

Reform and Practice of the Course “Electrical Control and PLC” with Innovative and Entrepreneurial Thinking¹

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Abstracts: Colleges and universities should pay more attention to innovation and entrepreneurship education in combination with social needs and the development of the times, take innovation and entrepreneurship education as the core content, constantly promote the positive development of students, and provide more entrepreneurial opportunities for students. In the current environment of innovation and entrepreneurship, colleges and universities must combine the characteristics of the times to reform and optimize the course of Electrical Control and PLC, give play to students' advantages, and constantly cultivate students' innovation and entrepreneurship abilities. This paper studies and analyzes the reform practice of the course Electrical Control and PLC with innovative and entrepreneurial thinking.

Keywords: Innovative and Entrepreneurial Thinking; Electrical Control and PLC; Curriculum Reform

1. Introduction

Under the background of innovation and entrepreneurship, in order to ensure the smooth implementation of the reform of the course Electrical Control and PLC, colleges and universities must run through the teaching objectives of "dual certificate integration", achieve the innovation platform through integration, and innovate the teaching design and practice process through restructuring the curriculum system. We should reform and improve the assessment and evaluation system, so as to constantly cultivate students' innovation ability and entrepreneurial ability, and students can adapt to social development and play their own value in later work.

2. Analysis on the background and necessity of the course reform of Electrical Control and PLC

China's Opinions on the Implementation of Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities clearly points out that colleges and universities must further deepen the reform of innovation and entrepreneurship education mode, and establish a sound and unified innovation and entrepreneurship education system in colleges and universities. At the same time, according to the Opinions on Strengthening the Implementation of Innovation driven Development Strategy, Further Promoting the Further Development of Mass Entrepreneurship and Innovation, relevant documents also put forward the concept of mass entrepreneurship and innovation, which is also encouraging college students to actively start businesses. At present, innovation and entrepreneurship education in China has a new definition. Colleges and universities should take innovation and entrepreneurship education as the core content in combination with social needs and the development of the times, constantly promote the positive development of students, and provide more innovation and entrepreneurship opportunities for students.

Specifically, colleges and universities should continue to deepen the reform of the training method of compound technical

¹ **Fund Project:** Gansu Forestry Vocational and Technical College “Electrical Control and PLC” Innovation and Entrepreneurship Education Demonstration Course Project; Gansu Forestry Vocational and Technical College Electromechanical Integration Technology Innovation and Entrepreneurship Teaching Team Project; The 2022 Innovation and Entrepreneurship Education Demonstration Course Project of “Electrical Control and PLC” of Gansu Provincial Department of Education.

talents, combine entrepreneurship and innovation education, and run the concept of innovation and entrepreneurship education through the entire teaching process, so as to integrate into all aspects of student life, and constantly innovate and optimize existing professional courses. The course of Electrical Control and PLC is a comprehensive course with theoretical knowledge and practical operation. When reforming and optimizing the course of Electrical Control and PLC, colleges and universities must adhere to the principle of "expanding the foundation, paying attention to practice, and pursuing innovation", and integrate CDIO engineering education mode into the course of Electrical Control and PLC in combination with the teaching mode of mass entrepreneurship education and dual certificate integration, so as to constantly cultivate students' innovative thinking, improve students' entrepreneurial ability and ensure their comprehensive and all-round development.

3. Teaching reform process and innovation practice

Under the background of innovative and entrepreneurial thinking, in order to ensure the smooth implementation of the reform of the course Electrical Control and PLC, colleges and universities must strengthen the importance of innovation and entrepreneurship education, through restructuring the curriculum system, innovating the teaching design and practice process, building a reasonable course scheduling model and establishing a perfect and standardized teaching team. We should carry out innovative design for classroom organization, further reform and improve the assessment and evaluation system, and combine the characteristics of students to develop an assessment and evaluation mechanism, so as to implement innovation and entrepreneurship education throughout the teaching process, constantly cultivate students' innovative thinking, and improve students' entrepreneurial ability.

3.1 Reconstructing the curriculum system

The teaching reform and practical innovation of the course Electrical Control and PLC under the innovative and entrepreneurial thinking must be based on the reconstruction of the curriculum system, and the "task driven, behavior oriented" innovation and entrepreneurship must be the core content of practical training.

Specifically, colleges and universities can open the course Course Introduction and Cognition of Electrical Innovation Practice Platform to introduce the main contents of the course to students, so that students can understand the components of the innovation practice platform, master the use of electrical equipment, and understand the detailed prices of manufacturers' products and innovation materials. In addition, colleges and universities can carry out innovation and entrepreneurship reports for electrical installation enterprises, requiring students to prepare special reports, inquire about successful cases of similar enterprises, and prepare entrepreneurship plans for installation companies, so as to constantly cultivate students' innovation and entrepreneurship abilities, and enable students to play their own value in future work.

3.2 Innovative teaching design and practice process

In order to ensure that the innovative teaching design and practice process are scientific, reasonable and efficient, colleges and universities must, based on the reconstruction of the curriculum system, scientifically and rationally divide the three modules of knowledge training, ability training and quality training, and formulate practical paths and methods for each module, so as to combine innovation and entrepreneurship education with the existing teaching system, so that they can cooperate with each other. In the process of education and teaching, we should constantly cultivate students' innovative consciousness and thinking, improve their entrepreneurial ability and innovation ability, and ensure their comprehensive and sustainable development.

3.3 Reforming and improving the assessment and evaluation system

3.3.1 Analysis of students' characteristics

Colleges and universities should combine the characteristics of students to cultivate students' image thinking, so that students are willing to practice. In this process, colleges and universities should adhere to the behavior oriented education concept and constantly cultivate the craftsmanship spirit of students. Under the current circumstances, the traditional exam oriented education has not adapted to the development of today's society. The traditional teaching mode has seriously hindered the development of students' cognitive ability to theoretical knowledge. There is no way to cultivate students' ability to learn and analyze independently, which has constrained students' personality and characteristics. Therefore, colleges and universities should take classroom management as the core content, and implement the classroom assessment and evaluation system into the teaching process.

3.3.2 Design of assessment and evaluation system

When colleges and universities reform and optimize the classroom teaching system and teaching methods, they must make corresponding reform and optimization of the assessment and evaluation system based on the actual characteristics and

actual level of students. Specifically, colleges and universities can transform the traditional assessment mode (the total score is equal to 50% of the usual score plus 50% of the final score) into an assessment mode with process assessment as the core (the total score is equal to the total score of the module minus the total score of classroom discipline violations), and take the module score as the assessment basis to assess the completion of students' individual tasks. We can evaluate and grade each teaching module in the curriculum system, and complete the corresponding comprehensive evaluation according to the students' classroom performance, project completion, troubleshooting, question answering, and project report completion.

3.3.3 Characteristics of assessment mechanism

The unified and standardized assessment and evaluation system has the following characteristics: 1. Strengthen the process evaluation: colleges and universities should transform the traditional final examination evaluation system into the process teaching evaluation system, paying more attention to students' performance in the teaching process, rather than evaluating students in a one size fits all manner. 2. Cancel the make-up examination of the semester: after the reform of the curriculum, colleges and universities must focus on the assessment and evaluation of the teaching process of learning. When students fail to pass a single module, they must receive timely make-up training. 3. Strengthen teachers' responsibilities: colleges and universities should endow teachers with greater assessment efforts, constantly strengthen process assessment, the importance of process assessment, and establish and improve a teacher management system more suitable for process assessment, in order to develop a more scientific and reasonable mechanism for reducing scores for major violations of discipline. In order to ensure the smooth implementation of the strengthening of classroom management, and prevent some students from giving up their studies after good performance in the early stage, colleges and universities must cultivate students' spirit of perseverance and hard working craftsmanship, strengthen the importance of process assessment, and establish and improve the system of major violations of discipline to let students realize the importance of process teaching.

4. Conclusion

To sum up, in the current innovation and entrepreneurship environment, colleges and universities should pay more attention to innovation and entrepreneurship education, implement innovation and entrepreneurship education in the whole teaching process of students, and constantly cultivate students' innovative thinking and provide more entrepreneurial opportunities for students by establishing a sound, unified and standardized innovation and entrepreneurship thinking under the reform management system of Electricity Control and PLC, in order to improve the level of students' entrepreneurship and innovation ability, so that students can adapt to the development of the times and meet social needs.

Reference

- [1] Xiao J, Sheng Y, Wang P. Research on the reform of electrical engineering practice teaching to meet the demands of innovation and entrepreneurship [J]. China electric power education 2013.