Research on the Teaching Practice of Internet of Things Communication Protocol Course under the Mode of Integration of Industry and Education

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Abstract

In view of the Internet of Things engineering talent training mode emphasizes course theoretical knowledge training and lack of systematic engineering practice link, this paper takes the curriculum construction of Internet of Things communication protocol as an example, relying on the school and enterprise cooperation, wisdom learning factory and ZTE ICT integration innovation entrepreneurship base to explore and research the professional teaching mechanism of Internet of Things engineering.

Keywords

Internet of Things engineering; Internet of Things communication protocol; Integration of industry and education; One lesson and two teachers; Course assessment.

1. Introduction

With the advent of Internet of Things technology wave, the overall scale of IoT industry is constantly expanding, and the technological innovation brings the demand for talents. In the future, the Internet of Things industry will be a platform for active talents, and the Internet of Things industry needs the entrepreneurial talent with innovative consciousness and practical ability [1]. In May 2015, the State Council issued the Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Institutions of Higher Learning, among which the main tasks and measures clearly proposed to improve the curriculum of the innovation and entrepreneurship education system, reform the teaching methods and assessment methods, strengthen the practice of innovation and entrepreneurship, and strengthen the teaching capacity construction of teachers' innovation and entrepreneurship education.

The talent training mode of integration of industry and education refers to the education mode of training professionals who not only master basic theoretical knowledge, but also have strong practical skills according to the cooperation of industry, university, research, scientific and technological development situation and educational skills [2-4]. The integration of industry and education is an important way for local colleges to improve the teaching quality and the level of students' practice and application[5].In order to implement the Outline of the National Medium-and Long-Term Education Reform and Development Plan (2010-2020), Accelerate the construction process of building a modern vocational education system, Promote the transformation and development of local universities [6], In 2015, The Ministry of Education, the National Development and Reform Commission and the Ministry of Finance jointly issued the Guiding Opinions on Guiding the Transformation of Some Local Undergraduate Universities to Application, It clearly puts forward the decision and deployment of local ordinary undergraduate universities to application, "The relevant universities should truly turn the idea of running schools to serving the local economic and social development, Transfer to school and enterprise cooperation in the integration of industry and education, Go to cultivating applied

technical and skilled talents. " Under the guidance of this policy, the local colleges and universities began to transform and develop[7].

Aiming at the Internet of Things engineering professional talent training mode focuses on curriculum theoretical knowledge training, the lack of systematic engineering practice link. This paper takes the curriculum construction of Internet of Things communication protocol as an example, relies on school and enterprise cooperation, intelligent learning factory and ZTE ICT industry and education integration.

2. Current Situation of Talent Training of Internet of Things Engineering

In recent years, although home and abroad universities have actively engaged in Internet of Things engineering talent training [8]. But due to the single hierarchy of teaching staff, teaching platform and lack of resources, curriculum construction and teaching methods and social disconnection factors, often pay more attention to theoretical knowledge accumulation in teaching practice, and ignore the cultivation of engineering practice ability, innovation and creation ability, leading to talent output quality often can not meet the development needs of the industry.

At present, the Internet of Things engineering curriculum teaching practice mainly has the following problems: (1) The teaching mode with knowledge points as the core leads to the lack of effective connection between various courses, disconnection theory and practical engineering application, making it difficult for students to connect the courses they have learned and form an organic whole; (2) Focusing on cultivating students 'technical ability of the Internet of Things, ignoring the guidance of engineering cases, leading to the fragmentation of students' understanding of the Internet of Things industry, and the lack of multi-dimensional thinking; (3) The traditional Internet of Things courses lack of engineering practical links, which leads to the lack of students' engineering application ability and innovation and creative ability.

3. Teaching Practice of the Internet of Things Communication Protocol

IOT communication protocol is the basis of Internet of Things communication, It focuses on explaining the basic theory, architecture, performance characteristics, technical methods of IOT communication network protocol, which has the characteristics of many technologies, large cover category and wide range of application. At the same time, as an engineering course, the content of IOT communication protocol course is abstract, which is not easy for students to understand. There are problems such as single teaching mode, boring student learning, and disconnection of basic knowledge and application practice.

Combined with students' intellectual characteristics and academic situation analysis, a platform for innovation and entrepreneurship of integrating industry and education is built, and a wide variety of advanced teaching methods are used to conduct the deep integration of production and learning. With domestic communication well-known enterprises ZTE to carry out school-enterprise cooperation, collaborative construction of Internet of Things engineering professional practice teaching mechanism, student-centered, pay attention to the flexibility and diversity of teaching methods, cultivate students 'good habits of active learning, promote students' engineering practice ability and innovation creation ability, improve the quality of students' teaching. The specific teaching practice mechanism is as shown in Figure 1.
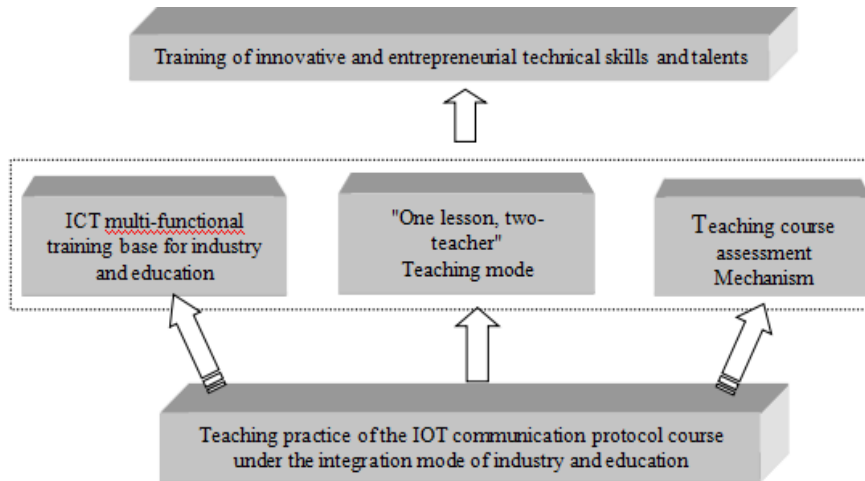
Figure 1. The Practical Teaching Mechanism of IOT Engineering

3.1. Build ICT Multi-functional Experimental Base for ICT Integration of Industry and Education

In order to cultivate advanced application-oriented engineering wide-caliber technical talents with remarkable engineering practice ability, we will use school-enterprise cooperation resources to build a high-standard professional laboratory integrating "experience, experiment, operation and maintenance, innovation and entrepreneurship", and serve the Internet of Things engineering and other majors.
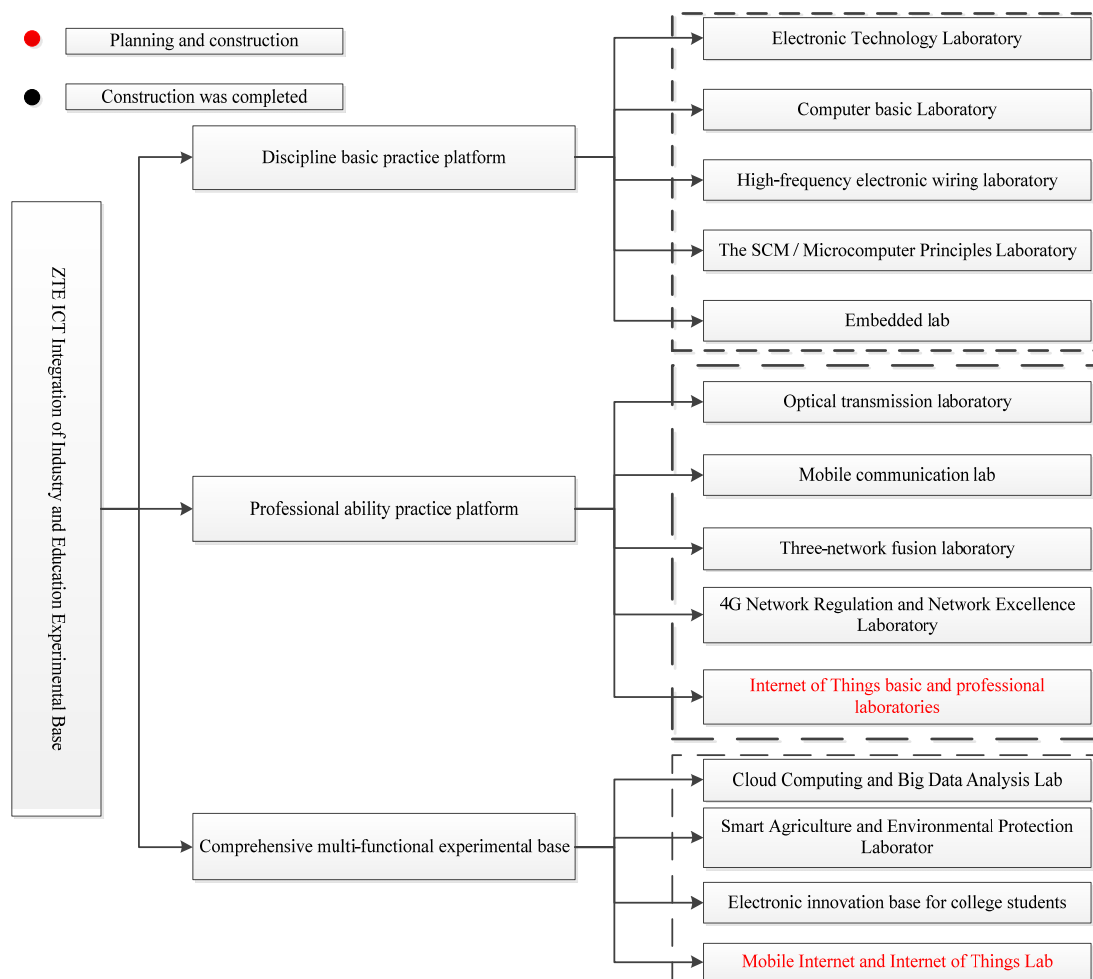

Figure 2. ICT industry and education integration innovation experimental base

As a highly practical engineering course, the IOT communication protocol involves a large number of new and complex new concepts, new technologies, and a wide variety of application fields. Therefore, it is very necessary to build an integration innovation platform of industry and education. According to the training goal of innovative application-oriented technology and skilled talents, with senior enterprise engineers as the lead, focusing on the construction of cloud computing and big data analysis platform, mobile Internet and Internet of Things laboratories. The framework of ICT industry and education integration innovation base serving the Internet of Things major is shown in Figure 2.

3.2. Implement the Teaching Mode of "One Lesson and Two Teachers" in School-Enterprise Cooperation

College teachers have high professional level, rich theoretical knowledge, but weak knowledge application ability and low practical operation level, while enterprise engineers have rich experience in engineering projects and strong practical ability. Relying on the mode of "integration of industry and education, school-enterprise cooperation", adopting the practical teaching mode of "one lesson and two teachers" of school-enterprise cooperation can effectively absorb the expertise of school and enterprise technical personnel, and improve the quality of Internet of Things engineering professional personnel training.

"One lesson double teacher" mechanism specific scheme for professional basic curriculum teaching and enterprise engineers, theoretical knowledge explanation of the teachers, practice experiment part led by enterprise engineers, teachers cooperate with enterprise engineers, in the whole process of course teaching into the enterprise elements, help students to the understanding of professional, engineering background, improve students' professional skills, at the same time teachers can use the training base site guidance to improve the practical guidance ability.

3.3. Improve the Curriculum Teaching Quality Management Mechanism

(1) Implement the professional teaching quality monitoring mechanism. Fully mobilize the enthusiasm of teachers to carry out curriculum construction, promote the steady development of teaching work and the steady improvement of teaching quality. The school has established the two-level teaching quality guarantee system, and established the teaching work assessment system and the annual assessment system of teachers 'teaching and evaluation work, included the evaluation results into the performance assessment content of teachers, and linked to the evaluation and promotion of professional title, to strengthen teachers' awareness of teaching quality.

(2) Establish the management quality standards. According to the orientation of the majors and talent training objectives of the Internet of Things, complete, standardized, scientific and reasonable teaching management quality standards have been formulated. Through routine teaching inspection and special inspection, according to the relevant teaching management rules and regulations, management, teaching construction, inspection and evaluation, timely find and properly solve problems, ensure the smooth operation of each link, constantly improve the teaching management level, improve the teaching quality.

(3) Improve the teaching quality monitoring system. Through the implementation of a series of measures such as information feedback, regular teaching inspection, teaching supervision and listening, student online evaluation, peer evaluation, middle and final student symposium, the problems and deficiencies in the teaching work are found and solved in time, and constantly improve the teaching quality monitoring system.

4. Conclusion

This paper analyzes the current situation of Internet engineering talent training mode, taking the teaching practice of Internet communication protocol as an example, relying on school-enterprise cooperation, ZTE ICT education integration innovation and entrepreneurship base, by building ICT teaching platform and integration innovation and entrepreneurship base, build a double team of "specialized combination", deepen the teaching quality assessment system, improve the quality of Internet of Things application talent training, and provide some reference and reference for the training of Internet engineering application talents.

Acknowledgments

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