

# Research on Theory and Practice of Automation Specialty Construction for New Engineering Course

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## ABSTRACT

To train the application-oriented talents of automation major who are satisfied by enterprises, based on the two-stage group training mode of 'college training and enterprise practice', this paper explores the methods of professional education reform and professional teachers' dual qualification certification. From the perspective of teaching quality supervision and enterprise feedback, this paper obtains the satisfaction degree of enterprises on the information quality, application ability, and innovation ability of the school's personnel training. It puts forward the training mode of automation professionals for the new engineering background, and explores the education and teaching means of cultivating students' application ability, innovation ability and position employment ability, to make automation specialty close to enterprises and jobs, from a teaching mechanism that attaches importance to practice and emphasizes the cultivation of application ability.

**Keywords:** *New engineering course, Automation, Teaching reform, Construction plan*

## 1. INTRODUCTION

Based on the demand of the national regional economic development trend for the construction of new engineering, facing the urgency of the implementation of international certification for engineering specialty, to create a new intelligent application-oriented automation specialty, and to innovate the talent training mode for automation specialty, is also an exploration and practice of a new training mode derived from Practice for practice verification and practice [1,2].

First, we will deepen the integration of schools and enterprises, and implement joint training and examination. The final effect of the joint education of University enterprises should be reflected in the joint education, training and examination of University enterprises. Only by integrating enterprises into teaching, practical training and assessment, can the seamless connection between enterprises and university education be truly realized and the practicability and pertinence of talent training be achieved.

The second is to solve the problem of lack of practical cases in teaching materials. In the past teaching materials, most of them are based on theory, and few of them have practical application content. Through sorting out the achievements of new engineering construction, the achievements tested by enterprises are incorporated into the teaching materials, which is more targeted.

The third is to solve the problem that the teaching content is out of line with the research and development of enterprises. Making full use of the advantages of the new engineering construction of our university, the enterprises of colleges

and universities establish a two-way exchange system. On the one hand, they introduce the notice of rich practical work experience of enterprises to teach in Colleges and universities, on the other hand, they arrange the employed teachers to work on behalf of the enterprises. Enrich the achievements in the construction of new engineering to the teaching, and update the teaching content dynamically.

The fourth is to solve the problem of teaching mode. We will change the traditional teaching mode from teacher centered, textbook centered and lecture centered to student-centered, problem centered and discussion centered. We will apply new engineering cases to teaching, and change the individual, one-way, passive and closed learning process to collective, cooperative, active and open learning process.

The fifth, to solve the problem of weak practical ability of teachers. Due to the lack of enterprise experience, many teachers have no opportunities to participate in actual R & D, although they have a substitute. They can improve their quality by participating in new engineering practical training, experiencing the development process, and establishing a quantitative evaluation mechanism for teacher qualification certification, growth road map and excellent talent evaluation [3,4].

The sixth is to solve the evaluation method of learning effect. The basic teaching quality evaluation and guarantee system is established. Supported by 'system, procedure and standard', the refined classroom teaching management system and operation mechanism are established. It is distributed to teachers in the form of 'teaching manual'. It is targeted and instructive to solve the quality problems of teaching team and ensure the continuous improvement of teaching quality and training objectives.

## **2. TEACHING REFORM OF AUTOMATION UNDER THE BACKGROUND OF NEW ENGINEERING COURSE**

### ***2.1. Constructing the Talent Training Mode of 'Theory Practice Application of New Technology'***

Set up the education and teaching concept of 'enhancing students' information literacy, improving students' application ability, innovation ability and post-employment ability', go out of a new way of personnel training based on a perfect talent training program, with the optimization of curriculum system as the main body, with the new engineering practice throughout the whole process of talent training, which are linked and integrated.

### ***2.2. Building a 'Teaching Scientific Research Guidance' Double Teacher Team***

Taking the new engineering laboratory as the platform, teachers as experts should give guidance to the new engineering construction in the process of scheme preparation, scheme review and construction, apply the enterprise achievements to teaching in real time, ensure the synchronization of teaching and enterprise, and connect with the direction of new engineering. Through exploration, practice and summary, establish teacher qualification certification system, teacher growth road map, and detailed rules for quantitative evaluation of outstanding talents, standardize behaviors with systems, and drive the whole with typical models, so as to build a dual teacher team.

### ***2.3. Forming a Teaching Curriculum System Centered on 'Students Problems Discussion'***

Combing the achievements of new engineering construction, incorporating the achievements tested by enterprises into the teaching materials, applying the practical cases of new engineering direction to teaching, transforming the traditional teaching mode that takes teachers as the center, textbooks as the center, and lectures as the center into the teaching mode that takes students as the center, problems as the center, and discussions as the center, and transforming the individual, one-way, passive, closed learning The learning process is transformed into a collective, cooperative, active and open learning process, forming a student-centered teaching curriculum system.

### ***2.4. Construction of Progressive Practical Teaching Mechanism of 'Basic Ability Practice Special Ability Practice Comprehensive Ability Practice'***

On the basis of the existing laboratory and training platform, the intelligent teaching and experimental conditions of new engineering are introduced into the course implementation process, a 'lifelike controllable complex' practical environment close to the enterprise is established, the basic ability practice and special ability practice process are completed, to the enterprise, according to the new engineering platform, the comprehensive ability practice is completed, and an information acquisition, processing and decision-making are constructed Management, intelligent control based whole system, whole process, all factor teaching guarantee ability and practice teaching mechanism of participating in new engineering practical training and testing.

### ***2.5. Expand the Way of 'Theory Practice Test Promotion' to Train Talents***

Take the new engineering practical training platform as the 'big laboratory' of the specialty, and take the 'new engineering off campus practical teaching base' as the carrier, unblock the university enterprise connection, make the University theoretical teaching and information warfare research results get the enterprise practical test, establish a virtuous cycle of 'theoretical research - practical test - summary improvement', promote the renewal of teaching content, academic research innovation and student practice ability training, promote the spiral rise of talent training level.

## **3. CONSTRUCTION SCHEME OF AUTOMATION UNDER THE BACKGROUND OF NEW ENGINEERING COURSE**

Students' ability of application, innovation and employment must be improved in practice. On the one hand, the cultivation of these abilities must play the role of the main channel of colleges and universities, on the other hand, it must give full play to the role of enterprises in the big stage, and the new engineering industry is the starting point of cultivating talents and testing talents.

### ***3.1. Ensure the Right Direction of Personnel Training through Top-level Design***

Focusing on the overall requirements for the ability and quality of students based on the needs of the industry, taking 'one accomplishment, three abilities' as the traction,

updating the education and teaching concept, adopting the systematic scientific method, analyzing the problems exposed by the existing engineering courses, clarifying the quality requirements for automation talents based on the needs of the industry, exploring the new model of automation talents training, and establishing a scientific and standardized talent construction plan, It is necessary to formulate a talent training plan and a targeted and practical curriculum standard that are organically linked with the new engineering, to ensure the steady improvement of the quality of talent training.

### ***3.2. Ensure the Intelligent Characteristics of Teaching Content by Optimizing the Course System***

By combing the research results of new engineering, finding out the new requirements of enterprises for talent training, optimizing the curriculum system, enriching the actual cases of new engineering in the teaching content, teaching materials and teaching, forming intelligent and distinctive content modules, and realizing close connection with the direction of new engineering. By means of teachers' participation in new engineering construction and accumulation of materials, feedback from new engineering enterprises and application of scientific research results, the problem of synchronous updating of teaching content and enterprises can be solved.

### ***3.3. Forming a Series of Teacher Training Systems***

Focusing on the overall goal of building a 'qualified post' high-quality teacher team, through the practical exploration and experience summary of new engineering, the system of teacher employment qualification certification, teacher growth road map, detailed rules for the implementation of quantitative evaluation of outstanding talents, introduction and training normal system, external part-time job supplement system and other systems are established to create an influential information control science and engineering field inside and outside the school The teaching staff.

### ***3.4. Construction of Three-stage Practical Teaching Mechanism***

In order to connect with the direction of new engineering major, the relevant teaching resources of new engineering are introduced into the practical teaching system by optimizing the personnel training program, and a teaching guarantee system integrating specialized laboratory and training simulation is constructed by combining engineering special project with school enterprise cooperation, so as to meet the environmental requirements of 'basic ability

practice' and 'special ability practice' of students in the school And directly apply skills in the way of school enterprise practice to meet the needs of 'comprehensive ability practice'.

### ***3.5. Expand the Way of Training and Testing Intelligent Automation Talents***

In order to connect with the direction of new engineering major, the relevant teaching resources of new engineering are introduced into the practical teaching system by optimizing the personnel training program, and a teaching guarantee system integrating specialized laboratory and training simulation is constructed by combining engineering special project with school enterprise cooperation, so as to meet the environmental requirements of 'basic ability practice' and 'special ability practice' of students in the school And directly apply skills in the way of school enterprise practice to meet the needs of 'comprehensive ability practice'.

## **4. THE WAY OF AUTOMATION SPECIALTY CONSTRUCTION UNDER THE BACKGROUND OF NEW ENGINEERING COURSE**

### ***4.1. Focus on Establishing a Scientific Talent Training Mechanism***

Guided by the requirement of 'one accomplishment, three abilities' in talent training, the whole process training and output leading concept are highlighted. The new engineering practical training platform provides an opportunity for talent training, and a scientific talent training mechanism is established to ensure the quality of talent training.

### ***4.2. Constructing the Teaching Curriculum System with Students as the Main Body***

Through sorting out the problems of personnel information quality, application practice ability, innovation ability and post-employment ability exposed by disciplines and specialties, this paper puts forward the goal of automation talent demand, guides the reform of teaching curriculum system; combing the results of new engineering practical training, incorporating the results of enterprise inspection into teaching materials, and applying the actual cases of new engineering practical training to teaching, forming The teaching curriculum system with students as the main body.

### **4.3. Expand the Channels of Teacher Training**

Based on the advantages of robotics engineering and intelligent science, the old teachers with rich enterprise experience are selected as experts to participate in the preparation and evaluation of new engineering construction scheme, guide the training process and evaluate the training results. At the same time, with a view to sustainable development, young and middle-aged teachers are gradually selected to step in and constantly improve their practical ability. Meanwhile, the system of teacher employment qualification certification, growth road map and other systems are adopted as the norms for guiding teachers to build a dual teacher team.

### **4.4. Construction of Progressive Practical Teaching Mechanism**

To clarify the relationship between ability and practice, to improve ability as the purpose, to practice teaching as the starting point, to use the combination of university practice and enterprise practice, to make full use of the opportunity for students to participate in robot competition and large-scale innovation activities, to build a comprehensive ability training mechanism for basic ability training and special ability training in Colleges and universities to gradually advance to new engineering practice training, so as to shorten the time for students to adapt to the environment To lay a solid foundation for improving the employability.

### **4.5. Explore the Way of CO Training Talents between Universities and Enterprises**

College enterprises are independent and closely related to each other in personnel training. They take the practical training of new engineering as the bridge and link between colleges and enterprises, realize the seamless connection of employment education and enterprise application practice in Colleges and universities, take the practical training platform of new engineering as the 'big laboratory' of their major, and take the 'off campus practical teaching base' as the carrier, so as to smooth the contact between colleges and enterprises, and make the theoretical teaching and Patent invention and other research achievements have been tested by enterprise transformation, and a virtuous circle of 'theoretical research practice test summary promotion' has been established, which promotes the renewal of teaching content, innovation of academic research and cultivation of students' practical ability, and promotes the spiral rise of talent cultivation level.

## **5. SUMMARY**

This paper aims to improve the application ability and post-employment ability, introduces the real environment of the new engineering platform into the professional laboratory in combination with the practical ability improvement process of automation major students, and forms the whole system, the whole process and the whole factor teaching guarantee ability with information acquisition and processing, decision-making management and intelligent control as the main part, as well as the practice and test of participating in the construction of the new engineering platform Teaching system. Take the new engineering training platform as the link and bridge between universities and enterprises, make full use of the opportunity that automation students can use machine vision, intelligent decision-making, computer software and other tools to practice in the real environment, form the education and teaching means to improve students' application ability, and realize the mutual education of talents and mutual benefit between universities and enterprises.

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