

# Exploring Teaching Reform Practices in Disaster Prevention and Control Courses

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## Abstract

Ideological and political education plays a crucial role in cultivating modern college students who love their country, are loyal to the Communist Party of China, are willing to dedicate themselves, and are unafraid of hard work. College students should receive professional knowledge as well as systematic ideological and political education. Colleges play a crucial role in cultivating students' ideology. In addition to teaching professional knowledge, colleges should integrate ideological and political courses to guide students in forming correct values and to cultivate students who possess both professional ability and good character. This work focuses on the core course 'Disaster Prevention and Control' in safety engineering. It combines the professional course with relevant ideological and political elements to enhance students' enthusiasm for the subject and stimulate their patriotic spirit and national pride.

## Keywords

Engineering college, ideological and political programmes, disaster prevention and control.

## 1. Introduction

Ideological and political work in colleges and universities, which is an important means of cultivating high-quality talents, has the fundamental task of forming morals and educating people, and how to combine the elements of ideological and political work and professional knowledge in an organic way is a problem to be solved in the context of the new era. General Secretary Xi Jinping pointed out that "in order to have a good 'great ideological and political class', it must be combined with reality". In order to implement the spirit of General Secretary Xi Jinping's important instructions and the decisions and deployment of the CPC Central Committee, the Ministry of Education and other departments have issued the Work Programme on Comprehensively Promoting the Construction of "Great Ideological and Political Classes", which stresses the importance of fully mobilising the strengths and resources of the whole society and promoting the combination of small classrooms for ideological and political studies and large classrooms for society. Colleges and universities have unique advantages as an important position for cultivating students' ideology and politics. Colleges and universities should effectively implement the concept of the "great ideology and politics course", follow the operation logic and construction law of the "great ideology and politics course", mobilise all educational subjects, explore all educational resources, and form a strong educational synergy in education and teaching practice, so as to promote the high-quality development of the ideology and politics course and contribute to cultivating more new talents of the times who are capable of rejuvenating the nation.

## **2. Educational objectives of the ideological and political programme**

The course 'Disaster Prevention and Control' is mandatory for safety engineering students. The main chapters cover mine gas, mine fire, mine dust control, and mine anti-surge water. The course has a strong focus on engineering practices, while also incorporating significant moral education content. Based on the course's attributes, this work identifies the goal of promoting a belief in the rule of law and a firm commitment to upholding it as the objective of political education. The programme's ideological and political teaching reform mainly encompasses the following concepts: security development, dual-carbon goals, practice and innovation, and hard work and enterprise.

### **2.1. The concept of security development**

China's approach to work safety is "Safety first, prevention, comprehensive treatment". The policy is reinforced by case studies and analyses to deepen students' understanding of disaster prevention and emergency management techniques. This approach aims to eliminate potential accidents, enhance students' knowledge of laws and regulations, and shaping people-oriented and safety-oriented culture. Valuing life and promoting safe development are important principles of the Communist Party of China in serving the people wholeheartedly. It is also a necessary requirement of the people-centred development ideology.

### **2.2. A vision of achieving both peak carbon and carbon neutrality**

China aims to reach carbon peak by 2030 and carbon neutrality by 2060. This is a significant strategic decision made by the Party Central Committee. Achieving the 'dual-carbon' goal is essential for promoting high-quality development and building an ecological civilization, which is crucial for creating a beautiful China. Mine gas is a valuable clean energy source. By explaining the significance of efficient gas extraction, students will understand the practical importance of developing and utilizing low-carbon clean energy sources, like mine gas, to achieve the country's dual-carbon goals. The aim is to improve students' understanding of the national new development concept. This will help students to establish the concept of ecological civilization firmly, build confidence in the preventability and curability of pollution. And cultivate students to become excellent builders of ecological civilization and advocates of the concept of green and sustainable development.

### **2.3. Practising the spirit of innovation**

The purpose of ideological and political education in colleges is to cultivate college students with a sense of social responsibility, innovative spirit, and practical ability for the country. It also aims to improve their scientific quality, enhance their spirit of innovation and sense of social practice. This plays a significant role in completing the talent cultivation programme, constructing the academic style, and advancing scientific research. Practical innovation can enhance students' problem-solving skills. Challenges in practical activities can motivate students to explore solutions, verify and improve theoretical knowledge through practice. The course 'Disaster Prevention and Control' can be better understood by students through practical problem-solving. The goal of ideological and political education is to enhance college students' problem-solving abilities by promoting the internalisation of Marxist theories through practical participation. This is achieved by integrating ideological and political education throughout the entire practical education process.

### **2.4. Make every effort and continue with determination**

The cultivation of a positive and forward-looking attitude is crucial for college students. Therefore, it is important to foster the spirit of striving and enterprising. College students are encouraged to participate in practical activities to exercise their practical ability and teamwork spirit. This helps them to overcome difficulties and persevere in learning and researching

relevant knowledge. By actively participating in scientific research projects and social practice, students can improve their problem-solving and stress-resistant abilities. The promotion of hard work encourages students to think innovatively, empowering them to take risks, experiment, and explore new solutions to problems. In practical situations, students can apply what they have learned to contribute to the country's security efforts.

### **3. Designing ideological and political teaching**

Disaster Prevention and Control teaches students to understand and apply mine safety-related technical standards and regulations. The course focuses on developing students' ability to solve practical engineering problems using professional theoretical knowledge.

#### **3.1. Integration Points of Ideological and Political Elements in the Chapters**

Chapter one focuses on “Mine Gas”, which has a significant impact on social stability and economic development. It is one of the sources of coal mine safety accidents and a major greenhouse gas. Additionally, it can be used as a clean energy source. Mine gas control is crucial not only for the safety of miners but also for the economic interests of the country and social stability. The purpose of this chapter is to use the case of a gas explosion to teach the mechanism of gas explosions and explosion hazards, emphasise the importance of production safety and personal safety, and help students form the professional concept of prioritising life and safety. Explaining the importance of efficient gas extraction can aid students in comprehending the national dual-carbon policy and promoting a strong synergy throughout society to pursue green and low-carbon development.

Chapter two discusses “Mine Fire Prevention”, covering the theoretical basis of coal spontaneous combustion, fire prediction and early warning, and mining technology fire prevention measures. Explaining the early prediction of spontaneous coal combustion can enhance students' theoretical self-confidence and scientific innovative thinking ability. Additionally, showing the prevention and control of exogenous fires can improve students' awareness of the system and rules. Finally, describing the prevention and control of endogenous fires can help to adhere to the safety concept of prevention and comprehensive management, respect science, and enhance theoretical self-confidence.

The third chapter focuses on “Mine Dust-prevention”, and mine dust is a highly hazardous substance. Prolonged exposure to mine dust can lead to pneumoconiosis, causing physical harm to coal mine workers. The eradication of mine dust requires continuous efforts from generation to generation. This topic instills a sense of responsibility and mission in students. Students of this major should participate in the development of efficient mine gas extraction and make suggestions for the smooth implementation of the national 'two carbon' policy. This will enhance their confidence in the industry and sense of professional identity, laying a solid foundation for the absorption of professional knowledge later.

The fourth chapter focuses on “Mine Water-proof”, which aims to strengthen students' safety concepts of 'safety first', 'prevention first', and 'comprehensive management'. It explains coal mine water prevention and control technology, improves students' theoretical self-confidence, and fosters a spirit of scientific rigour. This text explains the emergency treatment of water damage, the principles of emergency evacuation, and precautions to highlight the concept of safety first and life first. It aims to strengthen students' psychological resilience in case of an emergency.

Chapter five focuses on “Mine Emergency Rescue” knowledge. Real-life mine emergency rescue cases are introduced to help students understand the actual needs and challenges of emergency rescue work, enhancing their practical ability and adaptability. Theme discussions can also be organised to address hot issues in mine emergency rescue, guiding students to form correct

values and moral concepts. In mine emergency rescue, students must face complex and changing safety problems. Ideological and political education can help students establish correct values and moral concepts, cultivate their dedication, and better understand the meaning and value of emergency rescue work. This enhances their professionalism and social responsibility.

### **3.2. Teaching cases on the ideological and political reform of the curriculum**

This speciality has produced many advanced figures whose hard work has made great contributions to the development of the industry. Academician Xian Xuefu solved the internationally controversial gas adsorption bond problem from theoretical and experimental verification, revealed the structure of coal in the protruding zone at the molecular level, and systematically established a mechanical method for the prediction of potentially hazardous zones of coal and gas protrusion. Academician Xian Xuefu has always been steadfast in his ideals and beliefs, and has made the great rejuvenation of the Chinese nation his goal. As a scientific and technological worker, it is important to constantly explore and innovate in order to contribute to the progress of the country. Academician Xian Xuefu serves as a model of an outstanding scientific and technological worker who embodies this ideal belief and has achieved great success in his research. His ideals and beliefs, courage to take responsibility, service to the country and society, and focus on teamwork are all noteworthy and deserving of study and reference. Additionally, his scientific research results and academic achievements provide valuable experience and inspiration, and offer new impetus and direction for our future scientific and technological development.

Academician Zhou Shining is a renowned expert in the coal industry, particularly in the area of gas disasters. His research has been instrumental in developing the rubber ring pressure-viscous sealing technology, which has significantly contributed to solving the problem of gas leakage. Zhou Shining's life is a testament to his selfless dedication to the coal industry. This case highlights the link between personal values and industry development, demonstrating a strong focus on safety issues and a willingness to confront challenges. It shows that a deep understanding, innovative technology, and persistent efforts are necessary to solve the problem of gas hazards and ensure the safety of miners. This provides inspiration and motivation for current and future workers in the coal industry.

The accomplishments of these two academics in their respective fields not only make significant contributions to the advancement of national science and technology but also highlight the importance and necessity of ideological and political education. The authors demonstrate the significant role of ideological and political education in promoting social harmony and stable development. They emphasize that such education should focus on the combination of theory and practice, and the cultivation of talents with practical ability and innovative spirit. This approach is essential to fully realize the important role of ideological and political education in talent development and societal construction.

## **4. Methods of implementing reforms in the teaching curriculum**

Combining disaster prevention and control with ideological and political courses can improve college students' safety awareness and coping abilities, as well as cultivate their ideological and moral qualities and political literacy. In actual teaching, attention should be paid to designing and implementing teaching content and methods to achieve better results. The implementation plan for the ideological and political teaching reform of the course is shown in Figure 1.

First of all, it is necessary to apply a variety of teaching methods, such as reading method, combined with the characteristics of the course teaching content, provide students with character stories, accident case information and related new technologies, new norms and

literature, so that students can generate their own ideas by reading the information. The case study method is used to teach the prevention and control of various types of accidents. Accident cases are introduced to enable students to analyse and summarise the causes of accidents in a group. The discussion method is used to throw out problems for students to discuss during the teaching process, encouraging in-depth thinking and improving students' ideological awareness. Practical teaching is also strengthened. Disaster prevention and control require practical experience. Therefore, we can organise students to participate in mine fire emergency drills, mine fire accident site visits, and other practical activities. This will enable students to personally experience the hazards of fire and the importance of prevention and control, and enhance their ability to deal with mine fires.

Secondly, the course evaluation method has been diversified. Test questions are used to assess students' mastery of knowledge and skills, and practical operation standards and scoring rules are used to evaluate students. This allows for observation of the comprehensive quality of students during the practical operation process. At the end of each module, students should submit a summary of their study or insights, which will be evaluated by the teacher. The evaluation will be comprehensive.

Finally, the training and professional development of teachers should be strengthened. Teachers play a crucial role in implementing ideological and political programmes. Therefore it is essential to enhance the quality and practical skills of the teaching staff. Schools can organise relevant training and study opportunities for teachers to improve their professional level and practical ability.

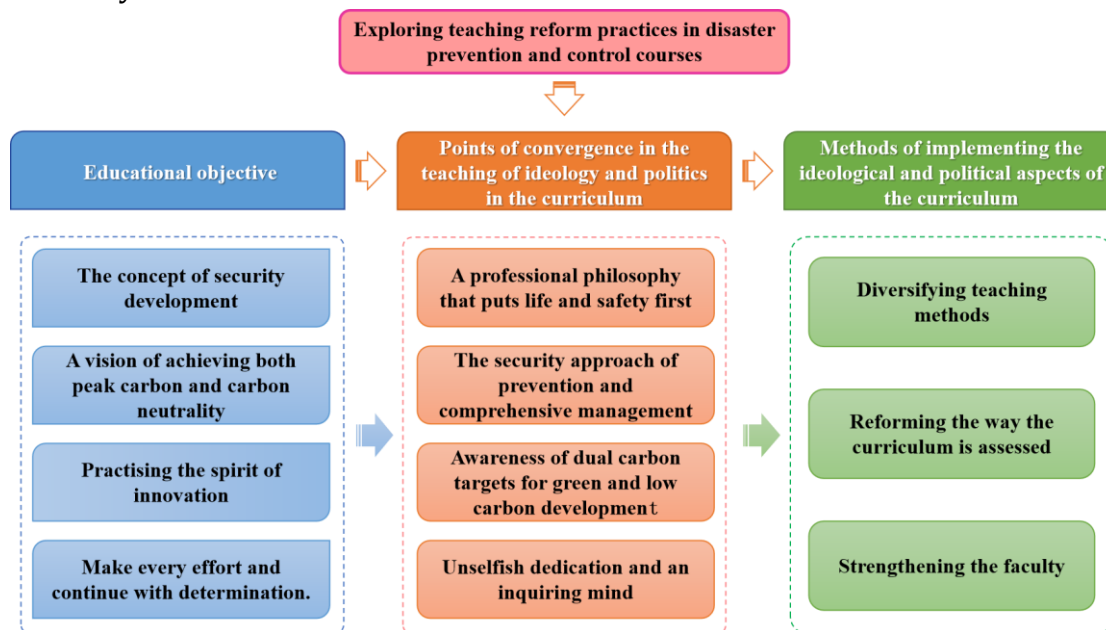


Figure 1 : Diagram of the implementation programme of the teaching reform

## 5. Conclusion

The practical exploration of ideological and political education reform in the context of disaster prevention and control is significant in improving the teaching effectiveness and the comprehensive quality of students. By diversifying teaching content, implementing innovative teaching methods, introducing social practice, and establishing an evaluation system, it is possible to effectively increase students' interest and participation in learning. This can enhance their awareness of disaster prevention and coping abilities, as well as improve their sense of social responsibility and dedication. In the future, it is important to continually

summarise experiences and refine teaching programmes to better achieve the goals of ideological and political education in disaster prevention and control courses.

Looking to the future, the ideological and political education reform of the Disaster Prevention and Control course will develop in a more scientific and systematic direction. The development of information technology allows us to make use of big data, artificial intelligence, and other technical means to assess and analyze students' learning more accurately and provide stronger support for teaching reform. Simultaneously, it is important to consider the most recent research and developments in related fields and regularly update teaching content and methods to meet current needs. The practical exploration of ideological and political education reform in disaster prevention and control courses is a long-term and complex process that requires continuous exploration, practice, summarisation, and improvement. This approach can enhance the educational objectives of the Disaster Prevention and Control course and foster a new generation of young professionals with both expertise and strong character.

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