

Exploration, Integration and Practice of Ideological and Political Elements in the Course of Construction Materials

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ABSTRACT

Colleges and universities shoulder the fundamental task of fostering virtue through education, and ideological and political education in courses plays a pivotal role. How to promote the reform of ideological and political education in engineering professional courses is an important issue in cultivating modern technical talents. As a basic course for engineering majors such as architecture and civil engineering, the "Construction Materials" course contains abundant ideological and political elements. This paper explores how to fully integrate ideological and political elements into the course teaching to realize the integration of knowledge and values. Combining the characteristics of the course, it discusses the practical approaches of ideological and political education in the course, including teacher team construction, teaching content and methods, practical links, and evaluation system.

KEYWORDS

Construction materials; Ideological and political elements; Practical approaches; Interdisciplinary integration

1 Introduction

With the development of higher education, ideological and political education in courses has gradually become one of the important tasks of various colleges and universities. The Ministry of Education has issued the document "Comprehensive Promotion of Ideological and Political Construction of Courses in Colleges and Universities", which links the effectiveness of ideological and political course construction with important dimensions such as teaching achievement evaluation, professional certification, and discipline assessment, and emphasizes the responsibility of curriculum education^[1]. As a compulsory professional basic course for engineering students, the "Construction Materials" course is particularly important for the practice of ideological and political teaching. The ideological and political teaching of the "Construction Materials" course guides students to understand the connotation of construction materials and their important role in national construction. Through the study of the course, students master the basic knowledge and skills of construction materials, establish correct values, and enhance their sense of responsibility and mission.

Scholars such as Zhao Hongyan^[2] started from the integration of ideological and political education into the "Construction Materials" course, discussed specific implementation paths, utilized the advantages of online and offline teaching, innovated teaching methods, formed a collaborative education mechanism, and achieved the educational goal. Scholars such as Sun Yu^[3] expounded the ideological and political teaching objectives of the "Road Construction Materials" course, and discussed five key points of ideological and political teaching: sand and gravel materials, asphalt, asphalt mixture, cement concrete, and other construction materials, and reflected on the ideological and political education in the course. Scholars such as Zhao Meixia^[4] analyzed the problems of ideological and political education in college courses, and combined with the teaching practice of the "Construction Materials and Testing" course, explored the implementation paths of ideological and political education in the course, including improving teachers' quality, excavating ideological and political elements in the course, innovating teaching methods, and optimizing the assessment mechanism. Taking the ideological and political teaching of the "Building Decoration Materials" course as an example, Xu Shaoni^[5] expounded the design, practice, and specific implementation examples of ideological and political education in the "Building Decoration Materials" course from the perspectives of teaching structure, teaching ideas, and teacher team.

The implementation of ideological and political teaching in the course combines theoretical knowledge with practical application, making the course content more vivid and interesting, and enhancing students' enthusiasm and teaching effect. In view of the characteristics of the "Construction Materials" course, it is of great significance to explore how to carry out effective ideological and political teaching practice.

2 Characteristics and teaching needs of the "construction materials" course

The "Construction Materials" course is one of the core courses for majors such as civil engineering and construction engineering, covering various aspects such as the basic properties, structure, preparation, and processing of materials. It has the characteristics of strong comprehensiveness, high practicality, and rapid update. The "Construction Materials" course covers the knowledge of the performance, testing, and application of various construction materials.

The course content is extensive and involves multiple fields, including the characteristics and applications of various construction materials such as inorganic and organic materials, metal and non-metallic materials, and composite materials.

The selection and application of construction materials are closely related to the actual situation of construction projects, so the course has high practicality. Students need to have an in-depth understanding of the performance and application of construction materials through experiments, practical operations, and other methods. With the development of science and technology and the progress of the construction industry, new construction materials continue to emerge, so the "Construction Materials" course needs to be constantly updated to adapt to the development needs of the industry.

In view of the characteristics of the "Construction Materials" course, it is necessary to systematically introduce the basic knowledge of the performance, characteristics, application scope, and testing methods of various construction materials to provide theoretical support for students' practical operations. It is also necessary to update the teaching content in a timely manner and introduce new construction materials and technologies. In response to the current social requirements for the construction materials industry, attention should be paid to the development trends and problems of the industry, and students' awareness of environmental protection and social responsibility should be strengthened.

3 Practical approaches of ideological and political teaching in the "construction materials" course

In the "Construction Materials" course, ideological and political education does not exist in isolation; it is integrated into every experiment, every project research, and every theoretical class explanation. It emphasizes not only the imparting of knowledge but also the cultivation of professional spirit and the cognition of social responsibility.

In the course, ideological and political education is integrated through various methods. Industry experts and enterprise engineers are invited to enter the classroom to share their practical experience and professional ethics in the field of construction materials, enabling students to have a more intuitive understanding of the current situation and future development trends of the industry. Students are organized to participate in social practice activities, such as volunteer services and community construction, to cultivate their sense of social responsibility and dedication. The practical approaches adopted for the implementation of ideological and political education are as follows.

3.1 Strengthening the construction of the teacher team

The teaching quality of the "Construction Materials" course is closely related to the quality of the teacher team. A high-quality "Construction Materials" course requires a high-quality teacher team with the concept of ideological and political education^[6]. Excellent teachers should be introduced to enhance the teaching strength and improve the teaching quality and practical teaching effect. Regular teacher training should be carried out to improve teachers' ideological and political literacy and educational teaching ability, so that they can better understand and implement ideological and political teaching and integrate ideological and political education into the "Construction Materials" course. Teachers should be encouraged to participate in scientific research projects to improve their scientific research ability and academic level.

3.2 Improving teaching materials and teaching resources, and innovating teaching methods and means

To implement ideological and political teaching in the "Construction Materials" course, it is necessary to attach importance to the in-depth integration of the course and ideological and political education. This integration is not a simple filling of ideological and political content, but focuses on the organic combination of course content, teaching methods, and teaching objectives, forming a mutually promoting and complementary relationship.

In-depth excavation of ideological and political elements in the course should be carried out. For example, the historical culture, development process, and technological progress of construction materials can be connected with national development, national progress, social changes, etc., to guide students to understand and feel the greatness of the country and the national spirit from them. When explaining the properties and preparation process of construction materials, content such as patriotism education and environmental protection awareness should be integrated to cultivate students' sense of social responsibility and mission.

Teaching materials that meet the requirements of ideological and political education should be compiled or revised, teaching materials and equipment should be updated, and more abundant and vivid teaching content should be provided. Digital teaching resources, such as online courses, online teaching platforms, and virtual simulation technology, should be used to provide more flexible and diverse learning methods and a rich and vivid learning experience.

The integration design of ideological and political elements into relevant knowledge points and the expected effects are shown in Table 1.

In view of the characteristics of the "Construction Materials" course, it is an important task at present to innovate teaching methods and means to realize the effective integration of ideological and political education. The case teaching method should be adopted to analyze the application and social value of construction materials in engineering construction in combination with actual engineering cases, and guide students to think about the relationship between construction materials and the environment. Through the multimedia teaching method, students can have a more intuitive understanding of the history, culture, social value, and other aspects of construction materials, and enhance the effect of ideological and political teaching.

Table 1 Design of integration points for professional knowledge and ideological and political education

Chapter Arrangement Integration	Points of Ideological and Political Education	Expected Effects
Introduction	Introducing the development history of construction materials	Cultivating national pride through the development history of construction materials
Basic Properties of Construction Materials	Explaining the composition, structure, and configuration of materials, and cultivating scientific thinking	Cultivating innovative thinking and scientific attitude by analyzing problems from the essence of things
Lime	Introducing the origin, development, and important role of lime in the construction industry. Explaining the hardships and persistence in the production and processing of lime, and emphasizing that the craftsman spirit is the foundation of success.	Cultivating students' sense of professional responsibility and mission. Promoting the craftsman spirit.
Cement	Explaining the historical evolution, production process, and application of cement. Introducing the important role of cement in infrastructure construction. Carrying out in-class discussions, case analyses, and other links.	Cultivating students' scientific spirit of seeking truth from facts and daring to explore. Cultivating students' sense of social responsibility and mission, and stimulating their patriotic feelings and dedication spirit. Guiding students to establish correct values.
Aggregate	Combining ideological and political elements such as national policies, industry standards, and corporate culture when explaining the knowledge of construction material aggregates. Analyzing the selection and application of construction materials in actual engineering cases, and guiding students to think about how to apply the knowledge they have learned in practical work.	Guiding students to establish correct values and professional ethics. Cultivating students' practical ability and innovative awareness.
Cement Concrete	The characteristics of cement concrete, such as durability, environmental protection, and sustainability, reflect people's pursuit of a better life and the embodiment of values.	Helping students understand and practice socialist core values
Steel	Helping students understand that China, as a world major construction country, has made contributions to the country through the production and application of steel. Emphasizing the craftsman spirit of rigor and striving for excellence in work, as well as norms such as integrity, responsibility, and innovation in the process of steel processing technology and application. Introducing the recycling of steel, environmentally friendly processing technology, etc., and emphasizing the importance of balancing economic development and environmental protection.	Cultivating students' national awareness and national pride, and enhancing their sense of engineering responsibility. Guiding students to establish correct professional outlook and values. Guiding students to establish the concept of sustainable development.
Asphalt	Introducing China's achievements in the research, development, production, and application of asphalt.	Stimulating students' national pride and sense of national honor.
Asphalt Mixture	Introducing the important role of asphalt mixture in China's road construction and its contribution to social development when explaining the knowledge of asphalt mixture.	Cultivating students' sense of social responsibility and mission.

3.3 Focusing on practical teaching links

In addition to classroom explanations, practical teaching links should be strengthened, such as experimental operations and field visits, to enable students to personally experience and feel the connotation of ideological and political teaching. Through practical operations, students can experience the preparation and application process of construction materials, and enhance their practical ability and innovative awareness. At the same time, students should be guided to think about the values and world outlook contained behind the experiments.

Students should be organized to conduct field visits to construction material production enterprises, construction sites, etc., to understand the production process, application status of construction materials, and their role in social

development, so as to enhance students' sense of social responsibility and mission.

Practical projects related to construction materials should be set up, such as material performance testing and building model making, to enable students to master knowledge and skills in practice, and improve their practical ability and innovative ability. Students should be guided to conduct ideological and political discussions, such as discussing the impact of the selection of construction materials on the environment and how to achieve sustainable development.

Course assignments and projects related to ideological and political teaching should be assigned, such as writing papers on the relationship between construction materials and social development, and making displays on the history and culture of construction materials, to cultivate students' comprehensive ability and quality.

Students should be organized to conduct market research on construction materials, participate in social practice activities, take part in relevant science and technology competitions, and carry out project research, so as to expand the space of ideological and political teaching. This enables students to apply the knowledge they have learned to practice, have a deeper understanding of the application and value of construction materials, cultivate their innovative ability and practical ability, and enhance their sense of social responsibility and mission.

3.4 Establishing a scientific evaluation system

A scientific evaluation system is crucial in evaluating the effect of ideological and political teaching practice in the "Construction Materials" course. To construct an evaluation system, first of all, clear evaluation objectives should be established, that is, through evaluating teaching practice, to understand whether students have mastered the relevant knowledge of construction materials and at the same time established correct ideological and political concepts and values. The evaluation content should include students' mastery of the basic knowledge of construction materials, practical operation ability, innovative thinking, team cooperation, and the application of ideological and political theories in practice. A variety of evaluation methods should be adopted, such as classroom performance observation, after-class assignment analysis, practical project evaluation, student self-evaluation and mutual evaluation, questionnaire survey, and interview.

Detailed evaluation standards should be formulated, and the weight and scoring standards of each indicator should be clarified. Through classroom observation, the performance of students in various aspects and the application of ideological and political theories in practice should be understood. The analysis results should be fed back to teachers and students to help them understand the advantages and disadvantages of teaching practice. At the same time, the teaching practice should be summarized to provide reference for future teaching work and promote the in-depth integration of ideological and political teaching and the "Construction Materials" course.

4 Application of interdisciplinary ideological and political education

The ideological and political teaching of the "Construction Materials" course is not just an independent course content; it can be cross-integrated with other related disciplines. For example:

4.1 Intersection with environmental science

When explaining the environmental impact of construction materials, relevant knowledge of environmental science can be introduced, such as environmental protection laws and regulations and the concept of sustainable development. This helps students fully understand the relationship between construction materials and environmental protection, and establish the concept of using green and environmentally friendly construction materials.

4.2 Intersection with sociology

By introducing the research methods and theories of sociology, the role and influence of construction materials in society can be analyzed. For example, studying the usage habits and characteristics of construction materials in different regions and cultural backgrounds can cultivate students' cross-cultural communication ability and sense of social responsibility.

4.3 Intersection with information technology

Combined with the development of information technology, network platforms and digital teaching resources can be used for the ideological and political teaching of the "Construction Materials" course. For example, virtual reality technology can be used to simulate the application scenarios of construction materials, so as to enhance students' learning experience and practical ability.

5 Implementation effects and prospects

Through the implementation of ideological and political teaching practice, the teaching effect of the "Construction Materials" course has been improved. It has cultivated students' feelings of patriotism and devotion to the country, and improved their ability to recognize and use construction materials. At the same time, students have paid more attention to environmental protection and resource conservation in engineering practice. In the course, through case teaching,

experimental practice, and other methods, students have a deep understanding of the scientific principles and preparation technology of construction materials, and their innovative thinking and practical ability have been cultivated.

In future teaching, we will continue to explore and improve the ideological and political teaching practice of the "Construction Materials" course. We will continue to optimize the course content to adapt to the changes in social development and industry needs. We will strengthen cooperation and exchanges with industry enterprises to understand the development trends and problems of the industry.

The development of ideological and political teaching practice of "Construction Materials" will move towards a more diversified and comprehensive direction.

Firstly, the teaching content will be more abundant. In addition to the traditional knowledge of construction materials, more content related to national development strategies, ecological civilization construction, and sustainable development will be added to guide students to think about the role and significance of construction materials in them. More cutting-edge construction material technologies and research results will be introduced to enable students to understand the latest developments in the industry.

Secondly, teaching methods will be more diversified. In addition to traditional classroom teaching, cooperation with enterprises will be strengthened, and teaching activities such as field visits and practical projects will be carried out to enable students to better understand the actual production process and application of construction materials.

Thirdly, teaching evaluation will be more scientific. Cooperation with enterprises will be strengthened, and evaluation standards and methods will be jointly formulated to better adapt to the needs of industry development.

Finally, practical teaching will become the focus of teaching. In addition to the aforementioned field visits and practical projects, more practical activities will be carried out, such as organizing students to conduct material performance testing and other practical activities. Attention will be paid to the cultivation of students' comprehensive quality and practical ability to adapt to the needs of social development.

6 Conclusion

The ideological and political teaching practice of "Construction Materials" combines professional knowledge teaching with ideological and political teaching. By integrating ideological and political teaching into the teaching of "Construction Materials", students' professional quality and skill level have been improved, and their sense of social responsibility and mission have been enhanced. In the future, with the continuous update and development of teaching methods and technologies, the ideological and political teaching practice of "Construction Materials" will pay more attention to the cultivation of students' comprehensive quality and practical ability.

The ideological and political teaching practice of the "Construction Materials" course is a long-term and arduous task. Through various methods such as integrating ideological and political content, interdisciplinary integration, case teaching, experimental practice, and classroom discussion, we will cultivate students' feelings of patriotism and devotion to the country, sense of social responsibility, scientific spirit, comprehensive quality, and innovative ability. We will improve students' ability to recognize and use construction materials. We will continue to explore and improve teaching practice to adapt to the changes in social development and industry needs, and cultivate more outstanding talents with a sense of social responsibility and innovative spirit.

About the Author

Meifang Huang, doctoral degree, mainly engages in the research of pavement materials and polymer materials.

References

- [1] Huang Meifang. Discussion on the Construction and Application of the Competence Model of College Counselors[J]. Education, 2025, 02: 116-119.
- [2] Zhao Hongyan, Li Gang, Tang Hua. Design of the Implementation Path of Ideological and Political Education in the "Construction Materials" Course[J]. Heilongjiang Education (Theory and Practice), 2022, 1401(9): 20-22.
- [3] Sun Yu, Liao Jian. Discussion on Ideological and Political Teaching of the "Road Construction Materials" Course[J]. Western China Quality Education, 2022, 8(8): 36-38.
- [4] Zhao Meixia, Yang Ning. Exploration on the Implementation Path of Ideological and Political Education in the "Construction Materials and Testing" Course[J]. Journal of Hubei Open Vocational College, 2023, 36(2): 94-95, 104.
- [5] Xu Shaoni. Design and Practice of Ideological and Political Teaching in the "Building Decoration Materials" Course[J]. Industrial and Science Tribune, 2024, 23(16): 146-148.
- [6] Huang Meifang. Exploration on the Construction of the Work Mode of College Class Teachers under the Concept of All-staff Education[J]. Education, 2023, 04: 44-47.