

## Research on Three-type Talents Training Model of Internet of Things Specialty under the Background of New Engineering

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**Abstract.** This paper analyses the relationship between the new engineering and the training of three-type talents. This paper analyses the problem of professional training, and puts forward three train of thought for professional training of Internet of Things. The four-in-one training plan is given, and its feasibility and characteristics are analyzed, which provides a reference for the construction of similar colleges and specialties.

### Introduction

Since our country joined the Washington agreement in 2016, our country's education has accelerated the pace of integration and synchronization with the world's education. Unprecedented integration of higher education with national development and social needs. In 2016, a series of activities such as "fudan consensus", "tianda action" and "Beijing guide" kicked off the construction of "new engineering"[1].

New engineering represents the latest direction of industrial development. New technology and new economy produce new engineering majors and their cross-integration. The biggest characteristic of new engineering is "new", which is different from the traditional major, but its essence is still "engineering" education. It is through the industrial demand to build professional, construction of engineering professional new structure, update the model of talent training and knowledge structure [2-3].

The "three types" in the cultivation of "three types" refer to innovative, compound and applied types, which is another major measure proposed by President xi jinping at the national education conference [4]. The first of the three types of innovation, that is, in the face of complex social requirements in the new era, must have the spirit of innovation, followed by interdisciplinary knowledge to meet the needs of all aspects of knowledge, and finally is applied, the focus can be practical application. The cultivation of three types of talents is also a long-term task in the reform of higher education.

The major of Internet of things is one of the "new engineering" majors, which is characterized by the cross-integration of multiple professional knowledge. Knowledge of computer science and technology, communication engineering, network engineering, electronic information engineering, etc. The Internet of things (IOT) is officially listed as one of the key strategic emerging industries in China. IOT industry has the characteristics of long industrial chain and involves multiple industrial groups, and its application covers almost all industries.

With the increasing demand for talents in the Internet of things, colleges and universities have applied for the new major of the Internet of things engineering, and our school also has the major direction of the Internet of things. How to train students majoring in IOT engineering and make them become urgently needed three-type talents has become an urgent and urgent problem to be solved.

### The Relationship between New Engineering and Three - Type Talent Training

"New engineering talents" are high-quality and inter-disciplinary talents with stronger practical ability, innovation ability and international competitiveness, who can adapt to and meet the needs of future emerging industries and new economy. The three types of talents refer to "innovative,

compound and applied talents". They are consistent and unified. It is to adapt and promote economic and social development. The three types of talents have injected substantial contents into the training of "new engineering talents". This paper expounds the training direction of new engineering talents more concretely.

### **Problems in personnel training.**

In the traditional professional training process, each major makes its own training plan and curriculum system. Only considering the training objectives of a specific major, the ability to train a single talent, employment competitiveness is not strong. Students do not have the slightest understanding of other related majors, and teachers also lack the understanding of frontier and interdisciplinary knowledge.

### **The model of "three types" talent cultivation.**

"Three types" personnel training is another important strategic decision of the state. But the situation of each school is different, the pattern that raises is different also. Our university is one of the first batch of application-oriented undergraduate pilot construction units in shaanxi province. Shouldering the responsibility of training for the local economy with practical ability of skilled personnel. So, my school in the process of three type of talent cultivation, the first to cultivate "applied" in accordance with the school-running orientation and the construction of the applied undergraduate demand in our school, the second training "compound" to meet the requirements of the new engineering construction, let the students master the interdisciplinary knowledge, meet the job requirements, finally develop "innovative", meet the needs of rapid economic and social development of the innovative talents.

### **Design of training mode for IOT professionals**

Our college has three majors: computer science and technology, electronic information engineering and Internet of things engineering. Understand the concepts and requirements of the new engineering. The person in charge of teaching and discipline of the college put their heads together and determined to combine the three independent majors that had been "fighting on their own" organically and look for related items. It constructs the train of thought of talent cultivation of "facing the subject category", "facing the social demand" and "facing the student development". The talent cultivation plan of "general education course" + "specialty group course" + "specialty course" + "skill course" is put forward [5]. See Fig. 1 for details.

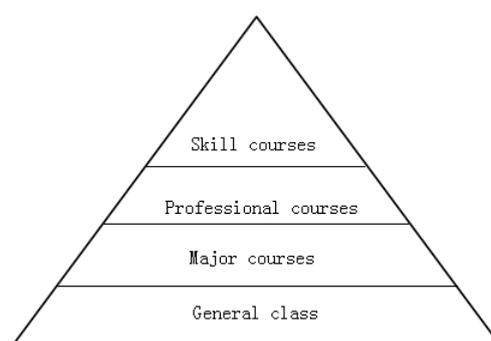


Figure. 1 The course of the three majors

The computer science and technology, electronic information engineering and Internet of things engineering in our college have realized the same general education course setting, interpenetrating professional group course setting, as well as the professional course setting with appropriate number of courses, stability and frontier-orientation, as well as the skill course setting with strong practicality. See Table 1 for details.

Table 1 A list of training programs of each major

	General class	Major courses	Professional course	Skills class
Computer science and technology	Higher mathematics University physics The university	The data structure Circuit analysis Electrical and electronic technology	Computer operating system, computer composition principle, software engineering	Web programming Android mobile phone software development Jsp dynamic web page development WeChat small program development
Electronic information engineering	English Etc.	Discrete mathematics Software engineering	MCU program design, embedded system, EDA program design, MATLAB	FPGA project development
Internet of things engineering		Python programming C language programming,	Computer network, Internet of things technology and application	Internet of things project development

### Specific Measures of talent Training Mode

#### School-enterprise collaboration in education.

IOT and intelligent technology research institute (undertaking of enterprise projects), school-enterprise cooperative internship (practical training) base construction, support of collaborative education project of ministry of education [6-7].

#### Optimize theory and strengthen practice.

In line with the principle of "sufficient", the existing courses are sorted out, theories are optimized, theoretical periods are reduced, experiments and practices are enriched, so as to improve students' practical ability. Make it a "craftsman"[8-10].

The study of interdisciplinary knowledge. The Internet of things is a major with a high degree of interdisciplinary. Students not only need to learn the school network and computer, but also the communication technology. Only with the support of multiple professional courses, can students meet the industrial requirements.

#### Tripartite educational mode of school, enterprise and scientific research institution.

In order to cultivate "three types" of talents, we adopt the three-party education model of school, enterprise and scientific research institution. Firstly, teachers can go to enterprises for training and train "two types of teachers". Students can go to enterprises for internship and get project training. Secondly, the enterprise provides projects and research subjects for the university's scientific research institutions, which undertake projects to solve the practical problems of the enterprise. Finally, the scientific research institutions in the university provide real project cases and techniques for the teaching of "feedback teaching", so as to update the knowledge. The specific mode of cultivation is shown in Fig. 2.

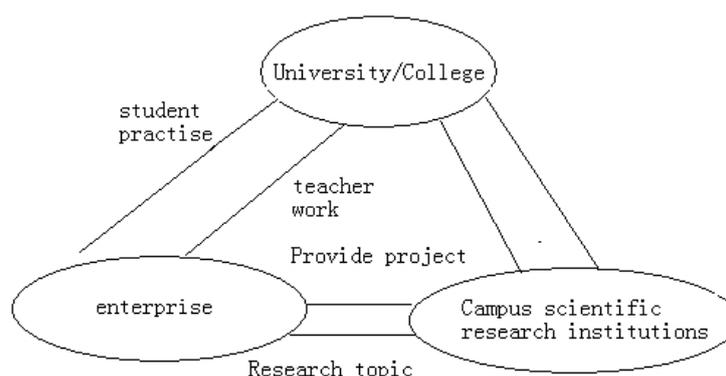


Figure. 2 Educational structure of school, enterprise and scientific research institution

Through the tripartite coordination and all-round education, schools and enterprises, teachers, students and society, knowledge has been applied and updated, and teachers and students have been trained and improved. So that the "three types" of talent training to the practical. In the actual training process, first of all through the practice and training, to meet the "application-oriented" requirements, secondly, through the development of enterprise projects, to meet the "compound" requirements, through the research subject to meet the "innovative" requirements.

## Summary

New engineering construction is an important measure for our country to catch up with and surpass the world-class universities, and also an important policy to meet the needs of China's economic and social development. It is an important means to cultivate innovative, compound and applied talents. The major of Internet of things is a major that is in the forefront of the new engineering construction. The successful experience in the construction of this major can effectively drive the development of other new engineering majors. The three-oriented and four-in-one talent cultivation ideas and plans proposed by us can better adapt to the cultivation of three-oriented talents and provide new ideas for the construction of this major.

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