

Research on the Teaching Reform of Vocational Education Based on the Integration of Competition and Teaching

Shaofei Pan

Leshan Vocational and Technical College, Leshan, China

Abstract: Vocational skills competitions take the latest technical requirements of enterprises as the assessment standard, which can better enhance and test the learning effect of students. Vocational education reform advocates the mutual integration of jobs, courses, competitions and vocational certificates, and the teaching research on vocational education courses with the integration of competition and education can better promote the reform and innovation of vocational education. In this paper, the teaching reform of the integration of competition and teaching is studied and discussed.

Keywords: Vocational education, competition-teaching integration, classroom teaching, textbook research

Date of Submission: 11-04-2024

Date of acceptance: 23-04-2024

I. Introduction

After more than a decade of development, the number and quality of awards won in vocational skills competitions have become an important indicator for testing the teaching level of higher vocational colleges and universities, and more and more higher vocational colleges and universities have begun to pay attention to vocational skills competitions¹. Vocational skills competition is not only an important way to test students' comprehensive quality and vocational ability, but also an important means to promote the teaching level of vocational colleges and universities². How to make vocational skills competitions better serve the curriculum teaching and better promote the cultivation of talents is a topic worth exploring in the teaching reform of vocational education³. The research on curriculum teaching reform can effectively promote the reform of vocational education and promote the innovation of classroom teaching, especially the research on the teaching reform of race-teaching integration has strong practical significance and practical value. This paper takes "Electrical Control and PLC Technology" as the object of curriculum research, and analyzes and explores the curriculum teaching reform based on the fusion of competition and teaching with "Modern Electrical Control System Installation and Commissioning Skills Competition".

II. The significance of implementing the integration of competition and teaching

Vocational skills competition is closely related to the production practice of enterprises, representing the latest technology, technology and standards of enterprises. In addition, vocational skills competition integrates corporate culture, professional accomplishment and other related contents into the competition process⁴. Reasonable integration of competition content, preparation process and course teaching can better build a bridge between enterprises and schools and realize the integration of competition and teaching, production and teaching. With the rapid development of manufacturing industry and technology, the number, quality and structure of enterprise talents have also changed greatly. In order for students to achieve good results in vocational skills competitions, vocational colleges need to carry out curriculum teaching in combination with competition standards, which are derived from enterprise standards. Therefore, through curriculum teaching and competition preparation, students can be well guided to become talents that meet the production needs of enterprises and build a bridge between vocational education and enterprise talent needs.

III. Analysis of courses, competitions and target audiences

3.1 Course and competition analysis

"Modern Electrical Control System Installation and Commissioning Skills Competition" is a national comprehensive skills competition widely participated by electromechanical college students, which mainly includes control system circuit design, control system circuit layout, connection process and debugging, independent functional design of work units, completion and optimization of the overall function of the control system, Electrical control system troubleshooting, professionalism and other seven aspects. The competition can effectively examine the students' mastery of core skills in electrical automation, electromechanical integration, industrial network technology, electrical equipment application and maintenance, electromechanical equipment

maintenance, electrical machinery and electrical appliances, power supply technology, etc. and at the same time, it can examine the students' quality awareness, safety awareness, energy conservation and environmental protection awareness and standardized operation of professionalism. Through the competition, it can effectively prompt the curriculum teaching of vocational colleges to follow up the development of industry and technology, and better cultivate skillful talents adapted to the needs of the industry; it can better guide the students to think independently, develop their innovative thinking, and promote the cultivation of students' innovative ability. Through the preparation for and participation in competitions, students can not only firmly grasp the core skills of their specialties, but also develop good vocational habits and professional ethics. At the same time, vocational skills competitions are often based on national vocational skills standards and enterprise job requirements, the competition equipment sponsors are generally representative of the industry, the competition can also better promote the depth of cooperation between schools and enterprises. The competition equipment is the cutting-edge mainstream equipment in the electrical automation industry, which is conducive to students learning and mastering the latest job knowledge and professional skills, and realizing the zero distance between the students' professional ability and the requirements of enterprises.

"Electrical Control and PLC Technology" is the core course of electromechanical specialty, which is mainly divided into three parts: electrical control, basic programming and debugging of PLC, typical control system design and fault diagnosis. The electrical control part mainly focuses on the structure and working principle of common low-voltage electrical components, the basic circuit of electrical control, the electrical control circuit of typical production machinery and the design method of electrical control system. The basic programming and debugging of PLC mainly focuses on the structure, principle, instruction system, programming and the use of related supporting equipment of programmable controller. The circuit design and maintenance of typical control system mainly introduces the design method of typical control system, Ethernet control technology, frequency conversion servo control, configuration software technology and common system fault diagnosis. Through the course study, students can achieve the following goals: be familiar with the structural principles, uses and models of commonly used low-voltage electrical appliances, correctly use and select various low-voltage electrical appliances, have the ability to read and analyze electrical control circuits, design simple electrical control circuits, analyze the working principle of electrical control circuits of typical production equipment, understand the physical model and system structure of PLC system, master the basic methods of programming and debugging of PLC, master the method of replacing relay control system with PLC control system, and develop good professionalism and safety awareness.

Through the above analysis, we can find that the content of "Modern Electrical Control System Installation and Debugging Skills Competition" involves almost all the knowledge points of the course "Electrical Control and PLC Technology". It can be seen that the integration of "Modern Electrical Control System Installation and Debugging Skills Competition" and "Electrical Control and PLC Technology" and the exploration of the course teaching reform of the integration of competition and teaching can integrate the competition content into daily teaching, and at the same time promote and test the learning effect of students through the competition content, which can better promote the course teaching and reform and innovation, and truly realize the integration of competition and teaching, promoting teaching by competition and promoting learning by competition.

3.2 Analysis of teaching objects

The target of this study is the students majoring in mechanical and electrical engineering in higher vocational colleges. The quality of students is relatively poor. Compared with ordinary college students, students have poor self-learning ability and initiative innovation consciousness. Students don't like traditional theoretical course teaching, but prefer hands-on practice, with strong practical ability. Combined with the typical characteristics of the teaching object, the traditional classroom teaching method based on theoretical explanation will inevitably fail to achieve the best teaching effect. In order to adapt to the learning characteristics of the teaching group, it is necessary to further explore and carry out the curriculum teaching reform, and the curriculum teaching reform of the integration of competition and teaching can just adapt to the learning characteristics of students.

IV. The implementation path of course teaching with the integration of competition and teaching

4.1 Establishing the guarantee mechanism of course teaching reform with the integration of competition and teaching

In order to achieve substantial results in teaching reform, we must establish an effective guarantee mechanism, vigorously deepen school-enterprise cooperation, increase investment in reform funds, and strengthen the construction of teaching teams and practical teaching conditions.

In particular, it is necessary to strengthen the construction of teaching team, and build a team of

teachers with reasonable age structure and professional title structure to conduct course teaching and competition guidance. Modern Electrical Control Department's Installation and Debugging Skills Competition is a comprehensive and multi-module practical competition, and it is urgent to build a "double-qualified" team that can be competent for both the guidance of the skills competition and the routine teaching. In addition, skill competition not only tests students' mastery of professional knowledge, but also tests students' practical ability and proficiency. In the process of preparing for the competition and teaching implementation, it is necessary to deeply analyze the contents of the competition, strictly refer to the competition guide to strengthen the construction of experimental training conditions in the school, and equip with sufficient experimental training equipment to ensure that the competition scene can be truly reproduced in classroom teaching and that students have enough opportunities to participate in experimental training.

4.2 Formulate the talent training scheme and curriculum standard of the integration of competition and teaching

Mechanical and electrical majors have higher requirements for students' practical ability. As a vanguard of vocational education, vocational skills competition can provide a platform for participating students and instructors to show exchanges and improve their learning. In the process of formulating the talent training plan, we should fully study the competition rules and sample questions, take the vocational ability training as the starting point, integrate the assessment points and requirements of skill competition into the talent training plan, optimize the talent training plan in multiple dimensions, and constantly innovate the talent training model⁵.

In the process of formulating curriculum standards, we should fully consider the relationship among posts, courses, competitions and vocational skills certificates, make clear the teaching objectives and orientation of the courses, and integrate the teaching contents, teaching methods and assessment schemes into the competition contents. In particular, it can better promote students to carry out classroom practice according to the competition requirements by formulating the course assessment standards with reference to the competition scoring standards, and truly integrate the competition into teaching and classroom.

4.3 Developing teaching materials based on the integration of competition and teaching

In order to make the course teaching better integrated into the competition content, it is necessary to develop teaching materials based on the integration of competition and teaching. According to the post requirements and competition process, the content and structure of teaching materials are designed, and the teaching materials will be divided into several assessment items according to different competition requirements, and each item is divided into three parts: project requirements, project implementation and project evaluation. The project demand part mainly describes the training objectives and related training contents of the project, and guides students to think about the ways and means to solve problems and the tools, instruments and equipment needed; The project implementation links mainly include the necessary theoretical guidance, the guide to the use of tools and meters, the practical skills guidance and the project implementation process, etc., which provide the necessary theoretical support and specific operational process guidance for students to carry out project training, so that students can further understand and master relevant theoretical knowledge in the process of completing the training; In the project evaluation part, evaluation standards and methods are designed based on skill competition. Students can comprehensively evaluate the training process according to relevant standards and methods, and summarize the problems in theoretical application, practical skills and professional accomplishment.

4.4 Carry out classroom teaching with the integration of competition and teaching

Classroom teaching is the main position to spread knowledge and skills. Only by effectively carrying out classroom teaching can vocational skills competition be truly integrated into curriculum teaching. Therefore, classroom teaching should combine the competition items to explain the knowledge points, and decompose the examination points of the competition into the explanation of each knowledge point, so that students can not only know what the knowledge points are, but also know the specific application of the knowledge points in the competition. In particular, the training can be carried out in the form of simulated competition, and the training time is strictly limited. After the training, the students can be evaluated with strict reference to the competition standards and requirements. Through the classroom is the competition, and the competition is the way to carry out teaching, so that students can find the feeling of competition in the classroom.

V. Conclusion

Combining with students' learning characteristics, innovatively integrating the competition content into the course teaching can significantly improve the course teaching effect. The integration of competition and teaching can achieve the goal of promoting teaching and learning through competition.

References

- [1]. Lina Li, Panfeng Xu, Zhe Gao, et al. Teaching reform and practice of single-chip microcomputer principle and application course under the background of competition and teaching integration [J]. Journal of Liaoning University of Science and Technology, 2024,26(01):61-63+69.
- [2]. Xinhua Wang. Development and design of loose-leaf teaching materials in higher vocational education based on the concept of competency-based education [J]. Vocational Education Forum, 2022,38(09):55-61.
- [3]. Wen Wang. Research on the combination of project-based teaching mode and subject teaching [J]. Shanxi Youth, 2024,(06):47-49.
- [4]. Jian Lu. Skills Competition to lead the path of teaching reform in vocational colleges [J]. Teachers, 2024,(06):114-116.
- [5]. Bo Gao, Mingming Huo. Research on Curriculum Reform and Practice of Chemical Engineering Major in Higher Vocational Colleges from the Perspective of Competition and Teaching Integration [J]. Inner Mongolia Petrochemical, 2024,50(02):69-72.