Promote bilingual teaching mode in practical teaching

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Abstract. In view of the current situation of bilingual teaching in hydrology and water resources engineering, the teaching mode of promoting bilingual courses was explored to train outstanding engineers. The author accurately locates the course through research, clarifies the purpose of teaching, and improves the teaching method. In the classroom, the typical case study was conducted in bilingual, which not only made up for the students' lack of understanding of professional practice, but also enhanced the application ability of professional English. Students have the opportunity, the environment (classroom requirements) to construct a disciplinary knowledge system with English thinking, so that university graduates have the ability to use English to communicate in professional fields, and become an international talent who understands both professional and English.

1. Introduction

For the four year undergraduate students of hydrology and water resources engineering, after the first two years completed the study of College Basic English and completed the course of Professional English in the first semester of the third year of the University, the "bilingual" course was began to study in the second semester. When students' professional knowledge and English have good foundation, teachers should combine the actual research problems to guide the students to discuss in bilingual [1]. Students can improve their understanding and application of professional English materials while gaining relevant professional knowledge. It can be said that it is very necessary to open a professional bilingual class in the third semester [2]. It can help students use English to learn professional knowledge, help students master the cutting-edge expertise of many disciplines and the terminology that is not commonly used in previous English learning. It can broaden the interface of students' professional learning and communication, enabling them to communicate in English in academic terms and meet the urgent needs of the society for professional bilingual talents [3].

2. The characteristics of the bilingual course "Urban Water Management"

The goal of opening the bilingual course of "urban water management" is to cultivate high-quality talents with a solid foundation, strong practical ability, innovative spirit and a good command of a foreign language. Urban water management is a very closely related course with the current practice. The new thinking of introducing urban water management of Germany is focused on urban residential area rainwater management, so that students are familiar with and master the engineering and non-engineering technologies of urban water management. Engineering technologies include water saving (water saving appliances), multi water use (rainwater collection and recycling and ash water treatment), drainage (sewage and rainwater), water ecological community, and manageable aquifer recharge. Non-engineering technologies include formulating laws and regulations on water saving, training public awareness of water saving and adjusting the price of water supply and drainage. Students will integrate knowledge of different disciplines into water management and ultimately understand the concept of sustainable development of water resources.

College Students' vision is limited to schools, and they lack perceptual knowledge of social management, especially on water resources. As far as the current management status of our country is concerned, it has many theories and few examples. Therefore, we choose the most advanced German research results in urban water management as learning materials.

In the classroom, teachers use the classroom language to organize teaching. When explaining professional knowledge and key points, try to use the English that the students have already learned to analyze. At the same time, materials are analyzed with easy-to-understand language. The relevant questions
are interspersed from time to time, so that students can understand their meanings and use English to think and answer questions. What’s more, students can understand and master the latest ideas, techniques and methods in urban water management. After the completion of the study, the students can correctly understand and preliminarily grasp the basic theory of water management; initially have certain knowledge of urban water management; have the most basic ability to analyze water management problems and solve problems and lay the foundation for professional work and scientific research.

3. Improving teaching methods and content

3.1 Use vivid multimedia courseware to enhance the teaching effect

The multimedia teaching is used in classroom. The courseware is made in Chinese and English, and a large number of visualized pictures are used to help students understand the basic theoretical knowledge, basic principles and mastery of water management. Each slide produced is highlighted in English and assisted by Chinese, so that both good English students and poor English students can be taken care of. The teaching content is vividly expressed through various graphs and tables, attracting students' attention and improving their interest in learning professional knowledge. More importantly, the complex principle is expressed in simple graphics, which is easy for students to understand and master. The test results show that most of the students are concentrated above a good level.

3.2 Select appropriate international knowledge materials for teaching

German mature urban water management research results were used as teaching materials. The content of teaching materials involves urban water resources management system, citizens’ water saving awareness at all levels of society, life water saving appliances technology, urban sewage treatment and reuse, supply and drainage water price system and urban rainwater utilization, etc. Classroom lectures have both theoretical and practical cases. Under the class, combined with the research of the subjects carried out by our teachers, several topics are proposed for students to discuss, and students are required to solve the practical problems in urban construction with advanced urban water management concepts.

Through the combination of international advanced theory and practical cases, students have mastered the advanced concepts and technical of sustainable urban water management in Germany from these professional practice activities.

3.3 Enriching teaching methods

Bilingual teaching is based on the latest foreign research literature on hydrology and water resources. At the same time of using multimedia teaching, the relevant professional videos are inserted timely to improve students’ interest in learning, help students to understand thoroughly, effectively promote the updating of teaching content, increase the amount of information given, and quality of teaching is greatly improved.

4. Improve the quality of the teachers

4.1 Actively participate in international academic conferences

In order to better complete the teaching tasks, the members of the course group have participated in many international seminars held at home and abroad, and often pay attention to international research trends. Each member has a study abroad experience. The course group has scientific research cooperation with Germany, Australia, the United States, South Africa and other countries. What’s more, the exchanges with abroad are frequent, and the latest research results in the field of foreign hydrology and water resources are continuously collected and mastered.

4.2 Apply for a foreign study

Members of the course group have six months to one year of foreign study or research experience, with high English listening, speaking and expression levels, and solid professional knowledge. The members of course group can use the two languages freely in the classroom to explain the basic concepts, relevant theories and learning focuses of the subject, so that students can more easily accept, understand and apply what they have learned.

4.3 Hire foreign professors to teach

With the support of the school and college, the professors from the University of Essen in Germany were
invited to teach the contents of the rainwater collection and utilization course in the residential community for three consecutive years, and exchange information and experience of urban water management. The course group learns the curriculum design and teaching methods of German professors. Through the exchange and discussion with the German professors in the course teaching and textbook selection, the teaching level and teaching effect of the course group teachers are greatly improved.

5. The close combination and mutual promotion of scientific research and courses

In the teaching, combined with the “Jinan Groundwater Action Plan” and the National Natural Science Foundation project “Experimental Study on Residual Fractured Karst Aquifer after Urban Roof Rainwater Treatment”, taking Jinan City as an example, the urban water management has been extensively expanded in many aspects. These cases add vivid and informative examples to the teaching of urban water management courses, making it easier for students to learn and understand the course, and the learning level is further improved. In combination with our research and practice activities, the organization of students focused on the following two aspects.

5.1 Water resources management system

Whether the water resources management system is reasonable or not directly affects the effectiveness of water resources management, our country's water resources management system is constantly adapting to the situation and making timely adjustments. In the course of teaching, combined with the experience of urban water management in Germany, taking Jinan City as an example, it is proposed that water resources should be developed from decentralized management to unified management. Urban water management involves the process of water source, water supply, water transportation, water use and drainage. In terms of water sources alone, Jinan has groundwater, local surface water and exotic Yellow River water. Groundwater is responsible for the water company. Enterprises self-prepared well water, civil defense tunnel water and surface water are managed by the Water Resources Bureau. Water is divided into industrial, agricultural, and domestic water in Jinan. After long-term integration, Jinan City has formed a reasonable water resources management system. The water source was managed by the Water Resources Bureau, and the corresponding companies were established: the water source company, the water plant company, and the user company, which ensured the optimal scheduling of multiple water sources. The incomprehension and confusion of the students are solved in the depth discussion, and it also cultivates students' ability to solve practical problems and develop innovation and practice.

5.2 Water price system of water supply and drainage

In the course of teaching, combined with the research on the adjustment of water price in Jinan, the water price is used as the economic lever to promote water saving. In order to maintain in the spout of spring water, Jinan city has successively built two reservoirs for the Yellow River water supply, which has huge investment. However, the water price at this time was too low, which led to the long-term debts of the project and affected the operation of the project. After adjusting the price of water, it has played a good guiding role in water supply for enterprises and residents, and the water supply project is gradually moving towards a virtuous circle. Urban water management curriculum closely tracks the dramatic changes in water prices in the new era. The theory is combined with the production case, and the problem-based teaching method is adopted to train the hydrological and water resources engineering engineers who are urgently needed in the new period of work.

In teaching, many innovative points of research results will be taught to students. Students are willing to listen, and they can feel the actual situation and the problems of water resources management in the city. The students' interest and enthusiasm were fully mobilized and achieved very good teaching results.

6. Experience

Nowadays, college students have a strong sense of self-determination. If classroom teaching methods and contents can attract them, they will change passive learning into active learning.

They will have a desire to express themselves, and they will actively think and speak positively. In this way, students and teachers naturally interact. Under the guidance of teachers, students can learn to use the knowledge what they have learned to solve various practical hydrological problems and methods, and the teaching objectives will be smoothly realized.
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References