



Original Research Article

doi: <https://doi.org/10.20546/ijcrbp.2022.906.001>

Cultivation and practice of entrepreneurial ability of horticulture students in the perspective of innovation and entrepreneurship

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Article Info

Keywords:

Entrepreneurship development
Horticulture
Talent training system
Student entrepreneurship team

Abstract

The present study was conducted to explore the entry point of entrepreneurship education by continuously following and investigating the entrepreneurship team of horticulture majors and exploring the integration of entrepreneurship teaching based on the existing professional curriculum and teaching system. We examined the goals of developing a teaching system for horticulture students' entrepreneurial competence training, and we summarized the entry points for horticulture students' entrepreneurial competence training. We discovered that in curriculum design, teachers should pay more attention to leading and engaging students in entrepreneurial thinking, and that entrepreneurial competency training for team students with goals and targets should be provided.

• Received: 29 March 2022 • Revised: 23 April 2022 • Accepted: 10 May 2022 • Published Online: 6 June 2022

Introduction

The "Guidance on Further Supporting College Students' Innovation and Entrepreneurship" was issued by the General Office of the State Council in 2021, claiming that college students are the driving force behind mass entrepreneurship and innovation (China Human Resources Social Security, 2021). The continual promotion of China's agricultural and rural modernization projects has raised the bar for "New Agricultural Science" professionals.

The "New Agricultural Science" talents, who are expected to be persistent entrepreneurs and pioneers, should possess not only wide "Agricultural Science"

basic knowledge, humanistic cultivation, and professional knowledge and abilities, but also innovative consciousness and entrepreneurial spirit (Cao, 2022; Chen et al., 2021). Current teaching research focuses on deepening college and university reforms in innovation and entrepreneurship education, carrying innovation and entrepreneurship education through the entire talent cultivation process, and establishing a new model of talent cultivation oriented to innovation and entrepreneurship.

The state, province, and university all spend a lot of money to encourage college students' innovation and business ventures. Hubei Province invests a significant amount of money and funds numerous entrepreneurship

support projects for college students annually in order to further promote college students' innovation and entrepreneurship, deepen the "mass entrepreneurship and innovation" plan, implement the "talent gathering Jingchu" project, and encourage and support more college students' innovation and entrepreneurship in Hubei. The government will provide 100,000 yuan in business subsidies to college students in Zhejiang Province who are engaged in modern agriculture business. The government will also provide business failure loans on behalf of the repayment (Han, 2017; Bulletin of Hubei Provincial People's Government, 2021).

Horticultural Product Storage and Processing and the Introduction of Modern Biotechnology were elevated to required courses in the Ministry of National Education's undergraduate talent training standards for horticulture majors, which also required students to improve their knowledge storage in horticultural commodity quality testing and product marketing.

The composition and concentration of horticulture majors' education should align with the needs of the local industrial chain. Meanwhile, as smart agriculture and big data technology advance, horticulture majors' key skill needs are shifting. Graduates should be able to engage in modern horticulture production, information management, urban horticulture enjoyment, and modern agricultural business system management, according to the requirements of the industrial chain (Li et al., 2020; Yu et al., 2021; Han et al., 2022). In the vision of innovation and entrepreneurship, it is necessary to establish a new talent training and curriculum system through cultivation and practice.

Through the establishment, tracking, training and investigation of entrepreneurship virtual class, this paper explores the overall design of bringing entrepreneurship education into the cultivation scheme of horticultural professionals, constructs a three-dimensional and multi-dimensional entrepreneurship training teaching system, improves the training of professional teachers' understanding of entrepreneurship activities, effectively stimulates students' entrepreneurial potential, develops students' personality, and truly embodies the student-oriented teaching concept.

The construction target of the horticulture students' entrepreneurial training teaching system

The way students participate in their teachers' research projects at the undergraduate level, as well as the fact that the undergraduate horticulture education system itself focuses on experimental and practical instruction, make it reasonably easy to cultivate innovative abilities. However, there are numerous issues in entrepreneurship education, such as teachers' professional values influencing students' professional values and career choice orientation, affecting students' willingness to start a business; a lack of instructors' personnel or ability; the difficulty of learning interdisciplinary knowledge; the selection of entrepreneurial projects and the accumulation of original capital; personnel composition, and so on. Because of these issues, developing entrepreneurial abilities is extremely challenging (Chen et al., 2020).

The horticulture major has a relatively mature talent training curriculum framework due to its long history (Zhang et al., 2009). As a result, we integrate the entrepreneurship theory and practical teaching system, cultivate solid horticultural professional knowledge skills, social etiquette, and humanities and social science knowledge, guide students to practice entrepreneurship, and build a more scientific and perfect entrepreneurial talent training system for horticulture majors on the basis of the existing professional curriculum and teaching system. It is done in three stages to reach this purpose.

In the first stage, we change the views of professional teachers and students on entrepreneurship, broaden their entrepreneurial vision, find appropriate ways and means of entrepreneurship, and lay the foundation for the formation of entrepreneurial teams, with the help of the horticulture introduction course and the entrance education of new students, through lectures, visits, talks, and surveys. In the second stage, establish a virtual entrepreneurship class, a team of instructors, follow up and conduct questionnaire surveys, and focus on educating entrepreneurial mentors and student teams.

In the third stage, modify the syllabus, determine entrepreneurship education courses, sort out the product system unique to horticulture internships and experiments, and integrate the concept of entrepreneurship education into the talent training program using the existing teaching system.

Cultivation and practice of entrepreneurship in

horticulture

More than 30 students from each grade level, mostly horticulture majors, were chosen to create a virtual entrepreneurship class without compromising their original talent training plan. The virtual class's pupils are replaced on a regular basis, keeping the total number of students at around 30 per semester. Instructors are chosen from on-campus teachers with extensive experience in base production management and off-campus industry technical experts.

Candidate entrepreneurial directions are offered through a concentrated project introduction, allowing like-minded students and instructors to choose to engage and eventually establish entrepreneurial teams for applicable project implementation.

The main entrepreneurial activities of horticulture majors are horticultural product exhibition and sales activities, such as succulent plants and small potted plants exhibition, chrysanthemum cut flowers exhibition, hydroponic plants exhibition, holiday bouquet sales, plant specimens and handicrafts exhibition, herbaceous potted plants exhibition, *Dendranthema indicum* perfume trial session, and so on.

In the last three years, students who have consistently participated in the virtual entrepreneurship class have been awarded a total of 13 entrepreneurial projects for college students, including three at the national level and one at the provincial level.

Questionnaires were given to student groups whose main focus was entrepreneurial activity. According to the survey, 96 % of students are interested in entrepreneurship education, indicating that there is a pressing need to increase the content of entrepreneurship education in the teaching system of horticulture majors, and that entrepreneurship practice is not excluded to students of all levels of expertise (Table1).

However, the poll indicated that 62.5 % of those who expect to continue their education after receiving a bachelor's degree intend to do so, whereas 28.1 % intend to start a business after employment and no student intends to start a business directly (Table2). The percentage of students who know a lot about entrepreneurship is 71.8%, and the percentage of students who know about the relevant policies and

regulations issued by the state to support college students' independent entrepreneurship is less than 50 % (Table5), students' entrepreneurial fields are primarily focused on their own majors and industries of interest and most of the entrepreneurial teams are about 3-10 people. Insufficient knowledge reserve, unclear policy understanding, scarcity of cash, unclear entrepreneurial orientation, no technical support, difficulty to build the market, and inability to generate a profit are the most common challenges within entrepreneurial teams in cooperative entrepreneurship (Table4).

Around 70% of students believe that existing entrepreneurship-related courses emphasize theoretical knowledge over practical training, and roughly 38% believe that these courses are not integrated with practice and that they cannot use what they have learned to their own business ventures.

Students' main recommendations for entrepreneurship-related courses include: assisting students in forming entrepreneurial teams for small-scale entrepreneurial activities and cultivating entrepreneurial thinking, combining practice as much as possible to solidify professional knowledge and provide useful guidance, beginning to promote entrepreneurship knowledge as early as possible to facilitate the long-term development of entrepreneurial teams, and strengthening professional skills and cultivating entrepreneurial abilities.

The following are the main issues that entrepreneurial teams face when it comes to continuous project tracking: a lack of a continuous profitable operation mechanism, difficulties in management and knowledge, the need to expand customers and markets, a lack of professional guidance, a lack of a location, a lack of a continuous product, and products that need to be expanded and upgraded (Table3).

Entry point for entrepreneurship education in horticulture

Because horticulture majors differ from pure scientific and technology majors, entrepreneurship education should match the features of the majors based on a combination of professional courses rather than applying the cultivation style of science and technology majors to students.

Elements of entrepreneurship are added to the professional curriculum in a targeted manner in the

training process of horticulture students, based on the characteristics of teachers and students of horticulture

majors, to increase the nurturing of entrepreneurship for students.

Table 1. Students' interest in entrepreneurship education.

Great interest	37.50%
A little interest	59.38%
No interest	3.12%

Table 2. Students' plans after graduation

Further study	62.50%
Employment before Entrepreneurship	28.13%
Take the civil service examination	6.25%
No other plans for direct employment	3.12%
Start a business	0%

Table 3. Main problems encountered by students in entrepreneurship

Insufficient knowledge base	75%
Unclear policy understanding	50%
Financial constraints	65.63%
The unknown of direction of entrepreneurship	59.38%
No technical support	37.50%
Difficult market	56.25%
Unprofitable situation	37.50%

Table 4. Problems encountered by students' entrepreneurial team cooperation

Unclear division of work	63.16%
Communication problems	42.11%
Uneven distribution of benefits	15.79%
Unclear division of responsibilities and rights	63.16%
Other	5.26%

Table 5. Students' understanding of relevant policies and regulations issued by the state to support college students' independent entrepreneurship

Regular attention, very clear	6.25%
Occasional attention, clear	34.38%
No active attention, understand a little	56.25%
No idea at all	3.12%

The entrepreneurship team's follow-up indicated that there are numerous courses in the present horticulture teaching system that can be integrated into entrepreneurship education or provide circumstances for entrepreneurial activity. Experiments and internships in Botany, for instance, can supply students with plant specimens and artifacts. We can incorporate the collection and sorting of plant materials, as well as the creation of leaf vein bookmarks, into practical education. The production, combining, and use of small potted plants can be incorporated into the theoretical and practical teaching of Ornamental Horticulture and Creative Cultivation of Urban Horticulture. These

courses are available early in the school year and can help students launch their own business. Horticultural Product Quality and Testing, Horticultural Product Storage and Processing, Urban Horticultural Commodity Theory, Facility Horticulture, and Floral Art Design are all subjects that can lead to service-based entrepreneurship as well as direct entrepreneurial products like jams, bouquets, and perfumes. Professional teachers should concentrate on multidisciplinary crossover and integration, current and future trends in the horticultural industry, the application and prospects of horticultural technology in production, opening students' minds, broadening their

horizons, and stimulating their active entrepreneurial consciousness when teaching. More emphasis should be placed in the course design on guiding and inspiring students to think entrepreneurially.

The nurturing and direction of entrepreneurial teams is critical for the development of horticulture students' entrepreneurial capacity, and there should be goals and targets in place to give project guidance, knowledge training, and increase the team students' continuous operating capacity.

The entrepreneurship theory and practice teaching system should be integrated into the existing professional curriculum and teaching system for horticulture students' entrepreneurship training. More emphasis should be made to the coaching and motivation of students in entrepreneurial thinking when designing the curriculum. Guidance should be given to students in a targeted and purposeful manner in order to promote their active entrepreneurial consciousness during the process of building their entrepreneurial aptitude.

Conflict of interest statement

The authors declare that there is no conflict of interest regarding the publication of this article.

Project Grant

The present study was supported by "Cultivation and Practice of Entrepreneurial Ability of Horticulture Students in the Perspective of Innovation and Entrepreneurship", Teaching Research Project of Yangtze University, No. JY2018051

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How to cite this article:

Yao, Z., Hou, S., Wu, L., Zhao, Y., Liu, C., 2022. Cultivation and practice of entrepreneurial ability of horticulture students in the perspective of innovation and entrepreneurship. *Int. J. Curr. Res. Biosci. Plant Biol.*, 9(6): 1-5. doi: <https://doi.org/10.20546/ijcrbp.2022.906.001>