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THE INTEGRATION OF ENGINEERING EDUCATION CERTIFICATION AND CURRICULUM IDEOLOGICAL AND POLITICAL CONSTRUCTION

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Abstract: Firstly, this paper discusses the engineering education certification. Secondly, this paper discusses the course ideology and politics. Finally, this paper discusses the research on the integration of engineering education certification and curriculum ideological and political construction. This paper provides direction, goals, implementation paths, and basis for the ideological and political education of teachers in the majors of Mechanical Design, Manufacturing, Automation, and IoT Engineering. This article also enhances the systematicity and completeness of ideological and political education in the courses of Mechanical Design, Manufacturing and Automation, and Internet of IoT Engineering.
Keywords: Engineering education certification; Curriculum ideological and political construction; Integration

1 INTRODUCTION

To solve the fundamental problem (what kind of people to cultivate, how to cultivate people, and for whom to cultivate people) in universities, ideological and political courses need to go hand in hand and collaborate in educating people. The proportion of professional courses in higher education is as high as 80%, and the necessity of ideological and political education in professional courses is self-evident. Meanwhile, with the advancement of internationalization of engineering education in China, the popularity of engineering certification has significantly increased. At the level of engineering majors, there are two important tasks facing parallel implementation: course ideological and political education and engineering certification. How to achieve the organic integration of the two and cultivate international engineering talents with both morality and talent that meet the requirements of the socialist new era has become an urgent problem to be solved. All universities have actively explored the construction of ideological and political courses and established demonstration courses for ideological and political education. Jin et al. [1] from Henan Agricultural University analyzed the necessity of integrating ideological and political education into forestry courses and proposed ways to teach ideological and political education in forestry courses. Zhang et al. [2] from Hebei University have established a chain style curriculum ideological and political education model that integrates the entire process of ideological and political education from four aspects: teacher guidance, teaching content, teaching methods, and curriculum evaluation. They have also conducted teaching practice in the Physical Optics course. Guan [3] from Jiangsu Normal University analyzed the necessity of ideological and political education in the course of analytic geometry from the perspective of the course characteristics and teaching status of normal universities. Based on the teaching practice of pattern recognition courses, Wen et al. [4] from Harbin Institute of Technology (Shenzhen) proposed the concept of expanding the core connotation of ideological and political education in courses and enhancing the effectiveness of education. They combined the characteristics of the courses with the idea of promoting the basic policies and achievements, as well as national wisdom and confidence, to design the courses. Chen et al. [5] from Taizhou University discussed the ideological and political elements, teaching methods, and approaches of chemistry majors, and proposed the six dimensions, four constructions ideological and political teaching strategy. Chen [6] from Yichun College combined the teaching content of animal protection courses, and completed the innovative design of ideological and political education in animal protection courses from the aspects of setting ideological and political teaching objectives, condensing ideological and political elements in courses, implementing ideological and political teaching methods in courses, and assessing the effectiveness of ideological and political education in courses.

The research on ideological and political education in courses with certification as the background is gradually being launched. Sun [7] from Suzhou University of Science and Technology carried out ideological and political reforms in the organic chemistry course under the background of engineering education certification, mainly focusing on teaching objectives, teaching team building, and teaching content construction. She comprehensively cultivated students' knowledge, abilities, and qualities, and established a normalized mechanism for the mutual infiltration of theoretical knowledge imparting, practical follow-up, and ideological and political education elements in the course. Hu et al. [8] from Beibu Gulf University explored the construction of the ideological and political education system for computer science and technology courses under the background of engineering certification. In order to cultivate engineering talents in computer science and technology, the ideological and political education of courses was organically integrated into the training of engineering talents in this major. The teaching system of ideological and political education in computer science and technology courses was constructed from five aspects: ideological and political objectives,

professional course teaching syllabus, professional course ideological and political elements, professional course ideological and political education teaching methods, and course ideological and political education teaching effectiveness evaluation. Wei et al. [9] from Anhui University of Engineering conducted ideological and political exploration and practice on the water engineering chemistry course from the perspective of engineering education certification. Based on the teaching content of the course and in accordance with the requirements of the three pronged education goal, they deeply explored ideological and political elements. In the three-stage education process before, during, and after class, they timely integrated philosophical materials, cutting-edge knowledge of the discipline, historical celebrity deeds, sense of responsibility, and the spirit of craftsmanship for excellence. Ye et al. [10] from Nanyang University of Technology closely focused on the concept of engineering education professional certification education. Taking the physics and chemistry course as an example, they explored how to effectively integrate ideological and political elements into professional knowledge from three perspectives: teaching objectives, teaching content, and teaching methods and means, so that ideological and political education can complement professional courses. Sun et al. [11] from Zaozhuang College explored and excavated the ideological and political elements and integration methods of the course based on the literature search and paper writing of the engineering certification process for pharmaceutical engineering. Gu et al. [12] from Shijiazhuang University sorted out and excavated the ideological and political elements in the biochemistry course based on engineering professional certification, and explored and practiced the organic integration with ideological and political elements.

There has been no relevant research on top-level design of curriculum ideological and political education from a professional perspective, which makes it difficult to form a complete curriculum ideological and political education system in talent cultivation, and there is still a gap from the construction goals.

2 ENGINEERING EDUCATION CERTIFICATION

Engineering education professional certification refers to the specialized certification implemented by professional certification institutions for engineering related professional education offered by higher education institutions. It is carried out by specialized professional or industry associations (federations), professional societies, education experts in the field, and relevant industry enterprise experts, aiming to provide quality assurance for preparatory education for relevant engineering and technical talents to enter the industrial industry. Engineering education is an important component of higher education in China, and it is one of the three parts of the higher education system. As of 2013, the number of engineering graduates from ordinary universities in China reached 2876668, the number of undergraduate engineering students reached 4953334, and the number of undergraduate engineering majors reached 15733, ranking first in the world in terms of total scale. Engineering education has played an irreplaceable role in the formation and development of a complete and independent industrial system in the process of national industrialization. Engineering education professional certification is an internationally recognized quality assurance system for engineering education, and an important foundation for achieving international mutual recognition of engineering education and engineering qualifications. The core of engineering education professional certification is to confirm that engineering graduates meet the established quality standards recognized by the industry. It is a qualification evaluation guided by training objectives and graduation export requirements. The certification requirements for engineering education majors revolve around the core task of achieving students' graduation abilities, including the establishment of a professional curriculum system, faculty allocation, and school conditions. It emphasizes the establishment of a continuous improvement mechanism and culture to ensure the quality and vitality of professional education.

3 COURSE IDEOLOGY AND POLITICS

Curriculum ideology refers to a comprehensive educational concept that integrates various courses with ideological and political theory courses in the form of building a comprehensive education pattern for all staff, the whole process, and the entire curriculum, forming a synergistic effect, and making cultivating virtue and educating people the fundamental task of education. The main form of ideological and political education in courses is to integrate elements of ideological and political education, including theoretical knowledge, value concepts, and spiritual pursuits, into various courses, subtly influencing students' ideological consciousness and behavior. Course ideological and political education is essentially a form of education aimed at cultivating moral character and nurturing individuals. From the perspective of the proposal of ideological and political courses, its purpose is to achieve the same direction and collaboration between various courses and ideological and political theory courses, and to achieve collaborative education. In the specific process of constructing ideological and political education in the curriculum, innovative thinking is also more needed, which can stimulate new ideas with new thinking, seek new development with new ideas, promote new methods with new development, solve new problems with new methods, and achieve innovative development of ideological and political education in the curriculum.

4 THE INTEGRATION OF ENGINEERING EDUCATION CERTIFICATION AND CURRICULUM IDEOLOGICAL AND POLITICAL CONSTRUCTION

Comprehensively sorting out and top-level designing the ideological and political construction of professional courses at the professional level, forming a new teaching system with the characteristics of a major project that takes into account both professional course knowledge and ideological and political elements, as well as a moral and professional

education system, and establishing a corresponding matrix between ideological and political requirements indicators and professional courses, to provide direction and set goals for professional teachers to carry out ideological and political education in courses. Through top-level design, effective coverage of ideological and political content can be achieved, enhancing the systematicity and completeness of ideological and political education in professional courses. At the same time, each channel of ideological and political education can provide more precise support for the main channel of ideological and political courses. Curriculum ideology and engineering education certification complement each other and promote each other. Curriculum ideological and political education not only enriches the connotation of the humanistic literacy requirements in the certification standards, but also draws on the indicator point decomposition method in the certification, making the responsibility for curriculum ideological and political education construction clear and solidly promoting it.

Optimize the curriculum system of mechanical design, manufacturing, and automation majors, explore the mapping and integration points of ideological and political elements, create an ideological and political system architecture for mechanical design, manufacturing, and automation majors that conforms to the concept of large-scale engineering, realize the top-level design of ideological and political education in the course group of mechanical design, manufacturing, and automation majors, and form a new teaching system that takes into account both the professional course group and ideological and political elements, as well as a moral and talented education system. By coupling ideological and political education, professional certification, and the concept of large-scale engineering in the professional course group, we aim to explore the alignment between course knowledge points and ideological and political content, promote the integration of ideological and political education in the professional course group with course team building, improve teaching syllabi, arrange teaching content, and optimize teaching methods, establish demonstration courses that highlight ideological and political elements, and construct a practical path for ideological and political construction in the mechanical design, manufacturing, and automation professional courses that leads by example, pilot by example, and covers the whole field. Combining the achievement oriented education concept in engineering education certification, guided by the value of curriculum ideology and driven by the student-centered approach in professional certification, we aim to create an ideological and political effectiveness evaluation system that is compatible with the content of professional courses, ensuring the timeliness of moral education in professional courses, exploring students' moral education goals, and constructing an open evaluation index system; Establish an active tracking and feedback mechanism, timely evaluate the effectiveness of professional course ideological and political education, and form a long-term evaluation mechanism for continuous improvement and revision, in order to promote the clever integration of course ideological and political education into professional certification and achieve a reasonable and scientific evaluation system for the effectiveness of professional course ideological and political education.

5 CONCLUSIONS

This article integrates ideological and political elements into professional courses, constructs a professional course ideological and political system architecture that integrates the concept of the Great Engineering Cultural Education Project, and realizes the top-level design of professional course ideological and political education. Plan the ideological and political construction of courses in the majors of Mechanical Design, Manufacturing and Automation, and Internet of Things Engineering, providing direction, goals, implementation paths, and basis for the ideological and political education of teachers in these majors. Through top-level design, effective coverage of ideological and political content is achieved, enhancing the systematicity and completeness of ideological and political education in mechanical design, manufacturing, automation, and IoT engineering courses, and achieving more precise support for the main channel of ideological and political courses in each section of the curriculum.

COMPETING INTERESTS

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