

How to Conduct Ideological and Political Education in Higher Vocational Chemical Engineering Courses

Qiu Chen, Lisha Feng

Yunnan Open University, Yunnan National Defense Industry Vocational and Technical College

Keywords: Higher Vocational Chemical Engineering Courses; Ideological and Political Education ;comprehensive education; teaching reform;

Abstract: This paper summarizes the necessity of conducting ideological and political education for higher vocational chemical engineering courses; the differences between ideological and political education and its curriculum; the connotation of ideological and political education; the selection and integration path of ideological and political contents in chemical engineering courses; the ways to conduct this education in these courses; and the "standard" of the integration of ideological and political goals with professional courses.

1. Introduction

College is an important and crucial period for the formation of college students' outlook on life and values. At present, because of the continuous integration of global politics, economy, culture and other factors, the collision and integration of various social cultures make college students face complex forms in ideological and political education. The rapid development of network information technology has produced the diversification of ideology while people enjoy the convenience. Besides, the complexity of the external situation also has a serious impact on the establishment of the three outlooks of college students. At present, the ideological and political education of college students still has some problems, like outdated teaching concepts, single teaching methods and forms, and lack of innovation in content[1]-[2]. The "ideological and political education" is one of the innovative means of ideological and political education for college students. Its idea is to make all courses play a role in moral education, and to integrate ideological and political education in the overall curriculum system. It excavates the ideological and political education resources in all kinds of courses and seeks its methods close to the contemporary young college students. While learning professional knowledge, it can imperceptibly achieve ideological and political education, so that students can establish complete values in colleges, and promote the realization of comprehensive education for all people[3].

In 2014, Shanghai launched the exploration and implementation of "ideological and political education"[4]; In December 2016, General Secretary Xi Jinping stated at the National College Ideological and Political Work Conference: "To make good use of classroom teaching as the main channel, ideological and political theoretical courses should insist on enhancement in improvement, promote the affinity and pertinence of ideological and political education, to meet the growth and development needs and expectations of students. All the other courses should stick to a certain length of channel and cultivate a good field of responsibility, so that all kinds of courses and ideological and political theoretical courses go in the same direction and form a synergistic effect"[5]; In 2017, the Central Government issued the "Opinions on Deepening the Reform of the Educational System and Mechanism", and "ideological and political education" has officially become a national strategic deployment; In 2018, the Ministry of Education successively issued the "Outline for the Improvement of the Quality of Ideological and Political Work in Colleges and Universities" and "Several Opinions on Strengthening the Construction of the" Situation and Policy " in Colleges and Universities in the New Era", and promoted "ideological and political education" nationwide[4]. Till now, the teaching reform of "ideological and political education" has raised a

wave of teaching reform among all majors in colleges and universities across the country. In "College English", Wang Shuang and Wang Yue conducted the teaching design of ideological and political education from teachers and teaching designs[6]-[7]. Zheng Baojiang et al. explored "ideological and political education" in "Botany"[8]. Wu Jie conducted reform research in the ideological and political education of accounting[9]. Based on their professional and curriculum features, other teachers also studied the teaching process of "ideological and political education" in courses of mechanical drawing, traditional culture, grain and oil processing technology, food safety, international trade, building and decoration materials and chemical industry introduction[10]-[17]. The knowledge systems and expressions of different majors and disciplines are different, and have unique moral educational functions and ideological and political elements[18]. Thus, students majoring in chemical engineering can be engaged in engineering design, technology development, production technology management and scientific research in the sectors of chemical industry, automobile, oil refining, coal chemical industry, natural gas conversion, metallurgy, energy, light industry, medicine, environmental protection and military industry in the future. They have broad and good employment and development prospects. However, if students do not form a good outlook on life and values in college, they may be tempted after entering the society. They may make use of the chemical engineering knowledge they have learned to commit crimes with high intelligence, like making drugs without permission, preparing explosives, preparing fake and shoddy cosmetics and fake drugs, etc. to reap staggering profits, endanger society and public safety, go astray, and bring many unstable factors to social stability; In recent years, the frequent safety accidents in chemical plants are partly caused by operators not following the standard procedures, which is related to the safety awareness and professional quality of operators; Some chemical plants illegally discharge wastes that do not meet the "three wastes" discharge standards, causing serious pollution to the surrounding environment. This is also related to the lack of awareness of ecological protection of the person in charge or technical personnel of chemical plants. This goes against the concept of green development proposed by General Secretary Xi Jinping since the 18th National Congress that "lucid waters and lush mountains are invaluable assets."; "protecting the ecological environment like protecting eyes"; "seeing the mountains, seeing the water and remembering the homesickness"; Besides, according to the "Max" survey data of our school, the employment analysis of graduates of various majors shows that a small number of chemical engineering graduates leave their jobs in a short period of time. This is related to students' lack of career planning, craftsmanship and good life goals. Thus, as the foundation of national economy, chemical engineering talents play an important role in national economic construction. Meanwhile, as the chemical engineering talents reserve, these college graduates should not only have a good outlook on life and values, morality, but also a clear career planning, professional craftsmanship and good professional quality. Thus, it is quite necessary for teachers of this course to be "four good teachers" and "guide" for students in the critical period to form students' outlook on life and values. They improve their ideological theoretical level through their own learning, read great literature, timely understand the social development trends and the latest information, and actively study and get training. Moreover, they should combine the features of professional courses and practical teaching experience to conduct effective "ideological and political education" teaching reform for chemical engineering students based on modern technical means, so as to achieve the effect of cultivating people silently.

Since the teaching reform of "ideological and political education" in colleges and universities, there have been many studies in non chemical engineering majors[6]-[16], but few studies on the integration of chemical engineering courses and ideological and political elements. Tian Weiliang et al. studied the integration of ideological and political elements with the course of introduction to chemical engineering[17]. This is a great exploration of integrating ideological and political elements into chemical engineering courses, and also provides a reference for the teaching reform of "ideological and political education" in other relevant courses. Yunnan Open University has also conducted a large area of "ideological and political education" teaching reform among full-time junior college students, and all the professional courses in the College of Chemical Engineering

have also done this teaching reform. However, because most of the professional teachers didn't have a thorough understanding of this teaching reform before, and because of the heavy teaching task, some teachers are too superficial. They even have the idea of "coping" and have not fully accepted the idea of teaching reform. The mechanical application of the teaching reform of "ideological and political education" has not achieved the deep integration of "courses" and "ideology and politics".

Different courses of different majors have their own unique expressive force for "ideological and political education". Thus, according to its own features, chemical engineering courses comb the knowledge point system of its different courses to find the organic integration point of professional courses and ideological and political elements. It is necessary to explore the path to integrate ideological and political elements in chemical engineering courses, and to find the means and methods suitable for professional features. This can keep the important position in the field of ideological and political education of college students, so that these graduates can have a correct value judgment and choice.

2. The Concept and Connotation of Ideological and Political Education

To conduct ideological and political education well, teachers must first clearly distinguish between ideological and political courses and ideological and political education. Ideological and political courses are ideological and political theoretical courses in colleges and universities, such as Introduction to Marxist Principles, Introduction to Mao Zedong Thoughts and the Theoretical System of Socialism with Chinese Characteristics, Ideological and Moral Cultivation, and Legal Foundation. Ideological and political education refers to a kind of comprehensive educational concept that all kinds of courses and ideological and political theoretical courses are in the same direction in the form of building a whole staff, whole process and whole curriculum educational pattern, form a synergistic effect, and take "moral education" as the fundamental task of education.

For a long time, ideological and political courses have been boring for students and tiring for teachers. How to break the bottleneck of ideological and political courses is a big problem. Since the proposal of the educational concept and design of "ideological and political education", it has been promoted from the narrow sense of "ideological and political courses" to the broad sense and richer connotation of "ideological and political education". This is more in line with the essence of education, which integrates ideological and political education into every link and aspect of teaching, and achieves the goal of cultivating people silently.

The curriculum goal of "combining knowledge teaching and value guidance" divides the college curriculum into two categories: explicit and implicit ideological and political education. The explicit ideological and political courses refer to the ideological and political theoretical courses in colleges and universities, while the implicit ones include general education courses, public basic courses and professional educational courses.

The ideological and political connotation of professional courses includes patriotism, personal character and scientific outlook. The patriotism includes the integration of Party and state consciousness, core values of socialism, national spirit and the spirit of the times, and the recognition and persistence of excellent traditional Chinese culture. The core of patriotism is to teach students to learn duty and responsibility. Then, personal character includes moral sentiment and sound personality. Moral sentiment includes social, personal and professional morality, humanistic quality, correct three outlooks, etc. Sound personality includes thought, emotion, attitude, behavior, psychology, philosophy, art, character, constitution, etc. In general, it is to teach students how to be a man. The scientific outlook is to guide students how to do things with correct epistemology and methodology, such as seeking truth and being pragmatic, pioneering, deliberate, perseverance, critical thinking, innovative awareness, etc. These connotations need our teachers and professional courses to be integrated, so that these educational content, like the soup with salt, look the same, but the taste inside has been greatly different.

3. Selection and Integration of Ideological and Political Content of Chemical Engineering Courses

Teachers in class should focus on the teaching of specific knowledge. Meanwhile, they should actively explore and refine ideological and political elements and cases with persuasiveness, affinity and appeal. The two complement each other, and focus on the goal of cultivating talents with national awareness, humanistic feelings, scientific spirit, professional quality and international vision, which play a unique role in implementing the education of whole staff, whole process and whole aspects. In the teaching of chemical engineering courses, the following aspects can be explored to get the ideological and political elements:

- (1) Starting from the examples of the development of the chemical industry in contemporary China, we highlight our path confidence, cultural confidence and institutional confidence.
- (2) The stories of the older generation of scientists can be used to inspire students. Patriotism is real and concrete, like Huang Minglong, Hou Debang, Tu Youyou, their growth path, and their choice and sacrifice for motherland.
- (3) The concept of green chemistry will bring new life to the whole chemical industry. Green chemistry is a new concept that advocates the friendly coexistence between human beings and the environment. Its main idea is "environmentally harmless chemistry". The concept of green chemistry is to no longer use toxic and harmful substances, and no longer produce waste that cannot be processed and is harmful to the environment, and guide students to establish a sense of protecting the environment and caring for homes.
- (4) Lessons of failure, warning questions. For example, in February 2000, Dalian Chemical Construction air transported 80 barrels of "8-hydroxyquinoline" from Beijing to Madras, India and stated that this chemical product was a solid powder. On March 15, Malaysia Airlines flight MH085 flew from Beijing to Kuala Lumpur. When the plane arrived in Kuala Lumpur that night, airport stevedores entered the cargo hold to unload and discovered that the cargo was liquid and a large leak occurred. Among them, 5 stevedores suffered from sudden syncope due to inhalation of harmful gas, and then rescued. Later investigation found that it was not "8-hydroxyquinoline", but oxaloyl chloride, colorless fuming liquid, belonging to acid corrosion item. China has compensated more than 65 million dollars for the chemical corrosion of Malaysia Airlines aircraft. This case reminds us to be honest and abide by the law.
- (5) Ideological and political elements contained in experimental courses. There are many experimental courses in chemical engineering, and these courses are the carriers with the largest ideological and political elements, the most items and the most frequency. This includes the reverence and conscious compliance for the institution, cultivation of scientific literacy, the rigorous and careful training of scientific outlook, teamwork, problem finding and solving, safe operation awareness and other ideological and political elements, which can be integrated in the experimental courses.
- (6) Remain true to our original aspiration and keep our mission firmly in mind-red traditional education. Hou's alkali process founder, Hou Debang, is the pioneer of Chinese chemical industry, one of the founders of modern chemical industry, and also the authority of the world's alkali process. In the 1920s, he broke through the mysteries of ammonia alkali technology and presided over the construction of the first soda plant in Asia; In the 1930s, he led the establishment of China's first joint enterprise that produces synthetic ammonia, nitric acid, sulfuric acid and ammonium sulfate; In the 1940s-1950s, he also invented the new process of continuous production of soda ash and ammonium chloride, and the new process of carbonation synthesis ammonia process to produce ammonium bicarbonate fertilizer; Then, He made it industrialized and widely popularized in the 1960s.
- (7) Focus on international current affairs and politics, introduce hot issues, pay attention to society and advocate science. Pay attention to the national situation and social hot spots, like chemical weapons-Syria issue; Russian-British diplomatic crisis-what is "Novichok" poison? On December 1, 2018, the heads of China and the US met in Buenos Aires and reached an

important consensus to enhance law enforcement and anti-drug cooperation, including the control of fentanyl.

4. Methods of Ideological and Political Education in Chemical Engineering Courses

4.1. Diversified Teaching Methods

When teaching, teachers mainly teach in class. In addition, more diversified teaching methods can be used to make the class more vivid and dynamic, like checking, doing, acting and discussing. Checking is to let students look up information, broaden their professional knowledge and find out answers by themselves. Doing can let students do social practice, research, combining theory with practice. Acting can let students to give lectures, performances to internalize the knowledge and then perform it. Only through participation and experience can students get emotional experience and behavioral training. Discussing can continuously bring forth new knowledge and truth through discussion and debate between teachers and students or between students.

4.2. Expand Teaching Time and Space

Our classroom teaching needs three combinations: inside and outside the classroom, inside and outside the school, online and offline. The school-enterprise cooperation, social practice bases and teaching Apps can continuously expand our teaching content and broaden students' horizons.

5. Integration "Standards" of Ideological and Political Goals and Professional Courses

1. Students can accept it naturally and think it is a part of the course.
2. Being able to arouse students' emotional resonance.
3. Being able to effectively stimulate students to generate internal learning motivation.
4. Being able to effectively promote students to understand, master, expand and deepen the knowledge of chemical engineering courses.

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