ISSN: 2637-6067 DOI: 10.6918/IJOSSER.201912_2(10).0004

Innovation and Practice of Educational Model and Method on Electronic Information Major in Polytechnic Colleges

Xin Yao[1] and Jing Sun[1]

[1]Department of Information Engineering, Zhongshan Polytechnic College, Boai 7th Road 25, Zhongshan, China.

Abstract

The electronic information industry is one of the most important industries in China. It covers many fields such as electronic technology, computer technology, Internet of things(IoT), software technology, artificial intelligence(AI), etc. AI, IoT, big data technology play important roles in modern technology, which will lead our daily life into new step. At present, the electronic information industry is mainly distributed in the Pearl River Delta, the Yangtze River Delta and the beijing-tianjin-tangshan region. These regions have large demand for jobs such as electronic information, and those enterprises are in great need of professionals with good hands-on skills and practical skills. Therefore, in order to apply social development and needs, improving students' practical application ability has become the focus of electronic information major. This paper focuses on innovation and practice of educational model and method on electronic information major in polytechnic colleges.

Keywords

Educational model and method, electronic information major, IoT, AI.

1. Introduction

Vocational education is an important part of education in China. It is different from undergraduate education. Undergraduate education is mainly for cultivating all-round students. Vocational education is based on cultivating application skills for students. It focuses on cultivating students' professional skills and practical skills. It provides talents to different field of society in production, construction, management and service.

The training mode of electronic information professionals needs to be diversified, systematic, informatized and practical. It includes classroom teaching, introduction of enterprise-level product development cases, establishment of project studios, establishment of competition teams and establishment of learning-progress tracking. The following discussion will discuss how to develop electronic information professionals.

2. Teaching Method Reform

Electronic information majors have more of the same professional courses, such as circuit theory foundation, digital electronic technology, analog electronic technology, C language programming, etc. Almost all electronic information majors have opened these courses. Such professional courses have both strong theoretical knowledge and practical experiments. When setting up such a professional course, you should focus on the practical application characteristics of the course.

Taking C language programming as an example, this course is a core course, which provides a basis for further study of the application of single-chip, programmable logic devices, embedded system and other subjects[1]. At present, C language is mainly for the development of embedded systems, especially the development of single-chip programs. In the Windows

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.201912_2(10).0004

platform and Android system, the development of C language is rarely used. In this way, you can set the course for the needs of the enterprise, such as cutting the chapter of "file operation" of the C language course (because the application programs under the windows platform is almost developed by the object-oriented programming language).So, students should focus on C language skills on embedded systems (such as skills on process control, etc.).

3. Build Clear Career for Students

The career roadmap is the planning and design of college students for their future life. For establishing career goals, students require clear planning and make a brief career path [2].The professional knowledge of electronic information is extremely broad, but in practice, only a certain range of knowledge is needed. As far as the professional courses of electronic information are concerned, the weights of different professional courses in practice and application are different. We can modify the weight of the courses according to the actual needs of the enterprises. By investigating the graduates, the needs for enterprises are divided into software and hardware. The basic requirements for hardware practitioners: familiar with C language, familiar with microcontroller development, familiarity with schematic and PCB design, Familiar with switching power supply design and familiar with EMC rectification. For software practitioners: familiar with C / C + + language programming, familiar with Linux and the kernel, familiar with QT and so on. According to the survey results, the requirements of the electronic information profession are divided into the following categories:

1. Practitioners are required to be familiar with STM32, familiar with C language, familiar with PCB design and EMC rectification, etc. This is the most common requirement for embedded hardware engineers, and has basically become the basic needs of SMEs, and its application fields are also extensive.

2. Practitioners are required to be familiar with Linux and kernel, familiar with C++ language, familiar with QT, etc. This is the basic requirement for embedded software engineers. The practitioners mainly work in the fields of industrial control, medical equipment, and monitoring.

3. Practitioners are required to be familiar with Android, familiar with Java and network protocols, etc. This is the basic requirement for Android engineers, and the practitioners mainly work in the field of consumer products.

4. Practitioners are required to be familiar with high-speed circuit design, multilayer board design, and RF circuit design. This is the demand for talents in the field of mobile phone PCB design, video surveillance, etc. As the work speed of the chip is getting faster and faster, the demand for this aspect has increased in these years.

5. Practitioners are required to be familiar with object-oriented languages such as C++, Java, C#, familiar with the visual studio platform, and familiar with Internet protocols. These talents are mainly engaged in Internet-related industries.

In actual development, students can be guided according to the needs of actual jobs. In the process of student learning, students are required to set up a clearer career path.

4. Establish Enterprise-Level Development Cases In Classes

Training students should be carried out in combination with professional background [3]. In order to better cultivate the application students for the society and enterprises, the most direct way is to introduce Enterprise-level product application case in classes. Taking the single-chip course as an example, the current demand for STM32 MCU talents is large. For different majors, the requirements of the course are different. Take the Internet of Things application technology as an example. The packing and unpacking of data packets is a practical application for this professional. Teachers can introduce the wind speed transmitter PR-3000- FSJT-N01 as an

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.201912_2(10).0004

develops into the teaching equipment. Through this case, students can learn to use the single-chip computer and C language to complete the basic packing and unpacking skills for transmission.

5. Establish Project Studios

In addition to basic teaching, students can also be trained through the project studio. The project studio uses the actual project of the enterprise as an application. Teachers introduce some simple development and engineering applications into the studio, and the students participate in the development work under the guidance of the teachers. Taking electronic information engineering as an example, there are many lighting products companies in Zhongshan, and some actual products are introduced into the project studios, which can train students for local enterprise.

6. Establish Competition Teams

Electronic products have improved or even changed our lives. A survey shows that compared with the past, today's teenagers prefer to choose electronic information majors, and interest is the main reason[4]. Electronic design competition can greatly improve students' practical ability. National College Student Electronic Design Competition is a typical example. There are great changes in the competition topics every year. The competition can be divided into several directions through the competition topics every year, such as measurement, control, signals, etc., so that students can train their interested directions. Interest is the best teacher.

7. Establish Learning-Progress Tracking System

In order to facilitate teachers to track students' learning-progress, it is necessary to establish a learning-progress tracking system. The learning-progress tracking system uses information technology to collect students' learning and living conditions in real time. The status of students is evaluated in real time, and the corresponding information is sent to the relevant responsible person by the way of network. Its function is to improve teachers teaching supervision, so that teachers and parents can jointly train students [5].

8. Conclusion

Vocational education takes "application" as the main purpose to construct the teaching system. The practical part of the teaching of electronic information major accounts for a large proportion, and lectures and practices are carried out simultaneously. In addition to the classroom, students also improve their hands-on skills by participating in project studios, electronic design competitions, professional skills competitions, etc. The training mode of electronic information professionals needs to be diversified, systematic, informative and practical.

Acknowledgments

2017 Major Provincial Key Scientific Research Projects of Guangdong Universities -- Characteristic Innovation (2017GXJK073)

References

[1] Shangli Zhou. Thoughts on Experimental Teaching of C Language Programming in Electrical Information Specialty. Information and Computer. Vol. 54, No 12, p. 248-249. (2019)

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.201912_2(10).0004

[2] Changwei Song,. Misunderstanding of College Students' Career Road Map Design. Economy and Management. Vol.32, No.9, p. 154-156.(2016)

[3] Jing Han. Exploration on the curriculum construction and education reform of the professional system integration of the Internet of Things in higher vocational education. Education World. Vol.45, No 09,p.276(2019)

[4] Lizhen Liu. Vocational schools should improve the fun of electronic circuit courses. Exploration and observation. Vol.35, No.16,p.108.(2019)

[5] Jingbo Zhang. Application of Student's Academic Tracking and State Real-time Evaluation System in Higher Vocational Teaching Supervision——Taking Sichuan Vocational College of Chemical Technology as an Example. Computer Knowledge and Technology. Vol.35, No.13,p.172-173.(2017).