Study on Curriculum Reform for the Curriculum Design of Mechanical Design in English

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Abstract. Based on the teaching experience of "Curriculum Design of Mechanical Design" in English, combined with the actual situation of Shanghai Polytechnic University, this paper sorts out the difficulties of English Teaching in mechanical engineering. According to the specific circumstances, effective measures are taken to carry out the solution and show the results of the phased teaching practice, so as to provide support for the international curriculum system, teaching staff construction and teaching management of mechanical engineering.

Introduction

With the development of social internationalization, many of the management majors in domestic colleges and universities have embarked on the road of international development and the professional courses are taught in English. The Graduating students are very popular both in domestic multinational companies and directly to foreign jobs. In view of this, the traditional mechanical engineering has also speeded up the pace of internationalization, more and more students go abroad, there are also students of other countries come into Chinese university to learn the major, so the international professional courses in mechanical engineering is facing the huge challenge.

In the teaching practice of Shanghai Polytechnic University, it is the first time to cultivate students in English as a teaching language. Therefore, the curriculum system, teaching contents and teaching methods are faced with new challenges. The teachers and students also have a suitable process. Combined with the actual situation of the teaching experience of "Curriculum Design of Mechanical Design" in English and teaching management, we will discussion on how to carry out the professional teaching in English and realize the training of international talents.

1 Problems in English Teaching

Since 2015, we have taught "Curriculum Design of Mechanical Design" in English, so that we can learn from the advanced teaching methods of foreign countries to cultivate international and compound innovative mechanical talents with good English foundation. After two years of teaching practice, the following points are summarized in view of the main problems existing in English teaching.

1.1 Teaching in English Increases the Difficulty of Students' Learning

The English level of the mechanical students is less than that of the liberal arts students. The teaching materials for class, the PPT and the related teaching materials are all in English, and the English level is tested. In particular, English teaching and project defense are more likely to test their weak English listening and oral English. Students generally reflect that it is difficult to accept and to keep up with the teacher's progress.

1.2 Selection the Teaching Content

There are many advantages of foreign original textbooks, but there are still many shortcomings. For example, it is not consistent with our course outline, the price is very expensive, and the delivery time
is long. Therefore, it is very difficult to choose suitable textbooks for students in the early stage of curriculum construction.

1.3 Teaching Organization

Most of the traditional teaching mode use PPT teaching, case teaching mode. Although the teacher introduced in simple English, the students' English listening is not good enough, sometimes they cannot fully understand it, so they soon lose confidence, start playing cell phones or do other things, and the teaching effect is not good.

1.4 Assessment Method

The traditional methods of assessment are usually attendance, homework and final examination. If English teaching using this model, will be too much emphasis on reading ability training, it was difficult to measure the specific effects of English teaching. It is also a difficult problem in front of teachers to develop new assessment methods that conform to the curriculum standards and arouse the students' enthusiasm for learning.

1.5 Improvement of Teachers' Level

At present, most of the teachers of mechanical engineering have a doctorate degree. They have been learning English for many years and have developed a high ability to read English, but their ability to express English is generally not high. Therefore, it is very difficult to arrange all English courses for teachers, which is a great challenge for professional teachers.

2 Implementation Method of English Teaching

2.1 Early Mobilization

Mobilize the students one semester before the start of the course. We show the students the video of the English teaching and the previous students' English presentation, and so on, so that they can actively enhance their English level and establish their self-confidence.

2.2 One to One Communication with Foreign Students

Shanghai Polytechnic University and Brandenburgische Technische Universität Cottbus synchronized teaching this course. In order to strengthen private communication between students, a German student and a Chinese student are arranged to form a team to work together to complete a design task. They have a common topic, and the students can interact with each other through various communication tools to improve their English expression.

2.3 Inviting Overseas Experts to Do Academic Reports

We regularly invite experts from overseas and famous overseas teachers in our University to make academic reports in English, carry out academic exchanges and organize senior students to participate.

2.4 Selection of Teaching Materials

The original English textbook which is close to the course outline is used as a reference book. Because the original textbook is more expensive, only a small amount of reference is provided for students, and the content closely related to the course outline is compiled ourselves.

2.5 Changes of Teaching Methods and Content

Change the original mode of teaching about the content of the textbook, and use the project driven way. The first class assigns the tasks well and points out the specific assessment methods. In the subsequent course, each student has the opportunity to interact with the teacher, report their progress
in the project and the problems encountered. Teacher gives students proper marks according to their progress and performance, so that they can improve their oral English skills in practice.

2.6 Construction of the Curriculum Website

All the Chinese and English teaching resources are published online. Students can login the course website and share all teaching resources, including syllabus, lecture notes, CAI courseware, assessment criteria, students' reply videos, and students' real-time answering questions, assignments submitted and corrected online.

2.7 Adjustment of Curriculum Assessment Standards

Change the standard of assessment that focuses on the final examination or the big homework model, instead, focus on the process assessment. Usual performance from the traditional accounting for 30% to 40% and the content from the original mainly depends on attendance and homework, increased to 10 different content to try to take care of the daily teaching aspects, and strive to fairly reflect the student level in the course. The examination form at the end of the course also changed into English homework and full English presentation.

2.8 Strengthening of Teachers' Skills

In order to build more English major courses, our university focuses on the recruitment of doctorate with overseas study or working experience, besides, selected professional teachers with good English to communicate overseas. After returning to China, they began to take English courses. At the same time we also arrange overseas teachers to train professional teachers.

3 Achievement of Teaching Practice

Since 2016, the construction and implementation of English professional courses have been highly recognized by the students. A number of graduates successfully passed the English interviews of foreign companies, and one of them successfully passed the German postgraduate entrance examination. The students who have graduated reflect the English professional courses are very helpful to their English communication in the professional field. At the time of the 2016 curriculum presentation, We invited the professor in charge of mechanical engineering as judges, after the presentation she gave a high evaluation; At the time of the 2017 curriculum presentation, We invited overseas famous teacher from Ryerson University in Canada as one of the judges. He also gave a high evaluation about the teaching methods and teaching effects. Especially for some excellent students, he invited them to apply for his postgraduate education. The teaching results of English professional courses have also been highly recognized by the colleagues. The course has been included in the teaching plan by other related major of machinery in our university.

End and prospect

According to the actual English teaching situation of “curriculum design of mechanical design” of the mechanical engineering of Shanghai Polytechnic University, this paper makes a brief analysis of the difficulties and solutions as well as the effect of teaching practice in the teaching of mechanical engineering in English. At present, the international development of mechanical engineering is not perfect enough. It is not mature enough. Many difficulties and bottlenecks are encountered in the development process. With the support of leaders, teachers and students, we have made a good start. It is believed that in the future, as long as professional teachers constantly strive to conform to the trend of international development, the development of the international development of mechanical engineering will be greatly promoted.
References
