

# Establishment of a Video Course System for the “Horticulturist Practical Training” Program

Tian Ji

Beijing University of Agriculture, Beijing, 102206, China

**Abstract:** To meet the cultivation requirements for interdisciplinary horticultural professionals under the framework of the “New Agriculture” initiative, this study relied on the nationally recognized first-class undergraduate horticulture program at Beijing University of Agriculture to develop and promote a “Horticulturist Practical Training Video Course System.” The objective was to overcome the spatial and temporal limitations of traditional practical training, update teaching content, and strengthen innovation and entrepreneurship education. A three-level evaluation framework (graduation requirements–course support–content alignment) was adopted, integrating three main approaches: curriculum system analysis, core faculty-led video production, and modular course design. A practical pathway of “investigation and design → recording and optimization → feedback and application” was implemented. Pilot applications were carried out in the university’s experimental teaching demonstration center and municipal-level training bases, with outcomes assessed through questionnaires, classroom observation, and learning behavior data. The main results showed that: (1) a modular and shareable training video library was established, covering both traditional core skills and new “New Agriculture” modules such as smart greenhouse operation and rapid quality detection of horticultural products; (2) online sharing of teaching resources significantly increased students’ self-directed learning frequency and skill proficiency (supported by questionnaire data and improved assessment scores); (3) the “mentorship-based” video production model enhanced young teachers’ instructional capabilities and digital teaching literacy; and (4) by embedding innovation and entrepreneurship cases, students’ creative thinking and project implementation abilities were substantially strengthened. Based on these practical outcomes, three transferable strategies are proposed: expanding new-industry modules, establishing a dynamic course updating mechanism, and deepening intercollegiate and university–enterprise collaboration. In conclusion, this video course system serves as a demonstrative model for reforming practical teaching in urban horticulture, with significant value and potential for improving teaching quality, supporting regional industry development, and cultivating interdisciplinary talent.

**Keywords:** Horticulture Video Course; New Agriculture; Teaching Reform

## 1. Introduction

With the advancement of the rural revitalization strategy and the rapid development of smart agriculture, China’s Ministry of Education launched the “New Agriculture” initiative, requiring agricultural universities to align talent cultivation with industrial demand and to strengthen practical teaching and innovation–entrepreneurship training [1]. Regarding the trend toward video-based practical instruction, Wang Li and Zhang Wei [2] analyzed the construction of university open video courses and pointed out that, although agricultural disciplines have shifted from a focus on “quantity accumulation” to “quality improvement,” the proportion of practical operation–oriented video content remains low. Zhang Yanjie and Zhao Ming [3] further proposed that, under the “New Agriculture” framework, horticultural practical teaching should enhance university–enterprise collaboration and interdisciplinary integration to strengthen students’ innovation and entrepreneurial capacities.

Although the Horticulture Department of Beijing University of Agriculture has already established a “3+1” practical teaching model and a “five-in-one” curriculum system, there remain shortcomings in the coverage of new industrial topics, alignment of curricula with actual industrial demand, and the construction of innovation–entrepreneurship platforms. This study addresses these gaps by applying a three-level evaluation framework (“graduation requirements–course support–content alignment”) to determine the priorities for video course development and implementing a closed-loop practical model of “investigation and design–recording and optimization–feedback and application.” Furthermore, the

study integrates modular video resources with a “mentorship-based” faculty development mechanism to simultaneously enhance students’ autonomous learning and improve young teachers’ instructional design abilities, ultimately forming a replicable and scalable model for urban horticultural education.

## 2. Current Situation Analysis

Since the implementation of the Undergraduate Teaching Quality and Teaching Reform Project in Chinese higher education, high-quality open video courses have become a core component of national open education resources. By leveraging modern information technology, these courses transcend the spatial and temporal constraints of traditional classrooms, enabling cross-institutional and cross-regional sharing of premium teaching resources. They play a vital role in improving teaching quality and promoting educational equity [2].

At present, the development of video courses in Chinese universities has shifted from quantitative expansion to qualitative enhancement. However, there remains considerable room for improvement in agriculture- and forestry-related disciplines, particularly in hands-on training courses. Specifically: (1) most content still focuses on theoretical instruction, with limited representation of practical training videos; (2) course topics are biased toward traditional cultivation techniques, with insufficient coverage of emerging areas such as smart agriculture and urban horticulture; and (3) the lack of a dynamic updating mechanism makes it difficult for current resources to keep pace with rapid technological advances in the agricultural industry [4].

Relying on the National Experimental Teaching Demonstration Center for Plant Production and municipal off-campus practice bases, the Horticulture Program at Beijing University of Agriculture has carried out a comprehensive reform of teaching methods by integrating the rapid development and practical needs of the capital’s horticultural industry [5]. This reform emphasizes heuristic and participatory teaching approaches, leading to the establishment of an innovative teaching model that combines teacher guidance with student-centered learning.

In this new model, teachers are no longer mere transmitters of knowledge but act as mentors and facilitators, encouraging students to think critically and explore independently. Meanwhile, students have transitioned from passive recipients to active participants in the learning process, taking greater initiative in classroom engagement and knowledge construction.

This pedagogical transformation has greatly enhanced students’ motivation and initiative, making them more engaged and self-directed in their studies. Moreover, it has significantly improved their independent learning, analytical thinking, and problem-solving abilities, providing a solid foundation for their future professional development. Through this innovative educational practice, students not only acquire solid disciplinary knowledge but also develop comprehensive competencies for lifelong learning and creative problem-solving.

### Existing Problems:

(1) Spatial and temporal limitations of practical training: Traditional on-site training relies heavily on specific venues, seasons, and personnel, making it difficult to accommodate flexible learning needs and multi-cohort teaching arrangements.

(2) Insufficient integration of emerging agricultural technologies: The curriculum still focuses primarily on conventional production techniques, with limited inclusion of modern technologies such as smart greenhouses, sensor-based monitoring, and data-driven decision-making. This gap has led to a mismatch between students’ skills and industry requirements.

(3) Inadequate interdisciplinary integration: The organic combination of general education—such as law, marketing, and design—with professional horticultural skills remains insufficient, resulting in students lacking the interdisciplinary knowledge structure required for employment in the modern agricultural sector.

(4) Weak innovation and entrepreneurship training platforms: Current practical courses emphasize procedural imitation rather than project-based learning oriented toward real-world industrial problems. This limits students’ innovation capacity and their ability to transform practical projects into tangible outcomes.

(5) Limited digital teaching capacity among instructors: High-quality course development depends largely on a small group of core faculty members, while the participation and instructional design skills

of younger teachers need to be further strengthened.

### 3. Countermeasure Analysis

#### 3.1 Deepening the Integration between Professional Education and Industry Needs

The traditional curriculum system in horticultural education has primarily focused on “production technologies,” with limited coverage of emerging fields such as smart agriculture, agricultural big data analysis, and intelligent monitoring systems. To meet the urgent demand of the modern horticultural industry for technically skilled professionals equipped with advanced technological knowledge and practical competence, the curriculum must be restructured to bridge the gap between talent cultivation and industrial needs.

A three-tier modular framework should be established—comprising *fundamental skills*, *specialized skills*, and *new-industry skills*. Each module should integrate three types of resources: short videos (for operational demonstrations), micro-lectures (for theoretical explanations), and case studies (for industrial applications). By leveraging cloud-based platforms, these resources can be dynamically organized according to learning contexts and tasks, supporting asynchronous learning and the implementation of flipped classroom practices.

#### 3.2 Enhancing the Integration of General and Professional Education

The rapid development of the urban horticulture industry urgently calls for interdisciplinary professionals who possess integrated knowledge across agriculture, engineering, management, and culture. However, within the current educational framework, the integration of cross-disciplinary content—such as legal foundations, marketing strategies, and artistic design—remains limited. As a result, students often struggle to acquire a well-rounded understanding of the diverse skill sets required in modern horticultural practice.

This deficiency in curriculum design constrains the holistic development of students’ competencies, leaving them less equipped to address the complex and evolving challenges of future professional environments. Therefore, optimizing the curriculum structure and strengthening the organic integration of interdisciplinary content have become essential steps toward cultivating versatile professionals capable of meeting the demands of the urban horticulture industry.

#### 3.3 Expanding Platforms for Innovation and Entrepreneurship Training

In the current design and implementation of practical training courses, instruction often emphasizes “imitative operations,” where students learn skills primarily through replicating established procedures. While this approach effectively reinforces technical proficiency, it tends to neglect deeper exploration of emerging industries and innovative practices. Consequently, students may struggle to adapt to the rapidly evolving market environment and exhibit limited creative problem-solving capacity.

Moreover, the lack of systematic engagement with new agricultural business models and entrepreneurial scenarios results in insufficient cultivation of innovation-oriented thinking. Without structured support and guidance, students find it challenging to develop the innovative mindset and entrepreneurial competence required in real-world professional contexts. Therefore, expanding training platforms that integrate industry-driven projects, interdisciplinary collaboration, and research-based learning is essential for nurturing students’ creativity and entrepreneurship in the context of modern horticultural education.

### 4. Reform Outcomes and Discussion

#### 4.1 Optimizing the Supply of Teaching Resources

The establishment of a modular and shareable video-based training system for horticultural education effectively overcomes the constraints of traditional practical teaching models that are typically limited by fixed schedules and centralized locations. Through this innovative approach, students can engage in flexible, self-directed learning anytime and anywhere, free from temporal and spatial restrictions. This model not only greatly enhances learning efficiency but also provides strong

support for off-campus internships, remote learning, and diverse learning scenarios, ensuring that students receive high-quality practical training experiences across different environments.

#### **4.2 Enhancing Teachers' Instructional Competence**

Through the “mentorship-based” collaborative video production model, young instructors are deeply involved in the development of high-quality courses. This approach not only enables them to make substantial progress in curriculum design and pedagogical planning, but also significantly strengthens their proficiency in applying modern educational technologies. At the same time, video courses serve as an open and dynamic platform that allows teachers to showcase their teaching expertise and personal style, thereby enhancing their motivation and enthusiasm for teaching. Collectively, these efforts contribute to a sustained improvement in overall teaching quality.

#### **4.3 Strengthening Students' Comprehensive Competence**

The video content effectively integrates emerging agricultural technologies with innovation and entrepreneurship case studies, presenting them in a vivid and engaging manner. This approach enables students to master key skills in smart horticulture while simultaneously stimulating creative thinking and enhancing their problem-solving abilities in practical contexts. Moreover, the adoption of self-directed learning modules encourages students to explore and acquire knowledge independently, without constant external supervision. Such a learning model not only fosters stronger motivation and active participation, but also allows students to develop a deeper understanding and application of new knowledge. Ultimately, this process cultivates a positive attitude toward innovative teaching approaches and builds a solid foundation for their future academic and professional growth.

### **5. Conclusion**

Under the framework of the “New Agriculture” initiative, integrating modular practical training videos with industry–academia–research resources provides an effective solution to the spatial, temporal, and content limitations of traditional horticultural training. This approach not only enhances teaching flexibility and resource accessibility but also cultivates interdisciplinary professionals equipped to meet the needs of the modern urban horticulture industry. The established system is scalable and replicable, holding strong potential for promotion across the Beijing–Tianjin–Hebei region and beyond.

Looking ahead, future efforts may focus on three directions:

- (1) Enriching video course content by incorporating new horticultural models such as “*Horticulture + Livestreaming*” and “*Urban Forest Wellness*”;
- (2) Establishing a dynamic content renewal mechanism to update video materials in alignment with technological advances in the horticultural industry; and
- (3) Strengthening inter-institutional and university–enterprise collaborations to jointly build a cross-regional open video resource database, thereby promoting high-quality practical teaching and sustainable development of horticultural education.

### **Acknowledgments**

Teaching Research and Reform Project for Undergraduate Education of Beijing University of Agriculture (BUA2024YB04); 2021 Beijing Higher Education Undergraduate Teaching Reform and Innovation Project – Innovative Practice of the Urban Smart Horticulture Curriculum System under the New Agriculture Framework

### **References**

- [1] Ministry of Education of China. *Opinions on Accelerating the Construction of New Agriculture and Promoting Innovation in Higher Agricultural Education* [Z]. 2020.
- [2] Wang L., Zhang W. *Practice and Reflection on the Construction of University Open Video Courses: A Case Study of Agricultural and Forestry Disciplines*. *China University Teaching*, 2021 (5): 45–49.

- [3] Zhang Y. J., Zhao M. *Exploration of Horticultural Practical Teaching Reform under the “New Agriculture” Framework*. *Higher Agricultural Education*, 2022 (3): 78–82.
- [4] Chen C., Huang W. *Modular Design and Practice of Horticultural Practical Courses*. *Anhui Agricultural Science*, 2023, 51(10): 276–278.
- [5] Department of Horticulture, Beijing University of Agriculture. *Construction Report of the National First-Class Undergraduate Program (Horticulture), 2019–2023 [R]*. Beijing: College of Plant Science and Technology, Beijing University of Agriculture, 2023.