Research on the Design and Practice of ESP Blended Teaching in the Context of New Liberal Arts Education

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Abstract. The author applied outcomes-based blended teaching model in the course of “English for Mechanical Engineering”, which follows the principles of "student-centered, outcomes-oriented, and practice-validated" and enables the Course to meet the needs of industry. With the help of modern educational technologies, the three-stage online and offline blended teaching process is continuously improved as well as the teaching design and assessment. This model emphasizes the integration of industry and education, highlighting the training mechanical engineering professionals with high English proficiency, autonomous learning abilities and critical thinking abilities.

Keywords: ESP; Blended Teaching; OBE; digital-AI platform.

1 Introduction

In November 2020, The Ministry of Education issued the "New Liberal Arts Construction Declaration," marking a new phase of comprehensive implementation of the New Liberal Arts construction in Chinese higher education institutions[1]. It is a new initiative at the national level in response to the educational development. Its purpose is to promote innovative reforms on humanities, aiming to cultivate talents that meet the needs of the new era.

In order to cultivate talents who are competent in interdisciplinary knowledge and equipped with strong communicative and cooperative skills, our school established the CRRC Department to cultivate graduates who meet the enterprise needs. We carried out various foreign affairs activities, such as product development and manufacturing, business negotiations, and after-sales services, to help our students grasp corresponding expertise to solve the problems they will face in the workplace. This study attempts to place students and teachers in an immersive learning virtual environment to complete interdisciplinary learning and cultivate more talents for enterprises.

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2 ESP Blended Teaching

2.1 ESP

The study of English for Specific Purposes (ESP), which began in the early 1980s, has continued for 40 years. It refers to English related to a specific profession or discipline. It can be divided into several types. For example, based on the learners' purposes and application scenarios, Jordan[2] classifies ESP into two main branches, English for Occupational Purposes (EOP) and English for Academic Purposes (EAP), which greatly differs from General English. ESP combines language learning and professional knowledge acquiring together. ESP teaching helps narrow the gaps between learning and application by adjusting the language teaching contents with the distinctive features of the targeted disciplines. Panelists [3] claimed that ESP teaching has four absolute characteristics. The four absolute characteristics are: ① the curriculum design must meet the specific needs of the learners; ② the curriculum content must be related to certain disciplines, professions or activities; ③ the emphasis should be on the language usage, especially in grammar, vocabulary, and discourse perspectives; ④ It must be in clear contrast to General English (EGP).

2.2 Blended Teaching

Blended learning can be comprehended in both broad and narrow senses. In a broad sense, blended learning includes the integration of learning theories, learning resources, learning environments, learning methods, and learning assessments (Mangina, 2022)[4]; while, in a narrow sense, it refers to the combination of face-to-face teaching and online learning (Yusny, 2021)[5]. He Kekang (2019)[6] believes that blended learning integrates the traits of online and offline learning and emphasizes the needs of constructing a student-centered teaching mode, which aims to create a learning atmosphere of "autonomy, inquiry and cooperation". It facilitates the cultivation of innovative talents in China.

3 Course Design and Practice

3.1 Teaching concept

Outcome-based education (OBE) is an educational model based on learning outcomes, that is the teaching design is driven by expected learning outcomes, respecting individual differences, emphasizing competence-based education, and using the feedback to revise the existing teaching designs (Subbarao, 2023)[7]. The blended teaching model aims to stimulate students' learning motives, promote personalized learning and emphasize the cultivation of their skills.

3.2 Teaching Desian

In the context of the new liberal arts, English courses need to take reforms in the integration of disciplines and focus on cultivating interdisciplinary engineering talents with global mindset. Therefore, the outcomes-based blended teaching model requires teachers to redesign and integrate the entire teaching process with a student-centered approach. It enables students' multi-channel, multi-media, and interdisciplinary learning resources and practice platforms, making student engagement and practice as the prime objectives of teaching. It aims to develop students' autonomous learning abilities, comprehensive English proficiency, communication skills, and teamwork spirits. In addition, it helps improve students' classroom engagement, learning confidence, and nurture them a sense of responsibility and craftsmanship spirit.

3.2.1 Course Objectives

The course objectives of the "English for Mechanical Engineering" are to cultivate interdisciplinary engineering talents with a solid foundation in English and strong professional abilities and global mindset. The course objectives try to meet the requirements of interdisciplinary integration and the cultivation of distinguished talents. In order to achieve the expected learning outcomes, the course syllabus has been reestablished in six aspects: interdisciplinary knowledge, skills, teaching modes, values, evaluation, and teachers' development. The expected curriculum values of the "English for Mechanical Engineering" are illustrated in Fig. 1.

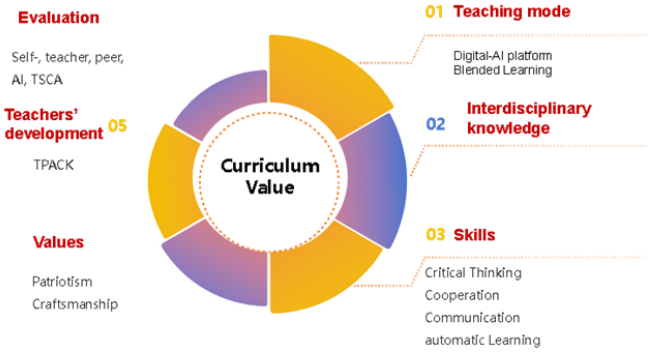

Fig. 1. The expected curriculum values

3.2.2 Course Content

We take "English for Mechanical Engineering" as the textbook. This is a classic textbook that has gone through several rounds of teaching. The contents and the design of the textbook have been recognized and highly praised by teachers and students.

3.2.3 Teaching Environment

We try to provide three major learning platforms for our students-the smart classroom, online platform and virtual simulation classroom. The aim is to meet students' diverse and personalized learning needs.

Here are the facilities that we used to construct our teaching environment:

a. Infrastructure and hardware: projectors, interactive whiteboards, computers, network equipment, VR controllers, touchpads, eye trackers, etc.

b. Network and internet connection: Provide stable and high-speed network connections for smart classrooms to ensure teachers and students can access the internet and online educational resources. This supports online learning, multimedia presentation, and remote writing activities.

c. Teaching software and platforms. Choose software and platforms that are suitable for smart classrooms to provide various teaching tools and resources. These software and platforms include interactive teaching software, online learning platforms and assessment tools, which facilitate teachers' teaching and students' learning. On top of that, we also use some common online platforms including Tencent Meeting, Zoom, etc.

3.2.4 Teaching procedures

The author takes Lesson 8 of the "English for Mechanical Engineering " as an example to conduct the research and try to apply blended teaching method, the theme of which is Rolling Bearing.

Pre-class

First of all, based on the teaching objectives, teachers need to reorganize content and design the teaching procedures. The teacher creates videos relevant to the theme to the lesson and sets learning tasks on the platform, and students watch the videos and complete the assigned tasks. The video presents the classifications of rolling bearings in English: radial bearings, thrust bearings, angular contact bearings, tapered roller bearings, deep groove ball bearings, thrust ball bearings, needle roller bearings, etc., with vivid operation cartoons and English explanations, allowing students to further improve their English proficiency on the basis of their original expertise. Based on the video and the text, some questions are provided to students to conduct a teamwork, such as, what are the usage scenarios of different bearings? Which type of bearings will we use in a given situation? What is the difference between radial bearings and thrust bearings? These questions are all based on students' understandings of the English video and the text, which examine students' comprehension of the video and the text. Students can be divided into groups, requiring students to conduct in-depth team discussions and research on the theme. Students are also encouraged to record any problems or difficulties and bring them to the class for teacher and classmates' help.

In-class

In this stage, teachers assign practical tasks to reinforce classroom learning. Students apply their knowledge in real-world contexts, engage in collaborative tasks, and reflect on their learning experiences. The focus is on the practical application of knowledge. The outcomes of learning are monitored and assessed by both the teach-er and students. The teacher will divide the students into different groups for team discussions. They are supposed to collaborate and produce presentations to answer questions or bring commonly used equipment in our daily life and display the methods of disassembling

and assembling. Meanwhile, other students are encouraged to ask questions and communicate in English. Through this student-centered, diversified teaching method, students achieve the internalization of knowledge and information sharing, ultimately achieving the teaching objectives. In this stage, the teacher and students conduct collaborative exploration, solve problems and experience mechanical operations. Teachers often play the roles of organizers, managers, and problem solvers, allowing students to control the classroom in an orderly and rational manner.

Post-class

Online platforms are used to extend learning discussions beyond the classroom. Students can also conduct simulation training in virtual stimulation classroom to introduce the functions and operations of their products as well as completing role-playing, which can be a technical engineer in the company's product department communicating technical issues with foreign experts, or a salesperson conducting business negotiations.

In this stage, professional mentors along with the teacher continuously monitor and guide students in their post-class practice. They summarize the issues encountered by students during online and offline activities, assignments and simulated practices and provide targeted instructional suggestions. The blended teaching procedure of "English for Mechanical Engineering" is illustrated in Fig. 2.

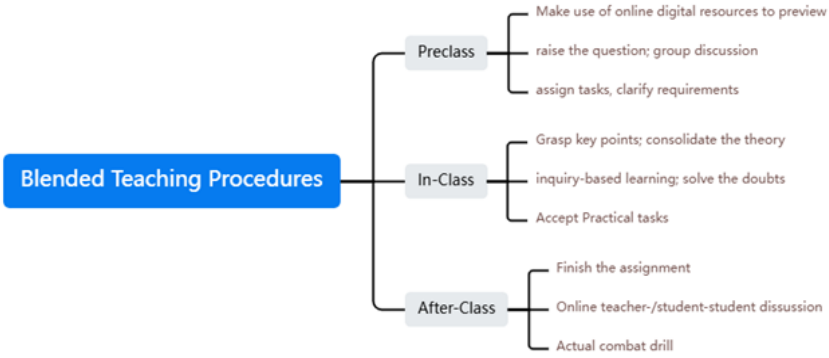

Fig. 2. The blended teaching procedure

3.2.5 Assessment

Assessment is an essential factor for ensuring the effective implementation of blended learning. Firstly, the course evaluation increases the proportion of formative assessment from 20% to 50%, which helps the students concentrate on acquiring the knowledge and improving skills. Secondly, formative assessments are conducted throughout the semester, providing a comprehensive evaluation of students' performance. By utilizing the digital platforms, students' autonomous learning activities are being analyzed and converted into points, which greatly motivate the students. Finally, the assessment content and methods are designed based on professional training objectives and occupational requirements. This includes explanations of the internal structure

of high-speed trains, English language communication skills and business etiquette demonstrations. This approach avoids rote memorization, ensuring a comprehensive evaluation of students' abilities.

4 Conclusions

In conclusion, the outcomes-based blended teaching model is applied to “English for Mechanical Engineering”, follows the principles of "student-centered, out-comes-oriented, and practice-validated" and helps the Course meet the needs of industry. With the help of modern educational technologies, the teaching resources have been greatly enriched. The three-stage online and offline blended teaching process—pre-class, in-class, and post-class—is continuously improved, together with the teaching design and assessment. This model emphasizes the integration of industry and education, highlighting the teaching mode of training mechanical engineering professionals with high English proficiency. This study further defines the role of teachers in the teaching process, motivates students' learning and cultivates their autonomous learning abilities and critical thinking abilities.

Fund

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References

1. Teaching Committee for College Foreign Languages, 2020.Guide to College English teaching(2020 [M].Beijing: Beijing Higer Education Press.
2. Jordan, R. R. English for Academic Purposes (A guide and resource book for teachers) || Lectures and note-taking[J].1997,10.1017/CBO9780511733062(Chapter12): 179192. DOI: 10.1017/CBO9780511733062.014.
3. Panelists, A. Koohang, J., Britz, & Seymour, T. (2022). Panel discussion hybrid/blended learning: advantages, challenges, design, and future directions.
4. Mangina, E. (2022). Students' continuous assessment through discussion threads within blended teaching method (face-to-face and e-learning).
5. Yusny, R., Rizki, F., Trisnawati, I. K., & Mulia, M. (2021). Offline or online? efl students' perceptions on working in face-to-face and virtual learning modes. Universitas Islam Negeri Ar-Raniry(1).
6. He Kekang. The important influence of emerging information technologies on the deepening reform of education in 21st century. [J]. Educational Technology Research, 2019.DOI: 10.13811/j.cnki.eer.2019.03.001.
7. Subbarao, R. (2023). Outcome based approach applied to a mechanical engineering course to advance the teaching-learning processes. The international journal of engineering education (2), 39.