

## **Practice and Exploration of Ideological and Political Education Reform in Course of Modern Food Testing Technology**

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### **Abstract**

*Based on the new era, “curriculum ideology and politics” as the mainstream advanced educational concept is the focus of teaching reform in higher education institutions. The rapid development of the food industry has put forward higher requirements for “three comprehensive education”. Modern food testing technology, as a fundamental course in the food industry, includes rich knowledge of detecting food through modern technological means, while the course contents also contain rich ideological and political factors, and occupies an important position in China's food discipline. With moral education as the core, it comprehensively promotes the construction of ideological and political courses and meets the high-quality training of high-quality talents, which is the top priority of teaching reform. This study adopts descriptive, qualitative research methods and mixed approach, collecting data through practical operations, interview techniques, and literature review. This analysis utilized continuous participatory techniques, including stages of observation, practice, interviews, case studies, focus group discussions and literature research, presentation, and drawing conclusions. In view of the current practice and exploration, this article extracts the commonalities between science and engineering courses and ideological and political education for integration to break the singularity of teaching practice. At the same time, it constructs a “three in one” collaborative education mechanism to enhance the organic integration of ideological and political education and curriculum teaching, in order to achieve the goal of inheriting the past and opening up the future. By introducing the significance and construction strategies of ideological and political education in the course of Modern Food Testing Technology, this article aims to provide suggestions and references for the reform of ideological and political education in relevant courses in universities.*

**Keywords:** *Course Ideological and Political Education; Cultivate Virtue and Cultivate People; Trinity; Food Major; Teaching Reform Plan*

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## **INTRODUCTION**

Ideological and political education spans various historical stages of human society and is an educational philosophy combining ancient and modern times, domestically and internationally. It is neither unique to a country nor private to socialist countries. Emphasizing ideological and political education has become a trend in the development of countries and times around the world. Although ideological and political education in foreign countries is not explicit and does not propose the concept of “ideological and political education”, this does not mean that there is no “political” color in the implementation of education. But it is silently carrying out ideological and political education under the banner of “civil rights and compulsory education, national spiritual education, moral education, religious education, and historical education”. Countries around the world regard it as an important part of national education and an important way to cultivate national identity, social identity, and political identity among college students, and China is no exception.

In 2015, the strictest legal system in history, the Food Safety Law of the People's Republic of China, was introduced. Strict food quality constraints, strict food safety supervision, and continuous increase in safety index. The research and development, updating, and rational utilization of advanced food inspection technologies continue to empower the field of food testing, continuously strengthening food safety monitoring. At the same time, the demand for professionals in society is constantly increasing. Modern Food Testing Technology is one of the core courses in the food industry and occupies an important position in the entire teaching system of the discipline. This course belongs to the practical type and mainly includes theoretical teaching, experimental operation testing, and assessment. It helps students understand the important role of various detection technologies in scientific research, factory quality control, and production testing, master the physical and chemical reactions between food ingredients, and the principles, characteristics, usage scenarios, and instrument operations of modern advanced food detection technologies. It aims to cultivate scientific experimentation and production practice abilities for future job positions. The rapid development of the food industry and the rapid advancement of food testing technology have put forward higher requirements for the high-quality cultivation of high-quality talents (Chen et al., 2021). According to data analysis from the Industry Research Institute, as food safety issues enter a period of proliferation, the global food safety testing market continues to grow, it is expected that the market size of China's food safety testing industry will increase by about 15.0% year-on-year in 2023. Therefore, it is necessary to cultivate high-quality and highly skilled food safety inspectors (Yang et al., 2023).

Cultivating students to shape the correct ideology of the curriculum is a prerequisite for better understanding and mastering professional knowledge. The curriculum teaches lacking a spiritual core is like “water without a source”, and the one-way output without ideological guidance is like a "tree without roots". The course of ideological and political education is not just a superficial list of political content, nor is it illogical and arbitrary, but it is truly integrated to deepen the guidance of scientific theory (Ouyang et al., 2024). In the process of strengthening the teaching of food safety testing technology, rich ideological and political theme elements are supplemented to create ideological and political courses. On the one hand, it can actively promote the formation of students' sense of social responsibility and professional ethics, and on the other hand, it can stimulate students' thinking, cultivate innovative creativity, and enrich practical experience (Zhang & Wan, 2023). For example, when learning a certain detection technology or instrument, on the basis of mastering the principles, one can independently consult literature or relevant cases for analysis. Simultaneously one can apply the basic concepts and principles to solve and master various biological, physicochemical detection technologies required in the food production process, and learn the ability to independently collect data and analyze results. Exploring and developing new modern detection technologies is to bring breakthroughs for the development of food safety detection, stimulating independent innovation and improving core competitiveness (Wen et al., 2023).

Under the background of the new era, the Party and the state have put forward new requirements for the education of students in universities to integrate ideological and political education through talent cultivation, and comprehensively promote the construction of ideological and political courses in universities (Yue et al., 2023). Transformation of university students' intellectual and political training can integrate contemporary education development, implement important ideas and regulations, and adapt principles and processes to develop in a better trajectory. Ideological and political education can achieve significant effects through several strategies, such as selection of better teaching tools and methods, or ways of systematic assessment of all phases of the teaching process, and so on (Zhang et al., 2024). According to the talent cultivation goals of ordinary higher education institutions, based on disciplinary rationality and essential attributes, the reform of ideological and political education in the course

of Modern Food Testing Technology is integrated into the entire process and link of education from three aspects: national consciousness, ideological shaping, and “trinity”.

## RESEARCH METHODS

This study adopts descriptive, qualitative research methods, and mixed methods (Zega & Sitanggang, 2025). The research focuses on Chinese teachers and students. This study describes the current differences between science and engineering courses and ideological and political education, as well as the singularity of teaching practice. Through observation, interviews, focus group data collection and discussion, literature research, and practical exploration, a “three in one” collaborative education mechanism is constructed (Sarkinfada & Kanoma, 2022). Qualitative research is a study that explores, practices, and understands the significance of new educational concepts and scientific reform plans for science and engineering courses (Husni et al., 2024). It involves distributing questionnaires, interviews, literature collection, and case analysis to all teachers and students to obtain information, restoring data, and presenting it as the basis for data reduction (Elizabeth et al., 2022; Manik et al., 2024). Interactive analysis is conducted to draw conclusions, enabling problems to deepen and continue to develop, exploring their origins, analyzing practical obstacles, and implementing specific plans and practices.

## RESULT AND DISCUSSION

### 1. Exploring the Integration of Ideological and Political Education into Food Testing Curriculum

#### 1.1. Theoretical coupling: the fusion of the essence of ideological and political education and the theoretical foundation of the discipline

Narrowly speaking, ideological and political education is a course teaching that students unilaterally receive. Broadly speaking, the essence of ideological and political education is the activity system of ideological and political education in universities, which is still a practical activity centered on the comprehensive development of human beings. It is an educational activity that promotes ideological changes, aligns with the political propositions of the Party and the country, and adapts to the path of social development.

At present, the representative views on the essence of ideological and political education in the academic community can be summarized into three categories: attribute theory, relationship theory, and activity theory. That is, the essence of ideological and political education is “political”, it is to solve the contradiction between social needs and the ideological and moral level formed by individuals, and it is a “practical activity” (Desmet & Sternberg, 2024). The foundational theories of disciplines that are on par with them are also rooted in practical activities and effective in human social production activities. As a skill application discipline, food inspection technology needs to incorporate a certain proportion of experiential teaching. The introduction of ideological and political education in the curriculum helps to bring students into real-life project situations, create a sense of patriotism and mission as foodies, enhance the quality of classroom teaching, enhance students’ practical skills, and enhance their ability to analyze problems, communicate, and collaborate.

In addition, the key propositions such as the connotation, significance, and extension of the discipline are integrated with the theoretical foundation of ideological and political education to form a self-consistent system, which greatly consolidates the theoretical construction of the

discipline and provides a theoretical reference for issues such as the disciplinary stance, ideological core, and practical regulations. Strictly control food safety, build a strong defense line for food safety, and ensure that people can eat with peace of mind. Highlighting the uniqueness and value of the food discipline is particularly crucial and prominent in promoting the sustainable development of the discipline.

Different types of courses have their own characteristics in terms of “similarity and integration” and “collision and impact” with ideological and political knowledge. From the perspective of value guidance, although the ways and processes of integrating ideological and political education are different, “cultivating morality” comes before “educating people”, and preaching and imparting knowledge is only the basic work of schools. Teaching reform ultimately aims to achieve the educational goal of cultivating morality and talent.

### **1.2. Internal and External Integration: An Overview and Reflection on the Reform of Ideological and Political Education from an International Perspective**

Throughout the world, modern countries under different social systems, political parties, and governments in any country or region focus their attention on cultivating public awareness, political literacy, and moral character among college students. Although the ideological and political education in the curriculum has rich political connotations, it has evolved into consistency in the process of diversified development. The ideological and political education models at home and abroad are comparable and can provide insights through comparative analysis (Li, 2020).

Many successful examples of foreign universities in the field of food and other engineering disciplines effectively promote ideological and political education based on disciplinary and professional courses. These examples include teaching by teaching teachers in combination with their research work. Teachers try their best to teach students their research methods, experiences, and innovative skills in the research process through specific research projects or cases. Cultivate food safety testing technicians who uphold the interests of the people, are loyal to the nation, and love the country. We need to organically combine Eastern and Western cultures. Facing the international community with a holistic perspective, one can attack jade with stones from other mountains. Drawing on the concepts that are in line with the development path of our country and our major, choosing the right one, promoting the reform of ideological and political education in the food subject curriculum, and helping students implement mainstream ideological and political awareness. Food safety laws are the standard, and morality is the cornerstone. Establishing a correct outlook on life, values, ethnicity, country, and the world, forming a stable ideological system, and possessing good professional ethics.

### **1.3. Ideological enlightenment: drawing on high-quality ideological and political elements to establish correct values**

How to grasp this critical period and “fasten the first button of life” is crucial for the entire education process. The curriculum of modern food testing technology contains abundant ideological and political elements, like a bowl of high-quality soup. The promotion of socialist core values in ideological and political education is like a handful of “salt”, which can make the soup more delicious and enhance its nutrition. At the same time, “salt” plays a crucial role as a seasoning in food, and how to grasp its weight is particularly important.

According to the national conditions of our country, we should take the position, views and methods of Marxism as the basis, Xi Jinping's thought of socialism with Chinese characteristics for a new era as the direction, and take the essence of Chinese excellent traditional culture by analogy. Narrowing the field of view to the structure of the Chinese character “food”, breaking down the radical components to obtain “character” and “conscience”. Taking traditional Confucianism as an example, ideological and political education is not an unchanging application, but rather viewed with a developmental perspective and applied appropriately. By

combining the concepts of “benevolence, righteousness, propriety, wisdom, and trustworthiness” that closely follow the changes of the times with the curriculum content, we aim to convey the core concepts of China's value system during the teaching process.

The organic integration of ideological and political elements and the supplementation of cutting-edge disciplinary knowledge in the teaching content greatly enhances the depth and width of modern food testing technology teaching, guiding students to establish a correct materialist philosophy and to use dialectical materialism to dialectically view, analyze, and solve problems. This cultivates technical talents who are professional, dedicated, and carry national beliefs in the field of food safety testing for the country, and achieves the effect of “cultivating virtue and nurturing people”.

2. Analysis of the limitations of the integration of modern food testing technology and ideological and political education

### **2.1. Objective hindrance leads to the lack of integration between science and engineering and ideological and political education in modern food testing technology**

In the process of deepening the education and teaching reform of ideological and political education in the course of Modern Food Testing Technology, the main contradictions caused by objective factors are reflected in 1) strong professionalism in science and engineering courses; 2) Difficulty in achieving organic integration of professional knowledge and ideological and political goals.

In the multidisciplinary integration mode, modern food detection technology is rapidly iterating and developing, relying on multiple disciplines such as biology, chemistry, mathematics, and optics to complement each other. Emerging technologies such as spectral scanning, electronic nose, electronic tongue, artificial intelligence algorithms, food physical properties, and biosensing technology are emerging, continuously improving the accuracy and sensitivity of detection (Deng & Zhang, 2022). Modern Food Testing Technology has developed into an interdisciplinary field and is widely used in food safety supervision fields such as harmful microorganisms, drug residues in food, and genetically modified foods.

The integration of disciplines has expanded the scope of knowledge covered by course content, making learning and teaching more difficult. In addition, the course possesses both theoretical and abstract elements of science, as well as operational and applied elements of engineering. Its rational content occupies a dominant position and possesses distinct professional characteristics. Different from humanities, which contain rich cultural connotations and differ greatly from ideological and political content, it is difficult to explore highly compatible ideological and political elements.

If relevant content is rigidly embedded and supplemented, it will lead to knowledge losing its value guidance, losing its foundation of existence, staying at the preaching level and not being accepted, or being too far-fetched and obscure to understand, which is contrary to the original intention of a comprehensive reform of ideological and political education in the curriculum. The primary issue currently facing is how to achieve a natural integration of ideological and political content and professional knowledge that complement and complement each other.

### **2.2. Subjective obstructive factors lead to insufficient teaching practice**

The implementation of ideological and political education requires a balance between theory and practice. While emphasizing the exploration of ideological theory, it is also important to pay attention to practical activities. In practical teaching and other processes, students should have a firsthand understanding of the spiritual washing of ideological and political education, sublimate their sense of identity with professional ethics and ideological and political culture, and feedback on the shaping and improvement of ideological and theoretical levels to form a closed loop.

At present, ideological and political courses in science and engineering courses, taking "Modern Food Testing Technology" as an example, are too theoretical and lack practical links, which can easily lead to students being unable to apply the theoretical knowledge of ideological and political courses to themselves and combine it with practical problems, greatly reducing the teaching effectiveness. Due to the lack of practical opportunities, problems such as monotonous course content and difficulty in determining the teaching direction of teachers have arisen. On the one hand, "curriculum ideological and political education" is limited to theoretical politics, laws, and regulations, and is separated from students' needs for ideological and spiritual development. On the other hand, "curriculum ideological and political education" requires a high-level teaching team to undertake, and it is difficult to meet the requirements of a high academic level and rich experience in ideological and political education at the same time. In reality, the exploration of ideological and political education by most professional course teachers lags behind, and there is a lack of attention and training for the teaching team in the early stage. As a result, the level of ideological and political education and professional competence of professional course teachers are relatively low, making it difficult to meet the needs of students.

In response to the above issues, this article focuses on the practice and exploration of ideological and political education reform in the course of "Modern Food Testing Technology". The fundamental problem is to integrate multiple resources, strengthen the deep integration of "politics, industry, education, research, and application", and collaborate to cultivate high-quality composite talents with theoretical application ability, practical innovation ability, and practical application ability in new engineering.

3. The reform and innovation approach of the ideological and political education system in the college curriculum

"If it is dyed pale, it is pale; if it is dyed yellow, it is yellow." Judging from the characteristics of ideological and political education in various countries, the state has always controlled the direction of ideological and political education, promoted the construction of ideological and political education through colleges and universities, and guided college students to cultivate national feelings. Through the horizontal extension of curriculum ideological and political system construction, the vertical development of ideological and political practice activities and the construction of trinity education pattern, the final effect of ideological and political teaching work is achieved. Based on national conditions, it guides college students to establish a mode of combining ideological, political, and professional with "correct" core values, so as to combine explicit and implicit and eventually form a college ideological and political education system that meets the needs of national development.

### **3.1. Promote the construction of ideological and political education in disciplines and transfer the national will horizontally**

Under the horizontal dimension, the ideological and political education courses in universities mainly consist of two types: one is the explicit ideological and political education that directly imparts political, historical, and moral concepts to students, and the other is the implicit ideological and political education that permeates through professional courses. Implicit ideological and political education courses such as "Modern Food Testing Technology" in science and engineering are certainly far from traditional ideological and political courses. This requires universities and teachers to pay attention to the integration of ideological and political education with professional course content, actively explore the ideological and political factors in professional courses, and enable various courses to subtly play the role of ideological and political education in the teaching process, promoting students to develop into talents that meet national requirements while learning scientific knowledge (Dimmock et al., 2021).

Emphasizing the connection between professional knowledge and various social issues in the teaching process can solve the dilemma of lacking ideological and political elements. By discussing and analyzing practical problems, students can fully understand the current international situation, the development status of their own country, and the overall level of the industry, enhance their awareness of leadership, catch up with the forefront of technology, and weaken the gap between strong and weak. To cultivate students' national consciousness, moral awareness, judgment ability, and professional mission. In the exploration of ideological and political education in the testing technology course, the teacher imparts content related to the regulations and national values of modern food testing in China to students through the course, aiming to directly address their thoughts and achieve political identity.

### **3.2. Transform educational achievements by daily practice education and promote ideological shaping vertically**

Under the vertical dimension, diversified practical activities such as “politics, industry, education, research, and application” are used as objects to jointly promote basic teaching. The main target of higher education is students, and simple theoretical accumulation is just a castle in the air. It is necessary to construct ideological and political education that enters the lives of students and is close to the mainstream values of society. Starting from the form of teaching, gradually shifting from single-form teaching to diversified teaching. Since the Ministry of Education launched the pilot work of the comprehensive reform of “three comprehensive education”, universities have fully implemented the education of all staff, the whole process, and all aspects, integrating it into various aspects of student ideological and political education, cultural knowledge education, and social practice education (Fang, 2024). The second classroom is closely integrated with the subject and major, practicing its functions of cultural and practical education. With the consistency of its content, diversity of forms, fun of activities, and universality of activity objects, it internalizes theory into students' literacy, character, and ability. As an extension and expansion of the first classroom, the implementation approach of the second classroom is as follows:

(1) By combining interactive integration and international experience introduction, we aim to break the single structure of ideological and political knowledge, solidify training programs, reshape flexible programs, balance comprehensive qualities with personalized professional training, and build a comprehensive and multi-dimensional exploratory self-learning approach, breaking through disciplinary barriers.

(2) Based on theoretical knowledge and research achievements in universities, combined with government guidance and social needs, project initiation is carried out, and efficient cultivation and exercise of students' application and innovation abilities are achieved through scientific and technological innovation competitions such as rural revitalization and red special projects.

(3) Relying on the cooperation between school and enterprise, based on jointly building production practice and practical training bases in the past, based on collaborative development to improve the practical ability of talent engineering, the diversified enterprise spirit and enterprise culture are educated in practice, and the co-existence of school and enterprise is promoted.

(4) Form a platform effectiveness mechanism, achieve win-win outcomes from multiple parties, and enable students to have advantages in problem-solving, collaborative innovation, and team collaboration in practical applications; The school has achieved the goals of “comprehensive education, integration of science and education, and implementation of ideological and political education” in teaching reform; Enterprises have advantages in technological breakthroughs, product research and development, and talent recruitment in

market competition; To achieve cutting-edge talent cultivation and industrial transformation and upgrading in the field of social and economic development (Shao et al., 2024).

### **3.3. Construction of the Trinity Model of “Scientific Origins, Humanistic Morals, and Patriotic Sentiments”**

#### **3.3.1. The Origin of Science Reflects Dialectical Materialism**

The food professional courses cover a wide range of phenomena, and one can easily understand the dialectical materialist philosophy contained within them. By citing classics and allusions, abstract knowledge can be visualized to help students better understand professional knowledge.

Taking the ideological and political reform of the PCR gene amplification technology course as an example, polymerase chain reaction uses a specific nucleic acid sequence of the pathogen as a template, synthesizes a single-stranded nucleic acid sequence according to the principle of complementary base pairing as a probe, and then uses fluorescence quantitative PCR to label it. The synthesized single-stranded nucleic acid sequence is combined with the nucleic acid of the tested pathogen. If there is evidence of binding between the probe and the tested nucleic acid, the instrument will detect fluorescence. The preparation of specific probes and fluorescent markers during this detection process fully reflects the classic article in “The Book of Rites: The Doctrine of the Mean”, which states that “everything should be prepared in advance, but not in advance, it should be abandoned.”. Dialectical materialism believes that there is an inevitable connection between cause and effect. “Everything is predicted, then it is established” to convey to students the correct scientific prediction set in advance, followed by the completion of specific operations, and then the detection results develop towards their desired direction; If people do not have a vision for development, disregard long-term results, and only focus on the present, they will inevitably not achieve their ultimate goals (Li et al., 2024). In recent years, with the development of food microbiological detection technology, nucleic acid probe technology has been increasingly applied to the rapid detection of foodborne disease bacteria such as Salmonella, Staphylococcus aureus, and Vibrio parahaemolyticus in food. Using allusions to warn students not to engage in unprepared battles, to plan before action, to understand before practice, and to step by step toward their own goals.

#### **3.3.2. Cultivating a sense of social responsibility through humanistic morality**

Teaching classic cases will bring painful lessons to educate students. By asking questions, existing problems will be identified, and ideological and political education will be integrated into the explanation, guiding students to establish correct values. Food quality and safety incidents at home and abroad have been coming one after another, such as the DDVP incident in Jinhua ham in 2003, the safety incidents of aged grains, poisoned lard, and red heart duck eggs in 2006; 4) The Sanlu milk powder incident in 2008, the incidents of residual pesticide glyphosate in beer in 2022, the poisonous bread incident in 2022, and so on.

Government departments carry out bold reforms and issue strict new regulations. But today, more than a decade later, there is still a crisis of public opinion and trust, and some even extend the hidden dangers to industries such as food, medicine, and manufacturing. The development of the food industry is essentially “profitable”. While pursuing economic benefits, it is necessary to adhere to the bottom line, rationality, and kindness, and create a “mutually beneficial and mutually beneficial society” rather than a “mutually harmful society” (Zhou et al., 2021). The food testing position integrates a humanistic spirit, adheres to the original intention of choosing a major, puts the people at the center, benefits humanity, and enhances students' sense of social responsibility and mission.

#### **3.3.3. National feelings and solemn sense of mission**

With the continuous increase in the proportion of college students joining the military, the group of college students who have retired and returned to school continues to grow, basically

achieving full coverage of majors. Taking the Fenghui Lecture Hall held on schedule by our school as an example, we often invite experts from different fields and award-winning students in ideological and political courses to drive the construction of students' value systems. At the same time, other extracurricular practical education that assists classroom education also has more advantages. Students participate in ideological and political learning activities through various channels such as ideological and political-themed class meetings, party training, and politically charged social practices.

Retired college student soldiers are both the object and subject of ideological and political education. From the supply side, the enlistment of college students provides inexhaustible educational resources and richer educational scenarios for the construction of ideological and political courses. The experience of enlisting is an important career, which contains contents such as patriotism, serving the country, typical role models, and helping and educating people, greatly expanding the depth and breadth of ideological and political education. It also combines theoretical knowledge with real life more closely, achieving the unity of rigid value guidance and flexible emotional influence of ideological and political education content (Liu, 2021). Point-to-point exploration of the “common people” heroes in this major, fully leveraging the advantages of high ideological awareness and good political literacy of retired and returning college students, allowing them to draw rich spiritual wealth from them, play the role of ideological value guidance, help college students find their own position in society, and better realize their personal value.

## CONCLUSION

In the Book of Documents, it is said: “The Eight Policies of Hong Fan, with food as the top priority.” Throughout history, food has always been the life of the people and the treasure of the country and is an important resource that can influence social, political, and economic development. Food safety is related to human health and the long-term stability of society. Food testing serves as an effective barrier to hidden dangers, and modern testing technology is an important support for cultivating high-quality talents. It is imperative to adopt new educational concepts and scientific reform plans to integrate ideological and political education into the teaching system. “Course ideological and political education” is an innovative educational concept that integrates various professional courses and ideological and political theories into curriculum education. Its core is to regard “cultivating virtue and nurturing people” as the fundamental task of education, in order to build a comprehensive education pattern for all staff, the whole process, and all aspects. The author delves into three parts: exploring its origins, analyzing practical obstacles, and planning and implementing specific practices. They provide talent cultivation measures that integrate multiple resources and guide the “three in one” approach and have developed a systematic education project, which is also a comprehensive practice of talent cultivation and education reform. To achieve synergy between professional courses and ideological and political theory courses. Universities should continuously summarize the practical experience of curriculum reform, and sort out the constraints and obstacles that exist in the smooth progress of curriculum ideological and political construction, in order to improve the level of curriculum ideological and political construction and the effectiveness of moral education.

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