Research on the Lexical Teaching of Engineering Academic English based on Corpus and Sociocultural Theory

Yanli Gu[1, a] Feng Shi[2, b, *]

[1]School of Architecture and Art Design, University of Science and Technology Liaoning, Anshan, 114051, China;

[2]School of International Studies, University of Science and Technology Liaoning, Anshan, 114051, China.

[a]2631633648@qq.com, [b, *]alanstone7772003@126.com

Abstract

Based on the sociocultural theory, this study is to explore the new teaching model for lexical teaching in engineering academic English. This model provides English learners with peer scaffold, instrumental scaffold, emotional scaffold and monitoring scaffold to build an interactive English feeding ecological environment. Meanwhile, based on the support of online writing platform and corpus data, and combined with the embedded semi-flipping classroom and multiple formative evaluation system to ensure the effectiveness of the teaching process and the occurrence of vocabulary acquisition. The research shows that the teaching model can effectively promote the non-English majors' academic English vocabulary and improve their academic English application skills.

Keywords

Corpus, Sociocultural theory, Academic English, Lexical teaching.

1. Introduction

Under the influence of English foundation and learning background, non-English major graduate students with engineering background generally have weak learning motivation and weak application skills, especially in GESP. How to effectively carry out targeted and efficient "poverty alleviation" for so called "poor students in English" has become an urgent problem for English teachers in ordinary engineering colleges. Teaching practice and relevant studies show that the first factor that troubles the disadvantaged group of college English learners is vocabulary acquisition. How to combine relevant linguistic theories, especially the theory of SLA with vocabulary teaching and learning, effectively avoid the disconnection between theory and practice, and apply theoretical models to solve such front-line teaching problems becomes the starting point of this study. Under the OBE's concept and sociocultural theory framework, this study is to build a new multidimensional interactive teaching mode and English vocabulary acquisition of ecological environment. This preliminary exploration aims to effectively solve the problem of "poor student" in engineering English vocabulary acquisition and find a sustainable path of learning English.

2. Literature review and research rationale

Linguistic theories related to language acquisition and foreign language teaching emerge in an endless stream, and teaching concepts and acquisition models influenced by various theories and hypotheses are constantly innovating. The following will be combined with the research framework and model construction of this paper, the relevant theories and research are briefly reviewed and sorted out.

2.1 Scaffolding theory

The Zone of Proximal Development in sociocultural theory is an important thought on teaching and development put forward by Vygotsky, a famous psychologist in the former Soviet Union. This theory holds that there is a gap between learners' actual level of development and their potential level

of development. Since human ability level is formed in the process of self-development through interaction with the outside world, the zone of proximal development is also dynamic (2013, Jiang Rong). The improvement of learners' ability is realized by internalization on the basis of surrounding help. This type of outside help has the function of "scaffolding", which inspires Bruner to put forward the famous scaffolding theory in the field of pedagogy. (2013, Du Jianying). The main functions of scaffolds are as follows: improving learners' interest in learning tasks; Make the task less difficult; Adhere to the pursuit of goals; Identify the gap and characteristics between the current progress and the ideal goal; Controlling anxiety during problem solving; The ideal model of demonstrative behaviour (Wood et al.,1976). In teaching activities, the important function of the scaffolding is to assist students to really go through the "proximal development zone" and finally break through their own actual level of development to achieve a higher potential level of development. Since the 1990s, the scaffold theory has attracted more and more attention in the study of second language classrooms. Some studies focus on the support function of teacher-student interaction; Others focus on the positive role of peer support; Some studies combine this theory with the cultivation of basic skills such as listening, speaking, reading and writing in college English. Literature shows that it is rare to apply scaffold theory to academic English vocabulary acquisition in combination with relevant new teaching concepts and models. This paper argues that there is a good fit between the theory of scaffolding and the teaching of academic English vocabulary in engineering. According to the preliminary results before the study, the new vocabulary acquisition model will provide the subjects with scaffolds in four aspects: companion scaffold, tool scaffold, emotion scaffold and monitoring scaffold.

2.2 Corpus and Vocabulary acquisition

Lexical teaching is one of the earliest and most fruitful fields in which corpus resources and research methods are applied in foreign language teaching (2007, He Anping). Empirical vocabulary acquisition research based on various types of corpus is more numerous. Corpus can provide language learners with "authentic" contextual co-occurrence information based on massive data, and it can also become a quality resource for teachers to conduct vocabulary testing and peer discovery learning. Two kinds of corpus are mainly used in this study: one is the native speaker corpus free online (such as British National Corpus, American contemporary corpus, etc.); The second is specialized engineering academic English corpus. Native speaker corpus is mainly used by teachers and student groups for extracurricular comparative analysis and knowledge expansion of typical usage of high-frequency vocabulary in general English. The corpus of the self-established academic English corpus is mainly composed of foreign academic journals such as SCI papers after collation, correction and text processing, covering engineering majors such as metallurgy, mining and machinery. Its main purpose is to provide learners with "real" corpus and "authoritative" examples with more "instrumental motivation attraction".

2.3 Flipped Classroom and Formative Evaluation

Flipped classroom, as an emerging teaching concept and model in recent years, has attracted the attention of many scholars, especially classroom teachers. Its basic connotation is to reverse the traditional classroom knowledge teaching and knowledge internalization so as to improve the teaching quality (Dundee, 2016). The difference between flipped classroom and traditional classroom lies not only in the space and time exchange of classroom teaching and extracurricular exercises, but also in the reasonable design and space and time distribution of teaching activities. In flipped classroom, knowledge input is assisted by information technology for learners to complete independently after class, while classroom is used to focus on person-to-person output interaction activities (Li Jingnan, Wu Zhongjie, 2015). In this study, flipped classroom model is used to carry out embedded ecological resources for vocabulary acquisition – supplementary contents of vocabulary acquisition related teaching and learning such as high-quality online MOOC and self-made micro-class video. In order to ensure the effectiveness of the flip, a multi-dimensional formative

evaluation mechanism is constructed to support teachers and peers, online and offline, and during and at the end of the semester.

3. Model and ecological environment construction

Before the study, a specialized survey on graduate Students' English learning found that the subjects' English learning needs and motivation were not the key to the problem, but the lack of continuous learning motivation and necessary process scaffolding. This also exactly verified Markova's opinion that a demand does not have enough energy to cause the change of students' behavior, unless the demand is converted into motivation in an activity related to the goal, and the motivation will be transformed into motivation if the motivation is consistent with the goal. Based on the sociocultural theory and the concept of ecological support, this paper, aiming at the significant characteristics of vocabulary acquisition for students with difficulty in engineering English learning, builds a teaching model in the context of ecological support for vocabulary acquisition supported by multi-dimensional scaffolds.

3.1 English Teachers

In the new teaching mode and ecological environment, the teacher's role has changed substantially -- from the traditional "lecturer" to the "organizer" of multiple roles. First of all, teachers provide instrumental scaffold for students through task activities based on writing platform, corpus and flipped network resources. Whether it is an online platform or a variety of corpus and flipped resources, in essence they are only the source of materials for teaching and learning activities, but how to use them and how to achieve them depends on the design mode of "teacher-centered" and "student-centered" in teaching activities. Motivation and emotion factor is very important for English learners. Therefore, teachers should also provide students with necessary "emotional scaffold", especially pay close attention to the dynamic changes of students' motivation and emotional factors, encourage students in real time, give more positive evaluation, and emphasize the evaluation concept of "progress is excellent". In addition, teachers play the role of supervisors through multiple assessment and evaluation methods such as "micro-exercise", "micro-assessment" and "micro-competition". In other words, teachers should provide "monitoring support" to students in vocabulary acquisition ecology, so as to avoid low self-learning efficiency caused by lack of confidence, weak self-monitoring ability and rigid acquisition.

3.2 English Learners

English learners themselves play a dual role. They are both beneficiaries of peer scaffold in the teaching mode and givers of peer scaffold to other members through the group. According to the stent theory, students can achieve a higher level of achievement in the proximal development zone through the peer students. Specifically, team members can cooperate with each other, discuss together, urge and encourage each other, and exchange experience in the discovery learning process based on two kinds of corpus. At the same time, the multiple evaluation system also includes the module of peer evaluation, so that the learners themselves also provide each other with monitoring scaffold.

3.3 Learning resources and platforms

The writing platform is a "correcting website" that automatically marks and evaluates English compositions online. Just like a doctor using a CT machine, a teacher can automatically scan the parameters of a student's composition with the correcting net, so as to make more accurate and objective judgments and comments. Its principle is to compare the distance between students' essays and the standard corpus, and to map the number of components and comments through a certain algorithm. Most importantly, teachers can set a variety of evaluation parameters according to the level of students, and students' writing can be corrected and automatically fed back. "Tool supports" such as high-frequency vocabulary and typical usage provided by the online platform are of great significance for students with learning difficulties to improve their vocabulary acquisition efficiency in "practical application".

In order to improve the specialization and motivation generation of ecological supply resources, this study constructed an Engineering Academic English corpus and conducted corresponding corpus processing. At the same time, AntConc, an easy-to-use corpus specific retrieval package for peer discovery learning, is provided for groups of students. On this basis, the free online native speaker corpus (such as BNC, COCA, etc.) are also used as a reference corpus to provide more authoritative and real corpus sources for learners and facilitate the comparative analysis of common English vocabulary and academic English vocabulary.

3.4 Evaluation system

Based on the school's examination reform plan, vocabulary assessment will be included in 25% of the semester's normal (50% final and 50% regular) grades. Specifically, it includes six modules: oral vocabulary test, written vocabulary test, online writing, corpus learning, flipped MOOC micro class and vocabulary Comprehensive Competition. The purpose of this study is to effectively improve the common core vocabulary and applied skills of engineering academic English for non-English major graduate students in engineering colleges, ensure their confidence and motivation in future study, and improve their practical ability in academic writing and oral communication. The combination of oral and written, examination and competition, online and offline, and vocabulary acquisition and writing will promote the validity and reliability of formative assessment.

4. Preliminary implementation effect

After a semester of experimental teaching, a competitive vocabulary test was specially organized to integrate high-frequency vocabulary in GE and core vocabulary of engineering Academic English, and a questionnaire survey and face-to-face semi-structured interview were conducted among the students. The vocabulary test shows that the vocabulary of the students in the subject class is significantly improved compared with that of the students in the parallel class. The questionnaire survey shows that the students' satisfaction has reached more than 90%, among which the most recognized is the positive role of "scaffolding". In the interview, it was also found that some students with learning difficulties felt that although corpus could provide massive real retrieval data support, it was difficult to complete the task without the "scaffold" of excellent group peers. For this group of students, how to design and provide targeted, multidimensional "scaffolding" based on learners' needs is the key to determine the effectiveness of vocabulary teaching and learning.

5. Conclusion

From the perspective of sociocultural theory, based on the peer scaffold, tool scaffold, emotional scaffold and monitoring scaffold, this study constructed a new vocabulary teaching model for engineering academic English. Meanwhile, teaching design effectively integrates flipped classroom and data-driven learning concepts and methods, and ensures the effectiveness of teaching and learning by combining the corresponding formative evaluation mechanism. The research shows that the teaching model and its ecological environment are beneficial to learners, especially engineering graduate students, to improve the learning efficiency of academic core vocabulary.

References

[1] Jiang rong, 2013. Research on Chinese learners' vocabulary acquisition based on socio-cultural theory [M]. Beijing language and culture university press.

[2] Wood D, Brunner J S, Ross G.1976. The Role of filtrating in Problem Solving [J]. Journal of Child Psychology and Psychiatry, 17:89-100.

[3] He Anping, 2007. Corpus Linguistics and English Teaching [M]. Foreign Language Teaching and Research Press.

[4] Dundee, 2016. Review on the Application of flipped Classroom Model in College English Teaching [J]. Foreign Languages, (4): 89-96.

[5] Li Jingnan, Wu Zhongjie, 2015. Practice and Reflection of College English Flipped Classroom [J]. Chinese Foreign Languages, (6).