

# *Exploration and Practice of Ideological and Political Elements in Pharmacology Course*

Caiyan Zhang<sup>1</sup>, Linwei He<sup>2</sup>, Ruiibo Zhang<sup>3</sup>, Nini Yang<sup>4</sup>, Guowei Zhang<sup>4</sup>

<sup>1</sup>Tongchuan Vocational and Technical College, Tongchuan, China

<sup>2</sup>Yulin University, Yulin, China

<sup>3</sup>Shaanxi Aviation Professional Technical Institute, Hanzhong, China

<sup>4</sup>Jingbian No. 3 Middle School, Yulin, China

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**Abstract:** This paper explores the importance and methods of incorporating ideological and political education elements into the pharmacology course. It analyzes the characteristics and teaching objectives of the pharmacology course and proposes an approach to integrate ideological and political education elements into it. Through the guidance of teachers and active participation of students, the aim of cultivating students' moral and ethical qualities, moral judgment, and behavioral norms within the pharmacology course is achieved. The paper presents fundamental research and experimental exploration of a pharmacology course based on ideological and political elements. The results indicate that the integration of ideological and political elements into the pharmacology course enhances students' comprehensive qualities and holds significant implications for their future career development.

## 1. Introduction

Ideological and political education is an essential component of higher education in our country, serving as a significant task within university education. In the context of higher education, the integration of ideological and political education with professional education has become a crucial concern. Pharmacology, as a vital foundational course within the field of medicine, places high demands on students' moral and professional ethics. Therefore, incorporating ideological and political education elements into the pharmacology course can assist students in enhancing their moral cultivation, professional ethics awareness, and sense of social responsibility, ultimately improving their overall qualities and future career development.

In China, there have been numerous studies on the integration of ideological and political elements into pharmacology courses [1-5]. The School of Pharmacy at Ningxia Medical University has conducted theoretical explorations by closely examining the characteristics of the pharmacology course to discover ideological and political elements at various levels. They have integrated ideological education cases to implement the moral education of students in the pharmacology course [6]. Meanwhile, the Pharmacology Teaching and Research Office of the Department of Pharmacy at Air Force Medical University, led by Li Mingkai, explored and evaluated the integration of

ideological and political education into cardiovascular pharmacology teaching, demonstrating improved learning outcomes in knowledge, attitude, and behavior dimensions following the incorporation of ideological elements <sup>[7]</sup>. Additionally, Yang Jixia from the School of Pharmacy at Hebei University of Chinese Medicine defined the connotation and requirements of pharmacology, combined with the characteristics of the course, to explore ideological and political elements within each chapter of the "Pharmacology" course, providing reference for ideological and political education in courses at universities nationwide and further promoting the reform and innovation of pharmacology education <sup>[8]</sup>. These studies have focused on the theoretical exploration of incorporating ideological elements into pharmacology courses, but there remains limited research on practical exploration.

This paper not only discusses how to integrate ideological and political education elements into the pharmacology course but also validates the feasibility of such integration through practical implementation. It demonstrates that the incorporation of ideological elements into pharmacology education is viable through empirical research.

## **2. Theoretical Research on the Integration of Ideological and Political Elements in Pharmacology Course**

### **2.1 Characteristics and Educational Objectives of Pharmacology Course**

Pharmacology is a crucial foundational course in the field of medicine, primarily focusing on the mechanisms of drug actions, pharmacodynamics, and pharmacokinetics. The pharmacology course exhibits the following aspects in its content and characteristics.

#### **2.1.1 Interdisciplinary nature**

As a discipline, pharmacology encompasses knowledge from various fields such as biology, chemistry, physiology, pharmacy, and clinical medicine. The pharmacology course incorporates knowledge from multiple disciplines, emphasizing the mechanisms of drug actions within the biological system and the interactions between drugs and organisms.

#### **2.1.2 Systematic teaching**

The pharmacology course is typically divided into two parts: basic pharmacology and clinical pharmacology. The former covers fundamental processes of drugs, including their chemical structure, absorption, distribution, metabolism, and excretion. The latter focuses on the clinical application of drugs and rational drug use. The pharmacology course adopts a systematic approach in teaching to provide students with a comprehensive understanding of drug mechanisms, clinical applications, and safe usage.

#### **2.1.3 Practical teaching**

The pharmacology course integrates practical teaching through experiments, clinical cases, and simulated clinical scenarios. These practical elements help students deepen their understanding and mastery of drug mechanisms and clinical applications through hands-on experience and problem-solving. Practical teaching enables students to apply pharmacology knowledge to real clinical situations, enhancing their practical skills and clinical decision-making abilities.

#### **2.1.4 Emphasis on drug safety and rational drug use**

The pharmacology course places great emphasis on drug safety and the principles of rational drug use. This includes topics related to the prevention and management of adverse drug reactions, drug interactions, and dosage adjustments. Throughout the teaching process, the pharmacology course emphasizes students' understanding of the rational use of drugs and the importance of drug safety monitoring, fostering their awareness of drug safety and rational drug use concepts.

#### **2.1.5 Timeliness and forward-looking nature**

Pharmacology, as a rapidly evolving discipline, continuously witnesses updates and advancements in drug research and clinical applications. Thus, the pharmacology course needs to maintain timeliness and a forward-looking approach by incorporating the latest drug research findings and clinical application guidelines, enabling students to be aware of the most recent progress and directions in drug research and clinical applications.

#### **2.1.6 Emphasis on self-learning and independent thinking**

The pharmacology course emphasizes students' abilities for self-learning and independent thinking. Pharmacology is a knowledge-intensive and complex subject, requiring students to delve into drug mechanisms and clinical applications through self-learning, reading pharmacology literature, and analyzing clinical cases. The course also encourages students to engage in independent thinking, such as analyzing the benefits and risks of drug therapy, evaluating drug effectiveness and safety, and discussing the pros and cons of different drugs, cultivating their critical thinking and problem-solving skills.

#### **2.1.7 Comprehensive assessment**

The pharmacology course typically employs various methods for comprehensive assessment, including examinations, laboratory reports, and clinical case analyses. This comprehensive assessment comprehensively evaluates students' mastery and application of pharmacology knowledge, including their understanding of drug mechanisms, ability to apply drugs clinically, and awareness of drug safety and rational drug use.

#### **2.1.8 Practical application orientation**

The pharmacology course emphasizes the application of learned pharmacology knowledge in real clinical and drug treatment scenarios. Through case analyses, simulated clinical practices, and clinical internships, students are equipped to apply pharmacology knowledge to actual clinical issues, fostering their clinical decision-making and drug treatment capabilities.

In general, the pharmacology course possesses interdisciplinary, systematic, practical, timely, emphasis on drug safety and rational drug use, emphasis on self-learning and independent thinking, comprehensive assessment, and practical application orientation characteristics. Its main educational objectives include the following aspects.

Understanding the concepts of drugs, including their definition, classification, nomenclature, dosage forms, and administration routes. Students must grasp the fundamental terms and concepts of drugs and comprehend their basic characteristics in clinical applications.

Pharmacology courses can teach students to familiarize themselves with drug pharmacological mechanisms, pharmacokinetic processes such as drug absorption, distribution, metabolism, and

excretion, and drug interactions with biological systems. Understanding the pharmacological behavior of drugs and their mechanisms of action is essential.

Mastery of pharmacodynamics parameters, dose-response relationships, pharmacodynamic curves, and the ability to analyze and interpret pharmacodynamic data. Also, understanding the interactions between drugs, drugs and food, and drugs and diseases. Students can recognize the mechanisms of drug interactions and the potential implications for drug treatment and safety.

Through learning, we can master clinical applications, such as indications, contraindications, side effects, drug selection and rational drug use. Students should be able to comprehend the clinical application of drugs and make reasonable drug choices and usage decisions based on different clinical situations. This course can cultivate medical students' awareness of drug monitoring and drug safety, including the importance of drug monitoring, identification and management of adverse drug reactions, and drug safety management.

The course can also develop medical students' critical thinking and analytical skills on pharmaceutical research and clinical practice issues. First of all, it cultivates the students' ability to think independently and solve problems, and uses the pharmacology knowledge learned to analyze, evaluate and solve problems in drug research and clinical practice. Secondly, understanding the basic process of drug research and possessing basic scientific research skills such as literature retrieval, experimental design, data processing and scientific writing in order to cultivate students' scientific research ability.

In the course, the teacher elaborated the ethical principles, laws and regulations, and professional ethics in drug research and clinical practice, emphasizing the ethical and legal requirements of drugs, ensuring that students understand the ethical and legal requirements involved in drug research and clinical practice, and follow the relevant ethical and legal guidelines in practice.

Teachers encourage students to actively participate in learning and develop the habit of independent learning and lifelong learning. After the course, students should be capable of deepening their knowledge of pharmacology-related topics, tracking the latest developments in drug research and clinical practice, and continuously improving their professional competencies.

In summary, the educational objectives of the pharmacology course should be adjusted and formulated based on factors such as the nature of the course, teaching level, students' backgrounds, and needs to ensure the effectiveness of teaching and students' learning outcomes.

## **2.2 Approaches and Methods for Integrating Ideological and Political Elements into Pharmacology Course**

Pharmacology is a critical foundational course that encompasses various aspects of the medical profession. To enhance students' comprehensive qualities and future career development, we can consider integrating ideological and political elements into the pharmacology course, strengthening students' ideological and moral education, and cultivating their sense of social responsibility and mission. Specifically, the approaches and methods for integrating ideological and political elements into the pharmacology course are as follows.

### **2.2.1 Focus on drug safety and medical ethics**

In the pharmacology course, we can enhance education on drug safety and medical ethics. This involves guiding students to understand the correct usage of drugs and raising awareness of drug safety. Additionally, we can strengthen education on medical ethics and medical laws to help students grasp the professional ethics and responsibilities of medical practitioners. Classic examples of drug safety and medical ethics include the Vioxx case, where a drug was withdrawn from the market due to serious side effects, and ethical considerations related to bone marrow or stem cell donation.

### **2.2.2 Emphasize a sense of social responsibility**

The pharmacology course can strengthen education on social responsibility, enabling students to recognize the societal responsibilities and missions of medical professionals. By fostering the establishment of correct life views, values, and worldviews, students' moral qualities and behavioral habits can be developed.

### **2.2.3 Prioritize practical and case-based teaching**

The pharmacology course should emphasize practical exercises and case-based teaching. Practical exercises can help students gain a deeper understanding of drug mechanisms and clinical applications. Case-based teaching can guide students to recognize the importance of drugs and their impact on patients, thereby raising awareness of drug safety and patient rights.

### **2.2.4 Enhance students' scientific literacy**

The pharmacology course should strengthen students' scientific literacy and guide them to correctly understand science, develop scientific thinking, and innovative capabilities. Through the course, students can be introduced to the basic concepts and methods of science, cultivating their scientific thinking and research abilities, ultimately improving their comprehensive qualities.

## **2.3 Specific Practices for Integrating Ideological and Political Elements into the Pharmacology Course**

To explore the practical effects of integrating ideological and political elements into the pharmacology course, we have designed several teaching activities, including the following aspects:

### **2.3.1 Lectures on drug safety knowledge**

Within the pharmacology course, arranging lectures by experts on drug safety knowledge will enable students to understand the correct usage of drugs and knowledge related to adverse drug reactions. Through these lectures, students can gain insights into the effects of drugs on the human body and understand precautions when using drugs, thereby increasing their awareness of drug safety.

### **2.3.2 Medical ethics discussion sessions**

During the pharmacology course, organizing medical ethics discussion sessions will help students understand relevant knowledge on medical ethics and medical laws, leading to discussions on ethical and legal issues in medicine. These discussions will guide students to recognize the professional ethics and responsibilities of medical practitioners, enhancing their understanding of medical ethics and laws.

### **2.3.3 Clinical case discussions**

Incorporating clinical case discussions into the pharmacology course allows students to gain in-depth insights into drug mechanisms and clinical applications. Through case discussions, students can appreciate the impact of drugs on patients, increasing their awareness of drug safety and patient rights.

### 2.3.4 Drug formulation laboratory experiments

The pharmacology course can include laboratory experiments on drug formulation, enabling students to learn about drug preparation methods and quality control. Through these experiments, students can understand the drug production process and quality standards, enhancing their understanding of drug safety and formulation quality.

### 2.3.5 Research paper writing

Within the pharmacology course, assigning students to write research papers on topics such as drug safety, medical ethics, and drug applications will encourage independent thinking and research. Through paper writing, students can improve their scientific literacy and research capabilities, fostering innovation and comprehensive qualities.

Overall, these practices aim to promote the integration of ideological and political elements into the pharmacology course and ensure its teaching effectiveness and students' learning outcomes.

## 3. Practice-Based Research on Integrating Ideological and Political Elements into Pharmacology Course

In order to evaluate the effectiveness of integrating ideological and political elements into the pharmacology course, we employed methods such as questionnaire surveys and discussion analyses to assess students' learning outcomes and moral qualities.

### 3.1 Classroom Effectiveness of Pharmacology Course with Ideological and Political Elements

Classroom effectiveness is a crucial factor in measuring the quality of teaching. To investigate the impact of integrating ideological and political elements into the pharmacology course, this study utilized questionnaire surveys and statistical analysis to explore its influence on students' interest level, class attendance, classroom grades, and post-class assignments.

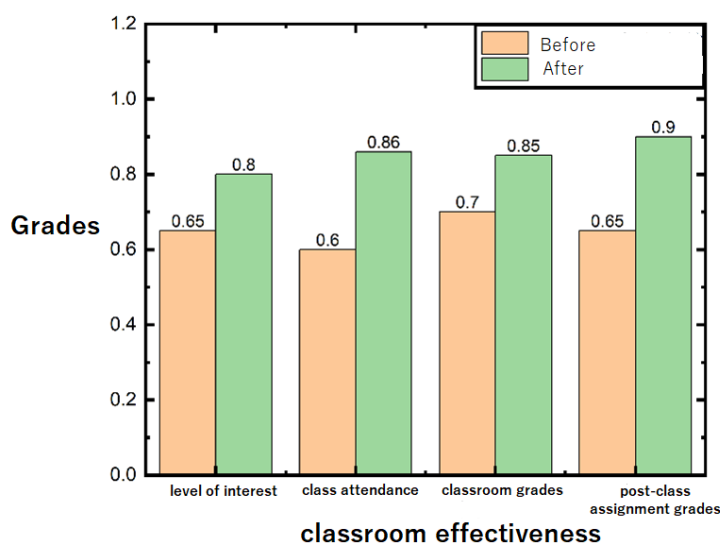


Figure 1 Comparison of Classroom Effectiveness Before and After the Integration of Ideological and Political Elements into the Pharmacology Course

According to Figure 1, after integrating ideological and political elements into the pharmacology course, there was a significant improvement in students' interest level, class attendance, classroom performance, and post-class assignment scores, with increases of 15%, 20%, 15%, and 25%, respectively.

This improvement can be attributed to several factors.

Ideological and political courses focus on cultivating students' ideological and moral qualities, aiming to instill correct values and ethics. Through the integration of ideological and political elements, students gain a deeper understanding of their responsibilities and roles, enhancing their patriotism and sense of social responsibility, thereby improving their performance in class.

It can boost students' confidence and expression skills: Ideological and political courses involve various social issues and current affairs topics, which require students to possess adequate knowledge and communication skills. Through the integration of ideological and political elements, students gain a deeper insight into social realities and hot topics, enhancing their confidence and ability to express themselves while engaging in discussions and reflections.

It can increase students' interest and engagement in learning: Ideological and political courses cover topics relevant to students' lives and future, sparking a strong interest among many students. Through the integration of ideological and political elements, students actively participate in classroom discussions and critical thinking, which elevates their interest and engagement in learning, resulting in enhanced classroom effectiveness.

### 3.2 Experimental Effectiveness of Pharmacology Course with Integrated Ideological and Political Elements

Experiments also play a vital role in assessing the improvement of teaching quality and enhancing students' overall competence. To investigate the experimental quality of integrating ideological and political elements into the pharmacology course, this study explored its impact on students' engagement, hands-on skills, experimental outcomes, and level of knowledge mastery.

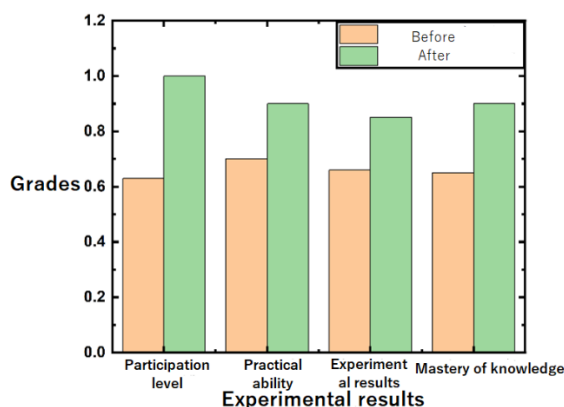


Figure 2 Comparison of Experimental Effectiveness Before and after the Integration of Ideological and Political Elements into the Pharmacology Course

The study uses statistical data on the number of students participating in experiments to measure their level of engagement. It assesses students' practical skills by examining the correctness of their experimental procedures and evaluates the reliability of experimental results based on whether they align with expectations. Additionally, in-class quizzes are utilized to gauge students' mastery of the subject matter. Figure 2 presents a comparison of the experimental effectiveness before and after the integration of ideological and political elements into the pharmacology course. The study measures



the experimental effectiveness in terms of student engagement, practical skills, experimental outcomes, and knowledge retention. Based on Figure 2, it is evident that after the integration of ideological and political elements, there was a significant improvement in student engagement (increased by 40%), practical skills (increased by 23%), experimental outcomes (increased by 15%), and knowledge retention (increased by 20%).

The observed improvements can be attributed to several factors. Firstly, the introduction of ideological and political education elements stimulates students' interest and enthusiasm for learning. Addressing social and ethical issues in pharmacology, such as drug abuse and drug approval, as part of the curriculum, enhances students' motivation to study and actively participate in experimental activities. Secondly, the incorporation of ideological and political education fosters critical thinking and decision-making skills among students. Pharmacology experiments involve substantial data processing and analysis, necessitating strong scientific literacy and comprehensive thinking. By integrating ideological and political elements, students gain a better understanding of the significance and value of pharmacology experiments, thereby enhancing their critical thinking and practical abilities. Thirdly, the integration of ideological and political education nurtures students' overall qualities and innovative abilities. Successful pharmacology experiments demand not only solid scientific knowledge and skills but also innovative thinking and problem-solving abilities. By addressing social and ethical issues in pharmacology, students' judgment and critical thinking are honed, cultivating a sense of responsibility and purpose, leading to enhanced overall qualities and innovative capabilities.

### 3.3 Improvement in Academic Performance Resulting from the Integration of Ideological and Political Elements into the Pharmacology Course

Exam scores are currently an important factor in assessing the level of course mastery. To investigate the impact of incorporating ideological and political elements into the pharmacology course on the quality of comprehension, this study conducted a follow-up survey across four classes at a higher vocational institution. The classes are denoted as Class 1, Class 2, Class 3, and Class 4, respectively. The study examined the influence of integrating ideological and political elements on students' academic performance in the pharmacology course.

Based on the findings, it was observed that the integration of ideological and political elements led to a significant enhancement in students' exam scores. Among the four classes, Class 1 showed an average score increase of 18%, Class 2 demonstrated a 20% increase, Class 3 experienced a 15% increase, and Class 4 exhibited a remarkable 25% improvement.

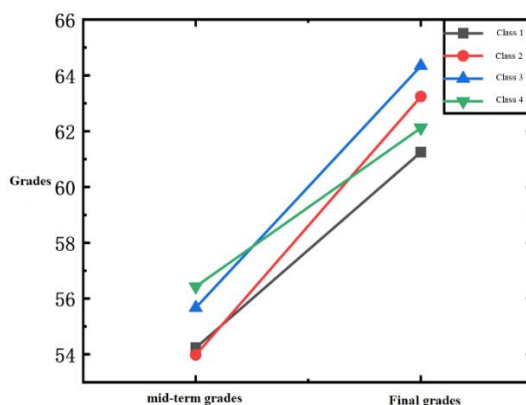


Figure 3 Comparison of Student Performance Before and After the Integration of Ideological and Political Elements.



Figure 3 is a before-and-after comparison chart of students' performance after the integration of ideological and political elements into the pharmacology course. According to Figure 3, it can be observed that after the incorporation of ideological and political elements, there was a significant improvement in the scores of all four classes. This is because integrating ideological and political elements into the pharmacology course can have the following impacts on students: Firstly, pharmaceuticals directly involve human life and health. By incorporating ideological and political elements, students become aware of the significance of their studies and research, leading to an enhanced sense of responsibility and mission. Secondly, ideological and political education emphasizes the cultivation of critical thinking and logical reasoning abilities. This helps students better comprehend the complexities of pharmacology mechanisms and concepts, enabling them to identify and solve problems effectively during their studies. Lastly, pharmacology encompasses numerous ethical and moral issues, such as drug safety and ethical considerations in clinical trials. Integrating ideological and political elements allows students to gain a profound understanding of these matters and enhances their professional ethics.

As a result, the integration of ideological and political elements can make the pharmacology course more comprehensive and profound, benefiting students in their in-depth comprehension and application of knowledge, thus leading to improved academic performance.

#### 4. Conclusion

Through the exploration and implementation of incorporating ideological and political elements into the pharmacology course, we have come to the realization that ideological and political education is an essential factor for the comprehensive development and growth of university students. It is also an aspect of pharmacology education that requires attention and emphasis. Integrating ideological and political elements into pharmacology education helps improve students' moral and ethical qualities, professional ethics awareness, and sense of responsibility. It also contributes to the cultivation of their innovative abilities and comprehensive qualities, and ultimately enhances drug safety and medical quality.

However, introducing ideological and political elements into the pharmacology curriculum also presents certain challenges. These include the need to design more comprehensive and specific teaching content, adopt flexible and diverse teaching methods, and establish a scientific and objective evaluation system that takes into account students' actual situations and needs while focusing on assessing their comprehensive qualities and abilities. Additionally, it requires strengthening the construction of a teaching faculty that combines ideological and political education with pharmacology education to enhance their teaching capabilities.

In conclusion, incorporating ideological and political elements into the pharmacology course is an important educational reform and innovative exploration. It contributes to the cultivation of students' moral and ethical qualities, professional ethics awareness, innovative abilities, and comprehensive qualities while promoting drug safety and medical quality improvement. We must fully recognize its significance and necessity and take measures to improve and optimize the process. By advancing the deep integration of ideological and political education with pharmacology education, we can make greater contributions to cultivating high-quality pharmaceutical talents.

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