Reform and Practice for Bilingual Teaching in Civil Engineering

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Abstract: The trends towards a multi-polar world and economic globalization are developing in greater depth. With rapid advancement of science and technology and increasingly fierce competition in countries' overall national strength, the high-quality professionals are strongly demanded in China at present. To meet this requirement, a new teaching model for bilingual teaching is officially promoted by Chinese ministry of education in recent years. Based on the practice in bilingual teaching for the specialty of civil engineering in Henan polytechnic university, the paper presents the arrangement of curriculums, the selection of textbooks and the method of teaching to investigate a talent educational way in civil engineering.

Keywords: civil engineering, bilingual teaching, education reform

1 Importance of Bilingual Teaching in Civil Engineering

The economic globalization must result in internationalization of high education. Over the past nearly 20 years, China has achieved tremendous progress in reform, opening up and modernization. The Chinese economy has become a part of World economy. China is merging into the world completely and it is becoming an important active part of the world. The call of globalization of economy forces the requirement for workers qualified to be competitive in internationalization of science and technology. This implies that the Chinese high education must cope with the global needs of the economic development. Students must be qualified to meet the 21st century's modern development. For this reason, the Ministry of Education of Chinese has delivered the document in 2001 asking for aggressively implementing foreign language in teaching basic specialized courses. In this circumstances, a new teaching model for bilingual teaching is strongly promoted and applied in the universities of China in recent years.

At present, basic and specialized courses are mainly taught in Chinese for Chinese undergraduates majoring in civil engineering specialty. This accords with language custom of Chinese students, but there are many problems. For example, students are still not familiar with specialized English vocabulary after learning common English for many years, common English learning has no relationship with professional knowledge learning, and students could not effectively read professional literatures. In addition, a single utilization of Chinese language teaching has little chance to communicate with world-class universities, and it is difficult to significantly improve the quality of teachers and students. Therefore, implementing bilingual teaching in some specialized courses is a good way to narrow this gap. Based on this consideration, we select Structural Mechanics and Concrete Structures to experiment with this new teaching model in undergraduates majoring in civil engineering specialty from 2002. After several years of practice and research in bilingual teaching for Structural Mechanics, an amount of experience has been accumulated. In 2008, our school's bilingual teaching of Structural Mechanics was projected as national model curriculum by Chinese Ministry of Education and the Ministry of Finance. Combined with the author's teaching experience, some views and issues about the arrangement of curriculum, the selection of textbook and the method of teaching are proposed for promoting and improving bilingual teaching in civil engineering education.

2 Reform and Practice of Bilingual Teaching

2.1 Curricular Arrangement

As we all know today, if we do not understand the structures as well as the reinforced concrete structures, we could not master the civil engineering well. In the process of learning professional knowledge, to
make the undergraduates majoring in civil engineering specialty be able to be familiar with the international language—English as early as possible, the courses of Structural Mechanics and Reinforced Concrete Structures are selected as two core courses for bilingual teaching. The following is the reasons:

(1) Structural Mechanics belongs to one of technically fundamental courses. It is based on the course of Higher Mathematics, Theoretical Mechanics and Strength of Materials; meanwhile it is the preceding course of Reinforced Concrete Design, Masonry Structure, Steel Structure and other specialized curricula. Structural Mechanics is connecting link and plays a very important role in specialized basic courses for the undergraduates majoring in civil engineering. Structural Mechanics is usually set up in the first semester during the third academic year because at this time, the students have already completed College English learning and a great number of students are through the examination of CET 4 or CET 6, whose English language level has been improved. For the bilingual teaching, it not only provides the necessary conditions and infrastructure for teacher’s teaching, but also give students chances to display their ability of foreign language expression. Bilingual teaching would enhance and improve students' knowledge and make students change their pure foreign common language learning into practical specialized language learning.

(2) The reinforced concrete structure plays a very important role in Chinese civil engineering at present or a longer period of aftertime. Therefore, Reinforced Concrete Structure is a sort of technical courses for the undergraduates specialized in civil engineering. It is also a course relating with Code for design of concrete structures, both the principle and the code of design introduced. Students should not only understand the basic idea and principle of design but also predominate how to design a concrete member. The bilingual teaching in Reinforced Concrete Structure is helpful. It is important to help student understand main content of structure design, master specialized vocabulary of civil engineering, improve the skill of reading professional literatures and advance the follow-up research study.

2.2 Selection of Textbook
The textbook is the foundation of good teaching. Good teaching materials can significantly increase student learning initiative and enthusiasm to learn. Some educators realized that the best choice of textbook in bilingual teaching is an original foreign edition textbook. However, according to investigation, the contents in original English textbook does not suit Chinese students well because these textbooks are written in terms of western students' cultural habit and thought manner. Especially in civil engineering specialty, the design of engineering structures is not completely carried out by the same standard, and the designer must comply with the native code to design. Thusly, the foreign textbook can only act as a reference book. It also requires the educator in China to make native textbook international. This implies that they must write Chinese textbook in English. This is an inevitable result of educational internationalization.

In order to do a good job in the internationalization of China's teaching materials, combining with the author for many years engaged in Structural Mechanics of teaching experience, the author and Bao Shi-hua, a well-known professor in Civil Engineering Department of Tsinghua University, have been co-written an English textbook—Structural Mechanics. This textbook is written in terms of the national education program, syllabus and requirement of the course. Because it is written by means of teaching plan and program of Structural Mechanics used in civil engineering specialty of Chinese universities, it is suitable for Chinese students and teachers. The book has been used in Civil Engineering School of Henan Polytechnic University (HPU) for many years and been proved successful. The book, published in 2006, has been confirmed one of national “Eleventh Five-Year Plan” textbooks. The textbook of Reinforced Concrete in bilingual teaching is Elementary Reinforced Concrete Design, written by Li-Zhujing, also a well-known professor in Civil Engineering Department of Tsinghua University. This book has been used in Tsinghua University for many years and is well received by students.

2.3 Implement Means
Building the teaching platform between English and Chinese is effective way to improve bilingual teaching. At present, there are about 10 classes and 300 students in the school of civil engineering of
HPU each year. The English level of the students are different, most students study English, while a few ones study Japanese, Russian or other languages. In addition, in order to satisfy all the students in different English levels who want to listen to bilingual teaching, constructing a teaching platform of Structural Mechanics and Reinforced Concrete Structure is necessary for bilingual teaching. That is to say, more than two teachers are needed to teach Structural Mechanics both in English and in Chinese at a same time period of teaching, and students can select any class according to their interest and ability.

2.4 Teaching Method

There are some difficulties and challenge in bilingual teaching. We must first meet the student’s level of understanding, it is necessary to consider the acceptance of students. This kind of bilingual teaching should therefore adopt a progressive manner in the initial medium of instruction. In the initial stage, the teachers can rein up the teaching schedule, explain the specialized vocabulary in both Chinese and English and lead the students to read through the text. This is a useful manner to help students adapt well this new teaching model. Then, the teachers gradually increase the amount of both oral and written English expressions. While the course goes on and the students' ability increase, the amount of English teaching increases too. And then gradually increase the proportion of English instruction to enable students to learn to think in English and answer the professional question in English. Telling should be a simple sentence as far as possible, and through the issue of foreign language professionals to ask questions, increase classroom interaction, to create a lively classroom atmosphere and enhance the enthusiasm of the students. This will help students to improve gradually their English comprehension and to comprehend the basic concepts of the course, besides enriching their way of thinking. Since the interpretation of the majority of professional English words in the English dictionary held in undergraduate students are not very accurate, in order to save students time, classroom teachers must be issued specifically for the students of professional courses relevant to explain English vocabulary, enabling them to learn English materials also have had more time to learn professional knowledge. Bilingual education teachers frequently spent on more classroom hours in a very tight way to explain professional English vocabulary, the instructors should thusly make full use of multimedia and other modern teaching methods to improve classroom utilization.

3 On the Future of Bilingual Teaching

Through the practice of bilingual teaching in these years, we realize that in the process of bilingual teaching, the most important point is making students learn specialized knowledge with the international language, but not learn English. So in the teaching process, we should make full use of the language as tool to increase the students' enthusiasm for learning professional knowledge. At the same time, enhance the students' abilities of applying foreign language. However, as a new teaching model in China, bilingual teaching is facing a lot of problems to be solved, such as, the English level of students may be language obstacle, and the expression in English of teachers is difficult and so on. In summary, the bilingual teaching in civil Engineering is a very challenging task, and has a very bright future with efforts from the instructors and the students.

References