

Exploration of English Teaching Reform: Case Study of USST Optoelectronic Information Science and Engineering Major

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With the vigorous development of Sino-foreign cooperative education, English teaching for specialized courses has become a crucial link in cultivating internationalized professionals. This paper takes the Optoelectronic Information Science and Engineering (Sino-German Cooperation) major of the University of Shanghai for Science and Technology as the research object, and deeply analyzes the dilemmas faced by English teaching in this major, such as significant differences in students' English foundations, poor adaptability of teaching resources, and insufficient cultivation of cross-cultural communication skills. Based on this, a series of teaching reform strategies are proposed, covering aspects, such as optimizing teaching objectives, innovating curriculum settings, changing teaching methods, strengthening the construction of the teaching staff, and improving the teaching evaluation system. Specific teaching reform cases are also incorporated, aiming to improve the quality of English teaching for specialized courses and cultivate internationalized talents with solid professional knowledge and excellent English capabilities.

Keywords: Sino-foreign cooperative education, English teaching reform for specialized courses, Optoelectronic Information Science and Engineering, Sino-German Cooperation

Introduction

In the wave of educational internationalization, Sino-foreign cooperative education has become an important way for Chinese universities to enhance their internationalization level and cultivate internationalized talents. The Optoelectronic Information Science and Engineering (Sino-German Cooperation) major of the University of Shanghai for Science and Technology relies on the educational resources of both China and Germany, aiming to cultivate professional talents in the optoelectronic field with an international perspective (Wang, Sui, & Cheng, 2022). English for specialized courses serves as an important tool for students to access cutting-edge international knowledge and participate in international exchanges and cooperation. Its teaching quality directly affects the talent cultivation effect. However, there are currently many problems in the English teaching of this major, which urgently need to be reformed.

Current Situation and Problems of English Teaching for the Optoelectronic Information Science and Engineering (Sino-German Cooperation) Major at the University of Shanghai for Science and Technology

To understand the main difficulties faced by students majoring in Optoelectronic Information Science and

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Engineering (Sino-German Cooperation) at the University of Shanghai for Science and Technology during their English learning process and provide a reference for future teaching reforms, a questionnaire survey was conducted. The survey targeted students majoring in Optoelectronic Information Science and Engineering (Sino-German Cooperation) in 2023 at the University of Shanghai for Science and Technology. A total of 23 valid questionnaires were collected. The survey content covered learning experiences, knowledge related to English international phonetic alphabets, as well as students' opinions and suggestions on the current situation of college English teaching. Through this survey, the following current situations and problems in the English teaching of the Optoelectronic Information Science and Engineering (Sino-German Cooperation) major at the University of Shanghai for Science and Technology were found.

Significant Differences in Students' English Proficiency

The students of this major come from a wide range of sources, and their English proficiency varies greatly upon enrollment. Some students have received high-quality English education in high school and possess strong listening, speaking, reading, and writing skills. However, there are also some students with a weak English foundation, having obvious deficiencies in vocabulary, grammar usage, and language expression. This difference leads to a situation where, under a unified teaching schedule, students with a good foundation are "not challenged enough", while those with a weak foundation "cannot keep up", making it difficult to meet the learning needs of all students and affecting the teaching effect.



Figure 1. Difficulties in English learning.

Results of the questionnaire survey: In terms of difficulties in English learning, different students showed significant differences. Writing was considered the most difficult by 65.22% of the respondents, and different proportions of students also had troubles in pronunciation, speaking, vocabulary, and reading (see Figure 1). This indicates obvious differences in students' comprehensive English abilities.

Inadequate Adaptability of Teaching Resources

On the one hand, there is a shortage of English textbooks suitable for this major. The content of existing textbooks often fails to closely integrate with the professional knowledge of optoelectronic information science

and engineering, or its update speed lags behind the development of the industry, unable to provide students with the latest professional vocabulary and industry trends (Chen, 2024). On the other hand, the development and utilization of multimedia teaching resources are insufficient. There is a lack of professional English audio and video materials, as well as interactive teaching software, making it difficult to create a realistic English learning context and limiting students' learning experiences and language practice opportunities.

Lack of Cultivation of Cross-Cultural Communication Skills

In the context of Sino-foreign cooperative education, students need to communicate and cooperate with teachers and students from different cultural backgrounds. However, in current English teaching, insufficient attention is paid to the cultivation of cross-cultural communication skills. Students lack an in-depth understanding of the cultural differences between China and the West, and are prone to cultural misunderstandings and communication barriers in international exchanges, affecting the effectiveness of academic exchanges and cooperation.

Single Teaching Methods and Evaluation Methods

Traditional teaching methods mainly rely on teachers' lectures, with students passively receiving knowledge. The classroom has poor interactivity, low student participation, and it is difficult to stimulate students' learning interest and initiative. At the same time, teaching evaluation mainly depends on test scores, focusing on the assessment of language knowledge, and ignoring the evaluation of students' practical English application ability and cross-cultural communication ability, making it impossible to comprehensively and accurately reflect students' learning achievements.



Figure 2. The current situation of college English teaching.

The results of the questionnaire survey show that more than half of the respondents (56.52%) believe that college English teaching can further improve its interestingness and interactivity, indicating that the current teaching methods are insufficient in attracting students' interest (see Figure 2). In addition, students' reflection on the lack of guidance in English public speaking shows their eagerness to improve their oral expression ability,

which also reflects the deficiencies in current teaching in terms of ability cultivation and teaching method diversity. Some students hope to increase classroom interactivity to enhance their sense of participation and enthusiasm in learning, which corresponds to the problems caused by the singularity of teaching methods and evaluation methods.

English Teaching Reform Strategies for the Optoelectronic Information Science and Engineering (Sino-German Cooperation) Major at the University of Shanghai for Science and Technology

Optimize Teaching Objectives and Clarify Training Directions

Combined with the professional training objectives and international industry requirements, the school redefine the teaching objectives of English for specialized courses (Han, 2012). Not only should students' English language foundation be cultivated, but more emphasis should be placed on enhancing students' abilities to use English for professional learning, academic research, and international exchanges. For example, students are required to be able to proficiently read international cutting-edge optoelectronic professional literature, write English scientific research reports, participate in international academic conferences, and give oral presentations. At the same time, teachers incorporate the cultivation of cross-cultural communication skills into the teaching objectives, enabling students to understand and respect different cultures and have the ability to communicate effectively in a multicultural environment.

In actual teaching, the teacher takes the international academic exchange on the theme of "Optoelectronic Sensor Technology" as a target case, guiding students to start with professional literature reading, and learn relevant professional vocabulary and expressions. By simulating the oral presentation session of an international academic conference, students are allowed to use the English knowledge they have learned to expound on their research results and insights into optoelectronic sensor technology, implementing the teaching objectives into specific practical scenarios.

Innovate Curriculum Settings and Strengthen Professional Integration

The school constructs a modular and multi-level English curriculum system for specialized courses. The basic module courses focus on consolidating students' English language foundation and increasing professional vocabulary accumulation. The professional module courses offer specialized English reading, writing, listening, speaking and other special courses, closely integrating with optoelectronic professional knowledge, such as offering courses like "Reading and Analysis of Optoelectronic Professional Literature" and "Writing English Instruction Manuals for Optoelectronic Products". In addition, the school sets up cross-cultural communication courses to systematically explain the cultural differences between China and the West and cultivate students' cross-cultural awareness and communication skills. Teachers strengthen the connection and integration among courses to avoid content repetition and improve teaching efficiency.

Take curriculum practice as an example. In the "Reading and Analysis of Optoelectronic Professional Literature" course, the teacher selects cutting-edge papers from international authoritative journals, such as Optics Express, leading students to analyze professional vocabulary, grammatical structures, and academic expression logic sentence by sentence. In the "Writing English Instruction Manuals for Optoelectronic Products" course, real optoelectronic products, such as laser rangefinders, are introduced. Students are required to write English instruction manuals based on the product features and functions, and then conduct peer assessment in groups and teacher comments to effectively improve students' practical application ability of professional English.

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Change Teaching Methods and Enhance Learning Experience

Teachers adopt diversified teaching methods to stimulate students' learning enthusiasm and initiative. Teachers use project-based learning methods, allowing students to complete English projects related to the optoelectronic major in groups, such as translating international optoelectronic industry standards and producing English optoelectronic popular science videos, to improve students' comprehensive English application ability and teamwork ability in project practice. Teachers introduce case teaching methods, select actual cases in the international optoelectronic field, and guide students to analyze and discuss in English to cultivate students' professional thinking and practical problem-solving ability (Zhao, 2023). With the help of modern educational technology, such as online learning platforms and virtual laboratories, teachers enrich teaching resources, expand students' learning time and space, and achieve the organic integration of online and offline teaching.

In the practice of project-based learning, the teacher assigns the project of "English Promotion Planning for an International Optoelectronic Exhibition". Students are grouped to be responsible for tasks, such as exhibition theme planning, booth design description writing, and promotional video production. In the process of completing the project, students not only need to consult a large amount of English materials and learn professional knowledge, but also use English for in-group communication and communicate with teachers for feedback. Finally, by holding a simulated exhibition, students showcase the project results in English, effectively exercising their comprehensive English ability and professional practical ability.

In terms of case teaching, taking "Technical and Communication Dilemmas Encountered in the Market Promotion of a New Optoelectronic Display Technology" as a case, the teacher guides students to analyze and discuss from multiple perspectives, such as technical principles, market demands, and cross-cultural communication in English, and propose solutions to cultivate students' professional thinking and cross-cultural communication skills.

Strengthen the Construction of the Teaching Staff and Improve Teaching Standards

The school builds a teaching staff that is proficient in both English and optoelectronic professional knowledge. The school encourages English teachers to participate in professional training and academic exchange activities, deeply understand the development trends of the optoelectronic major, and enhance their professional qualities. The school introduces professional teachers with overseas study backgrounds or industry experience to enrich the teaching force of English for specialized courses. The school regularly organizes teaching seminars and training activities for teachers, share teaching experiences, learn advanced teaching concepts and methods, and continuously improve teaching standards.

The school organizes English teachers to participate in the "Optoelectronic Professional English Teaching Workshop", inviting industry experts and senior professors to explain the cutting-edge knowledge of the optoelectronic field and the key points of English teaching for specialized courses. At the same time, teachers with study experience at German universities and an optoelectronic professional background are introduced. In the classroom, they can not only accurately impart professional knowledge, but also share the academic culture and learning methods in Germany, bringing a new learning experience to students. In addition, regular on-campus teaching seminars for teachers are held. Teachers share the problems they encounter in teaching and successful cases, and jointly explore solutions to promote the overall improvement of teaching standards.

Improve the Teaching Evaluation System and Comprehensively Evaluate Students' Abilities

Teachers establish a diversified teaching evaluation system to comprehensively consider students' learning processes and learning achievements (Zhao, 2004). In addition to traditional test scores, teachers add evaluation

indicators, such as classroom performance, group projects, assignment completion, and participation in practical activities to comprehensively evaluate students' English application ability, cross-cultural communication ability, and teamwork ability. Teachers adopt a combination of formative evaluation and summative evaluation to timely feedback students' learning situations, provide targeted learning suggestions for students, and promote students to continuously improve.

In the specific evaluation practice, for the project of "English Promotion Planning for an International Optoelectronic Exhibition", the teacher evaluates from multiple dimensions, including the quality of the English writing of the project plan (30%), the performance of English communication and collaboration within the group (20%), the English presentation effect at the simulated exhibition (30%), and the learning attitude and improvement during the project process (20%). At the same time, combined with students' performance in classroom discussions, usual assignments, and final exam scores, a comprehensive evaluation result is formed, and detailed feedback and improvement suggestions are provided for each student's strengths and weaknesses.

Implementation Guarantees for Teaching Reform

Policy Support and Resource Investment

The school should formulate relevant policies to encourage and support the teaching reform of English for specialized courses, and give policy preferences in teaching management, teacher training, teaching resource construction, etc. (Xu & He, 2016). The school increases investment in teaching resources, purchase professional English textbooks, introduce multimedia teaching resources, build online learning platforms, etc., to provide a solid material guarantee for teaching reform.

International Exchanges and Cooperation

The school strengthens exchanges and cooperation with German partner universities. The school regularly sends teachers to each other for teaching observation and academic exchanges, and learn advanced English teaching experiences and methods from Germany. The school invites German experts and scholars to the school to give lectures and training, providing students with the opportunity to communicate directly with international experts and broadening students' international perspectives.

Student Learning Support Services

The school establishes a sound student learning support service system to provide personalized learning guidance and assistance to students. The school sets up a learning tutoring center, and arrange professional teachers and outstanding students to provide extracurricular tutoring for students with a weak foundation. Teachers carry out English learning club activities, organize English corners, English speech contests, etc., to create a strong English learning atmosphere.

Conclusion

The English teaching reform for the Optoelectronic Information Science and Engineering (Sino-German Cooperation) major at the University of Shanghai for Science and Technology is an inevitable requirement for improving the quality of talent cultivation and adapting to the development of educational internationalization. Through a series of reform measures, such as optimizing teaching objectives, innovating curriculum settings, changing teaching methods, strengthening the construction of the teaching staff, and improving the teaching evaluation system, combined with specific teaching cases, it is expected to solve the current problems in teaching,

improve the quality of English teaching for specialized courses, and cultivate more internationalized optoelectronic field professionals with solid professional knowledge and excellent English capabilities. During the reform process, the joint efforts of the school, teachers, and students are needed. Continuous exploration and practice are required to continuously improve the reform plan and ensure the effectiveness of the reform.

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