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Development Ideas for Environmental Majors under the Background of Ecological Civilization Construction in the New Era

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Abstract

Ecological civilization construction and environmental science and engineering disciplines are all committed to achieving coordinated economic, social, and environmental development. To integrate the concept of ecological civilization construction into environmental science and engineering disciplines, it is necessary to carry out profound reform in many aspects, such as education philosophy, curriculum construction, etc. The task is extremely arduous. Therefore, this paper discusses the development strategy of the environmental discipline at Qilu University of Technology from the perspectives of strengthening the concept of ecological civilization, curriculum system structure, internships and practical training, and integration of production, learning, and research. It provides experience for the development of other environmental disciplines.

Keywords

Curriculum setting; Ecological civilization construction; Environmental discipline

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1. Introduction

The report of the 19th CPC National Congress pointed out: "Building ecological civilization is a millennial plan for the sustainable development of the Chinese nation." In the process of building a beautiful China, whether it is the establishment of ecological civilization concept, economic structural adjustment, lifestyle transformation, or institutional construction of ecological civilization, all of them cannot be separated from the participation and contribution of education.

Environmental science and engineering is a broad academic field that studies the interactive relationship between human social development activities and the evolution laws of the environment, and seeks ways and methods for the coordinated evolution and sustainable development of human society and the environment. In the future development, environmental science and engineering will provide scientific basis and technical

support through ecological evaluation, environmental monitoring, and ecological restoration, thus the undergraduate environmental science and engineering majors in universities bear a sacred mission of cultivating professional and technical knowledge and skills, as well as innovative talents with high quality for ecological civilization construction [1].

This paper takes the Environmental Science and Engineering Department of Qilu University of Technology and Engineering as an example to simply discuss the development ideas of environmental science and engineering majors in the new era of ecological civilization construction.

2. Strengthen the concept of ecological civilization education

At present, China is vigorously promoting the construction of the "five-in-one" system, and the construction of a resource-saving and environmentally-friendly society is not only the target orientation of economic development mode in the present and the future, but also the value orientation of environmental-related professional courses in the reform of ideological and political education [2,3].

One way is to guide students to deeply understand and recognize the great significance of ecological civilization construction through relevant courses on the theoretical basis, policies and regulations, and practical cases of ecological civilization construction, such as courses on environmental economics and policies, environmental law, and restoration ecology.

We offer a series of comprehensive elective courses on ecological civilization to the entire student body, such as "Environmental Protection and Sustainable Development," "Ecological Security and National Security Strategy," and "Decoding Green and Low-carbon Development to Build a Beautiful China." These courses aim to guide students to learn, reflect, and practice the ecological civilization thought, and work together to safeguard the national ecological security. Additionally, we have launched a series of lectures on the ecological safety and national security strategy of the Yellow River, which have been presented to the entire student body. The themed lectures include "Ecological Safety and National Security Strategy of the Yellow River," "The Source of Life-Our Water," and "The Impact of Agricultural Non-point Source Pollution on the Environment." These lectures aim to guide teachers and students to uphold the spirit of the Yellow River culture and establish a correct ecological security concept, thus shouldering the responsibility of safeguarding national security [4].

3. Strengthen the practical teaching process

Environmental science and engineering is a practical science and technology major, requiring students to have strong practical skills, so the Environmental Studies Department has always attached great importance to practical teaching and has taken various measures to improve students' practical ability [5,6].

By forming a team of college student volunteers, the department has taught community residents and students of all ages about environmental knowledge and promoted green and low-carbon lifestyle concepts, mobilizing them to carry out environmental cleanup activities with practical actions, thus practicing ecological civilization ideology and green development view. Environmental Science and Engineering Department has held a series of special lectures and outdoor science popularization exhibitions on major commemorative days, advocating that teachers and students work together to build a harmonious relationship between man and nature in a modernized society. It has established social practice teams and sent them to the Huanghe Culture Museum in Dongying and the ecological protection area at the mouth of the Huanghe River to carry out learning and practice activities.

Environmental Science and Engineering Department has encouraged students to join research teams and organized them to participate in environmental protection projects, environmental monitoring, and ecological restoration practical activities. In 2024 alone, the department's students won more than 30 awards in various academic competitions, enhancing their practical ability and innovative thinking. Furthermore, the Environmental Science and Engineering Department has conducted offline internship and practice activities, taking students to factories for visits and encouraging them to go to enterprises for fixed-position internships, helping them apply the knowledge they have learned in class to actual work.

4. Optimize course setting and content

The new era's high-quality development has put new demands on the industry, and the breadth of knowledge needs to be expanded; the full industrial chain upgrade has put new demands on environmental protection personnel [7,8]. In order to better adapt to social development needs and keep pace with the era of carbon neutrality and carbon peak, the Environmental Science and Engineering Department has constantly updated its teaching content, incorporating the latest environmental protection technologies, policies, and concepts into its teaching system to ensure that students have the most up-to-date knowledge and skills. The department has also optimized its curriculum structure and enhanced practical teaching, aiming to cultivate high-quality environmental professionals capable of addressing complex challenges and driving green innovation.

5. Strengthen the construction of the faculty team

The responsibility of ecological environmental protection is significant, and it is urgent and necessary to establish a professional, standardized and normative talent team in the field of environmental protection. The faculty regularly organizes teacher training activities, which can not only improve teachers' professional competence and teaching ability, but also enhance their knowledge and skills in ecological civilization construction. At the same time, the faculty actively introduces outstanding talents in environmental science and engineering from both at home and abroad to strengthen the faculty team and improve the overall teaching level.

6. Promote scientific research and cooperation between industry, academia and research

The Environmental Science and Engineering Department is a unit integrating education, science and technology, and industry. The faculty actively cooperates with enterprises to do the following:

(1) Establish internship and practice training bases outside the school to provide students with more internship opportunities, enabling them to practice operations and implement projects in real scenarios, thereby improving their ability to solve practical problems;

(2) By cooperating with enterprises to carry out practical projects, students can exercise their practical operation ability, teamwork ability and problem-solving ability in the projects;

(3) Invite professional personnel from the business sector to serve as student mentors, regularly exchange with them, and provide students with industry experience and career development advice.

7. Take a diversified teaching approach and improve the evaluation system

Innovating teaching methods and means is one of the important ways to ensure that classroom teaching is centered on students [9]. Using virtual simulation technology to simulate real work environments allows students to feel as if they are there in person, thereby enhancing their sense of exploration. Using various media resources such as animations, audio and videos makes students more intuitively aware of the content of knowledge, thereby stimulating their learning interest. Organizing students to engage in group activities allows them to learn knowledge and solve problems through cooperation.

In the evaluation system for courses, increase the proportion of the score for regular performance, add points for elements such as political literacy, practical operation, case discussion, etc., to promote students' reflection and exploration of environmental concepts and ecological civilization issues from multiple perspectives, thereby strengthening students' education in ecological

8. Conclusion

Through continuous reform and innovation, the professional construction and academic development of the Environmental Science and Engineering Department have achieved some achievements, but there are still some challenges in promoting ecological civilization education, mainly manifested in the need to deeply integrate talent chains and innovation chains, industrial chains with professional practice teaching, and the task of integrating

professional practice teaching is arduous. Looking to the future, the Environmental Science and Engineering Department of Qilu University of Technology will continue to adhere to the development philosophy of "integrating environmental education to cultivate moral character", actively participate in environmental education, and continuously supply talents for the construction of ecological civilization of our country.

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Disclosure statement

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