



Application Of Discovery Method in Experiential Teaching of English Grammar in A University of Henan Province, China

Yunxiang Chen¹, Yan Ye^{2*}, Feng Chen³, Chunxia Lu⁴

¹Henan Normal University, China; Email: janechen1993@hotmail.com

^{2*}Stamford International University, Thailand; Email: yan.ye@stamford.edu

³Zhejiang Ocean University, China; Email: 406956449@qq.com

⁴Yancheng Normal University, China; Email: 31396455@qq.com

*Corresponding author: Yan Ye

*Email: yan.ye@stamford.edu

Citation: Yan Ye et al (2024), Application of Discovery Method in Experiential Teaching of English Grammar in A University of Henan Province, China, *Educational Administration: Theory and Practice*, 30(11), 1334-1339
Doi: 10.53555/kuey.v30i11.9419

ARTICLE INFO

ABSTRACT

This study was intended to investigate the effects and differences of the discovery method and traditional method in English grammar teaching at a public university of Henan Province, China. A total of 120 English learners were selected and divided into the control and experimental classes. The participants were exposed to two different teaching methods and independent samples t-test was used to compare the students' perception of classroom atmosphere, classroom communication, sense of achievement, grammar learning understanding level, and their final exam scores. The researchers also selected students from two classes who are voluntary to be interviewed, to know more details of the learners' ideas. The qualitative and qualitative findings proved that there were significant differences in students' perception of classroom atmosphere, classroom communication, sense of achievement, grammar learning understanding level, and their final exam scores between discovery method and traditional method of teaching at the university level in Henan province, China. Discovery teaching method had positive effects on English grammar teaching. Meanwhile, the discovery method could lead to a better and more efficient contribution to the students' English language proficiency and confidence. compared to the traditional teaching method. Finally, some pedagogical implications have been presented for English language teachers and students at China's university level.

Keywords: English Grammar Class; Discovery Method, Traditional Method, China's University students

Introduction

A good command of grammar is considered a necessary condition for learners to communicate effectively and accurately in English language (Khalifeh et al., 2022). Despite all efforts rationalized around the significance of grammar instruction, it remains a contentious issue in the fields of second and English language teaching (Sik, 2014). The cultivation of skills such as listening, speaking, reading, writing, and translation in the process of English language learning cannot be separated from the learning of grammar knowledge, which is an important part of English language acquisition. Since the 1950s, grammar teaching has played an important role in English language teaching in China's universities (Guo, 2010). Although some scholars have suggested neglecting or weakening grammar teaching in recent years, grammar courses are still an important foundational course in English language teaching in most universities (Lee, 2007; Zhu, 2021; Mashudi et al., 2022).

Grammar learning is an important part of English language learning, and how to implement effective grammar teaching and learning in English language teaching in universities is regarded as an important issue in China (Du, 2010). Applying the discovery method to English grammar teaching in universities, guiding students to actively collect relevant information, raise questions, discover, and solve problems in the process of grammar learning. Practice has shown that the discovery method is a learning model that combines participation and

experience. It not only helps to stimulate students' interest in grammar learning, but also stimulates their enthusiasm for self-directed learning, strengthens the organic connection between teaching and learning, and improves the effectiveness of grammar teaching (Lee, 2007; Sik, 2014).

For a long time, the teaching of English grammar in universities has generally adopted the traditional method of instilling explicit grammar rules, that is, explaining grammar first and then giving examples, neglecting the cultivation of students' implicit grammar ability (Li, 2023; Zhu, 2021). This has led to a lack of interest in learning English grammar among students, and the teaching effect of English grammar classes is not ideal (Dekeyser, 2003). Faced with such a teaching situation, how to reform grammar teaching and implement effective grammar teaching models is an important issue worth considering (Erlam, 2003).

Gholami & Talebi (2012) claimed discovery teaching method is a teaching model aimed at cultivating students to actively think, independently explore, discover, and master grammar knowledge in the process of learning English grammar. Bakhshandeh & Jafari (2018) further explained discovery method was to take students as the main body, independently complete the cognitive process, that is, under the guidance and inspiration of classroom teachers, students can consciously and actively discover and solve problems. Obviously, the discovery method teaching mode is of great benefit in enhancing students' interest in learning English grammar and breaking the classroom "lecture practice" teaching mode (Darakhani & Rajabi; 2022).

Therefore, this study mainly aimed to explore the following two research questions: 1) What are the main positive effects of teaching methods in English grammar teaching in universities? 2) Can the practical application of teaching methods in English grammar teaching improve students' comprehensive abilities?

Literature Review

The Concept of Discovery Teaching Method

The ideological origins of the discovery teaching method can be traced back to the "midwifery" teaching method of the ancient Greek philosopher Socrates and the teaching ideas of modern. Bruner (1960) was a renowned psychologist and educator in contemporary America, who has consistently rejected the use of stimulus response theory and animal behavior acquisition research to explain human learning activities. Yazdani & Sadeghi (2022) has drawn the conclusion that the essence of learning is the process of cognitive structure, including autonomous selection, memory, and mastery of knowledge, through long-term research on human cognitive processes and how teachers design teaching processes to guide students to explore and discover knowledge autonomously. The best way to achieve this process is through discovery.

Cognitive discovery theory is a revolution against traditional indoctrination education, as Du (2010) proposed that knowledge is not "ready-made" but needs to be discovered by students, transforming passive acceptance of knowledge into active acquisition, and transforming learning content into "knowledge" waiting for students to discover. Various studies have tried to investigate the effectiveness of grammar teaching on the linguistic accuracy of language learners in different contexts (DeKeyser, 2003; Erlam, 2003).

Rafiei, Behnam & Seifoori (2024) believed the basic purpose of discovery teaching method is to put students at the center, guide them to explore knowledge and problem-solving methods and steps, discover the characteristics of things, the causes of their development, and the internal connections between things, find patterns from them, and form their own discoveries consciously and actively. This theory emphasizes that the role of teachers is not to impart knowledge, but to guide students to conduct their own research to discover and solve problems. It is necessary to introduce the discovery learning method into classroom teaching for practical research. This study found differences between learning methods and traditional deductive methods in improving student learning effectiveness, enhancing learning interest, and enhancing overall quality in English grammar teaching in universities.

Previous Studies on Discovery Method in English Teaching

Norris & Ortega (2001) mentioned with the help of teachers, by designing appropriate teaching environments and scientific teaching procedures, the basic concepts and principles of all subjects can be well mastered. Lee (2007) also proposed that during classroom teaching, emphasis should be placed on shaping students' intuitive thinking abilities. Intuitive thinking is different from analytical thinking in that it cannot be pre-set, but rather involves jumping activities based on the relevant existing knowledge scope and structure to find the answer to the problem. Regardless of whether the answer is correct or not, "intuitive thinking" reflects a positive attitude and active mental ability of students. It is also a prerequisite for "discovery learning" and a way for students to acquire knowledge. Hasanvand & Mohammadian (2022) examined the instructional methods that focused on the role of discovery learning methods on improving English language learners' grammar knowledge, and they believed the key to the learning process is learning motivation.

Some researchers found that discovery learning, specifically once it is guided, is beneficial, with the rationale that when we learn things on our own, they are assimilated better and more efficiently than when we are taught (Harmer, 2007). By utilizing a guided discovery approach that includes targeted support and instruction, students of all skill levels can engage in higher order thinking processes (Zohar & Dori, 2003). This is achieved through the active collaboration between students and instructors, and by utilizing a balanced combination of explicit and implicit strategies at various stages of its implementation (Marin & Halpern, 2011).

Sulistiani & Agustini (2022) explained unlike the traditional method of instruction, in this method, the students are not first provided with an explicit explanation of the rules, instead, initially some examples are presented as separate sentences or in text, then, they are directed to consciously explore the use of the rules and forms through a sequence of steps, these might be tasks, language awareness activities, pictures, key questions from the teacher, and so forth (Bjornsdottir, 2016). Contrary to traditional grammar instruction, in which the learner's output is manipulated to bring about modifications in their developing system, the goal of textual input enhancement is to change how students understand and process the input. Text enhancement involves highlighting specific input features that might otherwise be overlooked, using typographical manipulations (Nahavandi & Mukundan, 2013).

In China, teachers are responsible to adjust teaching content, design teaching processes, mobilize students' enthusiasm, make students have the impulse to discover and explore, achieve teaching goals, and improve teaching effectiveness. As is well known, teachers directly impart "ready-made" knowledge from textbooks, while students passively receive it, resulting in poor and unreasonable teaching effectiveness (Guo, 2010). At present, China vigorously advocates quality education, fully unleashes human potential, cultivates students' innovative thinking and lifelong learning abilities (Zhu, 2021).

Research Methodology

Participants

This study was conducted at the School of English Language, at a normal university in Henan province, China. To ensure the authenticity and reliability of the research, at the beginning of the school year of 2023, the researchers inducted a survey on relevant information and data of all college classes in our school. The researchers selected two classes in the first year of university as the participants, and designated them as control classes and experimental classes, respectively. The reason for choosing these two classes was that the number of students in these two classes was equivalent, with 61 and 59 students, and the students' English level was similar as they were freshman in that term. The total score is between the vocational and undergraduate admission lines, and the English admission scores of the two classes are very close, with an average difference of only 2 points.

Research Process

There were mainly two methods adopted: survey questionnaire method and testing method. The teaching experiment consists of two classes using the same textbook, taught by the same teacher, and lasting for one semester. The basic idea of using the discovery method in teaching experimental class was to first determine the discovery content and create problem scenarios. Then, the teacher designs teaching activities and target questions, guides students to analyze the problems, stimulates their discovery needs, clarifies the discovery goals, and assists students in collecting information to select and implement argumentative methods. On this basis, fully mobilize students to make various guesses and imaginations, and conduct logical reasoning to find internal connections. Finally, organize a review of the materials and provide a summary based on the findings made by students during the activity process. Traditional English language teaching methods were used in the control class for teaching. Firstly, comprehensively explain each grammar point and rule, so that students can understand and memorize it. Consolidate through examples and continuous practice.

There is no process of collaborative communication and learning among students in teaching, which is where the teacher talks, students listen, take notes, practice, and consolidate, and explain the answers. After the end of the semester, through observing classroom performance, comparing and analyzing the final exam scores of two classes, and conducting a series of practical and research activities such as questionnaire surveys on students, all data were analyzed and studied by using frequency and percentage as well as independent samples t-test, for providing practical basis for frontline English teachers to improve grammar teaching methods and theoretical reference for other researchers. After the end of the semester, a questionnaire survey was conducted on the experimental and control classes, with a total of 50 multiple-choice questions. Finally, 120 questionnaires were distributed, and 113 were collected. The survey results and data were valid. The students in English grammar teaching in experimental and control classes at the university of Henan province were also interviewed after the questionnaire survey.

Findings

The comparison of the main effects of teaching methods in English grammar teaching in experimental and control classes at the university of Henan province, China. The researcher compared the main effects between discovery method and traditional method, from the following perspectives:

1). Students' perception of English grammar classroom atmosphere in two classes

From Table 1, the independent samples t-test results showed the P value was less than 0.05, even 0.01; so, there were significant difference in students' perception of English grammar classroom atmosphere in two classes. Students in the experimental class believed that the classroom atmosphere was at the high level, while students in the control class believed that the classroom atmosphere was at the medium level, indicating that students in the experimental class were more interested in grammar learning, have a more positive attitude, and are

more active in class than those in the control class. It can be seen that discovery teaching method was more conducive to mobilizing students' enthusiasm for grammar learning than traditional teaching methods.

Table 1. Comparison of Students' perception of English grammar classroom atmosphere

Group	Mean	SD	T	P	Analysis
Control Class	2.831	0.861	1.976	0.009**	Medium
Experimental Class	3.632	0.784			High

Noted: ** $P < 0.01$.

2). Students' perception of English grammar classroom communication situation in two classes

Table 2. Students' perception of English grammar classroom communication situation

Group	Mean	SD	T	P	Analysis
Control Class	3.731	1.286	.986	0.023*	High
Experimental Class	4.102	1.078			Very High

Noted: * $P < 0.05$.

From Table 2, the independent samples t-test result indicated there were significant difference in students' perception of English grammar classroom communication in two classes, as the students reflected in the interview, they feel that the discovery method teaching provided students with a large amount of practice time, with various forms, including teachers asking and answering students, as well as students communicating with each other, seeking advice from teachers, and self-exploration. Learning and practicing in activities are the prominent features of this method, and all students in the class have had the opportunity to practice, effectively improving their grammar application ability. The control class was the opposite.

3). Students' sense of achievement in English grammar classroom communication in two classes.

Table 3. Comparison of Students' sense of achievement in two classes

Group	Mean	SD	T	P	Analysis
Control Class	3.231	1.286	1.976	0.012*	Medium
Experimental Class	3.932	1.078			High

Noted: * $P < 0.05$.

From Table 3, the independent samples t-test result reflected that the students' sense of achievement in English grammar classroom communication in two classes were significantly different. As shown, the students from control group occasionally experienced a medium level of sense of achievement. However, the students from the experimental class had a higher sense of achievement in learning grammar in the classroom. Through the guidance of the teacher and communication with classmates, they have found solutions and answers to problems on their own, achieved success, enjoyed the fun of learning, and even discovered the significance of learning, as some students mentioned in the interview process.

4). Students' understanding level of grammar knowledge in two classes.

Table 4. Comparison of Students' understanding level of grammar knowledge in two classes

Group	Mean	SD	T	P	Analysis
Control Class	3.531	0.986	1.682	0.021*	High
Experimental Class	4.032	1.001			Very High

Noted: * $P < 0.05$.

From Table 4, it showed that the students' understanding levels of English grammar classroom communication in two classes were significantly different. In the interview, most of the students in the experimental class said that they had a basic understanding of grammar knowledge, could proficiently apply it, and feel confident in independently completing the relevant homework after class. However, many students in the control class mentioned that there were difficulties, and they were unable to proficiently apply it. For the same homework, due to a lack of activity practice, their mastery of content remained limited to translation and sentence structure conversion, resulting in a lack of sufficient confidence in completing related assignments. The lack of confidence has a negative impact on motivating students, as they may not feel successful and directly affect their future learning.

5). Students' final exam results in two English grammar learning classes

Table 5. Comparison of Students' final exam results in two English grammar learning classes

Group	Mean	SD	T	P	Analysis
Control Class	39.1	5.016	1.910	0.013*	High
Experimental Class	45.4	4.987			Very High

Noted: * $P < 0.05$.

After one semester of study, at the end of the first semester of 2023, the experimental results of the final unified exam scores of the experimental class and the control class were analyzed. As this teaching experiment mainly focused on grammar teaching, the focus was on statistical analysis of the scores related to grammar in the final exam questions. From the analysis of Tables 5, it reflected that the experimental class was higher than those of the control class, and the difference is very large. Moreover, the students from the experimental class also feedbacked that their mastery of grammar knowledge has greatly improved their overall English proficiency, as well as their language confidence.

Discussion

Based on the findings, it has been found that the teaching of English grammar meets the requirements of quality education. Applying the discovery method in vocational English grammar classroom teaching can improve teaching effectiveness.

(1) The discovery method is beneficial for students to acquire, understand, and consolidate knowledge, and improve academic performance more effectively. Because teachers always play the role of learning facilitators in teaching activities, helping students find and collect information, guiding students to actively reason and draw conclusions based on their own thinking patterns and existing knowledge. This new knowledge is explored, summarized, verified, and summarized by students themselves, integrated into their own knowledge structure, and can be retained in memory for a long time. The finding of this study is consistent with Harmer (2007), who also found that discovery learning, specifically once it is guided, is beneficial, with the rationale that when we learn things on our own, they are assimilated better and more efficiently than when we are taught). By utilizing a guided discovery approach that includes targeted support and instruction, students of all skill levels can engage in higher order thinking processes (Zohar & Dori, 2003).

(2) The discovery method may help to stimulate students' intrinsic motivation and interest in learning. When students, in the process of exploration and research, regard learning methods as methods of discovery rather than acquisition and use discovery as a reward to engage in learning activities on their own, it will inevitably generate the joy of success. Students discover the connections and patterns between things on their own, generate a sense of achievement, enhance their confidence, and easily transform the learning process into internal motivation, thereby enhancing their interest in learning. This is achieved through the active collaboration between students and instructors, and by utilizing a balanced combination of explicit and implicit strategies at various stages of its implementation (Marin & Halpern, 2011). Different from the traditional grammar instruction, in which the learner's motivation is focused and taken care in the language teaching (Nahavandi & Mukundan, 2013).

(3) The discovery method is also beneficial for cultivating students' creative thinking and scientific spirit of independent exploration. The discovery method of teaching creates an environment for students to train their intelligence, enabling them to learn independent research and find the internal connections and basic principles between things. Through accumulated cultivation and training over time, students' spirit of exploration, independent thinking ability, and creative thinking will inevitably be cultivated, which will benefit them for a lifetime. The findings of this part of the present study were in line with those of (Alcaraz & Isabel, 2018; Alfieri et al., 2011; Erfanrad et al., 2020; Darakhani & Rajabi, 2022). In addition, the study provided similar results to those obtained by Bakhshandeh and Jafari (2018) by indicating that various instructional techniques may result in distinct outcomes.

In summary, it has been found that the effectiveness of teaching methods in English grammar teaching in universities is quite significant (Hasanvand & Mohammadian, 2022). This teaching method greatly stimulates students' interest in learning grammar, allowing them to experience the joy of learning by exploring and finding results from discoveries, thereby mobilizing their enthusiasm and initiative in learning English grammar, and improving the efficiency of English grammar learning (Yazdani & Sadeghi, 2022; Rafiei, Behnam & Seifoori, 2024). This method has enabled students to take the initiative in learning and achieved a significant breakthrough in the learning methods of students and teachers in grammar teaching (Zhu, 2021; Li, 2023).

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