

Construction of the Talent Cultivation Mode of "Four-Seasons-Driving and Double-Integration Double-Upgrading"

Zhiqiang Li^{a*}, Zhaoquan Gao^b, Jian-jun Cheng^c, Xiaoyun Wu^d and Yushu Li^e

Beijing Vocational College of Agriculture, Beijing 102442, China

^a61393@bvca.edu.cn, ^b72009@bvca.edu.cn, ^c72300@bvca.edu.cn, ^d70216@bvca.edu.cn, ^e80907@bvca.edu.cn

** Corresponding author*

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Abstract: At the Beijing Vocational College of Agriculture, a talent cultivation mode for the horticulture technique specialty group, which is featured by "four-seasons-driving and double-integration double-upgrading", has been innovatively constructed. The teaching contents are arranged according to the laws of plant growth and agricultural production activities in the four seasons. This talent cultivation mode can comprehensively upgrade the students' professional skills and occupational qualities through production-education integration and books-certificates integration. Thus a new talent cultivation mode that plays an equal emphasis on virtues vs. skills and work vs. learning is formed. Under this new talent cultivation mode, the projectized curriculum system for the specialty group is constructed based on the job capacity requirements. Specialized courses featured by the consistency of concepts and connectivity of contents are developed. Deep integration of production and education is realized with the supports from the Engineering Institute, and the Hu Ge mode is advocated during the teaching activities. Teaching reform is carried out on a broad scale based on the vocational education concept of "production-education integration and work-learning combination". Project-based teaching is organized by building an integrated team of teachers, classifying students into groups, and content modularization, to ensure teaching effectiveness. A diversified evaluation system for teachers, students and enterprises is perfected to cultivate skilled talents with both virtues and techniques.

1. Introduction

The construction projects of High-Level Vocational Schools and Specialties with Chinese Characteristics are another major initiative with strategic importance after the Construction of Demonstrative National Model Higher Vocational Colleges [1,2]. The horticulture technique specialty group of Beijing Vocational College of Agriculture was listed as the national class-A key construction specialty group in 2019. The horticulture technique specialty group consists of four

specialties: horticulture technique, gardening technique, environmental art design, and protected agriculture and equipment. This specialty group is mainly intended to cultivate composite high-end skilled talents oriented towards modern urban agriculture construction. Beijing's 13th Five-Year Plan advocated the "development of modern urban agriculture", that is, an agriculture integrating ecology, production, and life [3]. In 2018, the planting industry's output value, dominated by the horticultural production and forestry industry, accounted for 70.7% of agriculture's total output value. The employees of the planting industry accounted for 80.9% of the total agriculture-related employees. With the horticulture technique at its core, the industrial cluster has become a pillar of Beijing's modern agriculture. This new industrial format has also been emerging constantly in other cities. In 2018, the land use of Beijing's horticulture industry was over 3 million mu, and plain forestation of over 1.2 million mu was completed. There were over 3,500 horticulture enterprises, over 2,300 landscaping enterprises, and over 2,000 medium- and large-scale decoration and design enterprises in the same year. The transformation and upgrading of horticulture and forestry industries dictate a need for a greater number of high-skilled talents. The horticulture technique specialty group can satiate the demand for Beijing's modern agricultural development. Our college has innovatively created a novel talent cultivation mode to promote the comprehensive construction of a high-level horticulture specialty group, elevate the qualities of the horticulture specialty group talents, and fuel Beijing's modern agricultural development. These measures are essential for building a horticulture technique specialty group with distinctive features of modern urban agriculture and play a leading and exemplary role in the specialty construction of China's similar colleges.

2. Results

2.1. Positioning of the Specialty Group

The horticulture technique specialty group has the horticulture technique (modern agronomy) specialty at its core and gardening technique, environmental art design, and protected agriculture and equipment as the three pillars. This specialty group is highly tailored to Beijing's urban agricultural development demands (Fig. 1). The four specialties in the specialty group share similar basics and technical domains. The occupational posts are intercorrelated, and the teaching resources are shared between the specialties [4]. Horticulture technique specialty cultivates skilled talents proficient in plant landscaping, production management, and creativity operation, who work at stock breeding, horticulture product manufacturing and creative agriculture enterprises in the urban horticulture production sector. Gardening technique specialty cultivates skilled talents proficient in design, construction and maintenance, who work at green space maintenance, landscaping and seedling breeding enterprises in the urban forestry sector; environmental art design specialty cultivates skilled talents proficient in hand drawing, plant arrangement and art design, who work at urban home gardening, exhibition agriculture, and agricultural craft enterprises; protected agriculture and equipment specialty cultivates skilled talents proficient in innovative product design, assembly and debugging, management, operation & maintenance, who work at the equipment design, equipment research & development, and high-end horticultural production enterprises in the modern agriculture sector. The horticulture technique specialty group mainly corresponds to the industrial clusters of urban horticulture, urban forestry, home gardening, and facility horticulture, all of which represent the future development trends of urban agriculture. The horticulture industry is a leading industry of the agricultural sector in Beijing, which guarantees food safety of Beijing. Landscaping supports ecological construction and habitable city construction; home gardening offers services related to urban family life; facility horticulture is an emerging category of modern

horticultural production.

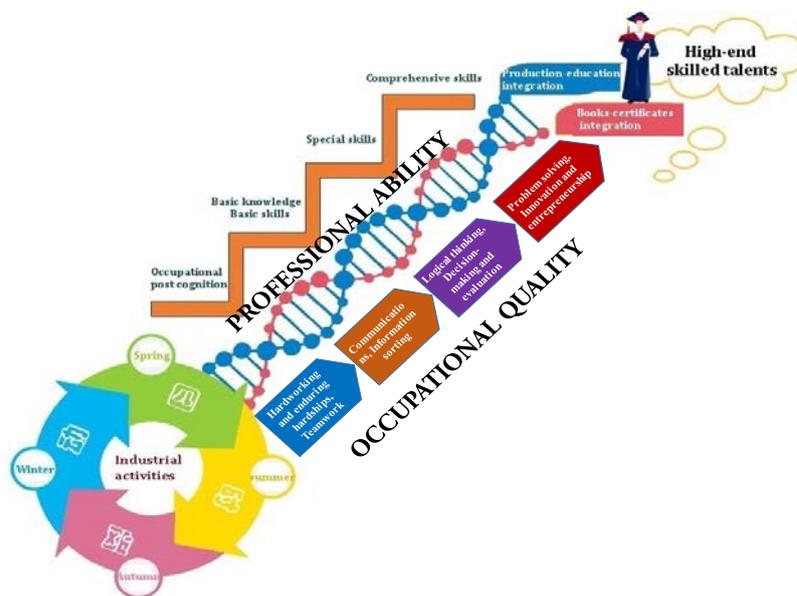


Figure 1: Schematic of the talent cultivation mode of "four-seasons-driving and double-integration double-upgrading".

2.2. Talent Cultivation Mode of "Four-Seasons-Driving and Double-Integration Double-Upgrading"

The horticulture technique specialty group serves the overall needs of Beijing as "four centers". Also, it satisfies the requirements for realizing the "ecology-, life-, and production-related" goals of modern urban agriculture. This specialty group aims to elevate the talent qualities and cultivate the professional skills and sustainable development ability of students[1]. We have developed the talent cultivation mode of "four-seasons-driving and double-integration double-upgrading" based on the vocational education concepts of production-education integration and work-learning combination[5-7], and the occupational post demands and vocational education features of the horticulture technique specialty group[8,9] (Fig. 1). The teaching contents are arranged according to the plant growth laws and agricultural production activities in the four seasons. This talent cultivation mode can comprehensively upgrade the students' professional skills and occupational qualities through production-education integration and books-certificates integration. Thus a new talent cultivation mode that plays an equal emphasis on virtues vs. skills and work vs. learning is formed.

A projectized curriculum system, where different courses share similar basics while having distinctive features, is constructed based on the analysis of the occupational ability demands on students. The school, enterprises, and enterprises jointly undertake the task of learning transformation and determine the contents of projectized teaching of the specialty group. Professional skill training is mainly undertaken by the Engineering Institute and bases inside and outside the school. Projectized teaching is implemented to cultivate students' comprehensive ability in a stagewise manner. The credit-based evaluation system is built and perfected, where credits are assigned to military training, virtues, curriculum, practical training, internship, and competitions [4-10].

2.3. Operation of the Talent Cultivation Scheme of "Four-Seasons-Driving and Double-Integration Double-Upgrading"

Teaching activities driven by plant growth laws in four seasons and enterprises' annual production activities are constructed with supports from China Urban Agriculture Vocational Education Group, Engineering Institute and renown enterprises. The students' professional skills and occupational qualities are upgraded through production-education integration and books-certificate integration. Teaching is implemented following the talent cultivation mode of "four-seasons-driving and double-integration double-upgrading", with a dual emphasis on virtues and techniques and the involvement of both the school and enterprises for talent cultivation.

During the teaching process, the cultivation of comprehensive vocational ability is the central task. Using the advanced Hu Ge teaching model[11] and according to the actual working process, the teaching is organized by alternating between work and learning. Under the guidance of dual tutors (that is, a full-time teacher and part-time teacher from the enterprises), the students are expected to achieve stepped, progressive progress in the sequence of "occupational post cognition → basic knowledge → professional skills → post-specific skills → comprehensive skills of the post".

2.4. Construction of the Specialty Group Curriculum System Integrating the "1+X" System

The "1+X" certificate system is first proposed in the Implementation Plan of National Vocational Education Reform[12]. The occupational post ability demands on students of the horticulture technique specialty group are analyzed. Then, under the talent cultivation mode of "four-seasons-driving and double-integration double-upgrading", the goals and standards of talent cultivation are determined. The standards laid down by the occupational grade certificate are introduced into the curriculum. We have established the specialty group curriculum system consisting of public elementary courses, general elementary courses of the specialty group, and general skill courses of the specialty group, which share similar basics while having respective features. This is a specialty group curriculum system featured by books-certificates integration.

The credit-based system is perfected, and the transformation mechanism between the "X" certificate and credits is constructed. That is, the "X" certificate is mutually transformable with credits [13]. Therefore, a bridge is created between "1" and "X", and a road is paved for the growth of skilled talents (Fig. 2).



Figure 2: A books-certificates integration cultivate system incorporating the "1+X" certificate system

2.5. Construction of a Student Evaluation System Based on Work Performance

A new student evaluation system is built with the students' comprehensive qualities at the core and the extensive development of their knowledge, capacity and qualities as the goal[14]. This system is based on the national occupational standards and post standards of enterprises. Through school-enterprise cooperation, this student evaluation system has the following features: pluralism of evaluation subjects (teachers+ enterprises+ students), diversification of evaluation methods (diagnostic evaluation+ formative evaluation+ summative evaluation), diversification of the evaluation contents (basic qualities+ general ability+ professional ability+ ideological and ethical qualities), and diversification of evaluation results (grading+ hundred mark system+ descriptive evaluation) (Fig. 3).

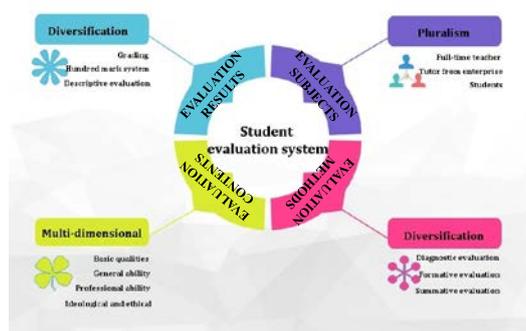


Figure 3: Schematic of the student evaluation system

2.6. Construction of an Innovation and Entrepreneurship Education System Involving Full-Staff Participation

The innovation and entrepreneurship education system involving full-staff participation is built through the national innovation and entrepreneurship platform, curriculum, skills competitions, with innovation and entrepreneurship competitions and student clubs as carriers, and a team of teachers providing innovative services supports. Students' innovative and entrepreneurial abilities are cultivated through extended courses and optional courses on career planning and innovation and entrepreneurship. Furthermore, skills competitions, innovation and entrepreneurship competitions, student clubs of innovation and entrepreneurship, and credit recognition mechanism for innovative and entrepreneurial practice and skills-level competitions are organized (Fig. 4) to arouse the students' awareness of innovation and entrepreneurship[15].



Figure 4. Innovation and entrepreneurship education system of the specialty group

3. Conclusions

The new business format of modern urban agriculture is featured by the integration of the three industries, production, life and ecology. Under this context, constructing a specialty group centered around the horticulture technique has become the overall goal of building a domestic leading specialty group of higher vocational education with distinctive features. The talent cultivation mode of "four-seasons-driving and double-integration double-upgrading" based on the vocational education concepts of production-education integration and work-learning combination was innovatively constructed by the Beijing Vocational College of Agriculture. The talent cultivation mode of "four-seasons-driving and double-integration double-upgrading" provides important guidance for carrying out specialty group construction, supporting the development of modern urban agriculture, and leading the high-quality development of vocational education in the new era.

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