

# Exploration of cultivating innovative and entrepreneurial talents based on college students' innovative and entrepreneurial projects-- Take the biology discipline of Southwest Forestry University as an example

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**Abstract.** In the current background of entrepreneurship and innovation education domestic and abroad, this paper discusses the necessity and effectiveness of integrating innovation and entrepreneurship education into the reform and practice of biology teaching. By integrating the teaching content and key points of biology courses in Southwest Forestry University, the practice of cultivating innovative and entrepreneurial talents is explored to strengthen students' ability to solve practical problems, and to improve students' innovation awareness and entrepreneurial ability, we adhere to practice teaching as the main teaching content. This study organically combines innovation and entrepreneurship education with professional education, and explores the reform and practice of biology innovation and entrepreneurship education with the goal of improving both ability and quality, aiming to provide a certain theoretical basis for the biology curriculum teaching system, and cultivate excellent students and teams with certain innovation and practice ability. The results show that this measure effectively improves the practical application ability and comprehensive quality of the students, and provides a new idea and method for the training of biology-related majors.

## 1 Introduction

Innovation and entrepreneurship education (referred to as *double innovation education*) aims to cultivate people's innovative consciousness, entrepreneurial thinking, entrepreneurial spirit, entrepreneurial skills and other comprehensive qualities, and finally enable the educated to have certain innovative and entrepreneurial ability. Innovation and

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entrepreneurship education is not knowledge and theory education, but spirit and quality education.

The cultivation of entrepreneurial consciousness, innovative spirit and entrepreneurial ability should be integrated into the whole process of talent training in Chinese colleges and universities, into teaching, scientific research and social services, so as to solve the problem of "time-limited" innovation and entrepreneurship education. We should adhere to the common principle of innovation and entrepreneurship education, carry out practical teaching methods, and cultivate students' acute entrepreneurial consciousness, teamwork coordination, entrepreneurial risk tolerance and comprehensive entrepreneurial ability, so as to meet the needs of society for diversified entrepreneurial talents.

In order to strengthen the education and teaching of basic biology subjects further, mobilize students' enthusiasm for learning fully, train students' innovative thinking better, innovative ability and independent analysis and problem solving ability, make full use of the existing resources of the university, enable students to accept new technologies and new knowledge, and improve the teaching quality, it is particularly urgent and important to reform and practice innovation and entrepreneurship education for students majoring in biology basic disciplines so that teaching can keep up with the development of new technologies and the needs of innovation and entrepreneurship training.

Innovation and entrepreneurship competition can effectively improve students' comprehensive quality, enhance students' innovative consciousness, creative spirit and entrepreneurial ability; Improve students' teamwork ability, thinking ability and execution ability, so as to meet the needs of applied talents for economic and social development. Practical teaching provides a good platform for students, so that theory and practice can be organically combined, effectively promote students' understanding of theoretical knowledge and the transformation of scientific research ability, and enhance the effect of teaching theoretical knowledge in class.

## **2 The existing problems in the innovation and entrepreneurship education**

The biology discipline of Southwest Forestry University (SWFU) is a key discipline with advantages and characteristics in Yunnan Province. Since its establishment in 2015, the experimental course teaching of biology in SWFU has been gradually improved, but its curriculum system is still designed according to theoretical courses, and a separate theoretical course corresponds to experimental courses.

### **2.1 Curriculum system design is not perfect**

The design of biology curriculum system is too simple, and there are the following problems: First, the curriculum is not systematic and coherent, and students' grasp of biological knowledge is not solid enough; Secondly, the curriculum content is too theoretical and lacks the opportunity of practical operation, which makes it difficult for students to convert theoretical knowledge into practical application; Finally, the evaluation method of the course is simple, focusing too much on exam results, but ignoring the evaluation of students' innovative thinking and entrepreneurial ability. The existence of these problems hinders the effective development of innovation and entrepreneurship education in basic biology disciplines. It is necessary to further improve the design of curriculum system.

## **2.2 Laboratory instrument management is not standardized enough**

With the supports of the government, universities in China have increased the construction of biological engineering laboratories, and equipped better. However, the use of equipment management scattered. Some instruments and equipment are difficult to share, and the use rate is low, most of the instruments are idle, so that the limited resources in universities are in a certain degree of waste. And some valuable large-scale teaching instruments are mostly used by teachers and students themselves, because of lacking the professional operator.

## **2.3 Experimental assessment methods lag behind**

The traditional experimental assessment methods only pay attention to students' experimental reports and experimental results, but ignore the comprehensive evaluation of students' experimental process and experimental skills. This assessment method tends to cause students to rely on textbook knowledge too much, ignore the exercise of experimental operation skills.

## **2.4 The traditional mode of practical teaching still has its limitations**

### *2.4.1 Traditional practical teaching lacks independence.*

As the supplement and continuation of theoretical teaching, practical teaching takes the content of theoretical courses as the main body and the experiment content as the purpose of verifying the knowledge of theoretical courses. It usually adopts the thinking mode of theoretical courses to carry out the thinking training of practical courses. However, the theory course is to train the deductive thinking of theoretical generalization, while the practice course is to train the inductive thinking of empirical generalization.

### *2.4.2 The traditional practice teaching lacks comprehensiveness.*

Traditional practical teaching lacks comprehensiveness in two aspects: it is manifested in the practical content. Traditional practical teaching usually carries out practical teaching according to a single course and a single skill, and fails to fully reflect the scientific, systematic and comprehensive nature of practical teaching between courses. On the other hand, it is manifested in the way of practice. It leads to the lack of students' comprehensive practical ability and application innovation ability to solve practical problems.

### *2.4.3 Lack of integrity in traditional practice teaching.*

Traditional practical teaching pays more attention to the first class, teaching time is so limited that it's only enough to teach the basic theory, basic knowledge and basic skills of the course; The activities of the second class are competitive in nature, which helps to motivate students to study hard and have an incentive effect. The guidance of professional teachers to the activities of the second classroom is usually temporary participation, resulting in the second classroom can not give full play to the professional role. This mode lacks the integrality of the first and second classrooms' mutual integration and cross-penetration.

### **3 The basic ideas and methods of innovation and entrepreneurship education reform**

The biology discipline of Southwest Forestry University (SWFU) is a key discipline with advantages and characteristics in Yunnan Province. Since its establishment in 2015, the experimental course teaching of biology in SWFU has been gradually improved, but its curriculum system is still designed according to theoretical courses, and a separate theoretical course corresponds to experimental courses.

#### **3.1 Strengthen professional practice teaching**

At present, many colleges and universities are vigorously promoting innovation and entrepreneurship education by strengthening professional practice teaching. It has greatly promoted the cultivation of innovative talents, but the reform of practical teaching should be carried out from the whole teaching system. First of all, we should strengthen the construction of experimental courses, increase the proportion of experimental courses, and integrate creative projects into practical teaching. Secondly, a practical teaching base should be established to strengthen the cooperation between schools and enterprises to provide more opportunities for students to practice. Finally, reform the evaluation method of practice teaching, pay attention to the evaluation of students' practice process and innovation ability, encourage students to carry out independent learning and inquiry learning, and cultivate their innovative thinking and entrepreneurial ability.

#### **3.2 Strengthen the reform of curriculum teaching system for related majors of biology basic subjects**

In terms of experimental curriculum and content design, modular construction of experimental teaching system is a necessary measure to improve the quality of experimental teaching and cultivate innovative talents. First of all, the curriculum should be optimized, and innovation and entrepreneurship education should be integrated into the curriculum system according to industry development and social needs, so as to form a systematic and coherent curriculum system. Secondly, we should strengthen practical teaching links and improve the proportion and quality of practical teaching basing on the actual needs of the industry development. Finally, reform the teaching methods and means, the use of heuristic, inquiry and other teaching methods, guide students to study independently, active thinking, cultivate their innovative thinking and entrepreneurial ability.

#### **3.3 Improve the training program of college students' innovation and entrepreneurship projects**

##### *3.3.1 Strengthening the professional knowledge foundation*

Teachers should learn new professional knowledge at any time, change the teaching method, use smart classroom as a tool to guide students to be the lecturer after the completion of professional learning, and consolidate their own knowledge. Supplemented by practical teaching, combination of theory and innovation and entrepreneurship content. Improve the systematicness, coherence and novelty of the curriculum.

### *3.3.2 Participate in the research projects of teachers at all levels*

Most of the biology teachers undertake or participate in scientific research projects. These scientific research projects are carried out with the active participation of outstanding college students. In the process, students not only cultivate and improve their professional skills, but also exercise their scientific thinking and writing ability. Through deepening the understanding of scientific research projects, students also broaden their professional cognition, contact and understand the latest and even cutting-edge technologies and methods of the discipline.

### *3.3.3 Student-oriented innovation and entrepreneurship training program for college students.*

The Innovation and Entrepreneurship Training Program for college students is one of the undergraduate teaching quality projects of the Ministry of Education. Biology of Southwest Forestry University is a first-class discipline with advantages and characteristics in Yunnan Province. Since its establishment in 2015, project funds of different levels have been set up, including graduate innovation Fund and key discipline opening Fund. Through the establishment of this project, students with innovative consciousness will be funded to carry out relevant research, which will lay a good foundation for further application and implementation of college students' innovation and entrepreneurship projects. In addition, our undergraduates actively applied for national and provincial innovative projects. From July 14 to 15, 2022, the 8th Yunnan Province "Internet Plus" Innovation and Entrepreneurship Competition for College students was held in Southwest Forestry University. 83 universities in Yunnan Province participated in the competition, including undergraduate, higher vocational and secondary vocational colleges. In the main track of higher education, "Youth Red Dream Journey" track, vocational education track and industrial proposition track to compete, through the form of project roadshow, decided 180 gold awards. The project greatly stimulated the students' innovation consciousness and enthusiasm for scientific research.

### *3.3.4 Set up students' scientific and technological innovation collaboration group*

Undergraduates in biology majors can set up scientific and technological innovation cooperation groups according to their interests, and exploration activities in their spare time. They can jointly explore innovative ideas, realize resource sharing, and improve the overall level of the project by group cooperation. It can also cultivate students' teamwork spirit and leadership skills, which will prepare them for their future careers.

### *3.3.5 Strengthen service work such as practice guidance and training assistance for innovation and entrepreneurship.*

In recent years, schools and colleges attach great importance to students' innovation and entrepreneurship education, encourage teachers to lead students to participate in college students' innovation and entrepreneurship activities, and educate students in a purposeful, planned and organized way through classroom teaching, extracurricular practice and competition tests.

### *3.3.6 Reform the mode of talent training for innovation and entrepreneurship education*

We should continue to deepen the reform of higher education teaching, and attach importance to the whole process of innovation and entrepreneurship education in the training of biological professionals when formulating training programs. This requires us to break through the traditional educational framework and focus on cultivating students' innovative thinking and practical ability. By introducing more practical projects and practical opportunities, students will be able to practice innovative thinking and problem-solving skills in practical operations. At the same time, we also need to strengthen cooperation with the industry, so that students' innovative projects are closer to the market demand and improve their practical application value. Such a training model will help cultivate more high-quality talents with innovative spirit and entrepreneurial ability to contribute to the country's innovation and development.

## **4 Conclusion**

The goal of innovation and entrepreneurship education is to cultivate innovative and entrepreneurial talents with improved ability and quality, and effectively provide intellectual support for social development. Innovation and entrepreneurship education lies in the creation at the thinking level and the action level, in the pioneering spirit and attitude, and in the development of new undertakings or posts in various fields of society. First of all, universities should integrate the cultivation of entrepreneurial consciousness, innovative spirit and entrepreneurial ability into the whole process of talent training, teaching, scientific research and social services. Second, universities should adhere to the common principle of innovation and entrepreneurship education, carry out practical teaching methods, and cultivate students' acute entrepreneurial consciousness, teamwork coordination, entrepreneurial risk tolerance and comprehensive entrepreneurial ability. Third, universities should integrate innovation and entrepreneurship education into professional talent training goals and teaching plans with the school curriculum system, explore and enrich the resources of various professional courses. Finally, according to the orientation of talents and the target needs of innovation and entrepreneurship education, universities should properly adjust the curriculum of major courses, and develop and set up elective courses for all undergraduates in the directions of scientific research methods, discipline frontier, innovation foundation, employment and entrepreneurship training to build special subject groups. The theory of innovation and entrepreneurship education should be combined with practice to truly achieve the goal of cultivating college students' entrepreneurial quality.

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