# Research on the Cultivation of Practical Ability of Students Majoring in Internet of Things

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## Abstract

**Based on the basic requirements for the training of engineering talents in the Internet of Things, this paper focuses on the exploration needs of new subjects for engineering education in new concepts, new modes and new methods, analyses the problems existing in the practical teaching of Engineering Specialty in the Internet of Things , and puts forward the idea of engineering education and the goal of cultivating talents in the Internet of Things in our university, which is based on the idea of engineering education and integrates entrepreneurship and innovation. The practical teaching model of Internet of Things specialty is designed with emphasis on layered modular practical teaching content and corresponding practical teaching methods.**

## Keywords

**Internet of Things, Cultivation of Practical Ability, New subject.**

## 1. Introduction

Internet of Things (IOT) is a new generation of network technology, which is based on the expansion and extension of the Internet. As a strategic emerging industry of the country, it has 10,000-level market space every year. The Internet of Things (IOT) is a high integration of various new technologies and concepts. It opens up the channels between electronics, communication, biology, machinery, materials and other previously unrelated technologies, thus realizing the expansion of communication from people to people, things and things. At the same time, the application scope of the Internet of Things industry covers almost all walks of life. The core of manufacturing in China is the organic combination of the Internet of Things and manufacturing industry. The Internet of Things represents the core of the fourth industrial revolution. The wide application of Internet of Things is another information revolution after computer, Internet and mobile communication network. Internet of Things (IOT) specialty, with its interdisciplinary and practical application-oriented features, has been identified as a new subject specialty by the Ministry of Education.

Colleges and universities are still in the primary stage of Internet of Things education, especially local applied undergraduate colleges and universities. The talent training system is not perfect, mainly manifested in: training objectives are divorced from industrial needs, teaching content can not keep up with the development and update of technology, and school-enterprise cooperation is not deep enough. At present, the graduates of the Internet of Things engineering specialty can not meet the development needs of the Internet of Things industry. There is a shortage of innovative engineering application talents who can be competent in the planning, design, development and management of the Internet of Things. Comparing with the requirement of training "new subject" talents, there are many incompatibilities in the educational guiding ideology, teaching content and teaching means of Internet of Things engineering specialty, which need to be reformed urgently.

## 2. Reform Contents and Practices

### 2.1 Rebuilding the practical teaching system

How to integrate innovation and entrepreneurship elements into the construction of practice platform and complete the transformation from general engineering training mode to new discipline training

mode is the most critical issue. The practical teaching platform is composed of engineering practice teaching throughout the whole process, innovative practice teaching oriented to the cultivation of Applied Engineering talents, engineering practice teaching environment and base construction, and Double-teacher structure teaching team combining specialty with concurrence. Practice platform needs to establish two-way interactive information channels between schools and enterprises, create a benign ecosystem, and become the bottom foundation and supporting conditions for college students' innovation and entrepreneurship.

Designing a set of specific training programs for students' practical teaching modes, such as course experiment, course design, professional practice, graduation project and so on, to establish a good off-campus practical teaching mode. It integrates students' professional training with professional innovation and creativity in practice platform, so as to cultivate students' practical ability and creative ability. A complete set of management system, practice teaching standard system and evaluation system should be built, the mode of school-enterprise cooperation management should be straightened out, and the tasks and related work of practice base construction should be carried out smoothly.

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### 2.2 Deepening the integration of industry and education

According to the characteristics of the training objectives of new subjects, on the basis of mastering professional theoretical knowledge, strengthening practical teaching and optimizing practical training system are necessary means to deepen and consolidate students' theoretical knowledge. In the guidance of new engineering construction, guiding college students to innovate and start businesses is gradually incorporated into the training system of engineering students in Colleges and universities. It is an important foundation and guarantee for the development of practical education of new engineering to redesign all links of practical teaching, form reasonable practical teaching modules, establish a practical teaching system complementary to the theoretical teaching system, optimize the structure and function, and use various new technologies to build and improve the practical platform.

Training students' engineering practice ability is the foothold and starting point of the practical teaching environment of Internet of Things engineering specialty. Therefore, besides designing the system and level of experimental curriculum system, we should also pay attention to the realization of open practical teaching environment.

The Laboratory of Internet of Things specialty is the main place for course experiment teaching. The experiment teaching should take the four-tier hierarchical structure of Internet of Things technology system as the starting point, and construct the corresponding experimental teaching environment of Internet of Things perception, information transmission, information processing and upper

application respectively. At the same time, we can rely on our existing research laboratories and school-enterprise engineering training centers to strengthen the cultivation of students' innovative ability. The training center pays more attention to training students' engineering quality, which is an indispensable practice base to improve students' practical ability.

### 2.3 Improve the mechanism of collaborative education

Training and construction of Engineering teachers. Teachers are the key to the engineering training of Internet of Things. It is necessary to form a high-level team of full-time teachers and part-time teachers to ensure the smooth implementation of school-enterprise cooperation. The level of professional teachers can be improved through training, introduction and employment. A teaching team with high professional level and strong practical ability can be formed by taking turns of professional teachers, participating in on-the-job practice, participating in and presiding over horizontal project development. Establish a more closely cooperative personnel training mechanism with the social employing departments. We should improve the coordination mechanism of training objectives, formulate standards for talent cultivation jointly with relevant departments and improve the talent cultivation program. We should improve the coordination mechanism of teachers, co-ordinate the extension of full-time and part-time teachers, promote two-way communication and improve the level of practical teaching. We will improve the mechanism of resource sharing and promote the transformation of high-quality educational resources into educational and teaching contents. We will improve the management coordination mechanism, promote relevant departments to build docking platforms with universities, coordinate the management of personnel training, and train high-quality professionals who truly meet the needs of economic and social development.

Practice teaching system and platform construction suitable for application-oriented undergraduate talents training. As an application-oriented personnel training, strengthening practical teaching and its platform construction is one of the most important tasks. It is a good way to realize the training of applied talents to carry out the reform of practical teaching, strengthen the integration of production and education and school-enterprise cooperation. Strengthen close cooperation with all walks of life, strengthen the development of applied scientific research and production education, build teaching faculty team, share equipment and facilities and other platforms, fully realize mutual benefit and mutual benefit with enterprises, so as to enhance teachers' scientific research and teaching ability, students' social practice ability.

The school-enterprise joint practice platform is an important way to realize the combination of engineering education inside and outside school. Implement the "Four One" project of school-enterprise cooperation: each teacher contacts an enterprise, makes a project, pairs with a professional engineer, and leads a group of students into the enterprise. Through this reform measure, we will build a solid platform for innovation and entrepreneurship practice, integrate the latest development of industry and technology into teaching, and establish graduation design and production practice closely related to industrial needs. Our school can make use of its own advantages in key disciplines, base itself on industry, and promote the transformation of production, teaching, research and achievements by establishing an interdisciplinary platform and a joint training base between schools and enterprises, and promote the cultivation of talents in the specialty of Internet of Things with the help of the practical conditions of enterprises. Utilize the platform and conditions provided by enterprises to complete higher quality production practice and graduation design.

## 3. Conclusion

How to ensure the quality of school-enterprise cooperation and what level should school-enterprise cooperation reach before it is qualified? From the current situation, all links of school-enterprise cooperation, such as specialty setting, faculty building, laboratory building, classroom teaching, practice training, graduation design, lack of quality standards and normative management system suitable for the training of applied talents. How to effectively manage students' practice, especially

decentralized practice, how to stipulate the responsibilities of University and enterprise instructors, how to evaluate the effect of practice and so on, are all problems that need to be explored.

## Acknowledgements

The First Group of Teaching Reform Research Projects in the 13th Five-Year Plan of Higher Education(jg20180310).

National Innovation and Entrepreneurship Training Program for College Students (201811488016).

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