

New Teaching Mode of Cognitive Practice Course for Foreign Communication Engineering Students in China

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Abstract. Under the background of “The Belt and Road” construction, the scale of education for international students in China has been expanding. Improving the quality of foreign students’ education has become one of the urgent tasks of the internationalization of higher education in China. The cognitive practice is of great significance for improving the quality of foreign students’ education. In view of the current situation of foreign students and the characteristics of communication engineering courses in China, effective teaching modes are needed in cognitive practice teaching. This paper demonstrates the implementation of specific teaching modes, the application of teaching methods and the experience of practice guidance.

Introduction

With the rapid development of China’s economy, the scale of internationalization of higher education in China is also gradually expanding. In the wave of internationalization of higher education, more and more foreign students come to our country to study engineering undergraduates. With the development of information globalization, communication specialty has gradually become a popular specialty for foreign students to study in China. With the rapid development of communication industry and the globalization of communication enterprises, the demand for internationalized technicians in communication industry is increasing [1].

“Studying abroad in China” is an important part of the construction of “The Belt and Road”. It is a booster for promoting economic cooperation and cultural exchanges among different countries. Improving the quality of teaching and learning for engineering students in China and cultivating compound talents with international vision and participation in international competition is an important mission and foundation for the current university education to support the “The Belt and Road” construction in an all-round way [2]. Zhejiang University of Science and Technology has officially opened a four-year English-based undergraduate course for students majoring in communication engineering from 2014. The course enrolls about 30 students annually. This paper preliminarily explores the teaching mode and method of cognitive practice course for foreign students, and provides a reference for the education of foreign students majoring in communication engineering in China.

Analysis of Current Situation and Conditions for Course Opening

Considering the quality of foreign students, the openness of internship and the closeness of business secrets, cognitive practice teaching not only puts forward higher requirements for the basic quality of teachers and teaching resources, but also puts forward for the suitable and effective teaching design.

Different Knowledge Foundation. With the vigorous development of the international communication market, especially in the developing countries of Asia and Africa, the international market of our national communication enterprises has been accelerating[3]. A large number of high-quality communication professionals are urgently needed in the developing countries of Asia and Africa, and the number of overseas students who come to our country to study communication engineering related professional degrees is increasing year by year. Taking Zhejiang Institute of

Science and Technology as an example, foreign students majoring in communication engineering are mainly from Asian and African countries and regions, compared with domestic students, foreign students from the developing countries generally have the limitation of the weak education foundation[4], especially the mathematical basis. Also their knowledge of science is relatively narrow, and the ability of combining theory with practice is relatively low. However, the study of communication engineering requires not only a solid mathematical foundation, but also a special emphasis on strengthening the practical ability in experiments and engineering practice. Therefore, how to teach foreign students in accordance with their aptitude is the most important problem we are facing.

Language Difficulties. A considerable part of foreign students in China is from former French colonial countries, which generally use French as their mother tongue. Zhejiang University of Science and Technology has accumulated rich experience in English teaching, and has trained a group of young backbone teachers who teach in English. English teaching is adopted in the full-established undergraduate classes of foreign students. Most foreign students in China have been trained in Chinese. Even though they can pass the Chinese proficiency test for foreign students in China, their Chinese proficiency still can not meet the requirements of professional learning, and they can only have simple conversations in daily life. Unfortunately, Chinese is the dominant language in our country's enterprise environment, and the open practice links need to interact with enterprise engineers. Therefore, language differences are the first difficulty faced by foreign students with academic qualifications in their recognitive practice course.

Regional Advantages. Zhejiang University of Science and Technology is located in Hangzhou city, Zhejiang province. Recent High-tech Production of Torch by ministry of science and technology industrial development center announced the evaluation results of the National high-tech industry, Hangzhou High-tech Zone won the third place of 147 national high-tech zones in China.[5] There are many worldwide famous ICT() companies located in Hangzhou, such as Alibaba, Eastcom, Hikvision and etc, which provide us good opportunities to show our students the developments and real vision of communication industry.

Different Teaching Schemes

Because of the particularity of cognitive practice course, teachers initiate and cooperate with enterprises to discuss and formulate specific practice programs. Then teachers focus on explaining practice requirements, arranging preview content and emphasizing practice discipline in class, students write reports after the completion of practice in enterprises, and teachers will review and grade. In view of the characteristics of the course of communication engineering, we focus on integrating theory with practice, teaching with production, carrying out the practice level of "production line-product-network-system", and giving full play to students' subjective initiative in practical learning so as to ensure the teaching quality of foreign students.

"Production Line - Product - Network - System" Practice Levels. For students of communication engineering, the most important thing is to establish the concept of communication system after four years of study. Cognitive practice course is the first step to establish the basic concept of communication system. Through cognitive practice, students can understand the composition of several specific communication systems and the role of each part. It includes understanding the national technical standards, technical requirements, system organization, workflow, management norms, implementation process of communication systems, and the development trend of electronic information technology. Students complete their internship in the form of on-site practice, concentrated explanation and simple practical operation, which lays a good foundation for becoming an excellent communication engineer in the future.

Based on the above teaching objectives, we designed practice levels of "Production line - Product - Network - system". After defining the purpose and specific arrangement of the cognitive practice in telecommunication enterprises, the students recognize the components module, learn the core process,

understand the process of product standardization, and finally visit the whole manufacturing process, including automatic electronic assembly line, integrated assembly line, and outsourcing logistics line. Fig.1 shows the automatic electronic assembly line in EastCom. Also the students are taken to have a tour in an exhibition hall, where they can have a close look at the different products and systems. A switching center produced by Eastcom is shown in Fig.2. And due to the increase need of safe city, hi-tech surveillance technology is highly developed these years. So we took our students to visit some companies devoted to surveillance products like Dahua and Hikvision. These companies manufactures hi-tech surveillance cameras which provide reliable Security services. The students can not only see the different surveillance product but also have a access to know real surveillance cases in some big cities in China.

Because the practice content is beyond the scope of classroom teaching and the knowledge of undergraduate students, teachers need to summarize the main points of the task in advance, and students are required to finish the task according to the task list and task index during the practice, so as to ensure the basic effect of the practice.



Figure 1. Automatic electronic assembly line in Eastcom



Figure 2. A switching center produced by Eastcom

Special Requirement of This Course. The constraints of foreign students' knowledge level and Chinese ability put forward higher requirements for the teaching of cognitive practice in Colleges and universities. Firstly, teachers are required to have a strong sense of professional responsibility, not

only need to pay more energy and patience, but also maintain good interaction with relevant enterprises, school-enterprise cooperation to design practice content, actively explore teaching methods to train foreign students, improve the efficiency of internship.

In addition, since the practice environment is relatively scattered, teachers can not take care of all students in the field. Therefore, it is necessary to recruit several assistants to ensure the quality of teaching in practice. In the practice activities, one Chinese student will be assigned to four foreign students to form an internship group. The main task of Chinese students is to act as technical translators to help foreign students familiarize themselves with the production cognitive environment.

Report and Assessment. During the internship process, students can use mobile phone to shoot and record, or use ordinary paper and pen to record the internship content, with the company's permission. Problems in the field can be communicated or discussed with enterprise engineers and lecturers through the translation of Chinese students, which objectively promotes the students to actively engage in internship. Students with good Chinese can communicate directly with enterprise engineers, and the effect is better. After the internship, the teacher asked the students to collate the original records and submit the internship report. In particular, the students were encouraged to write their own practical experience by combining the knowledge in class with the needs of national economic development and the degree of social development. Teachers will score based on the students' performance (initiative and practice discipline) and their reports in the teaching process, which are comprehensively assessed by the teachers.

Summary

Cognitive Practice course teaching of communication engineering for foreign students in China require higher standard for teachers' professional level and coordination ability. In teaching practice, we take full account of the limitation of Chinese communication ability and the knowledge level of foreign students, make full use of school-enterprise cooperation resources for different types of teaching content, simplify and refine teaching content, emphasize basic knowledge points, and adopt different teaching methods with different emphasis to cultivate students' ability and knowledge of analyzing and solving problems. In this way, the teaching of Cognitive Practice course has achieved good teaching results, enabling foreign students to understand what they have learned in a relatively short period of professional cognitive practice, with special emphasis on cultivating their engineering awareness of manufacturability design.

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