

Exploration on the ideological and political implementation method of the engineering professional course “intelligent fixture design and debugging”

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Abstract: intelligent fixture design and debugging is a core course for the major of mechanical manufacturing and automation. The course is based on the cultivation of post core ability, integrates the requirements of competition, X certificate, three new standards and so on, and contains rich ideological and political elements. Combined with the new mode of Ideological and political teaching reform in the current era of the environment, this paper selects the integration points of Ideological and political education from the nature and structure of the course, excavates the ideological and political elements contained in the course, matches the ideological and political points, and researches and explores the specific implementation of Ideological and political education in professional courses.

Key words: intelligent fixture design and debugging; Ideological and political integration point; Ideological and political elements; Ideological and political points; Research and exploration

1. Introduction

Professional courses are the main battlefield of the ideological and political construction of courses. The excavated ideological and political elements are effectively integrated with the curriculum knowledge points, and a progressive ideological and political system is formed, so that professional courses and ideological and political courses go hand in hand. As the main force of the ideological and political construction of the curriculum, teachers should guard the main position of the classroom, realize the all-round education in the classroom teaching, unify the explicit education and implicit education, and cultivate the five good high-quality technical and skilled talents with morality, intelligence, physique, beauty and labor. New engineering education is the only way, strategic support and leading force for China to build an education power. It is particularly important to study the ideological and political system of engineering courses in line with the latest situation, which has a typical demonstration and leading role.

2. Course nature

The course of intelligent fixture design and debugging is a professional core course based on the requirements of post core competence and combined with the work tasks of machinery manufacturing and automation specialty. The course creates a complete system of content integration, teaching environment integration and learning practice competition integration, which can not only meet the experimental teaching needs of students majoring in mechanical manufacturing and automation in practical training courses, but also provide a platform for students with strong practical ability to participate in skills competitions after class. Taking the intelligent fixture development training room as the platform, taking the typical machine tool power fixture and PLC programmable controller as the learning objects, this paper puts forward the teaching implementation method of “the course teaching content is related to the actual work of the post”. The course undertakes the dual tasks of professional and technical skills training and ideological and political education, contains rich ideological and political elements, and unifies education and education.

3. Learning needs

After a long-term online education, the daily life of going to college at home has made college students' physical and mental characteristics different, positive and negative states coexist, and the way, degree and transformation of knowledge are different. According to the education of college students in Engineering Vocational Colleges in the new era, it is not only necessary to teach students knowledge and skills, but also to strengthen students' value guidance at all times in the teaching process, guide students to arm themselves with sincere feelings of serving the country and the labor style of the new era at all times, and use skills and literacy to be the successor of the new era of socialism.

Centering on the technical skills requirements for the design, programming and debugging of typical automated fixtures, the ideological and political education of the course will be run through the whole teaching system of the course, and the system and mechanism for promoting the implementation of the ideological and political education of the course will be established. The ability of students' autonomous learning and thinking will be cultivated, and various kinds of education such as theoretical knowledge, career outlook, values, and labor outlook of the new era will be integrated into the teaching, Achieve the effect of “1+1>2”.

4. Ideological and political integration

The course is divided into two modules: mechanical structure design and electrical control. At the same time, in order to further improve the students' ability to control automation equipment, the comprehensive control projects of stepper motor, three jaw chuck system and truss manipulator are added. Following the logic line of design, control and debugging, the system framework is formed, which is focused and simple to difficult. The ideological and political integration points are selected in the teaching system, Excavate the ideological and political elements and match the ideological and political points.

4.1 Rely on intelligent manufacturing, strengthen the four self-confidence and cultivate patriotism

“Made in China” is moving towards the direction of “made in China intelligently” and “created in China” at an amazing speed. Based on the trend of international intelligent manufacturing industry reform, the government proposed the strategic deployment of “made in China 2025”, expecting the high-quality and high-level development of China’s manufacturing industry, changing the current situation of “large but not strong”, so that China can enter the ranks of manufacturing powers, thus driving the high intelligent development of domestic manufacturing industry.

In the process of machining, the fixture is mainly used to fix, support and clamp the workpiece, and fix the workpiece in the correct position of the machine tool, which affects the production quality, efficiency and cost of the product. The development of intelligent fixture technology plays a vital role in the realization of “made in China 2025”.

This course will learn the development of fixture industry, understand the national 2025 development plan, enhance the “three identifications” and strengthen the “four confidence”. By designing the overall scheme of intelligent fixture, the design idea of “whole part whole” is extended to the dialectical relationship between “whole and part” in Marxism, and gradually guide students’ Patriotism of loving the collective, school and motherland.

4.2 Cultivate safety awareness and promote labor spirit through rules and regulations

Safety education has always been an important part of vocational education, creating a safe and stable learning environment for college students. As vocational college students, they must have safety awareness and quality, and be able to prevent all kinds of safety accidents in the process of practice in advance.

This course cultivates the occupational standard of “safety first” by learning the hardware configuration and equipment debugging, and the safety requirements during the use of electrical training equipment; By learning the control of stepper motor and three jaw chuck, the requirements that the wiring of motor must be cut off and the three jaw chuck must not be touched, we should strengthen the cultivation of safety first occupational norms.

The spirit of labor is a kind of accomplishment that college students lack relatively, but it is the basis for harvesting a happy life. This course is a professional skill training course. It is essential to carry forward the spirit of labor in the teaching process. We should always guide students to work actively, love and respect labor. Let students always experience the sense of achievement brought by work, and promote students’ expectation of harvest is based on their own work, and guide students to harvest a better life in the future with their own hard work and creative work.

By explaining the rules and regulations of the training room, this course guides students to consciously maintain the health of the training room and cultivate the spirit of labor.

4.3 Introduce enterprise cases, cultivate team consciousness and carry forward craftsman spirit

Craftsman spirit is the positive value orientation and behavior of practitioners in the process of work, which reflects the professional ethics, professional ability and professional quality, such as love for work and dedication, excellence, effort and concentration, honesty and trustworthiness, and creation of greatness.

If you want to become a highly skilled talent in the workforce in the future, you must start from school to study the fine spirit of model worker, craftsman spirit, labor spirit and other fine spirits of craftsmen in big countries. While mining your own skills, you should not forget to improve your quality, and strive to become a highly skilled talent and successor of socialism in the new era.

By designing the mechanical structure of the fixture, this course extends the reliability requirements of fixture design to the professional norms and craftsman spirit of the industry, enhances the professionalism of excellence, and cultivates students’ love and dedication to their posts; Through the design of power device and control system, the requirements of performance and economy should be taken into account when selecting electrical equipment. It is necessary to repeatedly calculate and select the most appropriate electrical components to cultivate the craftsman spirit of excellence; By learning the basic knowledge of PLC, i/o table and hardware schematic diagram are relatively cumbersome, but they must be drawn in a standardized way, so as to cultivate the spirit of patience and concentration of craftsman; By learning the PLC control of truss manipulator, and according to the use environment of truss manipulator, students are guided to think more about the use of truss manipulator and cultivate the spirit of pioneering and innovative craftsman under the background of China made 2025; According to the requirements of completing the course design and group cooperation, the members of the group need reasonable division

of labor, cooperation and mutual help to cultivate the professionalism of unity and cooperation. See Table 1 for the correspondence between curriculum items and ideological and political elements.

Table 1 correspondence table between curriculum items and ideological and political elements

module	Project / task	Ideological and political elements
Module I Basic cognition of fixture	Task 1 recognize the role of fixture in machining	1. By explaining the rules and regulations of the training room, guide students to consciously maintain the health of the training room and cultivate the spirit of labor; 2. Learn about the development of fixture industry, understand the national 2025 development plan, enhance the “three identifications” and strengthen the “four confidence”
	Task 2 recognize the classification and composition of fixtures	
	Task 3 recognize the position of fixture in the process system	
	Task 4 recognize the development direction of modern fixture	
	Task 5 understand the requirements of fixture design	
	Task 6 understand the basic steps of fixture design	
Module II Development of nut inner hole processing fixture for production line	Task 1 overall scheme design of fixture	Through the design of the overall scheme, the design idea of “whole part whole” is extended to the dialectical relationship between “whole and part” in Marxism, and gradually guide students to love their class, campus, life and motherland
	Task 2 fixture clamping component design	Through the design of the mechanical structure of the fixture, the reliability requirements of the fixture design are extended to the professional norms and craftsman spirit of the industry, so as to enhance the professional spirit of excellence and cultivate students’ love and dedication to work
	Task 3 fixture support assembly design	
	Task 4 fixture power assembly design	Through the design of power device and control system, the requirements of performance and economy should be taken into account when selecting electrical equipment. It is necessary to repeatedly calculate and select the most appropriate electrical components to cultivate the craftsman spirit of excellence
	Task 5 fixture control system design	
Module III PLC control of nut inner hole processing fixture for production line	Item 1 understand the storage mode and workflow of Siemens PLC	By learning the basic knowledge of PLC, i/o table and hardware schematic diagram are relatively cumbersome, but they must be drawn in a standardized way, so as to cultivate the spirit of patience and concentration of craftsman
	Item 2 installation and understanding of botu software	
	Item 3 draw the i/o table and hardware schematic diagram of PLC control nut inner hole processing fixture	
	Item 4 master hardware configuration and equipment debugging methods	By learning the hardware configuration and equipment debugging, the safety requirements in the use of electrical training equipment can cultivate the occupational specification of safety first
	Item 5 understanding the production and use of PLC variable table	By learning PLC programming, the feature that the same logic function can be realized without program instructions is extended to the need to constantly try a variety of programming methods, compile relatively simple PLC programs, and strengthen the cultivation of craftsman spirit of excellence
	Item 6 Preparation of PLC ladder diagram for manual control of nut inner hole processing fixture for production line	
Module 4 HMI control of nut inner hole processing fixture for production line	Task 1 get to know Siemens HMI	HMI can realize the human-computer interaction function between human and PLC, which extends to the development direction of the mechanical automation industry under the background of made in China 2025, and master the role of professional skills in promoting the development of China’s intelligent manufacturing industry, so as to strengthen the cultivation of the spirit of loving and dedicated artisans
	Task 2 using HMI to control the nut inner hole processing fixture	

Course design report	Complete the course design by using the designated instructions and self-made projects in groups	According to the requirements of completing the course design and group cooperation, the members of the group need reasonable division of labor and cooperation, help each other, and cultivate the professionalism of unity and cooperation
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5. Summary

Based on the analysis of the course nature and learning situation of intelligent fixture design and debugging, this paper combines the teaching modules and teaching contents in the actual course structure, organically integrates the ideological and political elements into the professional knowledge points of the course, and invisibly integrates the “Ideological and political education” elements through typical course cases, so as to stimulate students’ patriotism, dedication, dedication, and dedication around the professional knowledge of intelligent manufacturing. Develop positive energy such as innovation, solidarity and cooperation, and cultivate students’ craftsman spirit of excellence.

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This paper is a general project of philosophy and social sciences research in Colleges and universities in 2020. The title of the project is: Research on the implementation methods of Ideological and political education in professional courses under the background of national epidemic prevention. The project number is (2020sja1506).