

# *Development and Optimization of the Talent Training Mode in Higher Vocational Colleges Based on the '1+X' Certificate System*

**Jiangting Liu, Hongzhu Long**

*Chongqing City Vocational College, Yongchuan, 402160, China*

**Keywords:** "1+X" certificate system, higher vocational colleges, apprenticeship, talent training

**Abstract:** This article explores the innovative construction of the talent training mode in the industrial robotics specialty of higher vocational colleges, taking exemplary schools with excellent modern apprenticeship programs as examples, from the perspective of the "1+X" certificate system. By integrating the "1+X" certificate system with modern apprenticeship, the maximum utility of the system is realized. Practical optimization suggestions are proposed from multiple perspectives such as curriculum system, evaluation system, and school-enterprise cooperation, providing new ideas for improving the quality of talent training.

## **1. Introduction**

With the rapid development of the Chinese economy and the transformation of its economic structure, the demand for high-skilled talents is increasing. However, the employment rate of graduates from higher vocational colleges in China is relatively low. At the same time, enterprises face challenges in recruiting skilled workers and high labor costs. The modern apprenticeship system in higher vocational colleges has emerged as a new talent training model, which combines theoretical teaching with practical training to provide skilled and highly proficient talents for enterprises. However, there are still certain issues in the implementation of the modern apprenticeship system. Therefore, it is urgent to further improve the modern apprenticeship system.

## **2. Theoretical Overview**

### **2.1. "1+X" Certificate System**

The "1+X" certificate system refers to the introduction of industry-recognized vocational qualification certificates in higher education, where students not only obtain a degree certificate but also need to acquire a certain number and quality of vocational qualification certificates. The numeral "1" represents the degree certificate, while "X" represents the optional number and types of vocational qualification certificates.

The purpose of the "1+X" certificate system is to improve the quality of higher education and promote students' career development. By studying and obtaining vocational qualification certificates,

students can gain more skills and experiences beyond their academic knowledge, laying a better foundation for their future career development.

From the perspective of educational supply-side, the "1+X" certificate system can optimize the allocation of educational resources and promote transformation and upgrading. By guiding universities and vocational education institutions to adjust enrollment plans and curriculum offerings based on market demands, it can better meet the society's needs for high-skilled talents. Moreover, it can promote the transformation and upgrading of universities, enhancing the quality and level of education.

In summary, the "1+X" certificate system is an important institutional arrangement that improves the quality of higher education, promotes students' career development, and advances the transformation and upgrading of universities. With the increasing demand for high-skilled talents in the country, the "1+X" certificate system will play an increasingly important role in future development.

## 2.2. Modern Apprenticeship Talent Training Mode

The modern apprenticeship talent training mode is a talent training model that places students in real workplace environments, allowing them to learn and master practical skills through practical experience. This mode mainly consists of three stages: initial training, workplace practice, and post-guidance.

In the initial training stage, students receive theoretical training, including explanations and demonstrations of relevant skills and knowledge, as well as basic experimental operations. In this stage, students acquire necessary theoretical knowledge and skills, preparing them adequately for workplace practice.

During the workplace practice stage, students enter real workplace environments for practical operations. Through interactions, collaborations, and learning from professionals and managers within the company, they gradually acquire the practical operational skills and experience required in the workplace.[1]

In the post-guidance stage, students receive guidance and counseling within the company, including improving vocational skills, cultivating professional ethics, and enhancing practical capabilities. Simultaneously, students also receive guidance and counseling from the university, including supplementation of theoretical knowledge, career planning, and development advice.

The modern apprenticeship talent training mode has certain advantages in talent development. Firstly, this mode combines students' learning with practical experience, enabling them to better integrate into the workplace and improve their employability. Secondly, through contact and learning in actual workplaces, students can better understand the needs and trends of the job market, laying a better foundation for their future career development. Finally, the modern apprenticeship talent training mode strengthens the cooperation between universities and enterprises, enhancing the quality and level of education in universities, while also meeting the demand of enterprises for training high-skilled talents.

In conclusion, the modern apprenticeship talent training mode is a talent training model that places students in real workplace environments, allowing them to learn and master practical skills and experiences required in the workplace. This mode better meets society's demand for high-skilled talents, enhances students' employability, and promotes cooperation and communication between universities and enterprises.[2]

### **3. Relationship between the "1+X" Certificate System and Modern Apprenticeship**

#### **3.1. Common Goals**

Both the "1+X" certificate system and the modern apprenticeship aim to cultivate versatile high-skilled talents. The "1+X" certificate system effectively combines academic education with vocational training. Students can acquire various vocational qualification certificates while obtaining their academic degree certificates, which serve as important criteria for assessing their skill levels. A diverse talent evaluation system helps combine theoretical knowledge with practical skills, enhancing the quality of talent training. The modern apprenticeship talent training mode emphasizes students' practical operations in real workplace environments and their gradual mastery of practical skills and experience through interactions, collaborations, and learning from professionals and managers within the company, thereby improving the versatility of talents.

#### **3.2. Complementary Relationship**

The "1+X" certificate system and modern apprenticeship also complement each other. In the "1+X" certificate system, students can gain a better understanding of the job market's demands and trends through the acquisition of vocational qualification certificates during their learning process. They gradually acquire practical operational skills and experience required in the workplace through practical operations. The modern apprenticeship adopts a traditional apprenticeship training model, where students enhance their professional technical abilities through on-the-job practical projects with mentorship.[3] Therefore, the "1+X" certificate system and modern apprenticeship can complement each other, actively promoting the cultivation of students' vocational skills and practical abilities in different ways.

#### **3.3. Integration Possibilities**

The "1+X" certificate system and modern apprenticeship can also be integrated with each other. In the "1+X" certificate system, the vocational qualification certificates can be organically integrated with the modern apprenticeship talent training mode, leveraging their respective strengths. For example, students participating in the modern apprenticeship talent training mode can gradually master practical operational skills and experience required in the workplace through practical operations. Based on this foundation, they can further obtain vocational skill certifications by taking examinations for vocational qualification certificates. Similarly, after obtaining vocational qualification certificates, students can further enhance their practical operational capabilities and workplace experience through participation in the modern apprenticeship talent training mode.

### **4. Advantages of the Organic Integration of the "1+X" Certificate System and Modern Apprenticeship**

#### **4.1. Meeting the Market Demand for High-Skilled Talents**

The development of the modern economy has led to an increasing demand for high-skilled talents. Traditional educational models often struggle to meet the market's demand for such talents. However, the organic integration of the "1+X" certificate system and modern apprenticeship enables students to closely align their learning process with the job market, actively participate in vocational practice, better understand the market demand and trends, enhance their employability, and meet the market's demand for high-skilled talents. In the "1+X" certificate system, vocational qualification certificates

are industry-recognized credentials. By acquiring vocational qualification certificates, students gain a better understanding of the market demand and trends. The modern apprenticeship talent training mode allows students to gradually acquire the practical operational skills and experiential knowledge required in the workplace through interactions, collaborations, and learning from professionals and managers within the company, thus nurturing high-skilled talents that can meet the needs of the job market.

## **4.2. Enhancing the Quality and Level of Higher Education**

Traditional educational models predominantly focus on theoretical knowledge, often neglecting the development of practical skills. In contrast, the modern apprenticeship talent training mode enables students to gradually acquire the practical operational skills and experiential knowledge required in the workplace through interactions, collaborations, and learning from professionals and managers within the company, nurturing high-skilled talents that can meet the needs of the job market. The organic integration of the "1+X" certificate system and modern apprenticeship contributes to improving the quality and level of higher education. By guiding universities and vocational education institutions to adjust enrollment plans and curriculum offerings based on market demand, the system better meets society's demand for high-skilled talents. Meanwhile, enterprises provide practical environments and opportunities for students to gain hands-on experience and receive career guidance, while universities provide theoretical support and learning guidance, enabling students to better grasp the practical operational skills and experiential knowledge required in the workplace.

## **4.3. Promoting Collaboration between Higher Education Institutions and Enterprises**

The implementation of the modern apprenticeship talent training mode requires close collaboration between higher education institutions and enterprises. Enterprises provide practical environments and opportunities for students to gain hands-on experience and receive career guidance. Universities provide theoretical support and learning guidance to students. Furthermore, the "1+X" certificate system can facilitate collaboration between higher education institutions and enterprises. By acquiring vocational qualification certificates, students gain a better understanding of the market demand and trends. Enterprises can also collaborate with universities to provide feedback on their own needs and market dynamics, promoting collaboration and communication between higher education institutions and enterprises.

# **5. Construction and Optimization Strategies for the Modern Apprenticeship Talent Training Mode in Higher Vocational Colleges based on the "1+X" Certificate System**

## **5.1. Curriculum System Optimization Strategies**

### **5.1.1. Competency-Oriented Approach**

Based on industry demands and the job market, determine the core vocational skills required for relevant positions in the field and design the curriculum accordingly. In the field of industrial robotics, higher vocational colleges should establish precise connections with the talent demands of the robotics and intelligent equipment industry. The higher vocational colleges should focus on positions involving the operation, maintenance, and integration of intelligent equipment systems and key components. It is essential to integrate the concepts of craftsmanship and new engineering to cultivate high-quality, multidimensional technical and skilled talents who have comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor skills. These talents should possess the

abilities of recognizing diagrams, understanding design principles, performing precise operations, proficient maintenance, integration capabilities, management skills, and teamwork. As shown in Figure 1.

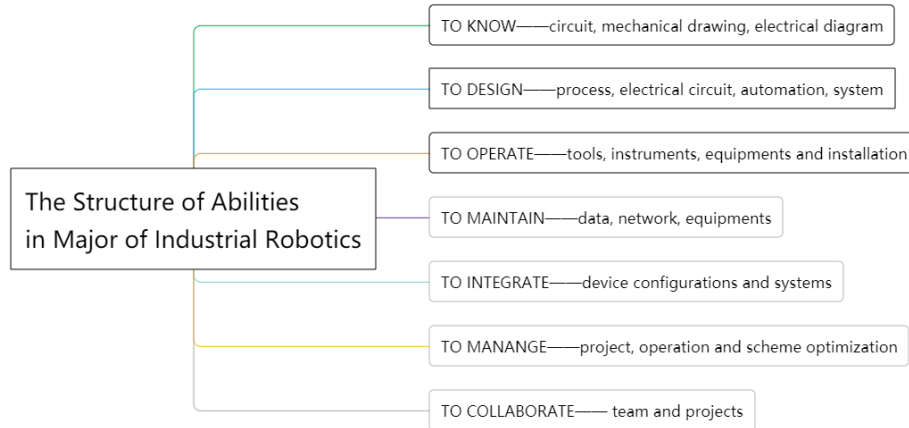


Figure 1: Professional capability structure system of industrial robots

### 5.1.2. Module-Based Curriculum Support

To meet the requirements of job adaptability and comprehensive job skills, higher vocational colleges should integrate teaching content and construct supporting curriculum modules to further clarify the teaching tasks and achieve the objectives of knowledge, skills, and qualities in the curriculum.

For the core competency requirements of the higher vocational colleges robotics field, the institution can divide the talent training content into four major modules and set up 2-4 integrated theory and practice courses as well as practical training courses to support each module. Additionally, the institution should pay attention to the reasonable arrangement of courses that align with the X certificates, ultimately aiming to cultivate high-quality technical and skilled talents in the field of industrial robotics. As shown in Figure 2.

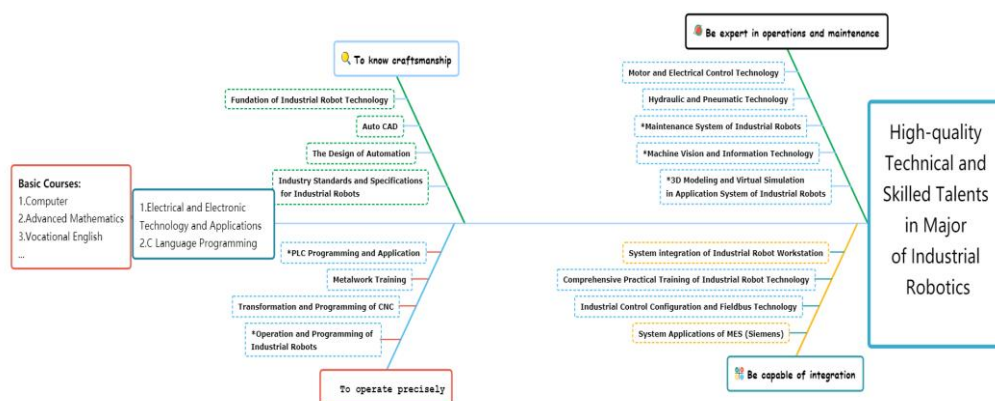


Figure 2: Professional Ability Support course for Industrial Robot

### 5.1.3. Strategy of Practical Teaching as the Main Focus

The integration of theoretical knowledge and practical application is crucial for students' competency development. By incorporating methods such as increasing practical courses, internships, practical training, and project-based learning, students actively participate in problem-solving and

task completion in real work scenarios, fostering practical skills and problem-solving abilities. Practical teaching also provides opportunities for students to engage with enterprises, enhancing their understanding of real work environments and professional requirements.

## **5.2. Evaluation System Optimization Strategies**

### **5.2.1. Multidimensional Evaluation Indicators**

Traditional evaluation systems often focus only on students' academic achievements while neglecting other important abilities and qualities. In modern apprenticeship-based talent development models, in addition to academic knowledge, students' practical skills, innovation abilities, teamwork skills, and professional qualities should also be evaluated. Introducing evaluation indicators from different dimensions such as project achievements, practical skills assessment, and vocational skills assessment can comprehensively and objectively evaluate students' overall qualities.

### **5.2.2. Diversification of Evaluation Participants**

In addition to teacher evaluations, student self-evaluations, peer evaluations, and industry expert evaluations can be introduced. Student self-evaluations allow students to reflect on their own learning and development, helping them recognize their strengths and weaknesses and promoting self-growth. Peer evaluations, through mutual observation and communication among students, provide more authentic and objective assessments, fostering learning and cooperation among students. Industry expert evaluations can help students understand industry requirements, guide teaching practices, and promote students' professional competence and career development.

### **5.2.3. Diversification of Evaluation Methods**

Examinations are commonly used by teachers to assess students, but this evaluation method often leads to rote memorization and mechanical problem-solving, failing to achieve the desired educational outcomes. Establishing a comprehensive evaluation system that incorporates academic performance, practical skills, professional qualities, and other aspects can be achieved through written exams, practical reports, growth records, and other methods. The comprehensive evaluation should objectively and accurately reflect students' actual abilities and level of qualities, avoiding excessive reliance on any single evaluation indicator.

## **5.3. Optimization Strategies for School-Enterprise Cooperation**

### **5.3.1. Determine Cooperation Objectives and Needs**

The first step in school-enterprise cooperation is to clarify the objectives and needs of the collaboration. Schools and enterprises should jointly determine the training objectives and expectations, clearly defining the skills, knowledge, and qualities that students should possess during internships or apprenticeships. This ensures that the direction and objectives of school-enterprise cooperation are aligned, enhancing the effectiveness and value of the collaboration.

### **5.3.2. Establish Cooperation Mechanisms and Platforms**

To promote school-enterprise cooperation, schools should establish stable cooperation mechanisms and platforms. This can be achieved by setting up a school-enterprise cooperation office or department responsible for communication, coordination, and management of cooperative matters with enterprises. Establishing an information exchange platform for school-enterprise cooperation

facilitates communication and collaboration between schools and enterprises. Additionally, schools can formulate relevant policies and systems to encourage and support teachers' participation in school-enterprise cooperation, while providing necessary resources and support for the collaboration.

### 5.3.3. Deepen Cooperation in Areas and Levels

Deep-level school-enterprise cooperation can start from aspects such as curriculum design, teaching staff, practical training bases, and technical services. For example, co-developing core courses can involve schools and enterprises jointly designing and developing courses related to actual work. By incorporating practical experience and industry demands into the curriculum, students can better grasp the knowledge and skills required for actual work. Another example is building a blended teaching staff, which involves inviting industry professionals to participate in course instruction. Through real-life cases and projects, students can gain practical understanding and application of their learning, helping them better adapt to the workplace environment and requirements.

## 6. Conclusion

The modern apprenticeship-based talent development model in vocational colleges based on the "1+X" certification system has broad prospects and application space in future higher education. Only by continuously deepening and improving this model can it better adapt to the needs of the future job market and cultivate more high-quality and highly skilled talents. Overall, the construction and optimization of the modern apprenticeship-based talent development model in vocational colleges based on the "1+X" certification system require the joint efforts of vocational colleges, enterprises, and the government. It is necessary to strengthen cooperation, improve the efficiency of resource sharing, and promote the continuous improvement of talent development quality, providing a continuous stream of talent support for the economic and social development of our country.

## Acknowledgement

This article is the research result of "Research on Modern Apprenticeship Talent Training Model under 1 + X Certificate System—Taking Industrial Robot Major as an example" (Project No.: XJSK202101003).

## References

- [1] Li Weiwei, Liang Weiping, Chen Kai, Shen Xiaoping. *Exploration of the integration of the modern apprenticeship-based talent development model in the gardening major of vocational colleges with the "1+X" certification system: A case study of Guangxi Agricultural Vocational and Technical University*[J]. *Economist*, 2023(03): 225-226+229.
- [2] Chang Pingping. *Research on the modern apprenticeship-based talent development model of accounting professionals under the "1+X" certification system*[J]. *Industrial Technology and Vocational Education*, 2022, 20(06): 77-81.
- [3] Hou Bing. *Research on the modern apprenticeship-based talent development model under the "1+X" certification system: A case study of tourism management majors*[J]. *Western Tourism*, 2022(21): 87-89.