

Construction of Ideological and Political Theories Teaching and Education Practice under the Background of New Engineering

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Abstract: In the context of the construction of new engineering disciplines in China, it is increasingly important to cultivate “well-rounded individuals” who embody “Chinese characteristics” in higher education. Therefore, in the construction of new engineering disciplines, ideological and political theories teaching in all courses must be considered as important foundational work, with a focus on integrating ideological education into teaching. This paper follows the student-centered teaching philosophy and integrates the three aspects of knowledge transmission, skill development, and value shaping into a unified curriculum to explore and identify the integration points of ideological elements and the “Environmental Planning and Management” course, and subtly integrate ideological education into the entire teaching process of the course. This achieves resonance between knowledge transmission and ideological education, and through multiple approaches, realizes the optimal effect and value guidance of curriculum-ideological education, achieving comprehensive education in a subtle and implicit manner.

1. Introduction

The implementation of the “new engineering” construction in universities across the country has prompted a growing consensus that professional courses have a critical role in shaping students’ perspectives on life, the world, and their values [1-4]. This sentiment is shared by the academic community, employers, and society as a whole. However, as the implementation of the “new engineering” framework progresses, educators face the formidable task of integrating ideological and political education elements into the engineering curriculum. This involves incorporating crucial concepts such as the harmonious and win-win ecological civilization, the innovative spirit of great country craftsmen, the scientific spirit of perseverance and excellence, the values of green, low-carbon and environmentally-friendly practices, patriotism, industry confidence, teamwork, awareness of laws and regulations, and adherence to standards. Successfully integrating these ideas into the engineering curriculum is crucial to prepare students for the complexities of their future

professions. This requires a conscientious and deliberate approach from professional educators who are committed to promoting a values-driven approach to education [5].

The course “Environmental Planning and Management” is a crucial component of our Environmental Engineering program. It encompasses a wide range of topics and emphasizes practical and technical skills [6]. With the increasing importance of ecological civilization and China’s environmental protection requirements, this course has a unique responsibility to shape students’ values and beliefs. However, many universities prioritize teaching technical knowledge in this course, neglecting to guide students’ ethical and moral compass. To address this issue, a study was conducted to explore the incorporation of ideological and political elements into the course content to align with the socialist core values of “people-oriented” and the ecological concepts of “carbon peaking and carbon neutrality” and “environmental protection first”. Using the “Environmental Planning and Management” course of Heilongjiang University of Science and Technology as an example, the research analyzed various ways to integrate these elements into the course. The ultimate goal is to produce well-rounded professionals who possess both strong technical abilities and a deep understanding of the importance of social responsibility and environmental protection. This will enable them to contribute positively to society and meet the demands of their future careers.

2. Construction and Implementation of Ideological and Political Theories Teaching

The “Environmental Planning and Management” course is a 32-hour course that emphasizes the development of students’ ability to solve practical engineering problems through engineering design. This approach combines knowledge transfer and moral education to produce well-rounded individuals. Compared to humanities courses, the integration of ideological and political education elements into science and engineering courses can be challenging. However, the course “Environmental Planning and Management” has its unique integration point of ideological and political education, as the environmental management policies and ideas embody the concept of “ecological civilization”. Thus, it requires careful consideration and practical exploration on how to organically integrate the ideological and political elements with the professional knowledge in this course.

2.1. Reform of Teaching

2.1.1. Integrating China’s Environmental Planning and Management History into Teaching

Introducing the history of environmental planning and management in China during the teaching process can have a positive impact on students’ emotions, attitudes, and values towards this course. It can also help cultivate students’ awareness of environmental science management and protection [7]. For instance, a systematic review of China’s environmental protection policies over the past 70 years since the founding of the People’s Republic of China can be conducted in class, analyzing their evolutionary trends, stage characteristics, and achievements, which would be of significant practical significance in developing the country’s ecological environment protection policies in the new era and promoting the comprehensive construction of ecological civilization and “Beautiful China” [8]. By focusing on the evolution of environmental protection policies in China, the history of environmental protection policies in China can be divided into stages, allowing students to gain a deeper understanding of China’s environmental protection history and key milestones in its development. During the case study and discussion process, students can be guided to recognize the difficulties and challenges that China will continue to face during the “14th Five-Year Plan” period due to population growth, resource depletion, and increasingly pressing environmental issues. This

can inspire students to have a sense of responsibility and mission to apply their knowledge and serve society.

2.1.2. Setting up the Module of “Environmental News Sharing + Key Knowledge Explanation + Interactive Activities + Discussion of Significant Environmental Issues”

In implementing the ideological and political theories teaching in the “Environmental Planning and Management” course, it is important to prioritize student-centeredness and the integration of knowledge, skills, and qualities in the teaching and learning process. The design of teaching activities should focus on the relevance between teaching objectives and teaching content, as well as the match between teaching objectives and teaching methods. To achieve the goal of holistic development throughout the process, the course has been divided into several sections, including “environmental news sharing”, “key knowledge explanation”, “interactive activities”, and “discussion of significant environmental issues”. These sections incorporate appropriate ideological and political elements through various teaching methods, such as lecturing, discussion, and case analysis [9]. By aligning the content with ideological and political elements, the teaching process strengthens students’ sense of patriotism, nurtures their professional ethics and safety awareness, fosters the spirit of being diligent and studious as a master craftsman, and inspires students’ sense of professional mission. Through the aforementioned teaching activities, students have gained a deeper understanding of their major, the course, and their social responsibilities.

2.2. Reform of Teaching Content

The course “Environmental Planning and Management” is divided into multiple teaching modules, including an overview of environmental planning, water environmental planning, atmospheric environmental planning, solid waste management planning, an overview of environmental management, and environmental management theory and methods [10]. Each module is designed to integrate six ideological and political elements, such as scientific exploration and innovation, the spirit of the great craftsmen of China, the concept of sustainable development, patriotism and love for the country in the context of building a beautiful China, legal awareness, professional norms and safety awareness, and professional sensitivity and identity. These elements are integrated into the teaching process through various teaching methods such as lectures, problem discussions, and case analysis, which establish a “6+6” curriculum ideological and political teaching content system, that is, “6 parts of teaching content + 6 ideological and political elements”, emphasizing the integration of teaching content and ideological and political education, aiming to cultivate students’ comprehensive knowledge, abilities, and qualities, as well as their social responsibility and professional ethics.

When teaching the modules of environmental management overview, theory, and methods, students can be guided to understand China’s rapid technological development in the field of environmental protection by using China’s management system, laws and regulations, and treatment technologies for sewage, air pollution, and solid waste disposal as the ideological points of integration. For example, by incorporating discussions on the environmental equipment and technology levels of China, students can gain a deeper understanding of how China has gradually surpassed other countries in the world in this field. During the lectures, students can also be introduced to the prominent contributions made by China during the COVID-19 pandemic, such as the sewage treatment and ventilation systems in the Leishenshan and Huoshenshan hospitals, as well as the medical waste disposal methods used. The difficulties and significance of constructing these hospitals can be emphasized, fostering a sense of patriotism among students and allowing them to appreciate the spine of our nation during times of crisis. This can also inspire them to

pursue careers in science and technology and contribute to their country. Overall, incorporating these elements can help students to better understand the theoretical knowledge of environmental management, and instill in them the determination and courage to learn and work hard to lay a solid foundation for their future endeavors.

2.3. Reform of Teaching Methods

2.3.1. Interactive Discussions

Since the outbreak of the COVID-19 pandemic, the teaching process has continued through remote learning. During this period, the learning progress of students has been monitored regularly, and the mastery of previously taught knowledge has been constantly reinforced. Each class includes a segment of active dialogue, which focuses on discussing current environmental planning and management issues that have gained widespread attention in society. By doing so, students' attention is captured, and their habits of actively engaging in and enjoying learning are cultivated. Through such interactive teaching, not only can students develop an innovative scientific spirit, but they can also further realize the determination and attitude of the government in improving the ecological environment.

2.3.2. Grouping Training

Students are guided by the teacher to simulate participating in an environmental policy consultation meeting from the perspective of environmental managers, based on actual planning and management work. They will learn the methods for environmental planning and participate in the entire planning process. According to their interests, students are divided into planning groups and environmental management groups, with each group member responsible for their respective tasks. Finally, a course presentation will be conducted. In the process of completing the course paper, students are required to understand the local culture, history, economy, education, and environmental knowledge to broaden their horizons and expand their thinking. In addition, the course integrates the innovation and entrepreneurship competition to enhance students' innovative spirit and practical ability, allowing them to grow rapidly in practice and exercise their willpower and qualities through the competition.

3. Conclusions

This paper uses the “Environmental Planning and Management” course as an example to discuss the reform and practice of course-based ideological and political education, based on the school's educational positioning, professional characteristics, and course content. Efforts have been made in the cultivation of teaching staff, the design of innovative teaching activities, the enrichment of course content, and the reform of teaching methods, in order to achieve the integration of ideological and political elements into the process of knowledge transmission, and to achieve the goal of educating students in terms of knowledge, skills, and qualities. As a result, students' research spirit, innovative thinking, creativity, and team collaboration awareness have steadily improved. The presentation and integration of ideological and political education in the course have received wide recognition and praise from students. According to the evaluation results, the course content, ideological and political theories teaching methods, and the integration of ideological and political elements have been widely praised by students.

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