mutual evaluation, student self-evaluation, teacher evaluation, group evaluation and expert group evaluation.

Taking the project evaluation of the "reciprocating motion of the trolley" as an example, in the process of project evaluation, because students will inevitably encounter various problems in the process of designing the project, at this time, teachers' evaluation should pay special attention to the artistry of language and the integrity of evaluation. Teachers had better not directly point out students' problems and give solutions, The most effective way is to let each group of students summarize themselves, such as advantages and disadvantages, which is more convenient to guide students to learn the strengths of other groups and examine their own weaknesses, which is conducive

to the comprehensive ability of students to be comprehensively improved with the evaluation. In the process of evaluation, teachers should comprehensively consider many aspects, including theoretical design, practical operation, innovative situation, etc., so as to promote the comprehensive development of students. Finally, the teacher will make a summary evaluation, such as analyzing the characteristics of each scheme, pointing out what is desirable and what needs to be considered again, and summarizing the flexible methods such as “travel” and “time relay”, and explaining in detail how to carry out interlock control on the motor. At the end of the project, the teachers and students summarized several sets of reasonable design, feasibility and practicability schemes based on the cost accounting data. In a word, the ultimate purpose of evaluation is to promote students’ continuous learning and progress, enhance their self-confidence in learning, and lay a solid foundation for the improvement of their professional ability and quality.

epilogue

In a word, as one of the most widely used and popular new teaching methods, project teaching method provides a new development direction for the teaching reform of electrical control, and is also conducive to the overall improvement of the quality and efficiency of electrical control teaching. During the implementation of the project, the roles played by teachers and students are unique. In the process of implementing the project teaching method in the future, teachers and students should always keep their original intention, especially teachers should give full play to the guiding and guiding role of students, fully tap the creative potential of students, and fully display the advantages and characteristics of modern undergraduate education.

References:

- [1] Penglai Qin Application and practice of project teaching method in electrical control teaching [j]Scientific consulting, 2022 (8): 143-145
- [2] Yingguang Zhang Effective research on the application of project teaching method in electrical control course [j]Journal of Hubei open vocational college, 2020,33 (7): 158-159
- [3] Jinsong Yang Teaching situation design based on project teaching method -- Taking the application course of electrical control technology in Higher Vocational Colleges as an example [j]Encyclopedia forum e-magazine, 2020 (11): 225
- [4] Teng Jiao Application and practice of project teaching method in electrical control teaching [j]Charming China, 2020 (34): 211
- [5] Hongmei Wei Discussion on the exploration and reform of project teaching method in the teaching mode of machine tool electrical control technology [j] Science and education guide - Electronic Edition (MID), 2019 (3): 130
- [6] Haichun Niu,Meilian Zhao,Fuzhen Qin Application and practice of teaching method of marine electrical control project [j]Ship vocational education, 2019,7 (2): 24-26
- [7] Wenhui Zhang The practice of project teaching method in the teaching of machine tool electrical control [j]Encyclopedia forum e-magazine, 2019 (7): 567
- [8] Yang Cheng Application of project teaching method in the teaching of electrical application technology in secondary vocational schools [j]Reading and writing, 2021,18 (11): 15
- [9] Hao Xiang Discussion on the implementation design of project teaching in the course of electrical control circuit assembly and debugging [j]Agricultural Engineering and equipment, 2021,48 (1): 70-72
- [10] Guangliang Hu Application and practice of project teaching method in secondary vocational electrical teaching [j]Friends of humanities, 2021 (2): 130-131
- [11] Lingyun Cai Help Mechatronics project teaching with information teaching methods -- Taking PLC control of manipulator as an example [j]Guangdong Education (VOCATIONAL EDUCATION EDITION), 2020 (5): 107-108
- [12] Caiping Zhu Application of project teaching method in Secondary Vocational “electrical control and PLC” course teaching [j]Green technology, 2020 (3): 252-253
- [13] Liwen Wang Application of project teaching method in secondary vocational electrical control technology teaching [j]New education era e-magazine (teachers’ Edition), 2020 (30): 226
- [14] Yanhui Yao Application of project teaching method in the teaching of machine tool electrical control circuit [j]Children, 2019 (10): 21
- [15] Jie Ding Application of project teaching method in secondary vocational electrical control technology teaching [j]China rural education, 2019 (11): 37