

Research on the International Teaching Mode of Civil Engineering Major in Applied Universities- Taking Engineering Mechanics as an Example

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Abstract: With the acceleration of globalization, China's construction industry has also been integrated into the international project market process quickly, which improves the ability of international exchanges and cooperation. Taking engineering mechanics course as an example, this paper starts with the teaching objectives, teaching concepts, teaching contents, teaching methods, classroom forms and assessment methods of civil engineering in applied universities, discusses the practical train of thought and main innovative contents of internationalized personnel training for civil engineering application. In view of some problems found in the teaching process, this paper expounds a numbers of teaching measures being implemented and continuously improved, and achieves good teaching results.

1. Introduction

The national program for medium and long term education reform and development (2010-2020) issued by the state council clearly states: "strengthen international exchanges and cooperation. Improve the level of internationalization of education in China. Drawing lessons from advanced international educational concepts and experience. We should promote the development of education. Promote the international status, influence and competitiveness of education in China. To implement the internationalization of talent cultivation, English teaching is an important part and implementation measures.

In order to promote the internationalization of all-English teaching methods for civil engineering majors, Improving the international competitiveness and communication ability of college students. Cultivate international talents to meet the social needs of economic globalization. In recent years, some universities in China have carried out all-English teaching successively. The goal is to have solid theoretical basis, systematic professional knowledge, outstanding practical ability, broad professional vision, positive innovation consciousness, good team spirit, and be competent for technical personnel in various fields of civil engineering.

Engineering mechanics is an important basic course for civil engineering majors. It has strong theory and closely related to engineering technology. Although it is a traditional subject, the theorems and conclusions are still the important foundation to solve practical engineering problems.

Different from the following professional courses, As an international general professional basic course, the teaching content and requirements of engineering mechanics are basically the same internationally. From this point of view, it is of great significance to teach engineering mechanics in English.

2. The necessity of international teaching for civil engineering major

With the improvement of China's comprehensive strength, international competitiveness and civil engineering technology the field and scale of foreign project contracting business in China's construction industry are expanding continuously, and the contracting share in the international project market has steadily increased. For all that, lack of internationalized talents in civil engineering. It has always been the main problem that puzzles Chinese enterprises in contracting foreign projects. It is also an important reason for the large gap between these foreign-related enterprises and the major international contractors. Therefore, exploring and practicing the training mode of applied international talents in civil engineering specialty, so as to cultivate a group of international talents with international vision and understanding of international competition rules. It has become an arduous and significant task for civil engineering major in colleges and universities in China. According to the results of the questionnaire survey on college students majoring in civil engineering, 83.51% of college students think it is necessary to start bilingual teaching courses. It shows that the all-English teaching is necessary in the field of civil engineering, and students have a strong interest in all-English teaching

3. Discussion on International Teaching Method

3.1 Selection of teaching objects

Engineering mechanics is taught to students in applied universities. Because there are fewer all-English courses, these students' English listening and speaking ability is slightly inadequate, but their reading ability is better, so it is difficult to teach students in accordance with their aptitude in teaching, which has a certain challenge to the development of bilingual courses. They can try their best to slow down the speed of language and write down the contents of the courseware in detail. For the first time, the basic concepts, special nouns and important theorems are provided in the courseware in English and Chinese. Although it is all English teaching, the core purpose is to enable students to master basic knowledge. Therefore, bilingual methods are basically adopted for some key and difficult contents. We can use English to explain, and then use Chinese to retell. This avoids students from losing self-confidence because of language barriers. At the same time, we should also tell students the importance of all-English courses. It can help to understand the frontier knowledge of civil engineering and improve the ability to participate in international affairs. Make students have a clear perception of the goal of all-English teaching and improve their willingness to participate in all-English courses.

3.2 Application of Teaching Method

Engineering mechanics course is more professional, theoretical and practical. Due to the objective situation of Chinese college students' English proficiency, the progress of all-English teaching is generally slower than that of Chinese teaching. In order to accomplish the teaching task, we should pay attention to the combination of language use and curriculum content in English teaching. The immersion teaching method is adopted to enable students to master curriculum knowledge in the English language environment. For example, the use of multimedia as a modern

means of teaching, more vivid display of content, which can save a considerable amount of drawing time. Statics and material mechanics involved in engineering mechanics, we can make full use of the advantages of multimedia, combining text, graphics, and fine animation, so as to attract students' attention, so that students can more vividly and intuitively understand the relationship between internal stresses of objects. Besides multimedia graphics and animation, teachers should pay more attention to interaction with students. Through body language and humorous language, students can easily keep up with the teacher's ideas, which will form a deep impression in their minds and even remember the picture for life.

3.3 Curriculum setting

In addition to the depth, breadth and topic atmosphere of traditional teaching knowledge, students pay more attention to the process and effect of knowledge transfer. In fact, it is the students' expectation of the teaching process and effect. As for the selection of textbooks, most students prefer to use the original English textbooks. This requires teachers to teach on the basis of textbooks. It can also take into account the difficulty of English while adding a variety of forms of industry frontier knowledge.

There are two obvious differences between foreign and domestic textbooks of engineering mechanics. Firstly, the original English textbook usually uses vector method to analyze the force state of objects in three-dimensional space. The plane problem is regarded as a special case of space problem. But domestic textbooks generally pay more attention to plane problems. It is particularly thorough, and the space problem is regarded as a simple extension of the plane problem. Secondly, the examples and exercises in the original English textbook pay more attention to engineering application. From the exquisite illustrations in the textbooks, students can feel intuitively what engineering problems can be solved by the theoretical knowledge they have learned. The domestic textbooks lay more emphasis on theory and problem-solving skills. The illustrations in the book are mostly abstract structural drawings. For all English teaching, the advantages of the original foreign language textbooks are obvious. Due to the poor English foundation of college students in China which reduces the effect of the original English textbooks. Increase the difficulty of courseware appropriately so as to stimulate students' enthusiasm for classroom learning. It can make students feel that learning is useful. Many examples with engineering and application background have been added to the courseware. For example, the structure of sea-crossing bridge is analyzed by static method (Fig. 1). The vertical pendulum is analyzed by dynamic method (Fig. 2).

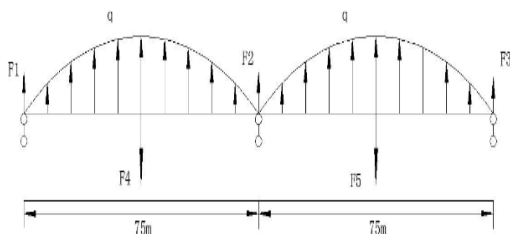


Fig.1 Statics of Sea-Crossing Bridge

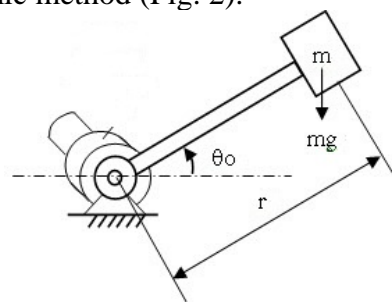


Fig.2 Dynamics of vertical pendulum motor

3.4 Form of examination

Currently, most of the course scores include the usual grades and the final exam scores. It has caused a lot of adverse effects. In order to arouse students' learning enthusiasm. Schools can

organize teachers with foreign educational experience and rich teaching experience. Establish evaluation criteria for assessment methods and teaching effects. We can draw lessons from foreign teaching experience, it is properly reduce the proportion of final exam results and add engineering mechanics project assignments, through the cooperation of project teams at the end of the semester, complete written reports, display research results, analysis methods and conclusions.

4. Conclusions

With the continuous improvement of internationalization, the competition for talents has developed from regional competition to international competition. It has become a trend in the reform and development of higher education to carry out all-English teaching in applied universities. The number of teachers and students participating in exchanges in the United States, Britain and other countries has increased. It has formed a bilingual teaching team with overseas visiting experience, solid professional foundation, fluent oral English and strong comprehensive ability, which makes bilingual teaching more feasible.

In order to develop all-English teaching, first of all, all-English teaching should not be restricted to the whole course of civil engineering specialty. Some basic courses with good international connection can be selected to carry out full English or bilingual teaching. Secondly, domestic teaching materials and foreign teaching materials are combined to find the best teaching content. Finally, all-English teaching requires that teachers' English proficiency and professional knowledge are very good. Promote discipline construction and teacher team construction, more prominent international, application-oriented two major characteristics, further improve the teaching effect.

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