

Study on Excavation of Ideological and Political Elements in Field Practice of Zoology and Botany

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Abstract Since the 18th National Congress of the Communist Party of China, General Secretary Xi Jinping has emphasized that universities should address fundamental issues such as what kind of people does education cultivate. A series of documents also emphasize the comprehensive integration of curriculum ideological and political education into the teaching of higher education majors. As an important practical teaching link of biology and related undergraduate majors, field practice of zoology and botany provides an opportunity for curriculum ideological and political integration. This paper analyzed the teaching cases of field practice of zoology and botany in universities in China, and explored curriculum ideological and political elements, including patriotism education, cultivation of sustainable development and ecological civilization consciousness, cultivation of scientific spirit and innovation consciousness, cultivation of unity and cooperation spirit, cultivation of hard work spirit through labor education, life education, cultivation of safety consciousness and cultivation of humanistic quality. Furthermore, this paper expounded the important role of field practice in improving students' comprehensive quality, and put forward that we should pay attention to ideological and political construction of field practice of zoology and botany in the future, and make contributions to the cause of higher education and ecological civilization construction in China.

Key words Field practice of zoology and botany; Curriculum ideological and political education; Undergraduate professional teaching; Ideological and political element; Comprehensive quality improvement

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Since the 18th National Congress of the Communist Party of China, General Secretary Xi Jinping has put forward new concepts and viewpoints on establishing moral integrity and educating people in higher education in the new era, emphasizing that the core of ideological and political work in colleges and universities is to fully implement the Party's educational policy and solve the fundamental problem of what kind of people to cultivate, how to cultivate people, and for whom to cultivate people^[1]. A series of important documents, such as *Opinions on Deepening the Reform and Innovation of Ideological and Political Theory Course in Schools in the New Era* issued by the General Office of the General Office of the CPC Central Committee and the General Office of the State Council in 2019^[2], *Guiding Outline of Curriculum Ideological and Political Construction in Colleges and Universities* issued by the Ministry of Education in 2020^[3] and *Work Plan for Comprehensively Promoting the Construction of the "Great Ideological and Political Course"* in 2022^[4], all emphasize the importance of integrating ideological and political education into the teaching of higher education, and require colleges and universities to take establishing moral integrity and educating people as the core of education, and run ideological and political education through the whole teaching process, so as to realize all-round education and promote the new development of higher education in China.

Field practice of zoology and botany is an important basic course and practical teaching link for biology and related undergraduate majors, and it is of great significance to the construction of curriculum system and talent training for undergraduate majors related to biology. It covers many disciplines such as zoology, botany, microbiology and ecology. It is like a bridge between the macro and micro fields of biological science, which not only promotes the integration of multidisciplinary knowledge, but also provides a practical platform for students, which can integrate students into nature and plays an important role in cultivating students' comprehensive literacy. Obviously, under the background of the integration of curriculum ideological and political education into professional teaching, the field practice of zoology and botany, as an important link between theory and practice, provides a unique opportunity for the integration of curriculum ideological and political education. Such integration is of great practical significance for further improving students' comprehensive quality and establishing outlook on the world, life and values.

However, how to fully tap into curriculum ideological and political elements, effectively integrate the concept and content of ideological and political education into the teaching process of field practice of zoology and botany, and effectively enable students to master professional knowledge while further enhancing their ideological and political literacy has become a new challenge. This study aimed to analyze the teaching cases of field practice of zoology and botany in colleges and universities in China, and dig deep into the curriculum ideological and political elements in the teaching process of field practice of zoology and botany, so as to provide some reference for the organic integration of curriculum ideological and political education.

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Field Practice of Zoology and Botany Provides Good Materials for the Integration of Curriculum Ideological and Political Education

Importance of curriculum ideological and political education in specialized courses

When discussing the importance of curriculum ideological and political education, we should first make clear its key role in specialized courses. Curriculum ideological and political education is not only to impart professional knowledge, but also to establish a correct outlook on the world, life and values in students' minds. It emphasizes the integration of ideological and political education elements into professional course teaching, and realizes the organic unity of knowledge imparting and value leading. General Secretary Xi Jinping pointed out that "To do a good job in ideological and political work in universities, we must make good use of classroom teaching as the main channel"^[5], which has pointed out the core goals and ways to achieve curriculum ideological and political education.

Characteristics and advantages of field practice in zoology and botany

As a highly practical course, field practice of zoology and botany provides a natural practical platform for the implementation of curriculum ideological and political education. In the current field practice teaching system of zoology and botany, it has become an inevitable trend that zoology, botany, microbiology and ecology intersect^[6-7]. Such practical learning method, on the one hand, deepens students' understanding and application of theoretical knowledge, and on the other hand, provides rich materials and a broad stage for the integration of curriculum ideological and political education.

Taking Northwest A&F University as an example, they have transformed traditional botany teaching practice into a comprehensive biology practice, which not only includes botany, but also adds cognitive practice contents such as zoology, meteorology, ecology and soil science^[7]. Such interdisciplinary field practice mode not only enriches the teaching content, but also enables curriculum ideological and political elements to be embodied and strengthened in a wider field.

Curriculum Ideological and Political Elements in Teaching of Field Practice of Zoology and Botany and Their Contact Point Excavation

Combined with the teaching practice of field practice of zoology and botany in universities in China, we have refined and excavated possible ideological and political elements and ideological and political contact points in the field practice of zoology and botany.

Patriotism education

Integrating patriotism education into the field practice of zoology and botany is an effective way to realize the goal of establishing moral integrity and educating people. Making use of the

special regional and temporal characteristics of the field practice of zoology and botany to carry out red education is also a beneficial practice that some universities in China have always adhered to in the field practice of biology^[8-9]. Students can deeply understand and comprehend the spirit of patriotism in practice by excavating the historical culture and red resources in the practice areas and combining with the professional teaching content.

In the field practice conducted by College of Life Sciences of Hubei University in Lushan Mountain, Jiangxi Province, teachers and students learned about the heroic deeds of the Lushan Defence War by visiting the former site of the Lushan Conference and the Anti-Japanese War Memorial Museum, and enhanced their confidence and recognition of the party, nation and country^[10]. During the field practice conducted by College of Life Sciences of Henan University in Tianchishan National Forest Park in Songxian County, students learned about the glorious course of the Communist Party of China (CPC)'s struggle in the past 100 years through visiting the Red Education Base, which stimulated patriotic feelings and enhanced their understanding of the sense of responsibility for national development^[11]. During the field practice conducted by College of Biological Sciences of Guizhou Education University in Yinjiang County, students learned about the history of local heroic sons and daughters who joined the anti-imperialist and anti-feudal struggle under the leadership of the Communist Party of China (CPC), which not only let them experience the heroism of revolutionary martyrs, but also deepened their patriotism^[12].

These cases fully show that field practice of zoology and botany provides rich materials and practical platforms for patriotism education. Through careful design and implementation, students' patriotic feelings, sense of social responsibility and professional identity can be effectively enhanced, laying a solid foundation for cultivating new people of the times who are responsible for national rejuvenation.

Cultivating students' awareness of sustainable development and ecological civilization, improving their legal awareness and enhancing their sense of responsibility and mission

In the field practice of zoology and botany, to excavate the ideological and political elements of ecological environmental protection and cultivate the consciousness of sustainable development and ecological civilization is an important way to realize the education of ecological civilization. Meanwhile, field practice also enables students to deeply understand their responsibilities and missions as future biologists and ecological protectors, and inspires their enthusiasm for contributing to the construction of ecological civilization and biodiversity protection.

Specimen collection is an important content of field practice in zoology and botany. However, traditional specimen collection activities not only destroy the ecological environment and wild resources of practice bases, but also dilute students' awareness of environmental protection, which is contrary to our educational goals. In order to solve this contradiction, many universities have adopted electronic specimen collection instead of traditional

specimen collection or other diversified measures^[8,13]. While emphasizing the importance of biodiversity and ecological diversity, we should also note that due to the demand of economic development, some nature reserves have been developed to varying degrees, resulting in the damage of biodiversity and ecological diversity. For example, using chemical herbicides to remove roadside weeds, discharging pollutants into water bodies, damming water and building small power stations have all had a negative impact on biodiversity. In addition, over-exploitation of wild Chinese herbal medicine resources has also led to the exhaustion of wild resources. Based on this, legal knowledge can be integrated into field practice, such as the *Wild Plant Protection Law*, *Wild Animal Conservation Law* and *Environmental Protection Act*, to improve students' legal awareness, so that students can learn to take correct measures to protect biological resources and the environment on which they depend for survival, thereby realizing sustainable development^[13].

"Reading ten thousand books is not as useful as traveling ten thousand miles". The field practice of zoology and botany not only enables students to master relevant professional knowledge, but also deepens their understanding of the importance of biodiversity and the urgency of ecological environment protection through personal experience. The College of Life Sciences of Yangtze University combined the field practice of zoology and botany with students' social practice activities. Focusing on the "Great Protection of the Yangtze River", they have carried out practical activities in Jingzhou Ancient City Wall, Jinhu Wetland Park, Jingzhou Chinese Sturgeon Protection Center and Shishou Elk Nature Reserve, helping Jingzhou to build ecological civilization. Through investigation, students can get a preliminary understanding of the current situation of biodiversity protection in Jingzhou, consolidate their professional knowledge and enhance their awareness of ecological protection^[14].

Therefore, field practice is not only a learning process, but also a profound educational experience, which is hard to be provided by traditional classroom teaching. It not only inspires students' awe of nature and life, but also stimulates students' thinking about economy and development, and cultivates their awareness of environmental protection. More importantly, it can help students build up their legal awareness, enhance their sense of responsibility and mission, and urge them to take action in their future life and work, so as to realize sustainable development and ecological civilization construction.

Cultivation of scientific spirit and innovative consciousness

Field practice of zoology and botany is not only the accumulation of knowledge and the improvement of skills, but also an important platform for cultivating students' scientific spirit and innovative consciousness. In the process of field practice, students face all kinds of unknown challenges and problems, which need to be explored and solved by scientific thinking and methods.

For example, in the identification of animal and plant species, students need to carefully observe the morphological

characteristics and growth environment of animals and plants, and make accurate identification by consulting materials and consulting teachers. This process can cultivate students' rigorous scientific attitude and the spirit of being brave in exploration. Meanwhile, in field practice, students may discover some new species or special ecological phenomena, which will stimulate their curiosity and innovative consciousness. In the field practice of botany, the biology major in Yili Normal University adopted heuristic and interactive field teaching practice mode to encourage students to think actively and ask questions actively, and cultivate their independent problem-solving ability. Such teaching mode not only enriches the practice content, but also improves students' learning enthusiasm and initiative. It provides good conditions for cultivating students' scientific spirit and innovative consciousness^[15].

In addition, field practice also provides opportunities for students to participate in scientific research projects. Under teachers' guidance, students can carry out research on some small topics, such as plant community survey and animal ecological habits observation. Through these practical activities, students can personally experience the process of scientific research, and understand the methods and steps of scientific research, which cultivates their innovative and practical ability. In the process of building a multi-disciplinary comprehensive practice teaching system of zoology, botany and ecology by Hunan Agricultural University and Huaiyin Teachers College, under a subject-oriented condition, students chose their own topics of interest for practice, resulting in a number of undergraduate-led scientific research achievements^[6-7]. College of Biological Sciences of China Agricultural University has been carrying out "scientific research" practice teaching for many years, and the research results of some students' internship projects have been published in SCI journals^[8].

Cultivation of teamwork spirit

Field practice of zoology and botany often requires students to carry out various tasks in groups, which provides an excellent opportunity to cultivate students' teamwork spirit.

In field practice, tasks such as specimen collection, data recording and ecological environment observation usually require team members to work together. For example, when collecting animal and plant specimens, some students are responsible for searching, and some students are responsible for collecting, and some students are responsible for recording information about the growth environment. Such clear division of labor makes students aware of their roles and responsibilities in the team, and only when everyone does his or her duty can they complete the task efficiently. When Northwest A&F University carried out field practice of zoology and botany in Qinling Mountains, students faced complex terrain and rich biological resources, and the groups cooperated closely. In the process of crossing mountain forests, students with good physical strength took the initiative to help students with weak physical strength, and they overcame difficulties together. When observing animals and plants, everyone was on duty in turn to ensure that no important observation data was missed. Such

atmosphere of unity and cooperation not only improved the efficiency of practice, but also enhanced the friendship between students. In addition, when encountering unexpected situations, such as bad weather and accidental injuries, students could deeply understand the importance of unity and cooperation. Everyone worked together to tackle difficulties, demonstrating strong team cohesion. At the conclusion stage after the internship, students also reflected on the process of teamwork and shared their experiences and gains. Through the exchange, everyone more clearly realized the value of unity and cooperation, and accumulated valuable experience for future study and work^[7].

Cultivation of students' spirit of hard struggle through labor education

Field practice of zoology and botany is also a kind of labor education and an important position for cultivating students' spirit of hard struggle. Students often face tough environment and many challenges in practice, and they can also experience the hardships of labor and learn to respect labor and laborers, which provides a rare opportunity to exercise their quality of hard work and plain living.

In order to make full use of resources of China Agricultural University and highlight the agricultural advantages of the school, College of Biology of China Agricultural University has added a day of agricultural practice/labor practice in its field practice of biology, which can be completed in Shangzhuang or Zhuozhou experimental station of the school. Students can experience the value and significance of labor through practical activities^[8].

The environment of field practice is often harsh, and students may need to collect specimens in the scorching sun and endure the high temperature. They may also carry out ecological observation in stormy weather and withstand the test of bad weather. In addition, the accommodation conditions in field practice are relatively difficult. Students may need to camp out and build simple tents by themselves and solve the food problem. In some remote areas, the supply of food and water may be limited, so students need to learn to allocate resources reasonably and overcome difficulties. Based on the difficult conditions of food, shelter and transportation during field practice, College of Life Sciences of Shaoxing University timely conducted activities such as getting hot water in turn among groups, washing dishes in turn, and holding jiaozi competitions in the field practice of biology, so as to cultivate students' basic qualities such as paying attention to hygiene, being polite, being hard-working and simple, and loving labor^[12]. Such kind of experience makes them deeply realize that life is not easy and can cultivate their spirit of hard work and hard struggle.

Life education

Field practice of zoology and botany provides a unique platform for students to observe and feel the miracle of life at close range, so as to deeply understand the preciousness and fragility of life and cultivate awe of life.

In the field practice, students can see the growth, reproduction and living conditions of various animals and plants in the natural environment. They may witness the moment when a bird

emerges from its shell and feel the joy and hope brought by the birth of a new life. They may also witness a plant growing tenaciously in harsh environments, and experience the tenacity and resilience of life. These vivid scenes make students deeply realize the diversity and preciousness of life. In addition, field practice can also let students know the fragility of life. During the internship, students may see some animals and plants that have been hurt by natural disasters and human activities. These scenes make them realize that life is so fragile that we need to care and protect it with our heart. Meanwhile, they will also learn about the survival challenges faced by some rare animals and plants, such as habitat destruction and food shortage, which will inspire their sense of responsibility to protect life and care for nature.

In field practice, teachers can guide students to think about the meaning and value of life. Through discussion and communication, students can understand that every life has its meaning and value, and we should respect and protect every life. Meanwhile, teachers can also guide students to turn their awe of life into practical actions and actively participate in ecological protection and life education activities.

Cultivation of safety awareness

In field practice of zoology and botany, it is very important to cultivate safety awareness. In the wild environment, there are various potential safety risks, such as complex terrain, changeable climate, and wild animals. Therefore, students must always be vigilant to ensure their own safety.

When College of Biology, China Agricultural University conducts field practice of biology, in-depth research is conducted in advance on the environment, climate conditions, and distribution of toxic animals and plants in the internship site, and targeted response plans are carefully formulated for various safety hazards that may arise. An internship mobilization meeting will be held before an internship officially begins to explain all kinds of information and points for attention related to safety in the internship site to students in detail. For example, when practicing in coastal areas, it is necessary to pay attention to the tidal schedule in advance to ensure the safety of the internship process. And accident insurance should be bought for students before internships start, so as to build a safe line of defense for internship activities in all directions^[8].

In addition, students should have basic knowledge of first aid, so that they can help themselves and each other in time in case of accidents. Teachers can organize students to carry out first aid training before practice, so that students can understand the treatment methods of common accidental injuries, such as sprains, abrasions, and heatstroke. Students can better complete their internship tasks and improve their professional quality on the premise of ensuring their own safety by strengthening the cultivation of safety awareness.

Cultivation of humanistic quality

Field practice of zoology and botany is not only a process of scientific exploration, but also an important way to cultivate

students' humanistic quality. In field practice, we can't just observe the morphological structure of animals and plants from a professional point of view. Students are in the embrace of nature and feel the beauty of nature, and we should also let students learn to appreciate the beauty of animals and plants from an aesthetic point of view and arouse their love for nature^[16], which is helpful to cultivate their aesthetic interest and artistic perception.

Meanwhile, the teaching process of field practice of zoology and botany contains a lot of knowledge of traditional culture in China. While teaching majors, the explanation of some traditional cultural knowledge can also be increased, which brings convenience to deepening students' recognition of plants, and can also let students feel the charm of traditional culture in China^[1,13].

Conclusions

As an important practical teaching link of biology and related undergraduate majors, field practice of zoology and botany provides rich materials and a broad platform for the integration of ideological and political education. Through the excavation and cultivation of various ideological and political elements in the practice process, such as patriotism education, environmental awareness, teamwork spirit, scientific spirit and social responsibility, we deeply realize the important role of field practice in improving students' comprehensive quality.

In the aspect of patriotism education, the red resources and history and culture in the internship can enhance students' self-confidence and recognition of the party, nation and country, and stimulate their patriotic feelings. The cultivation of environmental awareness makes students realize the fragility of ecological balance and the urgency of sustainable development, and contribute to the protection of the ecological environment. Teamwork spirit can be exercised in the group task in the internship, which cultivates students' ability to cooperate with each other and overcome difficulties together. The cultivation of scientific spirit and innovative consciousness enables students to explore the unknown in practice and improve their scientific research ability and innovative thinking. The cultivation of social responsibility makes students understand the importance of animal and plant protection and ecological environment construction, and actively participate in related actions.

In addition, field practice has played an important role in the cultivation of sense of responsibility and mission, cultivation of the spirit of unity and cooperation, labor education, life education, cultivation of the spirit of hard struggle, cultivation of safety awareness and cultivation of humanistic quality. The integration of these ideological and political elements not only enables students to master professional knowledge and skills, but also establishes a correct outlook on world, life and values for them, laying a solid foundation for cultivating talents in the new era with all-round development in morality, intelligence, physical health, aesthetics and labor.

In the future teaching, we need to adjust measures to local

conditions, pay more attention to the ideological and political construction for field practice of zoology and botany, and fully tap the ideological and political elements in the practice. The practice content and teaching methods can be carefully designed to run curriculum ideological and political education through the whole process of the practice. Meanwhile, we should strengthen cooperation with practice bases and jointly carry out ideological and political education activities to provide students with more practical opportunities and learning resources. Only in this way can we give full play to the important role of field practice of zoology and botany in personnel training and make greater contributions to China's higher education and ecological civilization construction.

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(Continued on page 111)

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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