

Research on the Construction of IoT Engineering Major System in the Background of Emerging Engineering Education

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Abstract: Ideological and Political Education in majors is a new model of current ideological and political education work, and colleges and universities have successively carried out practice and innovation. Based on the professional talent training goals of the applied IoT engineering major under the background of Emerging Engineering Education, and by integrating the target requirements, a core value system is constructed, and a professional ideological and political major is proposed to be divided into IoT major groups and open semester-by-semester in-depth and continuously improved majors. The ideological and political closed-loop system construction method adopts a three-dimensional, multi-dynamic evaluation method, and is implemented and promoted in the “three-dimensional education” pattern to cultivate students into advanced applied talents with comprehensive development of moral, intellectual, physical, artistic and labor.

Keywords: IoT engineering; Ideological and political education in majors; Three-dimensional education

Fund Project:

Industry-university cooperation collaborative education project of the Ministry of Education (220906093263030、220902802285212)

Introduction

In order to deeply implement the fundamental task of cultivating people with moral integrity, build an all-round education system for all employees, and cultivate builders and successors of the socialist cause. It is important for colleges and universities to carry out corresponding practices and innovations, and to integrate ideological and political education is one of the carriers and pathways.

1. Current professional ideological and political status

(1)Lack of overall design :At present, the Internet of Things(IoT) engineering majors in many universities do not carry out ideological and political construction. Even if offered, it only adds some ideological and political elements to the original courses.

(2)Separating ideological education and professional education:Professional teachers only focus on teaching professional knowledge, and fail to properly handle the relationship between teaching professional knowledge and value guidance, and lack the three-dimensional education concept of “whole staff, whole process, and all-round”.

(3)Ideological education and professional education are separated. Professional teachers only focus on teaching professional knowledge, and fail to properly handle the relationship between teaching professional knowledge and value guidance, and lack the three-dimensional education concept of “whole staff, whole process, and all-round”.

(4)The professional ideological and political evaluation system is not yet sufficient and complete^[1].

2. Professional ideological and political construction methods for applied IoT engineering majors under the background of Emerging Engineering Education

The construction of professional ideological and political major education for the IoT engineering major should be designed

based on the OBE concept^[2], and professional ideological and political education should be used to promote the full implementation of the “Engineering Education Certification”. The IoT engineering major courses are divided into the following three types of courses: professional courses with specific ideological attributes, natural science professional courses, and engineering technology professional courses. Professional courses with ideological attributes must always adhere to the core value positions, perspectives and methods of socialism with Chinese characteristics and strengthen value guidance.

2.1 Integrate ideological and political connotations into goal requirements and build a professional core value system

The construction of the professional core value system of the IoT Engineering major should aim at cultivating people with moral integrity. According to the specific training goals and graduation requirements of the applied IoT Engineering major, the professional qualities required by the IoT industry should be analyzed to build a IoT multi-dimensional two-level value system with distinctive characteristics in engineering majors.

Table 1 The Core Value System of IoT Major

Level 1	Level 2	specific description
political literacy	Ideals and beliefs	Establishing communist ideals and determine to shoulder the important task of national rejuvenation
	patriotism	Party and country consciousness, recognition and persistence of excellent traditional Chinese culture, etc.
specialty literacy	professional mission	Loving the major, take "craftsman spirit" as the mission, and support the national emerging industry strategy with excellent skills
	Creative Thinking	Pursuing excellence, daring to think and do, having an international vision and sustainable development concept
personal quality	Morality	Abiding by laws and regulations ,be a person with great love, great virtue and great sentiments .
	Physical and mental cultivation	Have good physical and mental qualities
	personal character	Pursuit of truth, courage to take responsibility, unity and cooperation, optimism
social responsibility	devotion	Willing to sacrifice some personal interests for others, the collective, and the country
	Professional ethics	Abide by professional ethics and professional standards

This professional core value system guides all aspects of the development of talent training programs for IoT engineering professionals, is integrated into the curriculum system, and ultimately forms a professional ideological and political system that is highly adaptable to professional education.

2.2 Construct professional curriculum system layer by layer according to the semester of the course

The professional ideological and political course system of the IoT Engineering major can be constructed according to the semester in which the course is offered. In the context of “Internet +”, whether students have “craftsman spirit” is highly valued by companies. The craftsman spirit of the new era mainly includes the quality spirit of excellence, the spirit of dedication to work, the innovation spirit of pursuing excellence, and the team spirit of collaboration and progress. Taking “craftsman spirit” as an example, its construction method is as follows:

(1)A number of ideological and political courses are offered in the first grade, and the spirit of craftsmanship is promoted and educated through professional lectures and basic courses by the class teacher and department to change students’ perceptions and clarify goals and missions. It focuses on the importance of craftsmanship and cultivates students’ rigorous, cautious and meticulous work attitude through programming in courses such as Programming Basics. Courses such as Introduction to IoT Engineering play relevant videos on the current status and development of my country’s IoT to inspire students’ national pride and feelings for their country.

(2)In the second grade, students are mainly trained to strive for excellence through courses such as Sensor Principles and Applications, computer composition principles, RFID principles and applications. During the hardware experiment, students may easily become bored with solving errors when making RFID tags or writing programs. Teachers should guide them and cultivate their spirit of striving for excellence.

(3)In Junior year, we focus on courses such as IoT Engineering Design and Practice, Curriculum Design, and Science and Technology Competitions. In the transmission layer design of IoT Engineering Design and Practice, typical cases such as ZTE and Huawei being sanctioned by the United States can be used to strengthen students’ patriotism. Only continuous innovation can never

fail. In experiments and course design, students are encouraged to innovate, first write out project experiment plans, constantly revise their plans during experiments and course design, and use craftsmanship to achieve goals.

(4) In the fourth grade, the focus is on professional internships based on school-enterprise cooperation, allowing students to visit companies and experience the importance of “craftsman spirit” in actual work scenarios. During professional internships, students are divided into groups, cultivating students’ team spirit of dedication and collaboration. Conduct quality evaluations after completing tasks students can develop the habit of excellence and innovation.

2.3 Build a continuously improved professional ideological and political closed-loop system for the Internet of Things engineering major

Ideological and political education in major should integrate the professional core value system into the curriculum system and talent training plan, and its training goals are determined according to the needs of social development and the application-oriented positioning of our school. Based on the goals and industry development needs, graduation requirements are formulated to support the achievement of training goals, and the professional core value system is integrated into the graduation requirements. The curriculum system supports graduation requirements, embeds ideological and political elements into the specific curriculum system, and selects teaching methods that are conducive to ideological and political education.

3. Construct a three-dimensional and multi-dimensional dynamic evaluation method

The professional ideological and political education of the Internet of Things Engineering major should establish a three-dimensional and multi-dimensional dynamic evaluation method, which runs through the entire teaching process, mainly including the evaluation of students’ ideological and political literacy and the evaluation of the effectiveness of ideological and political education.

The evaluation of students’ ideological and political literacy includes daily behaviors, communication, interviews, etc. It combines teachers’ evaluation of students, students’ evaluation of themselves, and mutual evaluation between students. According to the educational goals of teaching, each student’s evaluation chart is formed.

The effect of educating people on ideological and political education is mainly based on evaluating is short, medium and long periods of time. In the short term, the evaluation should be combined with the learning effects of professional courses; in the medium time, evaluation should be based on the professional abilities obtained by students upon graduation; over a long period of time, evaluation should be based on graduates’ professional abilities and contributions to society. Finally, a comprehensive evaluation of the achievement of the overall professional ideological and political goals is formed.

4. ”Three-dimensional education” is an effective way for professional ideological and political education in Internet of Things engineering majors

Educating everyone, educating people throughout the process, and educating people in an all-round way are the “Three-dimensional education”. To educate everyone, it is necessary to build a high-quality team of professional ideological and political teachers, improve teachers’ educational capabilities and level. The whole process of educating people means that students must carry out ideological and political education at all stages from enrollment to graduation. Starting from the first grade, they should integrate professional mission, family and country feelings, ideals and beliefs, and for the sophomores and juniors, they should master the corresponding IoT knowledge and cultivate students’ career planning, innovative spirit, etc.. In senior year of college, students should be cultivated love for work, correct outlook on employment and dedication. To educate people in an all-round way to achieve the effectiveness of professional ideological and political education requires coordinated efforts in all courses and education links.

5. Conclusion

The integration of the emerging IoT engineering major and ideological and political education is in line with the requirements of the development trend of the times. Through ideological and political education in majors, moral education will be implemented throughout the entire process from student enrollment to graduation. Educate people in “Three-dimensional education” way can cultivate socialist builders and successors with comprehensive development of moral, intellectual, physical, artistic and labor skills.

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