

Research and Practice on Continuous Improvement Mechanism of Engineering Major Construction of Internet of Things

Qiang Liu, Yiran Jiang

Baoding University of Technology, Baoding 071000, Hebei, China.

Abstract : In view of the weak links in the curriculum and knowledge system of the IOT engineering major, the overall goal is to cultivate outstanding talents with high independent innovation and practice ability, thinking and logic ability and their comprehensive ability in the society.

Keywords : Internet of Things Engineering; Talent Training; Continuous Improvement

Internet of things engineering major has obvious characteristics of comprehensiveness, intersection, application and so on. The key point is to build up students' ability of practical activities, independent innovation and comprehensive ability of engineering projects by using basic knowledge to analyze and deal with problems. Has "the foundation thick, the specification is broad, the ability is strong, the comprehensive quality is high" the characteristic. They shall mainly master the professional knowledge and skills such as system analysis and formulation of the IOT, attach great importance to the accumulation of basic knowledge, and pay more attention to the shaping of application and technological innovation capabilities. At the same time, Internet of Things Engineering is a new college major established by the Ministry of Education with a very short history. It is a new interdisciplinary subject closely related to today's social and economic development. Compared with the traditional content courses such as automation technology, computer, communication and so on, the teaching mode of engineering practice activities of Internet of things specialty is still in the exploratory link. Taking the undergraduate teaching verification of Internet of Things in our hospital as an example, this paper discusses the discussion and practice of the continuous improvement system of technical specialty in the process of project education. In accordance with the core concept of certification of undergraduate education with "students as the core, results oriented, and continuous improvement", the technical specialties shall, in accordance with the provisions on graduation from universities, turn the training objectives into the overall objectives, take the product quality standards as the basis, the output rate of students as the key point of evaluation, and focus on the continuous improvement of the quality of talent training, carry out the evaluation on the training objectives, the provisions on graduation from universities, the curriculum settings, the curriculum standards, the teaching links, the curriculum settings, the curriculum standards, the teaching links, the assessment and other key stages, and make continuous improvement on the training objectives, the provisions on graduation from universities, the curriculum settings, the curriculum standards, the teaching links, the curriculum quality and so on in accordance with the opinions and suggestions of the evaluation and report.

1. Current situation of talent training for IOT engineering

In recent years, although colleges and universities around the world and members actively promote the practice of teaching reform and innovation, but for a long time due to teachers force structure, lack of education resources, classroom teaching concepts derailment and other factors, resulting in the accumulation of basic knowledge of a high degree of attention, a single faculty structure, lack of education resources, classroom teaching concepts derailment and other factors. It is mainly embodied in the

Copyright © 2021 Qiang Liu et al.

doi: 10.18686/ahe.v5i9.3959

This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

following aspects:① The teaching mode with knowledge points as the core leads to the lack of reasonable connection between the contents of each course, the application of basic theories to specific engineering projects is derailed, and the students are unable to connect the contents of the courses they have learned with the contents of the courses they have learned, and are unable to connect with the contents of the courses they have learned; ② Attention is paid to the cultivation of the students' ability to use the Internet of things, and the lack of correct guidance for the construction process of the engineering in the field results in the students' understanding of the Internet of things technology being ubiquitous and lack of diversified thinking; ③ The lack of engineering examples of the contents of the Internet of things technology courses, the lack of correct guidance for the Internet of things project, and the insufficiency of the students' ability to apply the engineering and independent innovation.

2. Continuous improvement of management mechanisms by technicians

Internet of things engineering programs are based on the quality of the course content, the quality of the teaching process, the requirements of college graduation, the evaluation of social development of college graduates, the evaluation of the rationalization of training objectives, and the closed-loop control of feedback on four continuous improvements.

2.1 Feedback of opinions on quality supervision in the course content and teaching link

On this basis, quality supervision shall be carried out in the course of course content teaching, and teaching quality supervision and evaluation shall be carried out in accordance with the standards of course content quality, and in accordance with various forms such as key point inspection of teaching, evaluation of teaching links, student / teacher exchange meetings, follow-up evaluation of learning process and examination and approval of course content, and timely feedback shall be given to responsible persons to carry out closed-loop control of the teaching process.

2.2 Feedback on the implementation of graduation provisions

The evaluation results are used to revise the curriculum and syllabus, to improve the teachers' team and support point standards of the implementation of support point curriculum, so as to achieve closed-loop control.

2.3 College graduates tracking and social development evaluation feedback

According to the results of the evaluation, the system of college graduation is revised and perfected, and the continuous improvement of closed-loop control is produced.

2.4 Feedback on rationalization evaluation of training objectives

Through the communication and exchange of opinions and feedback among the authoritative experts of college graduates, classmates, employment companies and institutions in the field, integrate the social demands, the precise positioning of the colleges and the characteristics of technical majors, evaluate the rationalization of the training objectives on time, and timely evaluate the training objectives and make continuous improvement according to the evaluation results. Based on the core idea of continuous improvement, this paper constructs the teaching level guarantee mechanism of "product quality standard system software, operation terminal software, management evaluation system software and continuous improvement system software" with students development as the core. The product quality standard system software in the quality assurance mechanism shall include the training objectives, provisions on graduation from universities, curriculum arrangement, curriculum standards, and classroom instruction of curriculum contents; The operating terminal software shall include the implementation of the training plan, the implementation and evaluation of the teaching process, the assurance of the teaching staff, the guarantee of funds, and the guarantee of standards; The management evaluation system software shall include the evaluation of the reasonableness of the training objectives and the evaluation of the fulfillment thereof, the evaluation of the fulfillment thereof, the evaluation of the reasonableness of the curriculum arrangement, the evaluation of the reasonableness of the teaching objectives and the fulfillment thereof, the evaluation of the teaching links, and the special rectification; The continuous improvement of the system software shall include the training objectives, the provisions on graduation from universities, the revision of the curriculum arrangement, the evaluation of the course standards, and the gradual improvement of the classroom instruction of curriculum contents.

3. IOT technology practice system

3.1 Integrating students' IQ characteristics and teaching analysis

Establish an independent innovation and entrepreneurship service platform for industry-education integration, and select a variety of excellent teaching methods to carry out close integration of schools and enterprises. Cooperation between schools and enterprises, cooperation with large communication enterprises in China, jointly construct a comprehensive practical curriculum

system for the engineering technology major of the Internet of Things, with students as the core, attach importance to the flexibility and diversity of teaching methods, cultivate good habits of students' independent learning, promote students' independent innovation in engineering project practice ability, and improve students' classroom teaching service level. On the premise of the new system of "the subject of university, the core of government department, the specific guidance of industry, the participation of enterprises, and the integration of industry and education", the establishment of independent innovation company with integration of industry and education is the premise, the construction of independent innovation company with integration of industry and education is the prerequisite, and the "double-qualified" teachers is the key. At the same time, the aim is to guide students to participate in various competitions, to promote learning, to improve students' innovation and entrepreneurship in an all-round way, to strengthen the link between the class and the company, to stimulate the class's ability to improve, and to promote regional social and economic development.

3.2 Status of continuous improvement based on training objectives

Through questionnaires and interviews with college graduates who have been graduated from their majors for three years during the period from July to November 2020, we will evaluate the achievement of the training objectives of their majors. Through the content of the questionnairesurvey and the feedback information, the employers have given higher evaluation to the major ability of the graduates in the work. Practice can be summarized as follows: ① College students in the work of careful, correct attitude, diligent and stable, serious and responsible, focus on teamwork and communication, with overall awareness, integration ability. ② College graduates shall have a solid foundation of basic knowledge, a strong ability to carry out engineering projects in their own professional fields, a strong ability to work processes, and the ability to quickly integrate into job demands. In addition, employers said that students need to further expand their knowledge, strengthen the internship stage and the ability to use English, improve the spirit of innovation, so that students early admission to school, integration requirements.

3.3 Continuous improvement of the university graduation system to achieve evaluation results

In view of the fact that the graduates of the year 2020 have met the requirements for graduation, the Professional Construction Implementation Group has put forward the following suggestions for continuous improvement: Improving the students' ability to conduct scientific research, analysis and design solutions for the complicated itinerary problems in the Internet industry; Improving the students' ability to shape the risk management of engineering projects, so that the students can be capable of carrying out and supervising the whole process of undertaking new projects; And improving the students' ability to communicate and communicate in the cross-cultural communication environment. Technical majors thus establish the corresponding university graduation rules, including: Amending University Graduation Regulation 9 to strengthen the students' ability to organize, harmonize and cooperate with others in the operation of engineering projects in their professional fields; Amending University Regulation 10 to enhance the students' ability to communicate international emotions and improve their grasp of the development trends of the Internet industry and the hot spots of scientific research networks.

4. Conclusion

Derived from molecular biology, symbiosis theory is widely used in social development management and other fields. Everyone uses it to guide the reform and innovation of the "entrepreneurship and innovation" education of the engineering specialty, to analyze the practical dilemma of the "entrepreneurship and innovation" education of the engineering specialty, to explore the meaning and characteristics of the "entrepreneurship and innovation" education of the engineering specialty under the symbiotic theoretical perspective, and finally to put forward the interdependent implementation approach of the "entrepreneurship and innovation" basic education reform of the engineering specialty, thus rationally improving the quality of the "entrepreneurship and innovation" cultural education of the engineering specialty and further completing the molding of the senior talents of the engineering specialty.

References

1. Liu F. Investigation and analysis of the current situation of innovation and entrepreneurship education in colleges and universities: Based on the sample of 938 colleges and universities. China Youth Social Science Research Association 2019; (04).
2. Qu X, Liu X. Connotation analysis and construction of labor education system in colleges and universities in the new era. Higher Education Research in China 2019; (02).
3. Zhou G. From employment to entrepreneurship: challenges and responses to university curricula. Tsinghua Education Research 2018; (06).