

Exploration of Mining and Integration Paths of Ideological and Political Elements in the Food Quality and Safety Major

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Abstract: The two tasks of the Food Quality and Safety Department are protecting people's health and ensuring the credibility of the industry. It has a scientific spirit, is ethically conscious, and can be socially responsible; therefore, it can be used as educational materials for ideological and political education in schools. Given the interdisciplinary nature of "liberal arts, science and engineering" in this major, this paper will systematically study the mining and integration paths of ideological and political content in the curriculum. First, this paper will introduce the intrinsic attributes and logical foundation of ideological and political education in the curriculum from three aspects: the value connotations of the knowledge system, the isomorphic connection between core competencies and educational elements, and the professional adaptability of integration. Next, the three mining strategies are to find factors of implicit value in the curriculum knowledge modules, extract the spiritual lineage from the development history of the discipline and technological progress, and determine dimensions of value analysis in professional norms and ethical dilemmas. Based on the above, we need to build a complete road with three linked parts: a curriculum objective system for cognition and values, an organised structure of teaching content with values, and a teaching process mechanism that can flexibly integrate cognitive activities and value education. The goal of this paper is to provide a theoretical foundation and an implementation plan for achieving the deep integration of knowledge dissemination and value education in the major of Food Quality and Safety.

Keywords: Food Quality and Safety, Ideological and Political Education in the Curriculum, Mining of Value Elements, Integration Paths, Professional Adaptability

Introduction

Food Quality and Safety is an applied discipline that aims to foster talents with strong professional knowledge and skills, as well as sound value judgments and behavioural habits in the field of food safety for all people. The whole chain of the industry, from the production of raw materials to the end-user, is covered by the main part, and the professional attitude, ethical awareness and sense of responsibility of the practitioners will directly affect the effectiveness of quality assurance and risk prevention and control. However, professional education and value guidance have long been in a relatively separate state, and value elements in the curriculum system have been added on top of professional knowledge from the outside; they have not been truly integrated into the intrinsic logic of professional knowledge. Most of the previous studies have only provided general theoretical interpretation and have not explored in depth based on the knowledge logic of this major; therefore, this paper will be grounded in the knowledge structure and teaching principles of this major to systematically investigate the three levels of connotative characteristics, mining strategies and integration paths, and provide a theoretically adaptable reference for building ideological and political education in the curriculum.

1. Connotative Features and Logical Basis of Ideological and Political Education in the Curriculum for the Food Quality and Safety Major

1.1 Value Implications in the Knowledge System of the Food Quality and Safety Major

The courses in the curriculum system of the Food Quality and Safety major are Food Biochemistry, Food Microbiology, Food Toxicology, Food Technology and Food Safety Supervision and Management.

The knowledge core of this system will naturally contain the values of public health, the pursuit of scientific truth and professional ethics. For example, in teaching the topic of food additives, teachers should introduce not only their physicochemical properties and functional classifications but also convey the scientific understanding of the dialectical relationship between "dose and toxicity" and the demand for strict regulatory standards. Teaching food safety risk analysis shows respect for the health of the people and the protection of public interests. These values are not outside the knowledge system; rather, they are included in the technical ideas, process designs and test standards, and thus constitute an essential ethical foundation for professional knowledge^[1].

Further research has found that the knowledge system of this major also contains the scientific spirit of the pursuit of truth and pragmatism, as well as the craftsman's idea of continuous improvement. To achieve the highest degree of accuracy and reliability, we need to be able to detect even the slightest change in the sense of smell, and the precision of analysis by accurate instruments must be high. A good attitude of adhering to the technical specifications and taking full responsibility for the test results is also a sense of values. Therefore, the professional knowledge and the values in it will be combined in the curriculum system to provide rich internal materials for the following element mining.

1.2 The Isomorphism of Professional Core Competencies and Educational Elements

The objective of the Food Quality and Safety major is to cultivate students with the qualities of quality supervision and safety risk assessment at all times in the food production process. The composition of these professional core competencies is the same as that of the sense of responsibility, scientific spirit and ethical judgment in educational elements. The "precision analysis" of professional competencies should be carried out in an organised and realistic way at the educational stage, and the "process control" of these competencies requires respect for rules and adherence to procedural justice. Based on the above isomorphism, professional education and value guidance have been determined to have a high degree of consistency in their goals; therefore, they should not be treated as two separate systems but rather integrated and achieved together in teaching.

The goal of cultivating ability is to help students build an organised system of thought and solve problems in this area; thus, they will be able to learn about the whole world and think dialectically. When students face all-encompassing problems such as food traceability, detection of adulteration and early warning of safety, they need to collect knowledge from all sectors and also have the ability to judge whether something is right or wrong, accept facts and take social responsibility. To be professionally competent, students should integrate all kinds of qualities based on professional knowledge and also master the operations of technology to a certain extent, going beyond mere technical skills. The reason for the high quality is that the teaching staff works closely with the school and other schools.

1.3 Professional Adaptability and Pedagogical Foundation for the Integration of Ideological and Political Education in the Curriculum

The integration of ideological and political education in the curriculum should not be done according to a general model; rather, given the knowledge structure and cognitive laws of the Food Quality and Safety major, it needs to be customised to ensure professional adaptability. The first characteristic of interdisciplinarity in "liberal arts, science and engineering" is that it includes both the abstraction of fundamental problems in natural science and the application of technology and industrial management in real life. Therefore, the combination of values should be in line with the original ideas of that subject. The meeting point of scientific knowledge and ethical norms should be the integration point for theoretical teaching, and the focus of integration in technical teaching should be on the junction of operating procedures and a sense of responsibility. Only when it is based on the genetic logic of professional knowledge will value guidance help deepen one's understanding of the profession rather than acting as an external source of cognitive load^[2].

At the level of pedagogy, deep integration of ideological and political education in the curriculum for this major requires building a teaching system that integrates cognition and values. In accordance with the theory of constructivism, the cultivation of students' professional ethics should not be achieved through unilateral instruction but rather by allowing students to actively build their own knowledge in particular professional situations, such as case studies, experiments, projects, etc. For example, in the course of Food Standards and Regulations, students can learn about the scientific basis and social trade-offs of standard-setting by conducting independent research and thus gain value recognition and

professional knowledge. Therefore, the Design of integration paths for ideological and political education in the curriculum should focus on promoting the construction of meaning for professional knowledge and the internalisation of values. Create a learning situation, conduct problem-based teaching, make timely corrections, and strive to achieve the goals of instruction, foster student capabilities, promote moral education, etc.

2. Classification and Mining Strategies for Ideological and Political Elements in the Curriculum of Food Quality and Safety Majors

2.1 Identification of Implicit Value Factors According to Curriculum Knowledge Modules

The curriculum system of the Food Quality and Safety major can be divided into categories such as basic theories, detection techniques, process control, standards and regulations, and supervision and management, and knowledge modules are the subdivisions. All kinds of knowledge modules have different factors of implicit value. The basic theory module's knowledge cores in both the structure-function relationship of substances in food biochemistry and the microbial ecological balance of food microbiology are based on the laws of nature and the reverence for life. The detection technique module should have properly pretreated the samples and be highly accurate in instrumental analysis; therefore, it needs to be based on objective facts and meet technical requirements. To identify these factors of value, one needs to learn how to know the internal logical structure of each body of knowledge well and determine how scientific cognition can be combined with values naturally.

A good way to find the factors of implicit value is to construct a "knowledge-value" correlation matrix and systematically map the knowledge points in the course to their possible value connotations. The goal of the process control module is to identify the necessary control links in food production and then organise all kinds of risks to achieve the goals of future-oriented responsibility and prevention. The Standards and Regulations Module provides the foundation for the development of national food safety standards and specifies the implementation requirements of these standards; therefore, it is the intersection of science and public interest. Based on the systematic knowledge-ontology analysis above, the original value elements in all the course modules can be identified explicitly to obtain an element list and logical foundation for the design of the integration path^[3].

2.2 Extraction of the Spiritual Lineage from the Discipline's Development History and Technological Evolution

In fact, the development history of the discipline of food quality and safety is the intellectual evolution history of how technological innovation has responded to the demands of society and safeguarded public health through science. The spiritual inheritance will be based on the history mentioned above. From the early days of using sensory experience to assess quality to the development of modern chemical analysis methods and now to the application of contemporary molecular biology and high-throughput detection technology, every technological progress has changed the model of scientific research and increased the quantity of professional knowledge. At this time of progress, the first scholars in this field have been continuously working to lower the lower detection limit, and their careful consideration of unknown risks and awareness of technological constraints have provided the impetus for the development of this discipline.

To learn from this spiritual inheritance, we need to extract values that are not tied to any particular technology from the main links of technological development. Continue to improve the method of detecting pathogenic bacteria by iteration, and both its sensitivity and specificity will increase; by changing the form of the risk assessment theory from qualitative to quantitative, we can give equal weight to scientific decision-making and open communication. This spiritual inheritance is not a fixed memory of history; rather, it is an academic gene that actively shapes the present situation of teaching. Add it to the teaching materials in the curriculum so that students can learn about the spirit of science and professional integrity in class through knowledge of technology.

2.3 Dimensions of Value Analysis in Professional Norms and Ethical Dilemmas

The normative system of the food industry includes all kinds of production norms, quality requirements, safety regulations and food labelling standards. These norms provide the basis for technical operation and are also institutionalised expressions of the value consensus of the industry. At

this particular stage in the development of the food safety management system, the application of good production practices and the conformity audit of product labels are all manifestations of respect for consumers' rights, the demand for fair trade, and their wish for transparency. Based on the values of the above professional norms, one can extract fundamental values such as a spirit of contract, responsibility ethics and professional self-discipline, etc., to provide value materials for curriculum teaching rooted in authentic industry contexts.

The ethical problems in the industry are actually serious enough to be given more weight in the value analysis. The trade-off between necessity and safety in the use of food additives, the trade-off among the timeliness and accuracy of risk alerts, and the division of information transparency and trade secrets in supply chain traceability are all real problems that do not have simple solutions; therefore, practitioners need to have a high-level sense of values. By putting these ethical problems in the teaching environment and having students conduct multi-dimensional analyses based on professional knowledge, we can help them learn to make responsible choices in difficult situations and transform values from abstract ideas into practical and debatable problems in professional practice^[4].

3. Construction and Implementation of Integration Paths for Ideological and Political Education in the Curriculum for the Food Quality and Safety Major

3.1 Bidirectional Integration of Cognition and Values in the Curriculum Objective System

The construction of the curriculum objective system provides the foundation for the integration path, and its purpose is to achieve two-way integration of the cognitive dimension and the value dimension, not just to place them side by side. Cognitive objectives refer to the knowledge of the principles of food biochemistry, the ability to use detection techniques, the application of quality and safety control methods, etc., at different levels of professional competence; value objectives include the cultivation of scientific attitudes, the development of ethical awareness, the formation of a sense of responsibility, and other levels of character education. Bidirectional integration can be achieved by having the value element support the achievement of cognitive goals in the formulation of curriculum objectives, and cognitive deepening can provide a foundation for value creation. For instance, in the Food Toxicology course, the cognitive objective of "being able to independently carry out quantitative analysis of target substances in complex matrices" can be combined with the value objective of "cultivating a rigorous attitude towards the accuracy of testing data", and the two are in harmony and achieved together in the teaching process.

The general direction of the curriculum system for bidirectional integration should be to set a reasonable order among the levels of objectives. In the general course stage, the emphasis should be on cultivating a spirit of science and normative consciousness, and the goal of value education is to learn about basic professional ethics. Integrate moral education and systematic thinking into the main professional course to help students consider all aspects of a problem in complex technical issues. At the stage of expansion and in general, integration can be promoted to the level of innovation and industrial responsibility, and students can form high-level values in response to new and all-encompassing problems. Layered and progressive integration of the above goals can achieve the integration of cognition and values at all times in vocational education, creating a spiral development path from shallow to deep and from low to high^[5].

3.2 Structured Design of Teaching Content Organisation and Value Presentation

Organised Design of teaching content is to be expected in the transmission of values; therefore, it is necessary to integrate the identified factors of values into the logical structure of the knowledge system. Not only are there simple additions of value labels, but based on the inherent relationships among course knowledge, an organised Design places value elements at appropriate knowledge nodes so that they can be integrated into the understanding of professional content and the resolution of professional problems. "The Setting of Safety Margins in Process Parameter Selection" from the Food Technology course can be used as a knowledge node, and the value orientation of scientific prudence at this node can be introduced to help students learn about process principles and understand why safety redundancy is necessary. In the Food Toxicology class, we will learn the general idea of the "dose-response relationship" to foster a spirit of science and be objective in presenting the results of toxicological data.

The Design should know the internal relationships and display order of all the values to create a

logical system for presenting these values that is in line with students' thinking patterns. Based on the laws of cognitive development in professional courses, one can arrange the presentation order of values from concrete to abstract and from simple to comprehensive. At the beginning of a class, one can present the general attitude of being strict and practical by providing technical specifications and operating rules. In the middle part of the class, I will have the students study some cases and situations to learn about the application of science and ethics. In the latter half of the course, all kinds of projects and discussions on new and serious problems can be used to help students build an organised and dialectical system of professional values. The order in which this value will be shown can help students organise their sense of values and learn about the profession in an orderly manner^[6].

3.3 Dynamic Coupling Mechanism of Teaching Process Interaction and Value Internalization

The Design of the teaching process interaction is to promote the internalisation of values, so it should create a dynamic coupling mechanism between cognitive activities and value generation. Teaching interaction refers to all kinds of communication in the classroom, such as the exchange of questions and answers between teachers and students, the interaction of students with the knowledge context, collaborative discussion among students, and dialogue between students and professional norms or professional ethics. To teach the course Food Quality Management, one can organise a group discussion and a multi-role simulation based on the construction of a supply chain traceability system. By participating in all kinds of activities, such as being a producer, a tester or a regulator, students can feel a sense of responsibility in many ways and learn these values better through practice.

To build a dynamic coupling mechanism, all kinds of teaching interactions should be employed to create a good cycle that continuously promotes the development of students' cognition and values. In the experimental teaching part, one can create situations with anomalous data to have students learn the scientific spirit of seeking truth from facts by identifying sources of errors in their own work. In the teaching stage, one can select industrial cases with typical value conflicts and use a debate model to have students explore the value principle in more depth by presenting all sides. In the period of project-based learning, students can study real problems in the industry themselves and learn about life in society and how to solve practical problems. The Design of teaching and interaction aims to transmit values through experience, help students internalise these external attachments of knowledge into their own qualities, and thus achieve the goal of learning professional knowledge and cultivating moral character.

Conclusion

Given that food quality and safety are problems that need to be solved, this paper will study how to integrate ideological and political education into the curriculum. At the level of connotative characteristics, this paper shows that professional knowledge and values are in harmony, core competencies and educational elements are isomorphic, and professional adaptability is a necessary condition for the integration process; thus, it clarifies the internal logic of building ideological and political education in the curriculum for this major. At present, the three kinds of mining strategies for this purpose put forward in this paper are: identification of implicit value factors based on curriculum knowledge modules, extraction of the spiritual lineage according to the development history of the discipline, and dimensions of value analysis based on professional norms and ethical dilemmas; thus, an organised way has been established to extract value elements from the three dimensions of knowledge ontology, disciplinary evolution and industry context. The three parts of the integration path proposed in this paper are: first, the bidirectional integration of cognition and values in the system of curriculum objectives; second, the structured design of value presentation in teaching content organisation; and third, the dynamic coupling mechanism of value internalisation in the teaching process interaction, thus all links in the transmission of value elements, from identification and organisation to internalisation, have been covered.

The following are some directions for the future research. First, one can further refine the differentiated integration models for all kinds of courses (such as theoretical courses, laboratory courses and internship courses) to improve the operability and specificity of the paths. Second, I will inform you of the system for assessing the effect of integration and the relevant measures to guide the improvement of teaching based on data. Third, be aware of the new value problems that have arisen in the new areas of technology (such as foodomics, intelligent traceability and alternative proteins) and continuously expand the connotation and scope of ideological and political education in schools. Based

on the accumulation of theory and teaching experience, the general level of talent cultivation in the Food Quality and Safety major will rise.

References

- [1] Nan Guohui, et al. "Mining and Practice of Ideological and Political Elements in the 'Biochemistry' Course of Food Quality and Safety Major." *Food Industry*, Vol. 46, No. 08, 2025, pp. 180-183.
- [2] Sun Min, et al. "Exploration of Ideological and Political Practice in Food Quality and Safety Major Courses Based on OBE Concept." *Food Industry*, Vol. 46, No. 05, 2025, pp. 145-149.
- [3] Dong Xiaojing, et al. "Construction and Practice of a Project-Based System Integrating Ideological and Political Elements with Professional Knowledge: Taking the Course of Food Safety and Quality Control Technology as an Example." *Agricultural Engineering*, Vol. 15, No. 04, 2025, pp. 154-158.
- [4] Yu Zuyan, Wang Li, and Yue Yanxia. "Development and Practice of Ideological and Political Elements in Food Science Courses: Taking the Course of Food Quality and Safety as an Example." *Grain Processing*, Vol. 49, No. 04, 2024, pp. 117-119.
- [5] Guo Mei, et al. "Exploration and Practice of Ideological and Political Education in Food Quality and Safety Major Courses: Taking the Course of Food Technology as an Example." *Journal of Tianjin Agricultural University*, Vol. 30, No. 03, 2023, pp. 90-93.
- [6] Wang Cong. "Integration of Ideological and Political Education Courses in Colleges and Universities with Food Safety Education: A Review of 'Exploration and Practice of Ideological and Political Education in Food Quality and Safety Major'." *Food and Machinery*, Vol. 39, No. 01, 2023, pp. 247-248.