

# *Ideological and Political Education in the Interdisciplinary Integration: The Innovative Practice of Chemistry Major*

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**Abstract:** This paper explores interdisciplinary integration in ideological and political education, using the example of the chemistry discipline to demonstrate innovative practices. Through a deep fusion of chemistry and ideological and political education, it aims to promote the comprehensive development of students' thinking qualities and moral concepts. The research findings indicate that this integration not only enhances the effectiveness of disciplinary knowledge dissemination but also cultivates students' overall literacy, laying the foundation for the formation of their future sense of social responsibility.

## 1. Introduction

In the current context of higher education, the increasing separation between traditional disciplines often leads students to focus solely on their respective majors, lacking an understanding of other fields. To cultivate professionals with comprehensive literacy and a sense of social responsibility, interdisciplinary integration in ideological and political education becomes particularly crucial. Using the example of the chemistry discipline, this paper discusses how innovative practices can organically integrate chemistry with ideological and political education, aiming to propel the comprehensive development of students.

## 2. The Theoretical Foundation of Interdisciplinary Integration

### 2.1. Concept and Significance of Interdisciplinary Education

Interdisciplinary education is an educational philosophy aimed at breaking down traditional barriers between disciplines, organically integrating knowledge, methods, and ways of thinking from multiple fields. It encourages students to develop comprehensive cognitive abilities and problem-solving skills. In the context of the chemistry discipline, the significance of interdisciplinary integration is evident. By combining chemical knowledge with other disciplines, students not only gain a deeper understanding of the practical applications of chemistry but also cultivate the ability to think innovatively and comprehensively in interdisciplinary collaborations. This organic fusion provides students with a broader perspective, laying a solid foundation for their future career development.[1]

## **2.2. The Role of Ideological and Political Education in Higher Education**

In higher education, ideological and political education is assigned a crucial mission. Its core objectives include not only imparting political theory knowledge but also guiding students to form correct life values and worldviews, as well as nurturing their ability to take responsibility in society. In the context of the chemistry discipline, ideological and political education goes beyond providing theoretical knowledge; it emphasizes ethics, morality, and social responsibility, fostering a more comprehensive understanding of the profound connection between professional knowledge and society.

Through ideological and political education, students in the chemistry discipline can transcend disciplinary boundaries, realizing that their specialized knowledge is not just a technical tool but an essential component of social progress and human well-being. The values and sense of social responsibility emphasized in ideological and political education contribute to cultivating professionals in the chemistry discipline with higher humanistic qualities. Therefore, the significance of ideological and political education in higher education lies not only in its theoretical framework but also in providing a deep-thinking framework for various disciplines, guiding students to comprehend and apply their knowledge more comprehensively. The integration of this philosophy helps construct a comprehensive talent development system in higher education.[2]

## **2.3. The Relationship between the Chemistry Discipline and Ideological and Political Education**

The close connection between the chemistry discipline and ideological and political education reflects their shared concern for students' comprehensive literacy. While the chemistry discipline aims to equip students with scientific knowledge and experimental skills, a singular set of professional skills falls short of meeting society's demand for comprehensive literacy. In this context, ideological and political education, by emphasizing humanistic care and social responsibility, offers chemistry students a more comprehensive development space.

Through ideological and political education, students can not only apply chemical knowledge to practical life but also gain a profound understanding of the interactive relationship between science, technology, society, and the humanities. In the chemistry discipline, ideological and political education can guide students to examine the ethics and social impact of scientific activities, encouraging a greater focus on social responsibility and ethical standards in professional practice. This interconnectedness not only helps students form a comprehensive talent structure but also injects more social and humanistic elements into the development of the chemistry discipline.[3]

Therefore, the relationship between the chemistry discipline and ideological and political education goes beyond the transmission of disciplinary knowledge; it is a shaping of a mindset, an effective approach to cultivating students' comprehensive literacy. Through organic integration, students in the chemistry discipline will be better equipped to understand the interaction between professional knowledge and social ethics, making more positive and responsible contributions to future technological innovation and social development.

## **3. Innovative Practices of Ideological and Political Education in the Chemistry Discipline**

### **3.1. Innovation in Curriculum Design and Teaching Methods**

#### **3.1.1. Diversification of Course Content**

Innovations in ideological and political education within the chemistry discipline involve introducing diversified course content. The aim is to encourage students to delve deeper into the

societal applications and potential impacts of chemistry while studying the subject. This diversification extends beyond traditional chemistry theory and laboratory courses, focusing on expanding students' cognitive horizons through specialized courses encompassing ethics, social responsibility, and related topics.

In the new curriculum framework, students engage with societal issues closely related to the chemistry discipline. For instance, topics include the impact of technological development on society and ethical considerations related to the practical application of chemical technology. A notable example is the course "Chemistry and Environmental Ethics," where students delve into knowledge about environmental issues, resource utilization, and sustainable development. This course involves case studies to discuss the actual impact of chemical industry practices on the environment.

Such course designs provide students with a broader knowledge perspective, enabling them to comprehensively recognize the profound connections between their chosen discipline and societal ethics. By contemplating ethical issues presented in the courses, students develop sensitivity to ethical aspects in professional practice, preparing them to face future work and research challenges more maturely. This diversified course structure offers students a richer academic experience, contributing to the development of comprehensive professional qualities.[4]

### **3.1.2. Introduction of Interactive Teaching Methods**

To enhance students' sensitivity to societal issues and critical thinking in the chemistry discipline, innovative practices in ideological and political education introduce interactive teaching methods. These methods aim to combine traditional lecture formats with more interactive approaches, fostering a proactive consideration of the societal applications and ethical considerations of chemical knowledge.

In this new teaching model, instructors utilize interactive methods such as case analysis and group discussions. By introducing real-life cases, students are encouraged to engage in in-depth discussions within small groups, analyzing the societal impacts of chemical technology in industrial development. Particularly in the course "Chemical Ethics and Social Responsibility," students engage in intensive case studies through group cooperation, gaining a profound understanding of ethical dimensions.

The introduction of interactive teaching methods serves not only to impart professional knowledge but also to cultivate students' active thinking and teamwork skills. Through these discussions, students can freely express their viewpoints, gaining a more comprehensive understanding of the relationship between the chemistry discipline and societal ethics. This innovative teaching method not only enhances students' professional competence but also establishes a solid foundation for them to develop habits of deep ethical reflection and social responsibility.

### **3.1.3. Integration of Interdisciplinary Projects**

Innovations in ideological and political education within the chemistry discipline also incorporate the integration of interdisciplinary projects to better illustrate the connection between professional knowledge and ideological and political education. By combining projects from different disciplinary areas, students can apply their professional knowledge more comprehensively in practical situations, all while considering the societal ethical aspects of the projects.[5]

In this integration, interdisciplinary projects aim to break down disciplinary barriers, enabling students to better understand the interactions between various disciplines in a team setting. For example, a project involving both chemistry and environmental science may require students to focus not only on technical issues but also to contemplate potential environmental and societal impacts. This integration helps develop students' systems thinking skills, better preparing them to tackle future complex professional challenges.

The integration of interdisciplinary projects not only enhances students' professional practical skills but also lays the foundation for developing more comprehensive qualities. By participating in such projects, students gain a better understanding of the relationship between professional knowledge and societal demands, forming a more three-dimensional professional perspective.

## **3.2. Integration of Practical Projects with Ideological and Political Education**

### **3.2.1. Infusion of Ideological Elements into Project Design**

Innovative practices within the chemistry discipline emphasize the infusion of ideological elements into the design of practical projects. This approach guides students beyond traditional technical research and encourages them to focus on ethical considerations and social responsibility. For instance, in a project researching new materials, the infusion of ideological elements is evident in the project design.

Traditional practical projects often focus on technical aspects of research and development. However, in innovative practices, project design places a stronger emphasis on students considering the ethical and societal responsibilities associated with their work. In a project researching new materials, students are prompted to contemplate the potential environmental impact of the materials, extending beyond technical characteristics. This approach liberates projects from narrow technical goals and broadens considerations to encompass societal and environmental impacts.

To guide students in contemplating ethical and social responsibility issues, a specific ethics discussion segment is introduced into project design. During this segment, students are encouraged to engage in in-depth discussions regarding the social and ethical issues tied to their projects. This type of discussion not only enables students to transcend technical perspectives but also motivates them to consider the comprehensive impact of technological development on society and the ethical responsibilities associated with their professional fields.[6]

Through the ethical discussions embedded in project design, students engage in profound reflections on the comprehensive impact of technological development on society. This holistic reflection enables students to comprehend the deep connections between their chosen discipline and societal ethics comprehensively. They begin to recognize that technological development not only signifies technical advancement but also involves far-reaching consequences for society and the environment, fostering a profound awareness of ethical and social responsibilities.

In such project designs, students not only function as technical operators but also assume roles as bearers of social responsibility. The introduction of ideological elements not only enhances students' sensitivity to ethical and social responsibilities but also integrates these considerations into their practical work, providing a solid foundation for future professional development.

### **3.2.2. Cultivation of Social Responsibility and Humanistic Care**

The integration of practical projects does not only focus on exercising technical capabilities but also aims to cultivate students' sense of social responsibility and humanistic care. In these projects, students are not only required to address technical challenges but also to ponder how their work can positively impact society. This design transforms students from mere technical operators into bearers of social responsibility within practical operations.

In these projects, students not only face technical challenges but also need to contemplate how their work contributes positively to society. This combination allows their professional skills to intertwine with a sense of societal responsibility. Through such designs, students strive not only for the completion of projects but also for the benefit and development of society.

This particular project design enables students to develop a profound understanding of the societal

impact of technological development in practical operations. They gradually recognize that professional skills are not only for self-improvement but also for addressing societal issues and making positive contributions to society. This awareness helps students gain a more comprehensive understanding of the relationship between their chosen discipline and society.

Through such designs, students within their professional field gradually recognize the societal responsibilities they should shoulder. They start to contemplate how, as professionals, they can utilize their expertise to create more value for society. This cultivation ensures that students not only focus on the development of their own professional fields but also emphasize how to integrate their professional capabilities with societal responsibility, realizing the societal value of their professions.

Overall, the cultivation of social responsibility and humanistic care within practical projects enables students in the chemistry discipline to undergo a more comprehensive development. They not only acquire solid professional skills but also form an active sense of social responsibility and humanistic care, laying a robust foundation for their future professional careers.

### **3.3. Ideological and Political Guidance in Discipline Competitions**

In the field of chemistry, discipline competitions serve as crucial platforms for students to showcase their professional skills. Recent innovations in these competitions have shifted the focus from showcasing technical prowess alone to placing a stronger emphasis on guiding students in ideological and political literacy. By organizing discussions and encouraging students to write competition reports, these competitions have become more comprehensive, covering the societal impact of technological development, ethical considerations in projects, and the social benefits of proposed solutions.

#### **3.3.1. Practical Implementation of Ideological and Political Guidance**

In discipline competitions, the practical implementation of ideological and political guidance is evident in several aspects. Firstly, organizing team discussions prompts students to contemplate how technological development affects society, the ethical issues that may arise in their projects, and the societal benefits of their proposed solutions. Such discussions not only broaden students' thinking but also enhance their sensitivity to societal issues.

Secondly, during the process of writing competition reports, students are guided to shift their focus from technical aspects to the interaction between technology and society. They are required to deeply consider how their research serves society, addresses societal issues, and incorporates ethical and moral considerations. This writing process ensures that students, in competitions, not only showcase technical capabilities but also demonstrate a profound understanding of societal responsibilities.

#### **3.3.2. Cultivation of Social Responsibility and Humanistic Care**

By guiding students to focus on societal impact and ethical issues in competitions, there is a cultivation of social responsibility and humanistic care. Students gradually realize that behind their professional skills lies ethical responsibility, and technological development should be oriented towards societal welfare. This guidance enables students to integrate their professional skills with a sense of societal responsibility, fostering sensitivity to societal issues and positive humanistic care.

#### **3.3.3. Impact of Ideological Guidance**

The practical implementation of ideological and political guidance in competitions not only leads to outstanding performances by students but also shapes their comprehensive understanding of technological development's societal impact. Students gradually recognize that professional skills are

not only for self-improvement but also for solving societal problems and making positive contributions to society. This guidance not only influences their performance in discipline competitions but also plays a positive role in their future professional careers.

In summary, the innovative practices of ideological and political education in the chemistry discipline, implemented through guidance in discipline competitions, integrate a more comprehensive literacy and ideological perspective into professional subject areas. This innovation not only enhances students' overall literacy but also cultivates professional talents with a heightened sense of social responsibility for their future careers.

## **4. Evaluation and Prospects of the Innovative Practices in Ideological and Political Education in the Chemistry Discipline**

### **4.1. Enhancement of Students' Cognitive Qualities**

Through interdisciplinary integrated ideological and political education innovative practices, there has been a significant enhancement in students' cognitive qualities. Firstly, the diversification of course content exposes students to a broader range of knowledge domains, sparking their interest in different disciplines. This helps broaden students' thinking, equipping them not only with professional depth but also the ability to traverse multiple fields, forming a more comprehensive cognitive structure.

With the introduction of interactive teaching methods, students actively participate in class discussions, group exercises, and other interactive formats, honing their teamwork and problem-solving skills. Such practices encourage students to develop critical and innovative thinking, laying a solid foundation for their future academic research and professional development.

### **4.2. Shaping of Ethical Values**

Innovative practices in ideological and political education within the chemistry discipline effectively shape students' ethical values. Emphasizing ethical, moral, and social responsibility aspects in political and ideological courses helps students cultivate the correct worldview and values within their professional subjects. Through case analyses and group discussions, students deeply reflect on the ethical issues that may arise from chemical technology, making them more conscious of moral considerations in their professional practice.

This shaping of ethical values not only equips students with the right values in their professional field but also establishes a foundation for them to better fulfill social responsibilities in their future endeavors.

### **4.3. Cultivation of Social Responsibility**

Innovative practices in ideological and political education within the chemistry discipline have successfully cultivated students' sense of social responsibility. In practical projects, students not only solve technical challenges but also contemplate the positive impact of their work on society. Through research on new materials, they gain a profound understanding of the potential impact of their chosen field on the environment and society, fostering a proactive sense of social responsibility.

In discipline competitions, discussions on technological development and its societal impacts prompt students to realize that professional skills should not only serve personal development but also contribute to societal well-being. This cultivation enables students to better integrate into society, preparing them well for their future professional development.

#### 4.4. Challenges and Responses in Interdisciplinary Integration

During the practical process, interdisciplinary integration also brings about some challenges. Firstly, differences in teaching methods and evaluation systems among different disciplines pose a challenge in standardizing grading criteria. To address this challenge, establishing an interdisciplinary evaluation system that comprehensively assesses both disciplinary knowledge and ideological and political education outcomes is crucial.

Secondly, interdisciplinary integration may lead to oversimplification of disciplinary knowledge, affecting professional depth. To counter this, designing dedicated interdisciplinary courses ensures the comprehensive impartation of disciplinary knowledge. Simultaneously, encouraging students to delve deeply into their professional fields in practical projects ensures the expansion of cognitive breadth without sacrificing professional depth.

While interdisciplinary integrated ideological and political education innovative practices have shown significant effects in enhancing students' cognitive qualities, shaping ethical values, and cultivating a sense of social responsibility, continuous improvement of teaching methods and addressing challenges in interdisciplinary integration are essential. Future efforts should focus on refining course structures, strengthening faculty development, and promoting a more organic integration of ideological and political education with professional knowledge. This will lay a more robust foundation for cultivating well-rounded chemistry professionals with a heightened sense of social responsibility.

#### 5. Conclusion

This paper, through the analysis of interdisciplinary integration practices in the field of chemistry, demonstrates the promoting role of ideological and political education innovation in fostering students' comprehensive literacy within the discipline. In the future, it is imperative to further deepen interdisciplinary integration, continually summarize practical experiences, and effectively cultivate high-quality chemistry professionals with a heightened sense of social responsibility and innovation.

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