

Feasibility Study of CBI Teaching Concept in Flipped Classroom Teaching of Forest Fire Prevention Postgraduates' Specialized English

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Abstract

In order to promote the high-quality development of China's postgraduate education, the CBI teaching concept of flipped classroom teaching of Postgraduates' Specialized English for forest fire prevention students is proposed. In comparing traditional classroom teaching, we found that such classroom teaching has the effects of improving teaching mode, increasing teaching efficiency, improving teaching quality, and promoting knowledge internalization. The feasibility of the CBI teaching concept in the flipped classroom teaching of English for graduate students in forest fire prevention is concluded by using teacher ability, student ability, facility guarantee, and application effect as feasibility indicators.

Keywords

CBI, Teaching philosophy, Postgraduate education, Flipped classroom, Feasibility.

1. Introduction

The 20th National Congress of the Communist Party of China has deployed the integration of education, science and technology, and talent work, providing new policy support and opportunities for the reform, innovation, and high-quality development of higher education. To promote the transformation of postgraduate education from high-speed development to high-quality development, efforts should be made to build new concepts, models, and paths for the reform and development of postgraduate education. Taking the academic master's program in forest fire prevention as an example, this paper discusses the feasibility of applying the CBI teaching concept in the flipped classroom teaching of professional English courses, providing direction for innovative teaching of postgraduate professional English courses in China.

2. Theoretical Background

2.1. CBI Teaching Philosophy

CBI (Content-based Instruction) teaching philosophy is a teaching approach that combines content and language[1]. CBI originated from the "immersion" teaching experiment conducted in Canada in the 1960s[2]. After borrowing from second language acquisition theory and cognitive psychology theory, it was widely applied to foreign language teaching in the 1980s. It was introduced to China in the mid-1990s and attracted the attention of educators and related researchers.

CBI teaching refers to "teaching language based on a certain subject or theme, combining language learning with subject knowledge learning, and promoting language proficiency while improving students' subject knowledge and cognitive abilities"[3]. Teaching language itself is a traditional teaching method, which aims to improve learners' understanding of grammar and sentence structures, and thereby improve their language proficiency. However, this type of

method requires learners to have a certain level of focus and memory, and the learning experience can be dry. The CBI teaching philosophy develops the target language ability by exploring a certain subject knowledge using the target language. Its emphasis is on learning language through subject content, rather than focusing solely on language learning. This type of method can effectively reduce the dryness of language learning and make it easier for learners to accept language learning.

The CBI teaching philosophy has three factors: first, subject knowledge is the core; second, authentic language materials are used; and third, the needs of special groups of learners are met. These are the characteristics of CBI teaching[4]. There are four teaching modes: theme mode, auxiliary mode, curriculum mode, and topic mode[4]. Depending on different teaching requirements, teachers can choose different teaching modes, with theme mode being the most commonly used.

2.2. Flipped Classroom

Since the 1990s, student-centered teaching philosophy has begun to widely influence educational practices. American scholars Robert B. Barr et al. [5] referred to the teaching mode in which teachers are the center of the classroom as the "transmission paradigm." In the transmission paradigm, teachers are responsible for imparting knowledge to students, and universities provide teaching courses and degrees. The opposite teaching mode, which can be called the learning paradigm, is different from the transmission paradigm. In the learning paradigm, teachers guide students to discover and construct knowledge, promote students' exploration and problem-solving, and universities can create learning environments and experiences, with students as the center of the classroom.

In China, student-centered teaching is called the "flipped classroom." Teachers guide students to independently study the course content through providing learning materials in advance, and then interact with students by answering questions and providing supplementary teaching during class [6]. This teaching method can better cultivate students' active acquisition of knowledge and full participation in learning. The flipped classroom and traditional classroom have many differences in teaching flow, structure, and method, and not all courses are suitable for traditional or flipped classrooms. Therefore, it is necessary to evaluate the effectiveness of its teaching.

The flipped classroom can be applied to second language learning. Hsiu-Ting Hung's research results[7] show that flipped teaching enables second language learners to preview and review learning content according to their learning pace and needs, such as looking up words, understanding certain concepts, and reading more materials. Students can actively participate and improve the teaching effect.

2.3. Graduate English Course on Forest Fire Prevention and Control

Currently, there are mainly two universities in China that offer graduate education in forest fire prevention and control: Southwest Forestry University and Northeast Forestry University.

The Forest Fire Prevention and Control major at Southwest Forestry University (major code: 0829J1) is one of the cross-disciplinary majors recognized by the Ministry of Education. According to the training plan, the academic master's degree program offers a professional English course in the first semester, which is a degree course with 48 hours and 2 credits.

The Forest Fire Prevention and Control direction of the Forestry major at Northeast Forestry University (enrollment has been conducted as one of the research directions of the Forestry major since 2019, major code: 090700) is a characteristic and advantageous discipline of the university. According to the training plan, students in this major need to complete the professional English course in the first or second semester and pass the exam to obtain credits.

3. CBI Teaching Philosophy Applied in Flipped Classroom Teaching of Forest Fire Prevention Professional English for Graduate Students

The academic master's degree program in forest fire prevention is a distinctive program with unique teaching requirements for its English curriculum. In this context, applying the CBI (Content-Based Instruction) teaching philosophy in flipped classroom instruction for the professional English curriculum can provide direction for innovative postgraduate English curriculum instruction in our country. The CBI teaching philosophy is a task-based approach to teaching that enables students to learn language and knowledge through solving real-world problems and completing practical tasks. In flipped classroom instruction, students can prepare relevant knowledge and materials outside of class, and then participate in task-driven learning activities with teachers and classmates during class time. This teaching method can stimulate students' interest and motivation in learning, and improve their learning effectiveness and capabilities.

3.1. Teaching Process

Based on the CBI teaching philosophy and the theoretical background of the flipped classroom, the course is divided into two parts: pre-class and in-class[8]. Before class, the teacher needs to set a theme based on the teaching content and collect and organize relevant materials related to the theme, which are then distributed to all students. Students need to engage in self-directed learning before class by completing tasks assigned by the teacher and utilizing the materials provided. Students should also mark any areas of confusion during their self-directed learning to be discussed during class. During class, students engage in discussions and presentations with the teacher and classmates using the knowledge they gained from their pre-class self-directed learning. The teacher checks students' understanding of the knowledge and provides guidance and feedback on their presentations, and finally forms a feedback summary. See Fig.1 for the process.

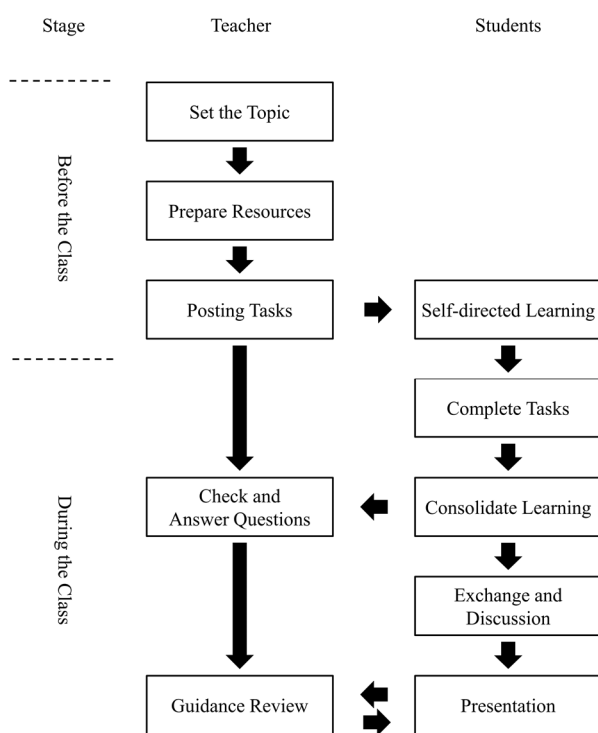


Figure 1. Flipped classroom teaching process based on CBI teaching concept

Table 1. Division of labor and objectives between teachers and students of specialized English course for forest fire prevention postgraduates

Stage	Teacher	Students	Objectives	
Before the Class	Set Topic	Set the topic of "Fighting Forest Fires" based on the content of the textbook or the direction of the topic.		
	Prepare Resources	Prepare teaching resources, such as learning websites, videos, e-learning materials and books and literature in relation to topic. For example, the movie Only the Brave or literature from the International Journal of Wildland Fire.		
	Posting Tasks	Make the teaching resources available to students about a week in advance so that they have sufficient time to study. Posting tasks: 1) watch movie to understand methods of forest fire fighting and discuss in class; 2) read contents of study literature, get familiar with terminology of forest fire fighting in text and learn language expressions in text; 3) summarize what they have learned and form a debriefing document to present in class.	Conduct independent study and complete tasks based on teaching resources provided by the instructor; understand the meaning of proper nouns in the materials, organize knowledge of forest fire fighting, and learn the language expressions of the literature; think about the topics discussed in class and clarify the direction of the presentations; and summarize and create debriefing documents for presentation.	1) Be familiar with basic vocabulary of professional English 2) Understand the translation methods of professional English Initially be able to read professional English literature
	Self-directed Learning			
	Complete Tasks			
	Check and Answer Questions	Test the effectiveness of the students in the independent learning process by asking questions or giving exercises in English about learning about forest fire fighting.	Complete the check content set by the teacher and correct errors. Discuss among classmates about what they don't understand and ask the teacher questions that are still not solved after discussion.	1) Acquire basic vocabulary in professional English 2) Further understanding of the translation methods of professional English
During the Class	Consolidate Learning	Answer questions raised by students.		
	Exchange and Discussion	We will discuss the topic of forest fire fighting in English and listen to the students' speeches by setting the topic with the content of movies and literature.	Discuss the topic in relation to the learning content, listen to what your classmates say, and add your own knowledge.	1) Familiar with translation method of professional English. 2) Be able to read professional literature. 3) Initially be able to communicate in English in a professional direction
	Guidance Review	Evaluate students' communication and discussion and debriefing presentations, add content missed by students in their independent learning, and emphasize key points. Evaluate course.	A debriefing presentation in English summarizing knowledge of forest fire fighting and the specialized terms and special sentence patterns for forest fire fighting covered in this course.	1) Read professional English literature more smoothly 2) Be able to communicate in English in a professional direction.
Presentation				

3.2. Teaching Goals and Tasks

Based on the teaching syllabus of some graduate professional English courses in universities, the course aims to achieve four teaching goals: 1) students should master basic professional English vocabulary; 2) students should be familiar with translation methods in professional English; 3) students should be able to read relevant professional English literature with relative ease; 4) students should be able to communicate in English regarding their professional field.

Taking the Forest Fire Prevention Professional English course for graduate students as an example, "Forest Fires and Combustibles" is used as a course theme, and the teacher and student tasks are specifically analyzed around the course teaching goals, as shown in Tab.1.

From Tab.1, it can be seen that using the CBI teaching theory in the flipped classroom of Forest Fire Prevention Professional English for graduate students can not only guide students to actively explore professional knowledge in forest fire prevention, but also enable them to learn professional English vocabulary and grammar, and form good interaction between teachers and students. Therefore, the flipped classroom approach based on the CBI teaching theory can achieve the established teaching goals.

3.3. Comparison with Traditional Classroom Teaching

The flipped classroom teaching approach of graduate professional English based on the CBI teaching philosophy is compared with traditional classroom teaching in terms of teaching time, teaching materials, teaching content, teaching mode, teaching efficiency, teaching difficulty, and teaching evaluation, as shown in Tab.2.

Table 2. A comparison between CBI teaching concept flipped classroom and traditional classroom in postgraduates' specialized English

Aspects	CBI Teaching Concept of Flipped Classroom Teaching	Traditional Classroom Teaching
Duration	Students study for an extended period of time due to the teacher's pre-class assignment.	With pre-reading assigned, it is possible to extend the teaching time, but it cannot be excluded that there are some students who do not pre-reading.
Materials	Audios, videos, literatures, books, e-courseware, exercises, etc.	The main focus is on textbooks, electronic courseware, and exercises.
Contents	The content is rich and includes, but is not limited to, specialized knowledge from the textbook, English vocabulary and sentence patterns and sentences.	The content is fixed and the textbook contains specialized knowledge, English vocabulary and sentence patterns.
Mode	Information-sharing teaching, two-way interactive communication between teachers and students, discussion and assistance in learning among classmates, and active learning of knowledge by students.	Information transfer type teaching, the teacher is responsible for teaching and explaining questions, students are responsible for absorbing and recording answers, students passively accept knowledge.
Efficiency	By using time outside of class for learning, teachers in class simply facilitate the internalization of knowledge and teaching efficiency is fully enhanced.	Teachers need to facilitate the construction of students' knowledge from nothing to something, and teaching is not very efficient, requiring a lot of exercise work to help students consolidate their knowledge.
Difficulty	More difficult, requires a higher level of teacher and richer teaching materials, and is suitable for use in courses with smaller class sizes.	It is easy, relatively easy for teachers to master, requires only basic teaching materials, and can be used in any classroom with any number of students.
Evaluation	The organic combination of self-evaluation, student-student mutual evaluation and teacher evaluation is realized, etc. [9].	Knowledge mastery is assessed by the teacher only.

It can be seen that although the flipped classroom teaching of the CBI teaching concept has certain teaching difficulties, it is superior to traditional classroom teaching in terms of teaching mode, teaching efficiency, and knowledge internalization. It also takes into account English listening and speaking teaching, which is easily overlooked in traditional teaching. If this

teaching model can be used properly, it will improve the quality of graduate professional English teaching.

4. Feasibility Analysis of CBI Teaching Concept in The Flipped Classroom Teaching of Graduate Professional English for Forest Fire Prevention

Currently, there are problems in the teaching of graduate professional English in China, such as limited teaching hours, heavy teaching tasks, rigid teaching modes, neglect of oral teaching, and disregard for knowledge internalization[10]. After comparing the flipped classroom teaching of graduate professional English based on the CBI teaching concept with traditional classroom teaching, it is concluded that the flipped classroom teaching of graduate professional English based on the CBI teaching concept can further optimize the problems faced by current graduate professional English teaching. Therefore, in order to confirm its applicability to the forest fire prevention graduate professional English course, relevant indicators affecting its feasibility are analyzed.

4.1. Teacher competence analysis

The report on the development of national education by the Ministry of Education shows that the teachers in schools with higher education qualifications in China are mainly postgraduates[11], who have a high academic level and scientific literacy and can accept innovative teaching in graduate classrooms. Taking the forest fire prevention graduate professional as an example, the flipped classroom teaching of professional English based on the CBI teaching concept puts higher demands on teacher competence. Firstly, teachers should have a certain level of English proficiency and knowledge system, and be able to innovate teaching based on their own experiences of learning English. Secondly, teachers should have professional knowledge in forest fire prevention, with corresponding learning background or experience. Thirdly, teachers can combine English with professional knowledge in forest fire prevention, and fully utilize the characteristics of the CBI teaching concept to implement content-based teaching. Fourthly, teachers should have certain information technology application abilities. These are the requirements for teacher competence in the flipped classroom teaching of graduate professional English based on the CBI teaching concept. As the leader of classroom teaching[12], teachers not only need corresponding teaching competence in the flipped classroom teaching of graduate professional English based on the CBI teaching concept, but also need to teach according to students' aptitude, teach reasonably, fully grasp the progress of the class, pay attention to students' dynamics in a timely manner, and improve the efficiency of the class. They should also make reasonable use of teaching resources to cultivate students' abilities in communication, cooperation, independent learning, and problem-solving while effectively imparting professional and English knowledge to them.

4.2. Analysis of Student Abilities

In the flipped classroom of CBI teaching philosophy for graduate-level English, students should meet three conditions: 1) the ability to learn independently; 2) the ability to express themselves in English; and 3) a background in professional studies. Firstly, because students in this type of classroom are required to study the materials provided by the teacher before class, the ability to learn independently is the key factor in implementing this type of classroom. Bu Caili et al.[12] stated in their research that undergraduate students already have a strong ability to learn independently and can complete pre-class studies. Secondly, students need to communicate and report in English during classroom activities. Lu Haiyan [6] found in their survey that university students with a foundation in English have a certain ability to express themselves in English, and it can be inferred that graduate students should have even better English expression abilities. Thirdly, having a basic background in professional studies can better

leverage the advantages of the CBI teaching philosophy by studying professional knowledge and then professional English to achieve teaching goals. As graduate students have systematically studied relevant professional knowledge at the undergraduate level, they possess a background in professional studies. Through an analysis of student abilities, it can be concluded that students at the graduate level already meet the requirements to a certain degree, and the flipped classroom of CBI teaching philosophy for graduate-level English is feasible.

4.3. Analysis of Facilities and Equipment Support

Infrastructure construction in Chinese universities has been improving [11], and multimedia classrooms, intelligent classrooms, and campus networks have been widely used in teaching. In the flipped classroom of CBI teaching philosophy for graduate-level English, various teaching facilities such as networks and multimedia play an important role. Before class, teachers need to use computers and networks to prepare courseware, search for resources, and acquire and process multimedia resources. They can then use internet tools to send these materials to students. Students can use computers or mobile devices to learn and use internet tools to synchronize their learning progress with the teacher in a timely manner. During class, teachers use multimedia to guide the class, and students use multimedia to report. Therefore, with the support of facilities such as networks and multimedia, the flipped classroom of CBI teaching philosophy for graduate-level English is feasible.

4.4. Analysis of Application Effects

With the advancement of graduate education reform, the flipped classroom of CBI teaching philosophy for forest fire graduate-level English has significant advantages over traditional teaching methods. This classroom model subverts the traditional teaching process, relies on professional knowledge in forest fire prevention, and allows students to practice various English abilities while learning relevant knowledge, achieving content-based English teaching. Combined with the teaching characteristics of the flipped classroom, students' learning is more independent and diverse. Classroom activities such as discussions or presentations promote students' thinking on the content and are conducive to internalizing knowledge. In addition, the small class sizes in graduate programs are more suitable for this teaching method, and graduate students have a strong ability to adapt to changes in teaching methods, making it easier to demonstrate teaching effectiveness.

The English curriculum for the academic master's degree program in forest fire prevention adopts the CBI (Content-Based Instruction) teaching philosophy. In this approach, classroom tasks are designed around real-world issues and cases relevant to the field of study, allowing students to learn both language and professional knowledge through problem-solving. Additionally, modern educational technologies such as online resources and virtual laboratories can be utilized to enhance the learning experience and effectiveness. In conclusion, applying the CBI teaching philosophy in flipped classroom instruction for the English curriculum in the academic master's degree program in forest fire prevention is feasible and beneficial, and it can provide new directions and ideas for innovative postgraduate English curriculum instruction in our country.

5. Conclusion

The Content-Based Instruction (CBI) teaching approach is beneficial for improving the teaching mode, enhancing teaching efficiency, increasing teaching quality, and promoting knowledge internalization in the flipped classroom of English for postgraduate students majoring in forest fire prevention. The CBI teaching approach, through its content-based teaching method supported by professional knowledge, enables students to master the use of English while learning subject-specific knowledge. This approach transforms the learning of English usage

into the application of English, which is more conducive to student acceptance. The flipped classroom, by changing the roles of teachers and students, effectively compensates for the weaknesses of traditional English teaching in listening and speaking instruction. The student-centered teaching approach highlights the students' position as the main subject in learning and enhances their ability to learn independently and collaboratively.

To ensure the feasibility of the CBI teaching approach in the English course for postgraduate students majoring in forest fire prevention, we analyzed the teacher's ability, student's ability, facilities, and application effects as conditions. The results show that the CBI teaching approach is feasible in the flipped classroom of English for postgraduate students majoring in forest fire prevention.

The next step is to select a group of postgraduate students majoring in forest fire prevention from a certain university as the research sample, and fully discuss the feasibility of the CBI teaching approach in the English course for postgraduate students through methods such as teacher and expert evaluations, questionnaire surveys, and statistical analysis.

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