

# Construction of “Curriculum Ideological and Political Education” in Instrumental Analysis Based on the Concept of Cultivating Applied Talents

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**ABSTRACT.** This article comprehensively analyzes the problems and challenges faced by the ideological and political courses of science and engineering majors in universities. Instrumental analysis is an important basic course for chemistry, applied chemistry, food, and pharmaceutical related majors. Taking “Instrumental Analysis” as an example, discussed the development and application of the instrument in the teaching process, and designed the ideological and political elements of the curriculum combined with professional knowledge. The ideological and political teaching was carried out with the spirit of innovation, humanity, patriotism, etc. The case design will help students to realize the correct values.

**KEYWORDS:** Ideological and political work, Instrumental analysis, Curriculum design

## 1. Introduction

Since the implementation of my country's education reform, the goal of talent training is no longer to improve a certain professional ability in a single aspect, but to cultivate talents with comprehensive development. It is necessary to persist in taking morality and cultivating people as the central link, and put ideological and political work throughout the whole process of education and teaching, and realize the whole process and all-round education.

At the National Conference on Ideological and Political Work in Colleges and Universities held on December 7-8, 2016, General Secretary Xi Jinping pointed out: “We must insist on establishing morality and cultivating people as the center, and integrating ideological and political work through the whole process of education and teaching, and realize the whole process of educating people. All-round education, and strive to create a new situation in the development of China's higher education”.<sup>[1]</sup> On February 27<sup>st</sup>, 2017, the Central Committee of the Communist Party of China and the State Council issued the “Opinions on Strengthening and Improving Ideological and Political Work in Colleges and Universities under the New Situation”, stating that “fully explore and use the ideological and political education resources contained in various disciplines, and improve the management methods of classroom teaching in colleges and universities.”<sup>[2]</sup> This shows that ideological and political education has been raised to the national strategic level.

In order to achieve this goal, many colleges and universities have been actively exploring the construction of a “three-in-one” ideological and political education system, comprehensive literacy courses, and professional courses. Each course that students learn during school is an important part of ideological and political education. Curriculum ideology is to organically integrate professional curriculum teaching and ideological and political education in the teaching process, find the combination point, grasp the entry point, and run through the whole process, truly “preaching, teaching, and solving puzzles”. Professional teaching must not only “teaching” (that is, imparting knowledge) and “solving puzzles” (that is, mastering methods), but also “preaching”, that is, cultivating students' character. When we upload professional knowledge in class, we fully excavate the ideological and moral elements contained therein, and guide students to realize the internalization of humanistic knowledge and the improvement of moral sentiment.<sup>[3]</sup>

## 2. Course Ideological and Political Element Mining

The so-called curriculum ideological and political education is to incorporate ideological and political education such as ideological concepts, political views, and ethics in the teaching of college professional courses.<sup>[4]</sup> Deeply excavate the ideological and political education resources contained in professional courses of various disciplines, solve the problems of mutual cooperation between various courses and ideological and political courses, give full play to the education functions of all courses, and build courses with comprehensive coverage, rich types, progressive levels, and

mutual support system, so that various courses and ideological and political courses go in the same direction, forming a synergistic effect. Following the law of curriculum construction, optimizing curriculum construction, and tapping into ideological and political elements are the foundation of ideological and political curriculum. In the higher education system, the Three-view Education, Chinese Dream, and Core Values of Socialism in ideological and political education are related to dedication, professionalism, and humanistic accomplishment, so that students can accept the influence of mainstream values in a quiet mode. Make the content of career education rich and deep. <sup>[5]</sup>

### **3. Typical Cases of Course Ideological and Political**

#### ***3.1 Development History , Innovative and Scientific Spirit***

The course of Instrumental Analysis is explained from the perspective of history and causality. Instrumental analysis is an inevitable result of the development of chemical analysis, and the development of scientific and technological progress is inseparable from the breaking and updating of original knowledge. In the history of the development of analytical instruments for more than 100 years, more than 30 Nobel Prizes have been produced, such as X-ray, Raman effect, distribution chromatography, electron microscope, high-resolution nuclear magnetic resonance, etc., which illustrate the trajectory and changing laws of things. From learning to use a developmental perspective to look at problems, to analyze problems and to solve problems.<sup>[6]</sup> The development of instrumental analysis is also a science of multi-disciplinary interpenetration and cross-development. It incorporates the trend of inter-disciplinary integration and industry development prospects to stimulate students' innovative spirit and make curriculum ideological and political to cultivate students' sense of innovation and consolidate innovation. Through the introduction of these typical innovative content, let students understand the innovation trend faced by the major.

#### ***3.2 Humanistic Feelings of Engineering Students***

Humanistic literacy refers to the humanistic knowledge that a person has the humanistic spirit that is internalized by this knowledge, which is embodied in a rich spiritual world such as a person's cultural taste, aesthetic taste, psychological quality, life attitude, and moral cultivation. It is a comprehensive manifestation of a person's external mental outlook and inner spiritual temperament, and also a comprehensive manifestation of a modern person's degree of civilization. The education of engineering students emphasizes professional technology and neglects humanistic accomplishment, which leads to the lack of humanistic knowledge. Strengthen the education of humanistic quality and feelings of engineering students, cultivate the will and character of erudite, careful thinking, discernment and determination, and guide them to recognize themselves and pursue the truth.

For example, the song Fireworks sung by Zheng Ziqi is a typical elemental flame color reaction. Based on this characteristic of the element, the atomic emission spectrum has been developed. And the aurora phenomenon in nature. The design and manufacture of instruments are born from nature and derived from the art. Educate students to enjoy the beautiful scenery and artistic at the same time enlighten and promote the development of the subject, cultivate applied talents with humanistic feelings. Mr. Qian Xuesen is an important pioneer of China's aerospace science and technology career and the two bombs and one star champion. As an outstanding scientist, he has profound humanities and arts attainments, and has a high level of music, painting, photography, etc. .He edited and published "The Art of Science and the Science of Art". Facts have been proved that only a university education that combines science and art can cultivate outstanding talents.<sup>[7]</sup>

#### ***3.3 Cultivate Patriotism and Reshape National Pride***

Patriotism is the national heart and soul of the Chinese nation, and is the most important spiritual wealth of the Chinese nation. Innovating the form of patriotism education, enhancing affinity and appeal, and achieving the same frequency resonance of curriculum ideological and political teaching. Student growth is the meaning of patriotism education in the new era. "Life is education, society is school, and teaching is one unity." Patriotism education cannot do without the comparison between the past and the past, as well as the comparison at home and abroad. By studying the history of instrumental analysis, you will find that our country has zero Nobel Prize winners in the development of this discipline. The development of Instrumental Analysis in our country has been lagging behind in the past decades, so as to stimulate students' morale and encourage students to work hard.

Instrumental analysis is particularly important in medicine and emergencies. In the fight against the new coronary pneumonia this year, real-time fluorescent RT-PCR testing has played a pivotal role in the screening of asymptomatic infections.

Through the introduction of detection methods, it is concluded that China is like a pure land at the time when the epidemic is raging all over the world. The epidemic is strictly controlled to eliminate all the viruses. Under the leadership of the Communist Party of China, the whole country is mobilized, all people participate, and the whole country fights against the epidemic which stimulates students' strong sense of national pride, historical mission and enterprising spirit, highlights the hard-core power of patriotism, and is also a manifestation of the significant advantages of the socialist system with Chinese characteristics.

At the same time, instrumental analysis methods are widely used in food safety testing. The course introduces instrumental analysis techniques through food safety issues. In recent years, there have been many food safety issues in China. This year's CCTV 315 party exposed dichlorvos feeding the sea cucumber incident. While analyzing these incidents in class, it also pointed out that food safety issues not only occurred in China, but also more serious abroad. A botulism food poisoning outbreak occurred in California in 2017. The toxin can cause paralysis, breathing difficulty and, in a small fraction of cases, death. A 37-year-old man died and nine others fell ill after eating the sauce.

Not only do students realize that food safety is related to everyone's life and health; it is also important to highlight the importance of food testing equipment and methods from the perspective of supervision, and encourage students to learn professional knowledge, cultivate a spirit of innovation, and future research directions may also be highlighted.

#### 4. Conclusions

Curriculum ideological and political education is a systematic project, which requires us to have the awareness of ideological and political education in every subject and every class. It is precisely in the process of accumulating and all-round education that it gradually produces substance to the physical and mental development of students. After many years of teaching experience summarized, we have drawn two enlightenments:

(1)The method of curriculum ideological and political education should pay full attention to the characteristics of the times of the physical and mental development of the student group.

Most of the current college students were born in the early 21st century. They are a generation that has grown up with the rapid development of information technology such as the Internet and artificial intelligence. They can be said to be "indigenous peoples" in the digital age. The methods of acquiring knowledge and information are obviously better than teachers which are more rich, diverse, instant, interactive.

This generation of young people has stronger self-concepts, is personally centered, and does not believe in authority. This requires ideological and political education in university need to pay more attention to contextuality and material vividness, and to appropriately introduce current events and interesting events in the field of science and technology, and appropriately infiltrate scientific concepts, scientific spirit, scientific attitudes, and scientific emotions.

(2)The content of curriculum ideological and political education should highlight the essence and spirit of science as much as possible.

Curriculum ideological and political education is also a kind of education in essence, still serving to realize morality and fostering people, but it is more pursuing the pattern and effect of full-staff, full-course, and full-disciplinary education. As an applied undergraduate college, our teaching subjects involve more science and technology courses, which requires us to develop the content construction of curriculum ideology and politics to explore the essence and spirit of science as much as possible, and to design it in steps and levels. Specific in each lesson. For example, in the discipline of chemical engineering, there are many dialectical and unified scientific thoughts contained in them: macro-identification and micro-analysis, changing concepts and balanced thoughts, experimental investigation and innovative consciousness, evidence reasoning and model cognition, scientific spirit and social responsibility, etc.

However, the learning and understanding of the essence and spirit of science is not an educational goal that can be accomplished in one lesson. It needs to be penetrated in an orderly and layered manner in the long-term adherence to each lesson.

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