

Application of the Mixed Teaching Innovation in the English for Science and Technology Teaching

SUN Yong^{[a],*}

^[a]College of Physics and Electronic Information, Inner Mongolia University for Nationalities, Tongliao, China.

*Corresponding author.

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Abstract

To improve the professional quality of students and train the ability of the students' innovation research, English for science and technology (EST) is established as a course. According to the characteristics of the applied physics majors, the course training requirements, and the traditional teaching reform of our university, it is innovation to the teaching modes, contents and methods of EST (such as physics in English). The mixed teaching mode for the first time is applied in the student's classroom. The method made the students to take part in acquired knowledge and achieved a very outstanding teaching result. EST which is the teaching reform and an important professional course can be used for the students to read the professional English literature and professional writing in the future. The mixed teaching innovation in EST has been popular with the students of applied physics.

Key words: Mixed teaching innovation; English for science and technology; Physics in English; Applied physics

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INTRODUCTION

EST is a branch of English for Special Purposes (ESP), and it is a kind of language style gradually formed by the scientific and technical researchers in the process of transferring scientific and technological information in English. EST generally refers to the English used in natural science and engineering technology, so it is strong pertinence and practicality, especially in vocabulary, voice, grammar, structure, style, and so on. It has a great difference between the ordinary English and EST. EST is usually characterized by conciseness, accuracy, conciseness and other characteristics. A large number of graphs, diagrams and data are used in the article. And the passive voice is as its common style structure in the sentences, thus learning and understanding of EST need to have an English foundation and background of science and technology. Besides, the scientific English vocabulary which can only be understood clearly by auxiliary tools is abstract and specific. It brings many problems to the learners of scientific English. Therefore, it is imperative to use the mixed teaching reform for EST.

1. THE NECESSITY OF THE MIXED EST TEACHING

The mixed teaching on the basis of traditional blackboard teaching contains the integration of multimedia network technology, the Internet technology and other teaching methods, which can achieve the optimum teaching effect. The mixed teaching reform will achieve the promotion of teaching effects. Since EST is important not only to the English majors but also to other arts and science students. In the college learning, the students (especially for science students) are inseparable from EST. The writing of graduation thesis involves reading, writing and translating skills of EST. EST is very important for

daily work in various aspects, especially when the people are engaged in work related to science and technology, such as the reading, writing and translating of the English scientific and technological information, the participation and holding of the various international scientific and technological conferences, the cooperation of the international scientific and technological, the negotiation of engineering projects, the introduction and installation of instruments, and so on.

Most college students, especially science students, have their own shortcomings in EST. Moreover, EST has a unique feature in grammar, vocabulary and style. Therefore, EST is a compulsory course for science students. The effective way to learn English is to combine theory and practice. The theory refers to the stylistic, grammatical and lexical features as well as the strategies of reading, writing and translating. EST, which is widely observed by scientific and technical workers in the process of development, has gradually formed the unique style and the writing norms. In order to learn EST, it is necessary to master the stylistic features, reading, writing and translating strategies of EST comprehensively, systematically and accurately. The traditional blackboard teaching has been unable to meet the needs of students learning and the students urgently need to learn the EST anytime and anywhere, so both the teachers and the students need a new teaching reform. On the basis of the traditional blackboard teaching mode, the Internet technology and multimedia technology are integrated into the teaching process, so that students can participate in the mixed teaching mode. It brings the change from “teaching and learning” to “learning and loving learning”.

2. MIXTURE REFORM OF EST

2.1 Course objective

EST is for the physics, applied physics and related majors in colleges and universities. In order to train the college students' reading, translation and writing abilities of professional English, EST is offered. At the same time, in order to enable students to better consolidate the study of professional knowledge, it is better for the students to have a professional international communication in English. The textbook is ‘English for physics majors’, which is suitable for undergraduate and master students majoring in physics and related majors in colleges and universities and bilingual teaching of physics in universities of science and engineering.

2.2 Course Content

The teaching content of the course mainly includes the introduction of professional English knowledge, such as the characteristics of professional English, morphology,

grammar, translation, writing, reading and international conference terms.

Mechanics, the fixed axis rotation of rigid body kinematics, particles, vibration and wave, electromagnetism, thermology, optics, atomic physics, quantum mechanics, electrodynamics, relativity and physics experiment contents of reader, with the appearing of English-Chinese contrast the vocabulary of physical specialized vocabulary, facilitate students to a targeted inspection before class and master;

Professional English, some of the commonly used expression of physics, in each lesson is in the form of thematic carried on the summary and detailed examples, including tools, instruments, equipment, structure, materials, precision, performance, shape, location, purpose, status, reason, conclusion and academic exchanges, international conference, bilingual teaching classroom language and other 36 projects.

Finally, the mixed curriculum contains the translation of the English physics majors, the teaching vocabulary, the teaching management, the mathematical symbols, and the English expression. The basic physical constants, the common Chinese-English physics professional vocabulary, the English-Chinese physics professional vocabulary are commonly used, when the students and the other readers reference.

2.3 The Basic Form, Content and Requirement of Course Assessment

The course assessment is divided into two parts: the formative assessment and the final theory exam. The formative assessment is divided into three parts: daily attendance (10%), daily homework (20%) and classroom performance (20%).

The teachers check the attendance of the students at any time and correct their homework, and urge to learn. In class, the students are asked at any time to exercise their ability to use knowledge flexibly. The students are expected to complete all assignments on time. For plagiarized the homework or not completed it on time, they should be given persuasion education and deduction points processing seriously. Praise and give high marks to excellent students who finish their homework on time. The final exam of the course is in the form of examination. The comprehensive teaching network platform is adopted to carry out the theory examination, and the subject is determined by the teacher. According to the students' learning situation and ability to master the knowledge, take the way of writing papers. The final exam of the course is based on the professional teaching plan, the curriculum standards and the use of teaching information. The topics of this course cover the knowledge and exercises contained in the textbook, with emphasis on grammar and syntax of EST, and writing knowledge of EST.

2.4 The Organizational Form of Assessment

The normal homework of this course is reviewed and graded by the teacher according to the students' completion. The final examination of the course is organized by the teachers, and the examination and the review will be conducted by submitting the limited time online. According to the learning situation of students in the class, the formative assessment scores can account for 50% of the total score, and the final theory exam scores can account for 50% of the total score.

2.5 Student Evaluation and Assessment Results

After the final assessment, the students are all through the assessment. And the excellence rate reached more than 30%. The students think highly of EST courses. Eighty percent of the students think the mixed curriculum is very successful and can promote their learning of EST. 10% students say the mixed curriculum is the same as the traditional curriculum. Another 10% students say the mixed curriculum needs improvement.

CONCLUSIONS

According to the characteristics of students in applied physics major, the mixed teaching reform was applied to the teaching of EST for the first time. The passing rate of the final exam has been greatly improved, and the students are more interested in this course. The students like the mixed teaching mode teaching content and methods of EST (English for physics majors). Moreover, it is easy for students to participate in the class and acquire knowledge, thus achieving outstanding learning effects. As a teaching reform course and an important professional course, EST can lay a foundation for students to read professional English literature and write professional articles in the future. The course of EST has been widely used in the teaching of applied physics.

REFERENCES

- Abrahams, I., Homer, M., Sharpe, R., & Zhou, M. (2015). A comparative cross-cultural study of the prevalence and nature of misconceptions in physics amongst English and Chinese undergraduate students. *Research in Science & Technological Education*, 33(1), 111-130.
- Afshari, F., & Haghverdi, H. R. (2017). Specifying English Needs of Iranian EFL Physics Students. *Journal of Applied Linguistics and Language Research*, 4(6), 40-61.
- Bates, M., & Dudley-Evans, T. (1982). English for science and technology. Longman.
- Braine, G. (1989). Writing in science and technology: An analysis of assignments from ten undergraduate courses. *English for Specific Purposes*, 8(1), 3-15.
- Cai, J. G. (2016). English for science and technology as a discipline in China. *Journal of Zhejiang University (Humanities and Social Sciences)*, 46(3), 69-80.
- Hudson, T. (1991). A content comprehension approach to reading English for science and technology. *Tesol Quarterly*, 25(1), 77-104.
- Kaplan, R. B. (2001). English—the accidental language of science. *The dominance of English as a language of science: Effects on other languages and language communities* (pp.3-26).
- Parkinson, J. (2013). English for science and technology. *The Handbook of English for Specific Purposes*, 120, 155-173.
- Richardson, R. C. (2018). *Experimental techniques in condensed matter physics at low temperatures*. CRC Press.
- Tanabashi, M., Hagiwara, K., Hikasa, K., Nakamura, K., Sumino, Y., Takahashi, F., Antonelli, M. (2018). Review of particle physics. *Physical Review D*, 98(3), 030001.
- Tarantino, M. (1991). English for science and technology: A quest for legitimacy. *English for Specific Purposes*, 10(1), 47-60.
- Wang, C. M., Niu, R. Y., & Zheng, X. X. (2000). Improving English through writing. *Foreign Language Teaching and Research*, 32(3), 210-212.