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Exploration on the New Mode of Ideological and Political Education in the Deep Integration Course of Environmental Engineering Specialty Education in Higher Vocational Schools

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Abstract: *Due to the rapid growth of science and technology and the increasingly prominent global environmental problems, environmental engineering education is of great significance in cultivating new environmental protection talents. However, there are some problems in the current education of environmental engineering, which need to be solved urgently. How to improve the quality of environmental engineering education and cultivate environmental protection talents with innovative ability and practical ability is an urgent problem to be solved at present. The purpose of this article is to explore the construction and practice of a new mode of ideological and political education (IPE) in the deep integration course of environmental engineering education in higher vocational schools. The new model aims to deeply integrate the content of IPE into all aspects of environmental engineering education, with the core goal of cultivating students' comprehensive quality and social responsibility. The research in this article can provide reference for solving the problems existing in the current environmental engineering education.*

Keywords: *Environmental engineering in higher vocational education, Education, Deep integration, Ideological and political education*

1. Introduction

With the rapid growth of economy and the improvement of people's living standards, the demand for environmental protection in China is becoming more and more urgent [1]. Under the background of accelerating urbanization, industrialization and modernization, the problems of environmental pollution and ecological destruction have become increasingly prominent [2]. In order to deal with these problems, China government has taken a series of measures to promote the growth of environmental protection. One of them is to strengthen the cultivation of environmental protection talents. As a new industry with green development, environmental protection industry needs a large number of talents with environmental awareness and professional skills to support it [3]. Therefore, how to cultivate more high-quality environmental protection talents by reforming and innovating the education mode of environmental engineering specialty is an urgent problem at present.

The professional education of environmental engineering aims at cultivating professionals with environmental protection awareness and knowledge and skills [4]. At present, the professional education of environmental engineering in China has made great progress, but there are still some problems. For example, the course content is out of touch with the market demand, the teaching method is single, and there is no practical link [5]. In addition, due to the strong interdisciplinary, curriculum and training objectives also lack unified standards and norms [6]. Based on this, this article aims to explore the construction and practice of a new mode of IPE in the deep integration course of environmental engineering education in higher vocational schools. The new model aims to cultivate students' comprehensive quality and sense of social responsibility by deeply integrating the content of IPE into all aspects of environmental engineering education.

2. Present situation of environmental engineering education and IPE

Environmental engineering education is an educational system to train students with knowledge and

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skills in environmental science, engineering principles, environmental monitoring and pollution control [7]. At present, the professional education of environmental engineering in higher vocational schools in China mainly focuses on the cultivation of students' professional skills and application ability to meet the needs of social development and environmental protection. However, there are also some problems in the existing environmental engineering education. First of all, some higher vocational schools focus on the teaching of professional knowledge and skills, and lack the cultivation of students' awareness of environmental protection, social responsibility and professional ethics. This makes some graduates often focus on solving specific environmental problems after they take up their jobs, but lack a comprehensive understanding of environmental problems and systematic solutions. Secondly, with the rapid growth of society and the constant change of environmental problems, the teaching content and methods of environmental engineering specialty education need to be constantly updated to meet the new market demand and industry standards. However, some higher vocational schools lack close contact with industry, enterprises and society in environmental engineering education, which leads to the disconnection between teaching content and actual needs, and the single and boring teaching method can not stimulate students' interest and motivation in learning.

IPE aims at cultivating students' ideological and moral quality, Marxist theoretical accomplishment and socialist core values [8]. In the current higher vocational education, IPE is one of the key links to cultivate students' all-round development. However, there are also some problems in the existing IPE. First of all, the content and methods of IPE in some higher vocational schools are too simple, mainly relying on traditional classroom teaching and theoretical indoctrination, lacking the combination with practice and diversified educational means, which leads to students' boredom and aversion to IPE and can not achieve the goal of IPE well. Secondly, there is a certain disconnect between IPE and professional education. The IPE in some higher vocational schools often only focuses on cultivating students' ideological and moral quality, but ignores the mutual integration and promotion with professional education. This makes it difficult for students to combine socialist core values with professional knowledge and skills in their professional study, and it is difficult to improve their overall quality.

3. Characteristics and development trend of environmental engineering education

3.1 Characteristics

The characteristics of environmental engineering education can be summarized as follows: Cross-cutting: Environmental engineering specialty involves many disciplines, including environmental science, engineering, chemistry, biology, geography, etc., so it has significant cross-cutting [9]. Students need to master multi-disciplinary basic theory and practical knowledge in order to comprehensively analyze and solve various environmental problems. Applicability: Environmental engineering education pays attention to practical application, emphasizing the cultivation of students' practical operation ability and ability to solve practical problems. Students need to apply what they have learned to the actual environment through practice and practice, so as to improve their professional skills and practical ability. Development: The professional education of environmental engineering needs to be constantly updated and developed to meet the ever-changing environmental problems and environmental protection needs. The emergence of new technologies and theories requires students to have the ability of autonomous learning and continuous learning to keep pace with the growth of the industry. Social responsibility: Environmental engineering education needs to cultivate students' social responsibility and environmental awareness, so that they can consciously participate in the practice of environmental protection and sustainable development.

3.2 Development trends

At present, with the increasingly prominent global environmental problems, international environmental cooperation is becoming more and more frequent, and environmental engineering education is also showing an international development trend. Students need to have an international vision and cross-cultural communication skills, understand and master international environmental protection rules and standards, so as to participate in international environmental protection exchanges and cooperation. Moreover, with the continuous growth of science and technology, environmental engineering education needs to introduce new technologies and methods to improve students' innovative ability and technical level. For example, the combination of environmental engineering with artificial intelligence, big data and other technologies can produce new research directions and methods.

ISSN 2522-6398 Vol. 6, Issue 26: 143-148, DOI: 10.25236/FER.2023.062625

With the increasing complexity and comprehensiveness of environmental problems, environmental engineering education also needs to have comprehensive characteristics. Students need to have multidisciplinary knowledge and skills in order to comprehensively analyze and solve complex environmental protection problems. In addition, environmental engineering education needs to pay more attention to professional and practical education to meet the needs of the market and enterprises. For example, by strengthening school-enterprise cooperation and combining Industry-University-Research, we can cultivate students' practical ability and professional quality.

4. A new mode of IPE in the deep integration course of environmental engineering major in higher vocational education

The new model emphasizes the comprehensive integration of IPE in environmental engineering education. Traditional IPE is often carried out in the form of independent courses, which are relatively separated from professional courses. However, the new model advocates infiltrating IPE into all aspects of environmental engineering education and realizing the deep integration of the two. For example, cases or projects in environmental protection, social responsibility and professional ethics can be introduced into professional courses so that students can understand and experience these values in practice. Moreover, the new model focuses on cultivating students' independent thinking and critical thinking. By guiding students to analyze and discuss environmental problems, encouraging them to put forward their own solutions, and on this basis, speculating and criticizing can help students form their own environmental protection concepts and professional ethics. In addition, the new model also encourages students to participate in social practice and voluntary services, such as the design and implementation of environmental protection projects, so that they can apply what they have learned to practical environmental problems and cultivate their sense of social responsibility and teamwork ability. The way of IPE in the deep integration course of environmental engineering specialty is shown in Table 1.

Table 1: The way of deep integration of IPE in environmental engineering specialty

Teaching content integration	
Basic knowledge	Integrate IPE with basic knowledge of environmental engineering, such as environmental science and environmental protection.
In terms of professional skills	Integrate IPE with professional skills of environmental engineering, such as pollution control technology and environmental management.
Integration of teaching methods	
Case teaching	Using case teaching method, it can be combined with simulation practice project cases in artificial intelligence virtual environments, the actual cases in the field of environmental engineering are combined with IPE to guide students to analyze and solve problems.
Research teaching	The research-based teaching method is adopted to guide students to independently choose topics related to environmental engineering and IPE for research, and to cultivate their independent thinking and research ability.
Group discussion	The teaching method of group discussion is adopted to let students discuss issues related to environmental engineering and IPE, so as to promote exchanges and cooperation between them.
Integration of practical links	
Practical project design	Integrate IPE elements into environmental engineering practice projects, such as environmental pollution control practice and environmental monitoring practice, so as to cultivate students' practical operation ability and professional accomplishment.
Social investigation and practice	Integrate the elements of IPE into the social investigation and practice of environmental engineering, such as the investigation of environmental protection measures and the practice of ecological restoration, so as to cultivate students' sense of social responsibility and practical ability.

The new model emphasizes innovative education. In the information age, environmental engineering majors need to constantly adapt to new technologies and trends, and IPE also needs to keep pace with the times. By introducing innovative educational means and technologies, such as online education and virtual simulation experiments, students' interest and participation in professional knowledge and ideological and political content can be enhanced. Moreover, encouraging students to carry out innovative learning and practice, such as participating in innovative and entrepreneurial

ISSN 2522-6398 Vol. 6, Issue 26: 143-148, DOI: 10.25236/FER.2023.062625

projects and independently conducting research on environmental protection topics, can cultivate students' innovative consciousness and practical ability. Moreover, the new model also emphasizes the participation of industry, enterprises and society. Different from the traditional school-led education model, the new model pays more attention to the participation and cooperation of industries, enterprises and society. For example, through the way of school-enterprise cooperation, the environmental protection concept and culture of enterprises can be introduced, and the actual cases and experiences of enterprises can be integrated into professional courses; Moreover, students are encouraged to participate in internships and practical projects in the environmental protection industry, so that they can better understand the development trend and needs of the environmental protection industry and improve their professionalism and sense of social responsibility.

5. Feasibility and effectiveness of the new model

The new model has high feasibility. On the one hand, the new model can be realized by optimizing curriculum, introducing innovative teaching methods and means, and strengthening school-enterprise cooperation, which provides the implementation basis for the deep integration of environmental engineering education and IPE. On the other hand, the new model conforms to the current reform direction of higher vocational education, can meet the social demand for environmental protection talents, and is conducive to improving students' comprehensive quality and social responsibility. Moreover, the new model has high effectiveness. Through the deep integration of IPE, the new model can run the education of environmental awareness, social responsibility and professional ethics through the whole process of environmental engineering education, so that students can gradually establish correct values and professional ethics in the process of learning professional knowledge. Moreover, the new model focuses on cultivating students' innovative ability and practical ability, which is conducive to improving students' comprehensive quality and employment competitiveness.

Specifically, the effectiveness of the new model is shown in the following aspects: the training goal is more clear: the new model closely combines environmental engineering education with IPE, and defines the goal of training environmental protection talents with environmental protection concepts and professional ethics. This will help students to gradually establish correct values and professional ethics in the process of learning professional knowledge, and lay the foundation for their future career development and social responsibility. The content of education is richer: the new model integrates the content of IPE into all aspects of environmental engineering education, so that professional courses and ideological and political content complement and promote each other. This can not only enrich students' knowledge system, but also cultivate their comprehensive quality and sense of social responsibility. Educational methods are more diverse: the new model introduces a variety of innovative educational methods and means, such as scenario simulation, group discussion, case analysis, etc., which can stimulate students' interest and participation in learning and improve their ability of independent learning and independent thinking. Moreover, through school-enterprise cooperation and practical practice, the new model can also provide students with more real practical experience in environmental protection and improve their professional quality and practical ability. The educational effect is more remarkable: the new model focuses on cultivating students' comprehensive quality and sense of social responsibility, which is in line with the current reform direction of higher vocational education. Through the deep integration of IPE, the new model can enable students to gradually establish correct values and professional ethics in the process of learning professional knowledge and improve their employment competitiveness. Moreover, the new model is also conducive to enhancing the social recognition and influence of environmental engineering education, and providing more excellent talent support for the growth of environmental protection industry.

6. The effect of the new model on the cultivation of students' ideological and political quality, professional accomplishment and innovation ability

The new model has a remarkable effect on cultivating students' ideological and political quality. By deeply integrating the content of IPE into all aspects of environmental engineering education, students can learn professional knowledge, accept the influence of IPE and establish correct values and professional ethics, as shown in Table 2.

ISSN 2522-6398 Vol. 6, Issue 26: 143-148, DOI: 10.25236/FER.2023.062625

Table 2: Cultivation effect of the new mode of IPE in the course of deep integration of environmental engineering education

Aspect	New mode effect	Specific content
Ideological and political quality	Significant culture	Establish correct values and professional ethics through the cultivation of environmental awareness, social responsibility and professional ethics.
Professional accomplishment	Remarkable improvement	Through the improvement of knowledge level, practical ability and innovation ability, high-quality environmental engineering professionals are trained.
Innovation capacity	Significant culture	Through the cultivation of innovative consciousness, critical thinking and innovative practice, we can improve our comprehensive quality and social competitiveness.

Specifically, the new model can cultivate students' ideological and political quality through the following aspects: (1) Environmental awareness: The new model will run environmental awareness through professional courses, so that students can have a deeper understanding of environmental problems and solutions through case analysis and scenario simulation, and cultivate students' environmental awareness and sense of responsibility. (2) Sense of social responsibility: The new model focuses on cultivating students' sense of social responsibility. By participating in social practice, voluntary service and other activities, students can understand the social impact of environmental protection issues and cultivate their awareness of caring for and serving the society. (3) Professional ethics: The new model takes professional ethics education as one of the important contents of training. By introducing practical cases and corporate culture in the environmental protection industry, students can understand the importance of professional ethics and cultivate their good professional ethics and behavior norms.

The new model has a remarkable effect on cultivating students' professional quality. By deeply integrating the content of IPE with the education of environmental engineering specialty, students can learn professional knowledge and constantly improve their professional quality. Specifically, the new model can cultivate students' professional quality through the following aspects: (1) Knowledge level: The new model closely combines the content of IPE with environmental engineering specialty, which can help students master the knowledge system of environmental engineering specialty more comprehensively and improve their knowledge level. (2) Practical ability: The new model focuses on cultivating students' practical ability. Through practical practice, innovation and entrepreneurship, it can help students apply what they have learned to practical environmental problems and improve their ability to solve practical problems. (3) Innovative ability: The new model encourages students to carry out innovative learning and practice. By carrying out innovative experiments and participating in innovation and entrepreneurship competitions, students' innovative awareness and ability can be cultivated.

The new model has a remarkable effect on cultivating students' innovative ability. By introducing innovative educational means and technologies and encouraging students to think independently and critically in their study and practice, students' innovative ability can be cultivated. Specifically, the new model can cultivate students' innovative ability in the following aspects: (1) Innovative consciousness: The new model focuses on cultivating students' innovative consciousness, and encourages them to put forward their own solutions and innovative ideas by guiding students to analyze and discuss environmental problems, so as to cultivate their initiative thinking and innovative ability. (2) Critical thinking: The new model encourages students to think critically, and helps students learn to analyze the nature of problems and things and improve their critical thinking ability through multi-angle analysis and discussion of environmental issues. (3) Innovative practice: The new model can cultivate students' innovative practice ability and improve their comprehensive quality and social competitiveness by encouraging students to carry out innovative learning and practice, such as participating in innovative and entrepreneurial projects and independently conducting research on environmental protection topics.

7. Conclusions

This article puts forward a new mode of IPE in the deep integration of environmental engineering education in higher vocational schools, which is very practical and innovative. By deeply integrating the content of IPE into all aspects of environmental engineering education, the new model can effectively cultivate students' comprehensive quality and sense of social responsibility, and improve the quality of personnel training. Moreover, the new model also pays attention to introducing innovative

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teaching methods, it can introduce simulation practice project cases in artificial intelligence virtual environment, strengthening practical links and emphasizing the participation of industry enterprises, which is conducive to promoting the growth of environmental protection and promoting the innovation of environmental protection technology. In practice, the implementation of the new model requires a series of measures. First of all, it is necessary to optimize the curriculum and combine the content of IPE with the courses of environmental engineering to form a complete curriculum system. Secondly, it is necessary to introduce diversified teaching methods, encourage students to take the initiative to participate and think, and improve their ability to think and solve problems independently. Thirdly, it is necessary to strengthen practical links, apply what we have learned to practical environmental problems, and cultivate students' practical ability and innovative consciousness. Finally, it is necessary to emphasize the participation of enterprises in the industry and introduce the environmental protection concept and culture of enterprises, so that students can understand the actual needs and development trends of the environmental protection industry.

Through the practice and application of the new model, we can expect to achieve the following effects: improving the quality of personnel training, promoting the development and progress in the field of environmental protection, and promoting the innovation and growth of environmental protection technology. The realization of these effects will help to cultivate more high-quality environmental protection talents and make positive contributions to the growth of environmental protection in China.

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