

Analysis on Strategies for Mining Ideological and Political Elements in the Course of Introduction to Life Science Course

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Abstract At present, in the process of student education, the implementation of ideological and political courses and the integration of ideological and political courses have led to insufficient exploration of curriculum ideological and political elements, insufficient teacher willingness, and unsatisfactory student acceptance. This paper aimed to deeply explore the ideological and political elements in the course of introduction to life science. This paper explored the ideological and political connotation of patriotism, scientific spirit and professional ethics by analyzing the development course, research content and subject value of life science in different dimensions, and expounded the strategies of organically integrating these ideological and political elements into the teaching process, so as to improve students' outlook on life, values and world and simultaneously provide theoretical basis and practical reference for the ideological and political construction of the course of introduction life science.

Key words Life; Ideological and political education; Values; Course

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Life science is a science that studies the essence, characteristics, occurrence and development laws of life phenomena and activities, as well as the relationship between various organisms and between organisms and the environment. Introduction to life science is offered as a public course in many colleges and universities, and it is a basic course for non-biological students who lack biological knowledge. The nature of the course determines that the teaching focus of introduction to life science not only teaches the basic knowledge of life science, but also undertakes the mission of ideological and political education^[1]. Under the background of current education emphasizing moral education and cultivating people, it is of great significance to fully tap ideological and political elements in the course introduction to life science^[2].

Ideological and Political Elements from Different Perspectives of Life Science

Ideological and political elements in the development of life science

Patriotism runs through the development of life science. The excavation of local life science achievements inspires national pride^[3]. China has a long history of exploration and brilliant modern achievements in the field of life science. For example, the ancient theory and practice of traditional Chinese medicine is the treasure of life science in China. *Compendium of Materia Medica* contains 1 892 kinds of medicines in 52 volumes, and systematically records the names, history, forms, identification, collection, processing and efficacy of medicines, and 11 096 prescriptions, which reflects the profound insight of ancient Chinese pharmacologists

into life science. These achievements were quoted many times by Darwin in the *Origin of Species* and other works, and praised the book as an encyclopedia of ancient China. It was appraised as "the greatest scientific achievement of Ming Dynasty" by Joseph Needham, a famous British historian of science. When introducing these contents to students, they can stimulate students' patriotic feelings and arouse their strong national pride. Modern China has also made brilliant breakthroughs in some fields of life science. For example, crystalline bovine insulin was synthesized for the first time in the world. After seven years of hard work, 100 researchers from Institute of Biochemistry and Institute of Organic Chemistry and Peking University successfully synthesized crystalline bovine insulin in 1965, which was an important milestone in the development history of human life science. This achievement is not only the pride of life science in China, but also a great contribution to the development of molecular biology. Students can realize China's strong strength in the field of life science by telling these examples, and it strengthens their road confidence, theoretical confidence, institutional confidence and cultural confidence. In the international cooperation of life science, China has also actively shouldered the responsibility and continuously contributed the wisdom of the East to the building of a community of human destiny. For example, in the process of global epidemic prevention and control triggered by novel coronavirus (19), China scientists actively participated in international cooperation, which reflected the responsibility of a big country on the international stage in controlling the source of infection, cutting off transmission routes and protecting susceptible people. Telling students about these contents is helpful to cultivate their international vision and sense of responsibility.

Scientific spirit is inherited in the development of life science. Ancient scientists showed the innovative spirit of bravely

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climbing the peak in life science exploration. The innovative spirit in ancient life science exploration leads, drives and infects the innovative and entrepreneurial actions of contemporary college students^[4]. For example, for a long time, there has been no effective prevention and treatment method for smallpox. In the process of fighting against this rampant infectious disease, ancient Chinese scientists invented the method of preventing smallpox "human pox inoculation" in the Ming Dynasty. These are the results obtained by ancient scientists through constant repetition, improvement and innovation under the basic and environmental conditions at that time. Through the excavation of examples of innovative spirit in ancient life sciences, students can be encouraged to be innovative and entrepreneurial in their study and scientific research. The research process of modern life science reflects the persistence and dedication of contemporary scientists. In the research of modern life science, many scientists have shown their persistence and dedication, in order to explore the mysteries of life and overcome difficulties. For example, Mr. Yuan Longping, the father of hybrid rice, experienced numerous failures in the pursuit of high and excellent rice yield. He consulted a large number of Chinese and foreign scientific and technological documents, carried out a lot of experimental research in the intense heat of summer, and finally made the output of hybrid rice in China continue to rise, making an indelible contribution to solving the problem of food and clothing in China and even in the world. Such persistence and dedication is the source of power for the continuous progress of life science research, and it is also a model worthy of learning from modern students.

Ideological and political elements in the research content of life science

The diversity of life presents the values of respecting life. Life science reveals the diversity of life on the earth. Due to the process of division and differentiation of tiny cells, muscle fiber cells show spindle shape, and mesophyll cells show fence shape, and nerve cells form multi-antenna shape. Different cells make up organs, and different organs form tissues and individuals with different shapes. Every living thing has its unique structure, function and niche. Biodiversity plays an irreplaceable role in maintaining species diversity and the balance of biosphere. For example, in teaching, students are encouraged to respect species differences and guided to establish the values of respecting life by explaining the importance of biodiversity. We should let students realize that every creature has its particularity and should be respected and protected, and they should understand life equality from the perspective of life science. From the perspective of life science, all life has a unique position and value in the course of evolution. For example, there are a large number of different kinds of microorganisms living in a small 1 g of soil, which can complement each other to keep the soil stable and meet the challenges of the external environment. Human beings have unique advantages in the development of intelligence and civilization, but it does not mean that they can ignore the state of other life. We should help students abandon anthropocentrism and form a correct outlook on life and values.

The course content in genetics inspires social ethical thinking. With the development of gene editing technique, such as CRISPR-Cas9, gene editing can be carried out more accurately, which provides a precise solution for treating genetic diseases, improving crop quality and enhancing the adverse effects of genetic mutations in organisms. Meanwhile, this technique has also caused serious ethical disputes. For example, in theory, CRISPR-Cas9 technique can achieve accurate point fixation, but whether the changed genes will cause changes in related genes and whether the introduced artificial coding sequence has security risks in organisms are not clear. In teaching, combined with examples, especially some negative cases that have happened around us, students are guided to think about these ethical disputes, so that they can understand that science and technology must develop under the premise of following ethics. The privacy and fairness of genetic information constantly attract students' attention. Genetic research involves a lot of human genetic information. The privacy protection and fair use of these genetic information is a problem that the public pays more attention to and cares about^[5]. For example, whether employers can discriminate against employees because of genetic information? Hostile forces can develop racial discrimination tools based on racial genetic information. And biological companies can analyze personal "friends circle" based on genetic information. Through the discussion of these problems, we can cultivate students' ethical awareness and social responsibility, so that they can take corresponding measures when they are involved in genetic information in their future work.

Ideological and political elements in the subject value of life science

Social responsibility and professional ethics are contained in subject value. The research results of life science often have a far-reaching impact on society. For example, as an environment-friendly pest control technique, biopesticides have great application prospects to replace chemical pesticides. However, they often show good performance in the laboratory, but their stability fluctuates greatly in field experiments. In teaching, through case analysis, the serious consequences caused by some biological pesticides with poor stability can let students understand that life science developers shoulder great social responsibilities. There are a series of professional ethics in the field of life science, such as seeking truth and being pragmatic and respecting ethics. In the teaching process, these professional ethics are introduced, so that students can establish relevant professional ethics concepts at the learning stage of their major. For example, it is emphasized that one can't make quick success out of nothing in the process of scientific research is a respect for science and a basic professional ethics requirement for scientific research personnel.

Ecological ethics and sustainable development is embodied in subject value. Life science provides theoretical basis and technical support for the continuous improvement of environment and the overall protection of ecology. For example, facing the environmental pollution caused by human factors, scientists can formulate reasonable ecological protection strategies based on the theory of life science by studying the structure and function of ecosystem. In

the course of history, the continuous development of human beings has accelerated the speed of species extinction, and the biological study of endangered species is helpful to formulate effective protection measures. In teaching, students should be made aware of the important role of life science in ecological protection, thereby inspiring their sense of responsibility to contribute to ecological conservation.

Subject value is endowed with the concept of sustainable development. The development of society advocates the concept of sustainable development, and its underlying logic is based on the sustainable theory of life science research. For example, in the development of agricultural biotechnology, we should consider the overall impact on environmental factors such as soil and water resources, thus expanding the impact on farmers' rights and interests and rural social structure. In the process of exploitation and utilization of biological resources, it is necessary to ensure the sustainable utilization of resources and provide a steady stream of strong power for the virtuous circle of human beings and even the whole ecosystem. Through the teaching of these contents, students can deeply understand the importance of the concept of sustainable development in the field of life science.

Problems in Curriculum Ideological and Political Education in Teaching of Introduction to Life Science

Teachers' ability of ideological and political education is uneven

Teachers of various courses, who come from different professional backgrounds, are not sure enough about the professional study of ideological and political teaching, which leads to inconsistent results in the excavation and integration of ideological and political elements. Sometimes the ideological and political elements in introduction to life science depend on the knowledge points of introduction to life science. Due to the lack of systematic ideological and political training, some teachers often study and improve their ideological and political professional knowledge in a fragmented, temporary and sudden way, and it is difficult for them to accurately grasp the combination points of ideological and political elements and life science knowledge. In the process of teaching, the ideological and political elements are ponderously or not deeply integrated, which makes students have a wrong cognition of conducting ideological and political education for the sake of ideological and political education.

The balance between ideological and political elements and professional knowledge

In the teaching process, it is easy to overemphasize ideological and political elements and neglect the teaching of professional knowledge. Some teachers prepare the introduction to life science with exquisite and full ideological and political elements, and the course is full of passion and appeal, which leads to the transformation of the teaching of introduction to life science into a theme class meeting, and the construction and integration of knowledge points are slightly poor under the prominence of ideological and

political elements. On the other hand, some teachers pay attention to the teaching of professional knowledge and ignore the integration of ideological and political elements. In the teaching process, they emphasize the mastery of knowledge, and pay less attention to the formation of values and the enhancement of humanistic literacy, which leads to students knowing their skills but not learning their ways. How to find an appropriate balance between the two, ensure the coordinated development of ideological and political education and professional education, build a curriculum-based ideological and political education and form an effective closed loop between ideological and political courses and curriculum ideological and political education is an important challenge in curriculum ideological and political construction.

Differences in students' acceptance of ideological and political elements

Students from different regions, different schools and different families receive the same curriculum ideological and political education in the same classroom, and their absorption, understanding and transformation are different. Some students are accustomed to didactic understanding, while some students prefer independent exploration, and some students dislike rote learning. Students' individual values, hobbies and knowledge background are different, and their acceptance of ideological and political elements is also different. Such situation requires teachers to adopt more flexible and diverse teaching methods to improve students' acceptance of ideological and political elements. In the face of different students, teachers adopt a single and direct strategy, which cannot arouse students' heartfelt resonance in the ideological and political courses. Stratified and differentiated ideological and political education needs to occupy a large part of the preparation time of professional teachers, and also puts forward new requirements for their professional quality and ideological and political ability, but the importance of stratified and differentiated ideological and political education for curriculum ideological and political education is self-evident.

Promotion Path of Curriculum Ideological and Political Education in Introduction to Life Science

Construction of teaching staff

Teachers' ideological and political literacy should be improved. Teachers are the implementers of curriculum ideological and political education, so improving professional teachers' ideological and political literacy is the primary way. Schools can organize teachers to participate in ideological and political training courses, and thoroughly study Marxist theory and Xi Jinping's Thought on Socialism with Chinese Characteristics for the New Era, and professional teachers' political theory level can be improved by means of attending meetings, self-study and seminar. Meanwhile, teachers are encouraged to participate in academic seminars related to ideological and political education, and professional teachers are encouraged to publish academic articles and exchange experiences and methods of ideological and political

education.

Teachers' in-depth understanding and excavation ability of ideological and political elements should be enhanced. Teachers need to have a deep understanding of the knowledge points in the course of introduction to life science, have the ability to integrate knowledge points of life science, get rid of the shackles of professional textbooks, and organically combine knowledge points with ideological and political elements. Knowledge points are designed for ideological politics, and ideological and political education promotes the understanding of knowledge points and encourages the reconstruction of knowledge point system. Teachers can deepen their understanding of the ideological and political connotation of life science by reading books on history of life science and philosophy of life science. Meanwhile, teaching research activities should be carried out regularly to discuss how to organically integrate ideological and political elements with life science knowledge. It is necessary to do a good job in teaching reflection and use typical cases to improve teaching effect.

Innovation of teaching methods

The case teaching method can be integrated into ideological and political teaching. Ideological and political elements can be integrated into the teaching of introduction to life science by the case teaching method. For example, when explaining the ethical issues of genetic engineering, we can introduce He Jiankui's gene editing baby event as a case. Teachers can let students analyze the principle first, and then further rise to ethical, legal and social issues, so as to guide students to establish a correct scientific ethics and maintain their original intention of respecting life and fearing the law.

The problem-oriented teaching method can inspire students to think. Through the problem-oriented teaching method, students' thinking and discussion are stimulated, and the questions put forward needs to be typical. For example, when explaining biodiversity conservation, the question "What can we do for biodiversity conservation as college students" is put forward to highlight the process of "learning, thinking, practice and understanding". We should combine theory with practice to guide students to think about how to turn the values of respecting life and protecting ecology into practical actions from their own perspective. After the questions are thrown out, students should be given sufficient time to think, and students should be given appropriate guidance after answering.

Reform of curriculum assessment and evaluation system

The assessment content of ideological and political elements can be added. The examination content of ideological and political elements can be added to the curriculum evaluation system. It involves not only the coverage of assessment content, but also the difficulty of ideological and political assessment content, which changes students' concept idea that the ideological and political content means score points easy to get. For example, some questions related to ideological and political education are set in the examination questions, such as "How can we view the bottleneck problem faced in the process of seed resources in China at present?", or students are required to write a small paper about the

double-edged sword of technology in life science in their usual homework.

The improvement of students' ideological and political literacy should be comprehensively evaluated. The establishment of a comprehensive evaluation system can not only assess students' mastery of ideological and political knowledge, but also evaluate the improvement of students' ideological and political literacy in the learning process, so that a before and after comparison and horizontal reference can be made. For example, teachers can observe students' performance in class discussion and whether they can actively participate in the discussion of ideological and political education-related topics and put forward constructive opinions, and pay attention to collecting some innovative answers from students, so as to expand ideological and political elements in the course introduction to life science in the future and make a summary and induction more suitable for students' reality.

Excavation of ideological and political elements from the frontier research of life science

Artificial intelligence and consciousness of human community with a shared future complement each other. As an important driving force of the new round of scientific and technological revolution and industrial transformation, artificial intelligence is an important cornerstone for cultivating and developing new high-quality productive forces, which will have a far-reaching impact on global economic and social development and the progress of human civilization. In this process, international cooperation has become increasingly frequent. For example, scientists from different countries cooperate to study how to use artificial intelligence technology to better serve mankind, such as training artificial intelligence to reduce the risk of high-risk industries. This process embodies the idea of building a community of human destiny, and scientists from all countries work together for the common interests of all mankind. Introducing these cutting-edge research in teaching can cultivate students' global vision and sense of cooperation, and make them realize the sense of human community that all countries unite and cooperate to overcome difficulties in the face of global challenges.

Brain science research carries humanistic care. With the deepening of brain science research and the continuous development of artificial intelligence, it involves the core fields of human cognition, emotion and consciousness. With the study of brain diseases such as Alzheimer's disease and gradual freezing, we should not only pay attention to the achievements of scientific research, but also to humanistic care. For example, when studying the treatment of these diseases, we should consider the quality of life and activity needs of patients. It requires guiding students to pursue scientific progress, while not ignoring humanistic values, and combining the knowledge of this subject with introduction to life science embodies the ideological and political connotation of combining science with humanities.

Excavation of ideological and political elements from an interdisciplinary perspective

Dialectical thinking in the intersection of life science and philosophy: Life science is closely related to philosophy. In the

development of life science, we need to learn to use philosophical thinking to think about life science phenomena. For example, the origin and evolution of life, how humans evolve and migrate, involves materialistic and idealistic worldviews^[6]. The question of which came first, the chicken or the egg, always reveals the dialectical materialism thought in the intersection of life science and philosophy. Students can learn to look at life science phenomena with a comprehensive, connected and developing perspective by guiding them to think about life science issues from a philosophical perspective.

Social justice consciousness in the blending of life science and sociology: The application of life science achievements in society will involve social equity and human equality. For example, the popularity of genetic testing techniques may lead to differences in access to health resources among different classes. Analyzing these phenomena from the perspective of sociology can make students realize the importance of social equity and whether the results of genetic testing will cause corresponding population discrimination. In teaching, students can be guided to explore how to ensure social equity and racial equality in the process of popularizing life science achievements, so as to cultivate their sense of social equity and social responsibility.

Conclusions

The excavation of ideological and political elements in the course of introduction to life science is a continuous and in-depth process. With the continuous breakthrough and progress of life science research, new knowledge, new theories and new connotations are constantly updated. We need to constantly explore new ideological and political elements, optimize integration strategies and overcome the challenges we face. We can cultivate talents with solid knowledge of life sciences and good ideological and political qualities who have comprehensive development in morality,

intelligence, physical health, aesthetics and labor by deeply exploring ideological and political elements and effectively integrating them into teaching. They will make greater contributions to promoting the healthy development of life sciences and building a community with a shared future for mankind. In this process, we should attach great importance to the excavation of ideological and political elements in introduction to life science, constantly excavate from all angles and different directions of life science, and simultaneously pay attention to the summary and research of experience in teaching practice, so that the ideological and political construction for the course of introduction to life science can be continuously developed and improved to meet the requirements of a powerful education country in the new era.

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