Practical Research on Flipped Classroom Teaching Model in College English Based on Production-Oriented Approach

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ABSTRACT

In the context of integrating technology into higher education and the widespread acceptance of a learning-centered philosophy, flipped learning (FL) is gaining popularity as a flexible new approach. To overcome the problem of input-output separation in the traditional text-centered teaching and learning paradigm in tertiary education in China, a flipped classroom teaching model based on the theory of the Production Oriented Approach (POA) was proposed and implemented for a vocational English course. Mixed research methods, including testing, questionnaire surveys, and interviews, were used to validate the effect of the model. Data analysis shows a notable enhancement in the mastery of new target language items among the experimental class that adopted the flipped classroom teaching model based on the POA. Moreover, this practice also has changed their learning behaviors both in and after class, increasing their time investment in learning and improving their performance and engagement in class, thus enhancing their autonomy in language learning. This study empirically supports the flipped classroom teaching model based on the POA. It aids in transforming traditional input-driven teaching into output-driven teaching and serves as a teaching reference for practitioner teachers.

Keywords
production-oriented approach; flipped learning; English teaching

Introduction

With the continuous integration of information technology and education, the Ministry of Education issued the English Curriculum Standards for Higher Vocational Education in April 2021, emphasizing exploring the transformation of teaching methods and learning styles in information technology to improve students' ability to use language. Accordingly, the higher vocational college where the author works implemented teaching reform, adopting a Text-Centered Flipped Classroom. This method, emphasizing input-processing activities in the classroom, has been criticized for inefficiency due to neglecting language use (Xia, 2002). Students lack learning initiative, resulting in challenges when integrating in-classroom and extracurricular learning activities. Besides, online and offline teaching cannot form a seamless and effective synergy. Therefore, it is necessary to adjust the current instructions.

Flipped classroom teaching is a new type of teaching mode emerging along with the development of the Internet, which has changed the fixed mode of the previous classroom lectures first, and students learn later. Instead, it uses information technology to transform teaching content into learning materials like text videos. It requires students to study independently by watching the video before class and then discovering the difficulties encountered in their learning. Classroom teaching focuses on explaining the critical content and difficulties students face, effectively stimulating students' sense of independent learning. The Production-Oriented Approach (POA) emerges as a pedagogical approach posited to address the issue of "input-output separation" in tertiary-level English instruction within China. (Wen, 2015). It challenges the commonly employed text-centered approach. It advocates a teaching paradigm that engages students with language use while learning with teacher mediation to improve the effectiveness and efficiency of language teaching in China. It can be seen that the flipped classroom teaching mode is in line with the POA theory. POA is theoretical guidance, and the flipped classroom is a teaching model; both are committed to highlighting the central position of students' learning and emphasizing students' autonomy. In light of this, the author attempts to construct a flipped classroom teaching model based on the POA concept to address the current issues.

Practical research on the flipped classroom teaching model based on POA has garnered considerable interest among researchers. The results obtained from preliminary practice in the classroom and research revealed that this model creates a conducive learning environment that promotes student participation, engagement, and academic success (e.g.,

Gao, 2018; C. H. Liu, 2021; Li, 2017; Wang, & Zhang, 2013; Wang, 2022; C. M. Yang, 2016). However, the perceived benefits primarily stem from subjective teacher observations and student feedback. More quantitative experimental research is required to assess the impact. A quasi-experimental study addressed the existing research gap by examining the impact of POA-based flipped classroom instruction on students' mastery of new target language elements and students' in-class and out-of-class learning behaviors.

Literature Review

Research on the flipped classroom teaching model

The so-called flipped classroom is a novel type of teaching where teachers deliver learning resources in an information technology environment, students complete instructional videos and other learning resources before class, and teachers and students collaborate in the classroom to complete homework and question-and-answer, collaborative inquiry, interactive communication, and other activities (Zhong, Song, & Jiao, 2013). Some researchers believe that teaching videos are not the core of the flipped classroom but rather a reversal of the traditional teaching process. The true meaning of the flipped classroom is built on "student-centered" thinking, and its success is due to active learning enabled by inquiry and project-based learning (Jin, 2012).

The early foreign research on flipped classrooms was conducted by Mazur, a physics professor at Harvard University, who split learning into two phases: information transmission and knowledge internalization. Since the 21st century, along with the progress of information technology and the creation of MOOCs and Khan Academy, the flipped classroom has attracted much attention because its concept has gained deeper and broader technical support. Foreign research on flipped classrooms mainly focuses on the application of flipped classrooms to teaching practice (Gardner, 2012), comparative research with traditional teaching mode (Strayer, 2012), and exploring the application effect of flipped classrooms in combination with other teaching methods or technologies (Cannod, 2008). Foreign research is dominated by applied research, and there are also related studies focusing on the development of learning resources, such as introductory videos and the implementation steps of the flipped classroom.

Compared with foreign research, domestic research on flipped classroom is still in the phase of introduction and presentation (Y. J. Zhang, 2012). For example, the flipped classroom's origins, concepts, characteristics, advantages, shortcomings, and theoretical foundations have been researched and discussed from different perspectives (G. Y. Zhang & Y. J. Zhang, 2012; Jin, 2012). There are also researchers who have conducted preliminary explorations of the flipped classroom teaching model (Jin, 2012) and studies on instructional design based on the concept of flipped classroom in an information technology environment (J. L. Zhang, Wang, & B. H. Zhang, 2012). In general, the literature on this topic contains more introductions than research, more theoretical analysis than empirical study. It mainly focuses on classroom teaching in primary and secondary schools, with less research on the application of teaching in colleges. In addition, the flipped classroom is not a "one-size-fits-all" educational picture that is entirely suitable for China's indigenous technology. Therefore, we need more in-depth theoretical research and rational thinking to verify the effectiveness through empirical research on real-life scenarios, to find and solve problems in time, and to form scientific research practice mode.

Research on POA

The Production-Oriented Approach (POA) is a novel pedagogy with distinct Chinese characteristics designed to address the issue of disconnect between input and output commonly observed in English instruction in Chinese tertiary education. Its primary objective is to enhance the effectiveness of classroom instruction. The framework of POA comprises three key components: teaching principles, teaching hypotheses, and teaching procedures. The first part serves as the guiding framework for teaching objectives and directions. The second part provides a theoretical foundation for various teaching and learning sessions, while the third part is responsible for organizing effective teaching sessions to implement pedagogical philosophies and test hypotheses (Wen, 2015).

Since its theoretical system's inception in 2015, it has garnered substantial interest from practitioners and researchers, and the studies in Table 1 can be categorized into five areas. However, there has been a scarcity of experimental research aimed at examining the impacts of the POA on students' language usage. Among the research reporting the impacts of the POA, some studies solely focused on the effects of individual instruction phases, while others who

implemented the entire procedure relied simply on test scores for the outcomes. In addition, how to combine this innovative teaching theory with the flipped classroom teaching mode and what difficulties will arise in the practice of English teaching need to be further explored and solved. This study addresses a research gap by employing a quasi-experimental research methodology to examine the efficacy of POA-based flipped classroom teaching in fostering students' proficiency in newly introduced language elements and enhancing their self-driven engagement in English language acquisition.

Table1. Current research on POA

Research focus	Studies
Theoretical construction in terms of its principles, hypothesis, and procedures.	Wen (2015, 2017, 2018); Ellis (2017); Matsuda (2017)
Proactive classroom activity design for its teaching procedures, namely, motivating enabling and assessing.	L. F. Yang (2015); Qiu (2017, 2019; W. J. Zhang (2015); Sun (2017, 2019)
Its application in different contexts such as teaching different foreign languages with feedback on its effects.	Cao (2017); Chen (2020); Liu and Feng (2019); Zhan (2019); W. J. Zhang, (2016)
Principal elements of teaching, namely, POA material development and use.	Bi (2019); Chang (2017); Cao(2017)
Experimental studies on its effects	L. L. Zhang (2017); W. J. Zhang (2017)

Methods

Research questions

This research aims to confirm the feasibility and effectiveness of applying the flipped classroom teaching model based on POA theory in English class. Based on the above discussion, the current study addresses explicitly two research questions:

i) Compared with the Text-Centered Flipped classroom, is POA-based flipped classroom more effective in helping learners use the target language?

ii) Does POA-based flipped classroom teaching positively influences students' in-class and out-of-class learning behaviors?

Participants

Two complete classes of the author's college were selected as subjects for this study. Class I was the experimental class (N=36, 17 boys and 19 girls), and Class II was the control class (N=40, 17 boys and 23 girls). These students were between 18 and 20 years old and majored in health management. They had been engaged in English language learning for at least six years and had experienced a traditional text-centered teaching model. Although there were individual differences in their English proficiency (ranging from approximately A2 to B1- according to the CEFR rating system), the general proficiency in the English language in both classes was comparable. The independent samples t-test findings revealed no statistically significant distinction in the English scores of the two classes as observed in the pre-experimental assessment.

Research design

POA theory has a significant optimizing and stimulating effect on the practical application of flipped classroom instruction. The teaching principles and hypotheses of POA can provide theoretical guidance for the development of flipped classroom, on which the flipped classroom can be implemented in accordance with the teaching process of POA theory, thereby integrating the two and making university English flipped classroom teaching more scientific and effective. The deployment of university English flipped classroom instruction based on POA theory can be conducted in three phases: (See Fig. 1)

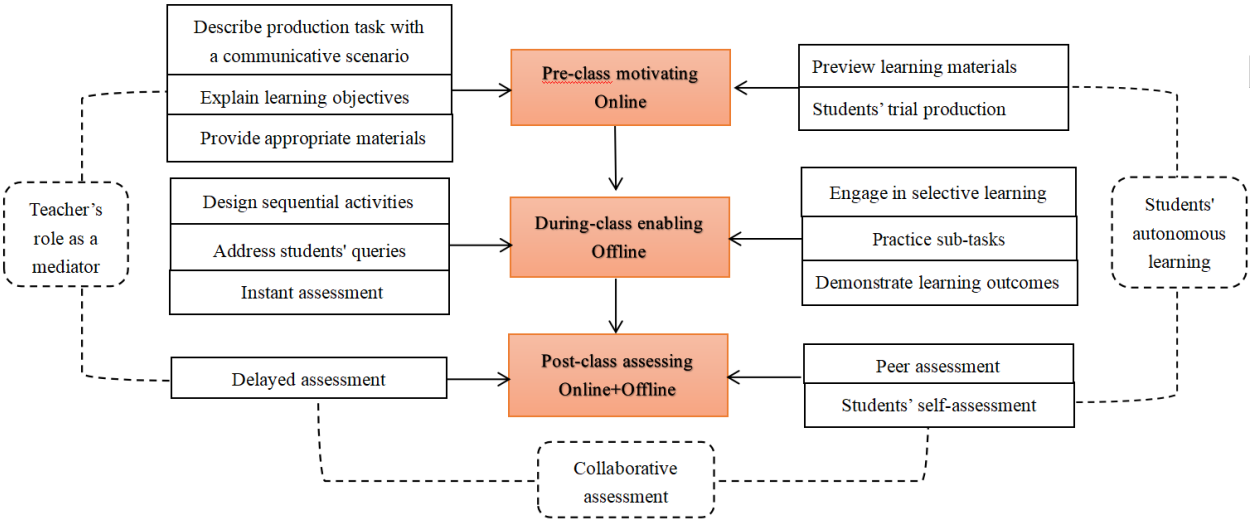

Figure 1. POA-based flipped classroom teaching model

1. Pre-class motivating phase

When a new unit is started in traditional foreign language teaching, teachers typically plan "warm-up" or "lead-in" activities to spark students' interest in learning new texts or to activate students' prior knowledge. Whatever form it takes, the aim is to learn the text better. In this sense, such "warm-up" activities are about paving the way for later study of the text or preparing for better input acceptance rather than stimulating the desire to produce. Unlike traditional teaching methods, POA places the "driven" output at the beginning of the new unit. The "Output-driven" hypothesis consists of three parts: 1) the teacher presents a communicative scene; 2) the student tries to produce the output; and 3) the teacher explains the teaching objectives and output tasks.

The first part, "Teacher Presentation of Communication Scenarios," attempts to present students with communication scenarios and discussion issues they may experience in their future studies and work before starting the new unit of study. Students may genuinely feel the "possibility" of these scenarios and the cognitive hurdles of the topics to be explored in these scenarios, even when they have never encountered them before. The second part, "Students Trying," allows students to experience that it is not easy to complete such a seemingly simple and common output task and that they may be embarrassed or in a dilemma later on. At this point, a kind of pressure and motivation to learn arises within them. The teacher intends to create a "state of hunger" for the students. The third part is "Teacher explaining the teaching objectives and output tasks." Teaching objectives are divided into two categories. The first is communicative objectives, which are the kind of communication tasks that can be completed; the second is linguistic objectives, which are the words, phrases, or grammatical information that must be mastered. In contrast to traditional instruction, the mentioned language objectives must be able to serve communicative purposes. Any language items in the input material irrelevant to the communicative objectives are not listed in the language objectives. This is the "selective learning" requirement discussed earlier.

Given the actual situation of fewer hours of college English classes and the large amount of information in the teaching materials, the author recorded micro classes in the section of "output-driven" and released the micro class videos, task lists, related courseware and texts on the college English online learning platform in advance. The students were assigned tasks in groups before the class, studied and discussed the input materials provided by the teacher according to their needs, tried to complete the communicative activities and submitted the relevant results online. Teachers can understand the student's learning progress and the degree of difficulty of the knowledge points according to the results and monitor them effectively. Students can also make suggestions on the course design through the forum area of the platform so that teachers can make timely adjustments to the teaching content. This model puts the "output-driven" part outside the classroom, which can bring students richer input materials, save more time to enter the "enabling" phase, and also create a "hunger" for students to learn so that they can take the initiative to seek answers to their questions in the classroom and be fully prepared for the output.

2. During- class teaching implementation phase

Classroom teaching is teacher-led and student-centered, with language and competence facilitation activities closely focusing on students' learning. According to POA teaching theory, the "Input-Enabling" hypothesis consists of three main parts: 1) the teacher describes the output task; 2) students engage in selective learning, and the teacher gives guidance and checks; 3) students practice the output, and the teacher gives guidance and checks.

What does POA direct students to choose from the input? Completing an output task requires, at a minimum, ideas, language, and a discourse structure that expresses the content in language. POA usually starts with ideas. For some output tasks, even if some students are asked to answer in Chinese, they may need the help of input materials. The second step focuses on acquiring language expression forms, such as words, phrases, and sentence patterns, that can be used to output tasks. The third step is to extract and imitate the discourse structures required for the output task from the excellent input texts. It should also be emphasized here that the discourse structures extracted by the students only serve as a starting aid. After that, the POA should encourage the students to use self-expressive structures rich in personality traits.

The teacher's scaffolding role is most evident in the "input-enabling" section, so we have organized this in a face-to-face classroom setting. Teachers should review what students have learned independently before class, which can be done through group or pre-class quizzes. Then, explain and interact with students on the critical points of the textbook and students' complex problems. Subsequently, the teacher divides the work among the groups according to the pre-class output tasks and breaks down the big tasks or projects; in the process of group consultation and discussion of the output of the tasks, the teacher leads the group to select functional input materials and expressions, and the students practice the outputs again at a deeper level. Finally, the groups present their results. During the group presentation, students from other groups should summarize the presentation's main points, evaluate it, and score it. After the group presentations, the teacher evaluates and summarizes the information points worth learning from the presentations made by the presenters, as well as the practical learning methods acquired by the students in completing the tasks so that more students can benefit from them.

3. Post-class evaluation phase

Combining the essential characteristics of the English subject and POA theory, the flipped classroom requires the implementation of scientific evaluation to achieve the continuous optimization and improvement of the teaching program. The output evaluation methods based on POA theory are mainly in the form of immediate evaluation and delayed evaluation. Among them, immediate evaluation is mainly for students' performance and results when they practice or complete output tasks, which requires English teachers to pay attention to both students' visible results and the process of student's participation in the completion of output tasks so that immediate evaluation can correct students' learning deviations in time and maintain students' enthusiasm and efficiency. Delayed evaluation usually requires English teachers to evaluate the overall outcomes of students' learning inside and outside the classroom. In addition, for the implementation of output evaluation and optimization, it is also necessary to strengthen students' participation initiative, encourage students' independent evaluation and mutual evaluation, and form an effective supplement to teachers' evaluation of students' outputs, which is more helpful for the achievement of the teaching objectives of the flipped course.

Data Collection and Analyses

This study used a combination of quantitative and qualitative research methods. Questionnaires and language tests were used to address the two research questions, and semi-structured interviews were used to supplement the findings.

The questionnaire was designed to investigate the experiment's effectiveness, including students' satisfaction with the effectiveness of the teaching model and the impact of the teaching model on learners' learning behavior. The questionnaire comprised 26 questions; the first 24 were multiple choice, and the last two were open-ended. Seventy-one valid questionnaires were collected, and the data were analyzed using SPSS 20.0 software.

The interviews were an extension of the questionnaire content, in which 10 participants were randomly selected for unstructured one-on-one interviews to understand the impact of this learning model on their learning behaviors from

various perspectives. Interview data were collected by audio recording, and the recordings were transcribed, coded, and counted the frequency of keyword occurrences to form a supplement to the quantitative data.

In order to examine students' learning of the target language items, a follow-up test was administered to both classes one week after the end of instruction. The test mainly examined the identification, retrieval, and application of the 35 language targets of the unit, and the test questions included word choice, word form conversion, Chinese to English, and English to Chinese. The same test paper was used in both classes; the students were not informed of the test beforehand, and the test length was 30 minutes. After the tests were completed, the author and other teachers marked the test papers. Finally, the test scores of the two groups of students were compared and analyzed employing the independent samples t-test in SPSS version 17.0.

Results

The test results

A comparative analysis was conducted on the pre-and post-test results of students in both groups. The pre-test comparison aimed to ascertain the equivalence of English proficiency levels in both groups before instruction. Subsequently, the post-test comparison sought to detect disparities in output quality between the groups after being taught, thereby assessing the impact of the POA-based flipped classroom teaching model on the mastery of the new target language items. The test results of the two groups were compared with the independent samples t-test. The results showed that the difference in language test scores between the two groups was statistically significant. Specifically, the experimental group exhibited notably superior language test scores to the control group. (see Table2).

Table 2. Comparison of language test scores

	Experimental Group (n=35)		Control Group (n=36)		MD	*t* (69)	*p*
	M	SD	M	SD			
Test score	23.40	3.71	20.91	4.93	2.49	2.39	.019

The questionnaire survey results

This teaching model has positively impacted students' in-class and out-of-class learning behaviors. According to our survey data, there are several significant findings: 69% of students believe that this semester's English instruction has made them more proactive in seeking and reading English literature；84% of students indicate that they actively engage in the pre-class assignments assigned by their teachers； 86% of students feel that pre-class learning tasks have increased their time commitment to studying (referred to as "increased time commitment"); 77% of students think that in-class output-oriented learning tasks have made their pre-class learning objectives clearer (referred to as "clarity of learning objectives") and have prepared them better for in-class activities (84%, referred to as "adequacy of class preparation")；86% of students believe that they have become more engaged in class (referred to as "classroom engagement").

Additionally, correlation analysis shows significant positive correlations between increased time commitment and clarity of learning objectives, adequacy of class preparation, and classroom engagement, with correlation coefficients of 0.778, 0.539, and 0.573, respectively ($p < 0.01$). As students increase their time commitment to studying, they also become more focused on achieving clear learning objectives, adequately preparing for class activities, and exhibiting a more positive classroom performance.

Furthermore, the survey reveals that students actively participate in various teaching activities in class (79%), enjoy collaborating with classmates to complete tasks (76%), feel more confident in English class (91%), believe that classroom activities help them apply and reinforce pre-class learning knowledge and skills (78%), can solve problems encountered in pre-class learning through interactive activities (76%), and find a significant connection between classroom activities and pre-class assignments (80%). Most importantly, 89% of students prefer using mobile devices

for learning English, and 92% of students believe that this teaching model enhances their self-awareness in learning. In summary, this teaching model provides students with a more proactive and practical learning experience, helping them achieve greater confidence in English learning.

The interview results

The interview questions mainly focused on students' self-perceived English proficiency changes at the experiment's end. The results of the interviews show that students generally believe that their English proficiency has improved for three reasons: first, the POA-based tasks are more driven, and the assignment of tasks before class gives students a clear goal to pursue; second, the collaborative assessment activities inside and outside the classroom put students under more significant pressure, which can effectively motivate them to carry out in-depth learning on their own with a purpose; and third, the use of the Internet and mobile devices facilitates the cooperation, learning evaluation and feedback, and also meets the demand for learning resources.

Discussions

The effect of POA-based flipped classroom on students' mastery of newly learned language items

The test results for the target language items reveal that the experimental group's language test scores were higher than those of the comparison group. The findings indicate that students in the experimental group exhibited a superior mastery of the target language items compared to those in the comparison group, indicating that the POA-based flipped classroom can promote students' absorption and use of newly learned language items.

According to the studies of scholars at home and abroad (e.g., Nation, 2001; Meara, 2005), the acquisition of language elements, such as vocabulary and chunks, is primarily correlated with factors including exposure frequency, attentive awareness, focused attention, and the intrinsic motivation to learn and apply, etc. Schmitt (2008, 2015) developed the idea of 'engagement' based on these influencing factors. Educators should actively enhance learners' engagement with the target language to facilitate learning.

Students in the experimental group were able to absorb better and use the newly learned language forms because POA "organically integrates what students 'learn'" with what they 'use' " (Wen, 2017), which improves the "relevance and directionality" (Chang, 2017) of the input according to the needs of the task. Under the guidance of the POA's concept of "learning by doing," "facilitative" sub-tasks are designed to help students increase their attention and "engagement" with the newly learned language during language use in the "language enabling" section, and to promote the connection between language form, function and meaning (Nunan, 2011). In the 'idea enabling' and 'structure enabling' sessions, more opportunities are created for students to use the language to increase the frequency of their exposure to the language so that they can move from "replicative" use of language to flexible use (W. J. Zhang, 2016). In contrast, although the teaching content of the traditional intensive reading method also covers the target language items, it lacks the teaching design of "learning by using. " In the one-way knowledge transfer process of the teacher, students' attention to the target language, the degree of demand for learning and use, the degree of participation, and the frequency of contact with language projects are low, which affects the effect of language learning.

The effect of POA-based flipped classroom teaching on students' in-class and out-of-class learning behaviors?

The data analyses show that this teaching model enables students to increase their out-of-class learning time by completing pre-class learning tasks. Students become more explicit about their learning objectives and are well-prepared for output-oriented tasks in the classroom through pre-class language input. Additionally, this teaching model improves students' learning behavior, making their classroom performance more positive and enhancing their learning autonomy. Students enjoy using mobile devices for English learning, which reflects the high likelihood of "traditional teaching elements (textbooks, content, methods, etc.) being replaced by new elements (computers, the internet, information resources)" in the information age (Chen & Ma, 2019). Sharing learning resources and interactive communication through mobile devices provide authentic and efficient learning contexts for language learning so that students "unconsciously learn through interaction with the environment (learning resources, teachers and peers)" (Jones & Jo, 2004).

The flipped classroom is a "learning before teaching" mode, flipping time and space, process and structure, and a "paradigm shift." From the perspective of teaching methods, teachers' classroom teaching is designed to promote students' active learning, focusing on conceptual exploration, meaning construction, and knowledge application in the

face-to-face environment of the classroom. In terms of instructional objectives, students achieve the lower-order cognitive goals of Bloom's instructional goals (knowledge and comprehension) before class and focus on the higher-order cognitive goals (application, analysis, synthesis, and evaluation) during class time with peer and teacher support. POA-based flipped classroom teaching creates favorable conditions for students in the experimental group to improve their subjective initiative in English learning, and the teacher extends the learning time outside the classroom, which cracks the problem of fewer class hours, more knowledge points, and more students in college English. In addition, the roles and expectations of teachers and students have changed, with students becoming the masters of learning and teachers transforming into "guides," making deep teacher-student interactions possible and ensuring time for adequate learning, reflection, and feedback.

Conclusion

Based on the theory of output-oriented method with Chinese local characteristics, this study constructed a "motivating-enabling-assessing" flipped classroom teaching model. The study results show that students generally accept the teaching model, which stimulates students' initiative to learn and improves students' English learning outcomes. However, this study still has some things that could be improved. The cultivation of students' abilities and the improvement of their language proficiency is a long process. This study has been carried out for only one semester, which leads to the fact that all parts of the teaching and learning activities cannot be carried out in more detail, and the online and offline teaching and evaluation system still needs to be improved. Future research on teaching practice can dig deeper into the driving, enabling, and evaluation of each teaching procedure, highlight the combination of the output-oriented method and the hybrid teaching mode of online and offline teaching and provide a more helpful reference value for improving university English teaching.

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