

Constructing a "Trinity" Experimental and Practical Teaching System, and Cultivating Outstanding "Innovation and Entrepreneurship" Talents in New Agricultural Science

Xiu Liu¹ Chenzhong Jin² Kaifa Guo³ Huixin Zheng⁴ Zefa Liu⁵ Yong Chen⁶

^{1,2,3,4,5,6} Key Laboratory of Green Prevention and Control of Crop Pests in Hunan Province/Hunan Collaborative Innovation Center for Weed Prevention and Control Technology and Application in Farmland of Hunan University of Humanities, Science and Technology, Loudi, Hunan 417000, China

ABSTRACT

With the advancement of agricultural modernization and the implementation of rural revitalization strategies, higher agricultural and forestry institutions are facing the challenge of cultivating modern agricultural talents with practical and innovative abilities. This article analyzes the current situation of agricultural and forestry majors in Chinese colleges and universities, and proposes a plan to build a "trinity" applied innovation and entrepreneurship talent cultivation experimental practice teaching system combined with the actual situation of Hunan University of Humanities, Science and Technology. This article also outlines specific implementation steps aimed at optimizing the experimental and practical teaching system, effectively enhancing students' practical abilities and innovative spirit, cultivating high-quality talents for rural revitalization and the construction of a modern agricultural power, and providing reference for experimental and practical teaching in new agricultural science majors.

Keywords: *New agricultural science, Experimental practice teaching system, Innovation and entrepreneurship, Personnel training.*

1. INTRODUCTION

In recent years, due to the rapid development of national high-tech and interdisciplinary integration, traditional agricultural industries are undergoing profound changes, and modern new agriculture is emerging. Unlike traditional agriculture, modern new agriculture not only prioritizes food security, but also needs to pay attention to ecological civilization, cultural heritage, and beautiful rural construction. The construction of new agricultural science is precisely to adapt to the development of the national new technological revolution and industrial transformation, and to serve the needs of the national rural revitalization strategy; At the same time, the new agricultural science should also adapt to the "four new" construction needs of new agriculture, new villages, new farmers, and new ecology. It is not only necessary to optimize the

structure of disciplines and students' knowledge and ability, but also to transform and upgrade traditional majors to form new knowledge combinations; By transforming and developing the traditional agricultural knowledge system, talent cultivation system, and technological innovation system, it is also necessary to build a new higher agricultural education system that can support the development of modern agriculture. Innovation and entrepreneurship education emphasizes the cultivation of students' innovative consciousness, innovative thinking, and innovative ability. Therefore, "innovation and entrepreneurship" education is an important lever for cultivating first-class "new agricultural science" talents. At present, the traditional training mode of agricultural science majors in colleges and universities is no longer able to meet the demand for new modern agricultural scarce professional talents, and the traditional

professional education in schools cannot meet the new market demand, resulting in difficulties in employment for graduates and difficulty in recruiting suitable talents for enterprises. Therefore, it is a must to optimize the professional talent training system, strengthen student innovation and entrepreneurship education, improve the quality of talent training, and cultivate "innovation and entrepreneurship" talents who are knowledgeable about agriculture, love agriculture, and based on agriculture. This article is based on the actual situation of Hunan University of Humanities, Science and Technology. Against the background of the "rural revitalization strategy", "new agricultural science" and "application characteristics" discipline construction, through the optimization of experimental practice teaching content, the construction of teaching staff, the construction of teaching platforms, and the information platform management of laboratories and practice bases, it is also a must to reform and optimize the "trinity" experimental and practical teaching system, explore new paths for agricultural education reform in universities, and cultivate outstanding new agricultural "innovation and entrepreneurship" talents.

2. CURRENT SITUATION OF TALENT CULTIVATION IN AGRICULTURE AND FORESTRY MAJORS IN COLLEGES AND UNIVERSITIES

2.1 Learning to Farm But Not Farming, Leading to Serious Talent Loss

According to the "2022 China Undergraduate Employment Report" and employment reports from various universities, only 20% of top agricultural universities, including China Agricultural University, Nanjing Agricultural University, South China Agricultural University, Northeast Agricultural University, etc., have majors directly related to agriculture. More than 24% of them continue their studies after graduation, and about 60-70% eventually work in agriculture and forestry. Taking Hunan Agricultural University as an example, there was a total of 7549 graduates in 2022, of which 27% chose to continue their studies, and only slightly over 7.8% chose to enter employment in agriculture, forestry, animal husbandry, fisheries, and other fields. Studying agriculture instead of farming, there is a serious loss of agricultural professionals. The root cause is

the poor employment environment and low salary in grassroots agricultural and forestry units, and many students from rural areas have little willingness to return to work in rural areas. It is urgent to solve the problem of "not going to rural areas" and "not retaining in rural areas" high-quality technical and skilled talents in agriculture. Therefore, on the one hand, it is necessary to strengthen the construction of agricultural and rural infrastructure, improve the employment environment for agricultural and forestry occupations, and make agricultural and forestry positions more attractive; On the other hand, it is urgent to strengthen ideological and political education in agricultural science education, practical teaching and other aspects, transform the image of agricultural science talents in students' minds, reshape employment concepts, and promote agricultural science students to enter rural areas and agricultural enterprises for employment.

2.2 Limitations in Professional Settings and Low Compatibility with Industrial Structure

With the rapid development of China's economy and society, and the continuous improvement of people's living standards, the demand for agriculture and agricultural products is also constantly changing, which has also prompted the structural reform of the agricultural supply side. Traditional agriculture is transforming into a diversified rural economy, including the transformation of scientific and technological achievements, adjustment of planting structure, integration of primary, secondary and tertiary industries in rural areas, and the formation of agricultural industrial chains and clusters. Traditional agriculture is transforming to modern agriculture through the development of ecological agriculture, agricultural product processing industry, leisure agriculture, rural tourism, rural service industry, local characteristic industries, and rural e-commerce. However, the relevant majors and talent training programs in China's agricultural and forestry colleges and universities still remain in the traditional mode, and the matching degree between graduates and the employment demands of emerging agricultural industries is relatively low. Therefore, adjusting the setting of agricultural and forestry majors in colleges and universities, while optimizing and upgrading traditional majors, exploring the construction of emerging majors to match the adjustment of agricultural industry structure.

2.3 Lack of High-quality Educational Resources and Incomplete Experimental and Practical Teaching System

The upgrading of traditional majors and the rise of emerging majors have posed new challenges to the teaching capacity and experimental practice teaching system of agricultural science majors. The phenomenon of traditional teaching systems emphasizing theory over practice has always existed, and teachers are mainly focused on teaching, with few opportunities to enter enterprises or frontline practice. Therefore, there are few teachers with rich industry experience and practical abilities. Teachers are unable to master the agricultural techniques required for frontline production and cannot participate in solving practical production problems, resulting in ineffective integration of theoretical learning with actual production. The practical teaching process of agricultural science majors is very important, which is a standardized and systematic project that enables students to link professional knowledge with production processes through practice. Due to objective factors such as insufficient experimental equipment, incomplete teaching bases, and limited funding for practical teaching, there has been a phenomenon of weakening the cultivation of practical operational skills in the teaching process. Emphasizing theory over practice, students' actual participation in some scientific research and practical projects is not high, resulting in poor practical teaching effectiveness.

3. CONSTRUCTION OF THE "ONE CORE, TWO WINGS, AND TRINITY" EXPERIMENTAL PRACTICE TEACHING SYSTEM

In response to the problems in agricultural education in universities, based on the requirements of the new agricultural science for students' practical and innovative entrepreneurial abilities, Hunan University of Humanities, Science and Technology has carried out the construction and reform of an experimental and practical teaching system under the guidance of "innovation and entrepreneurship". With the goal of enhancing students' practical and innovative entrepreneurial abilities, it is necessary to establish an experimental and practical teaching system as well as an innovative and entrepreneurial education system. By strengthening the teaching of theoretical courses,

experiments, practical courses, comprehensive practical courses, and innovative and entrepreneurial practical courses in students' first classroom, it is aimed to improve their hands-on operation and practical abilities; In the second classroom, various professional skills competitions, subject competitions, innovation and entrepreneurship project training and competitions can enhance students' comprehensive innovation and entrepreneurship abilities; In the third classroom, students participate in teachers' scientific research and horizontal projects, graduation internships, and are linked to the industry to gain a deeper understanding of social needs and cultivate professional qualities and skills, thus achieving the goal of cultivating application-oriented "innovation and entrepreneurship" talents.

3.1 Improving the Experimental Practice Teaching Content System of "Three Levels, Four Modules, Multiple units, and the Full Process"

Based on the requirements of solid foundation, strong practice, and emphasis on abilities, there is a must to optimize the talent cultivation plan and teaching outline, and construct a "three levels, four modules, multiple units and full process" experimental practice teaching content system. The teaching system is divided into 4 years, with the first year as the basic practical level, including basic experiments and internship modules. Experimental teaching and course internships are the main focus, cultivating students' mastery of basic knowledge, skills, experimental operation ability, as well as the ability to analyze and solve practical problems. In the students' sophomore and junior years, they focus on professional improvement, starting from professional practice and comprehensive practice. Through professional cognitive internships, professional production internships, professional social practices, professional competitions, scientific research training, etc., they cultivate students' comprehensive application abilities, professional scientific research literacy, and the ability to work independently and adapt to society. In their senior year, they enter the stage of innovation and entrepreneurship improvement, with a focus on innovation and entrepreneurship. Through participating in scientific research projects, college entrepreneurship training camps, college science and technology competitions, graduation projects, etc., they can develop their comprehensive

application, scientific research, and innovation and entrepreneurship abilities.

3.2 Developing an Experimental and Practical Teaching Path That Integrates the "Three Classrooms"

Theoretical courses and practical teaching are interdependent and mutually reinforcing, jointly promoting the transformation of teaching outcomes. According to the experiential learning cognitive method, a three-classroom model is set up to fully mobilize students' enthusiasm and autonomy in learning through the linkage of the first classroom, second classroom, and third classroom. In the first classroom, basic theoretical experiments and internship modules such as course theory, experiments, and practice are used to solidify theoretical foundations and basic experimental skills; In the second classroom, students are actively guided and encouraged to participate in professional skills competitions and scientific research projects, and exercise comprehensive practical abilities through problem-solving; In the third classroom, it is necessary to closely connect with internship units in enterprises, increase internship efforts, and allow students to experience real employment scenarios and job content and have a full understanding of future employment positions through professional production internships and professional social practices.

3.3 Establishing and Improving Experimental Training Bases and Faculty Teams, and Providing Conditions and Guarantees

Based on the experimental training base, a three-dimensional practical training platform consisting of on campus, off campus, and social practice will be constructed to provide students with comprehensive internship and training scenarios. The establishment of a new analysis and testing experimental center, a molecular biology research laboratory, and a plant production teaching laboratory has provided a solid foundation for teaching and research. At the same time, both software and hardware should be improved, the construction of the teaching staff should be strengthened, and professional experimental technicians should be provided to ensure that each student's experiment receives practical guidance. It is necessary to request professional course teachers to adjust the teaching model, increase the intensity

of practical courses, regularly hire corporate mentors to teach, bring frontline production experience to the classroom and expand students' horizons. Through the construction of experimental training bases and the development of teaching staff, conditions and guarantees will be provided for experimental practical teaching.

3.4 Establishing and Improving the Information Management Platform and System for Experimental Training Bases

In order to improve the management efficiency of the practical teaching platform, the college has adjusted the functional zoning of the laboratory and established a complete management structure. By centralizing management, improving laboratory equipment and space sharing reservations, and achieving comprehensive opening of experimental equipment, students can learn about various experimental facilities through online platforms. This arrangement provides a flexible and convenient environment for students to explore their personal interests, learn, participate in scientific research projects, and engage in technological innovation and entrepreneurship projects. The laboratory implements an open operation and management strategy, with all platforms open to students, providing a broader experimental space for students on campus. In this open experimental atmosphere, students can engage in innovative practices, stimulate their research enthusiasm and practical skills. This management model significantly improves the utilization rate of experimental equipment and promotes the fair use of high-quality educational resources. The college actively encourages students to engage in scientific research training and entrepreneurial projects, in order to cultivate their innovation, entrepreneurial thinking, and teamwork abilities, laying a solid foundation for cultivating agricultural and forestry professionals with excellent comprehensive qualities.

4. CONCLUSION

In the context of the construction of new agricultural science, agricultural and forestry majors in universities are facing both opportunities and challenges of upgrading traditional majors and integrating multiple disciplines into new ones. Hunan University of Humanities, Science and Technology actively explores the training mode of "innovation and entrepreneurship" agricultural

talents by constructing a "trinity" experimental and practical teaching system for cultivating applied innovation and entrepreneurship talents, focusing on cultivating students' innovative spirit and entrepreneurial quality. There is a necessity to enhance the teaching ability and practical experience of young teachers through secondment training, continuing education, and other means, and introduce industry professionals and build a teaching team to carry out "experimental practice and entrepreneurship education" at the same time. There is also a necessity to combine on campus training bases, off campus training bases, and social practice bases to stimulate students' vitality in innovation and entrepreneurship, practice the spirit of innovation and entrepreneurship, and promote the school to take innovation and entrepreneurship education to a new level.

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