

Research on Classroom Teaching Methods on Professional English for Mechanical Design, Manufacturing and Automation

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Abstract: The major of Mechanical design, manufacturing and automation is a major for undergraduate at all comprehensive universities. In the modern society of internationalization, informationization and technology, it is very important to cultivate high-quality and high-level engineering and technical personnel. It is an urgent requirement of economic globalization and internationalization of science and technology to improve the professional English level of mechanical engineering students and strengthen their application ability of professional English. This paper mainly focuses on the problems existing in the English teaching for Mechanical design, manufacturing and automation, the characteristics and teaching methods of English for this major, and puts forward some suggestions and reflections.

1. Introduction

With China's entering WTO and the popularity of Internet, the disciplines on traditional mechanical engineering are constantly being transformed, and the technicians of mechanical engineering are increasingly exposed to English literature in their fields of expertise and have more opportunities to have exchanges and cooperation on international technology. Therefore, in the situation of economic globalization and internationalization of science and technology, it is very urgent to improve the professional English level of the students in mechanical engineering and strengthen their application ability. In addition to professional terms, professional English for mechanical engineering has its unique features in professional language use due to its professional nature and cultural differences. Mechanical engineering English is usually another language for beginners without a special education. Therefore, professional English as a course must be set up in the courses of mechanical engineering to realize the transition from common English to bilingual teaching of mechanical engineering, and to create a platform for professional communication. In order to make students grasp the development and the trends of international engineering technology, teachers should try their best to develop students' ability to read and translate mechanical engineering English textbooks, reference books and other related materials, and meanwhile improve their ability to have academic exchanges in English.

2. Problems in teaching

There are many problems in professional English teaching now. First, there are fewer class hours. With a total of 32 class hours in a semester, students can not systematically learn professional English knowledge. Second, the professional English passages are highly professional, rigorous in structure, and with many new words. Furthermore, the sentences in them are too long and difficult to understand. These are the reasons why it is difficult for beginners to learn and why students' enthusiasm for learning is down. Third, some students have a poor foundation in common English, which makes the teaching system of professional English and the teaching system of common English incoherent. In the process of professional English teaching, the students' English level is uneven, which brings great difficulty to teaching. Students with a higher level in English sometimes feel it is a waste of time, while students with a lower level do not understand. It causes a waste of teaching resources and time, and it is also easy for students to get bored. Eventually, students feel

that professional English learning is not very rewarding. Fourth, there is not enough emphasis on professional English teaching. For a long time, professional English courses have not received the same attention as common English courses, and the setting of professional English courses seems to be dispensable. Fifth, there are not enough good teachers who are English majors to teach professional English, and most of the teachers who teach professional English are not English majors. What's more, professional English is highly disciplined, involving scientific theories and scientific methods of Mechanical design, manufacturing and automation and related disciplines. For this reason, teachers of English majors may not understand and most of the lecturers are teachers with good mechanical knowledge. However, teachers in mechanical disciplines are not very professional in English speaking and teaching compared to English major teachers, so they cannot attract students in learning. Sixth, the teaching methods are not various, the content is boring, and the teaching effect is not ideal. In the teaching of professional English, due to the limitations of the time, generally the teachers are too focused on reading and translating and there are more explanations, which influence the students' enthusiasm for learning. On the other hand, due to the strong profession of the major, generally the teachers are the teachers of this major who are better in English. Of course, they have a good command of the teaching content in the text, while in terms of oral expression and teaching methods, they are not as good as English major teachers. Therefore, the quality of professional English teaching is worrying. Seventh, there is not enough research on professional English teaching and there are no unified evaluation standards for professional English teachers.

3. Characteristics of professional English for Mechanical design, manufacturing and automation

First, the vocabulary is difficult. Because the words of professional English for this major is closely related to Mechanical manufacturing, structure, materials, heat treatment, fluid transmission, equipment, robots, etc., daily English rarely involves these specialized words, and students have limited professional knowledge, there are too many new words for students. On the other hand, English words are polysemous, and students are used to understanding professional English in the meaning of common English, which often leads to misunderstanding. Second, the sentences are difficult. Vocabulary is one of the reasons why it is difficult for students to understand sentences. In addition, professional English passages are more logical and formal in style. Each sentence contains a large amount of information. In most cases, the sentences are extremely long, and with complicated grammatical structure, which increases the difficulty in understanding. Third, it is difficult to translate professional English into Chinese. Due to the particularity of the vocabulary of professional English, most students have difficulty in English-Chinese translation. There are two main reasons for this: First, students don't know much about translation skills. They are accustomed to mechanical translation, which makes the translation unsatisfactory or irregular; Second, students are weak in Chinese which can't meet their will in doing this.

4. Exploration of teaching methods

On the topic of this paper, the teaching methods can be explored from four aspects---teaching material, handouts, courseware and the specific teaching methods. First, teaching material. Professional English is a highly targeted course that requires students to have the basic skills for college English and at the same time be familiar with the knowledge of the particular profession. It is for this reason that this course is set in the third year or fourth at college. Given these, it is important to select a proper textbook for professional English teaching. When selecting a textbook, based on the student's learning situation and actual application, we should select a textbook that is practical, rich in content, broad in knowledge, easy to understand, and relevant to the content of the subject. Why is selecting a textbook important? Because it is directly related to whether students can learn this course well. For the students in the third year or fourth, it is difficult to understand and accept a textbook which is with a lot of content and a large number of new and professional

words. Some professional words are only covered in deep theoretical research. In a certain sense, the choice of teaching material is also the choice of teaching content, teaching objectives and teaching methods, and should be of certain pertinence and professionalism. Second, handouts. The preparation of the handouts should be aimed at the professional level of the undergraduate students and some detailed explanations should be given for some words that are difficult, frequently used, difficult to understand and memorize. Teaching handouts must be constantly accumulated and updated in the teaching process. Not every passage is suitable for students and this requires a more in-depth study of the passage---to distinguish what is the knowledge that the students must master, what is the knowledge that the students only need to understand. In the course of explanation, we should follow the rule of gradual progress and gradually increase the degree of difficulty. At first, teachers should let the students start with some simple and easy-to-understand passages. Therefore, it is necessary to focus on the teaching order of the text. Third, courseware. PPT courseware is very important in teaching, and reasonable use can get a multiplier effect, especially for professional English. Some passages in professional English are difficult for undergraduate students, so teachers should take PPT courseware seriously. Through PPT presentation students can have a deeper understanding of the content of the passage. Professional English is more Abstract for some students, which requires animation vividly demonstrates the application of mechanical engineering to deepen students' in-depth understanding of mechanical principles. And, to deepen students' understanding and memory, it is a good way to intersperse professional vocabulary and mechanical English application methods in animation. PPT courseware demonstration not only facilitates the study of professional English, but also provides students with a better understanding of the basic operating procedures of Mechanical design, manufacturing and automation, which enhances the professional skills of students and students' preferences for the profession greatly. Practice has proved that in the process of teaching, the animation demonstration produced by the above method can have good learning effects. Fourth, it is about specific teaching methods. As to reading and writing: As the process of internationalization continues to accelerate, for most undergraduates, it is inevitable that they will continue to be exposed to English after graduation. In the work, they need to read not only a lot of foreign literature and material, but also the technical specifications. And for some special positions, technical personnel are required to exchange scientific research in English. Therefore, it is necessary to improve students' professional English reading and writing skills. The research on the writing method and sentence structure of scientific articles shows that professional English is different from common English---it conveys professional knowledge. This requires students to pay attention to the language and the structure of papers on science and technology. When it comes to writing in English, vocabulary is necessary. Most sentences in professional English are long, so students need to find a good way to remember and understand words. We can not memorize words by rote, but in a flexible way. When memorizing a word, we should start with the root, and then the part of speech, prefix or suffix. In teaching, teachers should analyze the frequently used vocabulary, point out the structural characteristics and laws, and make some simple sentences with them. Continuous practice and summary can make students achieve twice the result with half the effort. As to listening and speaking: With the emphasis on the training of English listening and speaking, the students' listening ability and speaking ability has been greatly improved. Most students can understand daily communication and can also have basic communication. But scientific and technological exchanges are still difficult for students. With the integration of scientific and technological information, students need to communicate with people in the professional field in English, understand what others are saying, and express their ideas in English. Students should learn more about their profession and be able to connect with the world. The long-term training of English listening and speaking requires persistence and accumulation to achieve better results. In training, students should start from simple sentences, then to complex sentences, to paragraph and to the whole passage. Step by step, students will make great progress. In the process of teaching, it is necessary to develop a good interaction between teachers and students. Teachers should ask students some questions according to the listening material, and develop students' ability to read or translate. By doing this, teachers will know whether the students

have a good command of the content, and then make timely adjustments and corrections. As to extracurricular reading and translation: Since the major of Mechanical Design, Manufacturing and Automation is a traditional and rapidly developing discipline, it has close links with various disciplines in teaching content. The research on this is also very active. Every year, a large number of new research results are published in domestic and foreign journals from which we can select some excellent papers that are closely related to the teaching content as the material of students' reading and translation, so that students will have a certain understanding of the development frontier of Mechanical design, manufacturing and automation, and improve their professional application ability. How to select material from the journals is a very important step, which requires teachers to read a large number of papers first, and then according to the teaching objectives and students' interest and level, decide which are suitable for teaching.

5. Conclusion

In order to improve the students' professional English in this major and strengthen their application ability, the research on the teaching methods needs to be further deepened in view of the practical problems in classroom teaching of the professional English, so as to cultivate students' initiative and interest in learning, to improve teaching effect, and to make students do well in practice.

References

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