

Comparing the Deductive Method and Inductive Method of Grammar Teaching for Chinese Senior High School students

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Abstract. Grammar is not only an essential component of learning a language, but it is also a challenging topic for foreign language learners. Inductive and deductive methods are two fundamental teaching strategies for grammar, both of which have advantages. The domestic research on this topic began relatively later than the numerous overseas studies on these two grammar teaching techniques, and the research findings are often insufficient. Therefore, it is necessary to explore grammar instruction strategies in the present context. By comparing experimental data from inductive and deductive research methodologies, this study examines the comparative impact of teaching English grammar. The study also sought to see which of the two approaches had a positive impact on the grammar academic performance of Chinese senior high school students. Based on previous experimental studies, a conclusion can be drawn that inductive and deductive teaching methods both have their own advantages and disadvantages. The variables in the language teaching or teaching context will determine the appropriate strategy for teaching grammar.

Keywords: Chinese students; Grammar teaching; the inductive method; the deductive method; senior high school; impact.

1. Introduction

1.1 Research Background

The Nationwide Unified Examination for Admissions to General Universities and Colleges, referred to as the "Gaokao", is a selective test taken by qualified high school graduates or candidates with equivalent academic ability. As a large-scale national admissions selection test, the college entrance examination has always been at the core of middle school teaching, which can comprehensively reflect the academic level of students [1].

English is one of the main subjects of the college entrance examination, accounting for 150 points of the total score of 810. One of the types of questions in the examination is grammar fill-in-the-blank, the form of the question is to disassemble some vocabulary in a short article with about 200 words and ask students to supplement the blank vocabulary according to the meaning of the text or perform a morphological transformation on a given vocabulary. It is a type of question that appeared after the reform of the college entrance examination. It can not only test the student's vocabulary and grammar mastery but also accurately divide the English scores of the college entrance examination students so as to ensure that the English subject of the college entrance examination is included in the total score of the students in the college entrance examination. It plays an authentic role in defining students' English ability [2]. In addition, the mastery of grammar can influence the performance and competence in doing the other sectors in the exam. According to this, grammar plays a vital role in "Gaokao." However, it has been steadily removed from the center of English teaching and even denied from some teachers' perspectives.

In order to better test the core English literacy and ability of Chinese senior high school students, the college entrance examination has undergone several rounds of reforms. The China Ministry of Education launched the Standard of English Curriculum for General Senior High Schools in 2003 and released a new textbook with the motto "Subject-Structure-Function-Task" as the country entered the twenty-first century. The guideline upholds the status of grammar instruction in high school and makes related recommendations for grammar instruction.[3].

1.2 Rationales and significance

In grammar teaching, the inductive method and the deductive method are the two main grammar teaching methods. The following are the teaching procedures of the deductive method: teachers write the example sentences of the grammar on the board, then it comes to teachers' explanation of the grammar rules. The explanation is usually given in the student's mother tongue and grammatical terms are used. The last part is students' practice application of the rules [4]. The inductive method is also divided into three steps: first give the authentic language material, then induct the rules, and finally practice [5]. Although the deductive method makes knowledge clear and easy for students to master, students are in the position of passive receivers in the classroom. By contrast, the inductive method pays attention to students' independent thinking and discovery thinking, which is conducive to the improvement of students' language ability and skills but ignores the accuracy of language. They both have their own advantages and disadvantages and it is impossible to simply say which teaching method is better. The purpose of this paper is to find out the different effects of the two teaching methods in teaching by comparing real experimental data and analyse which method is suitable for what kind of teaching background. In practical teaching, only by using the two methods flexibly can the efficiency of grammar teaching be achieved.

Since there are only very few previous studies comprehensive comparison between inductive and deductive research in China, this article intends to summarize the advantages of these two methods and the applicable teaching background through the comparison of several groups of real experimental data. At the same time, with reference to relevant foreign research, suggestions for improving grammar teaching methods are given.

1.3 The organizations

This thesis consists of six parts. The first chapter of this paper is the introduction part, which clarifies the research background, significance and framework structure of the paper. The second chapter is a review of the literature, expounding the importance of grammar and clarifying the definitions, advantages and disadvantages of the two grammar teaching methods. The third chapter is to compare the data of several teaching experiments of the above grammar teaching methods. The fourth chapter is the elaboration and comparison of the research and development in the related directions of the western countries and the related discussions. The last chapter summarizes and summarizes this research, clarifies the implications of this research for grammar teaching, and explains the limitations of this research and prospects for future research.

2. Literature review

2.1 The importance of grammar

Grammar and vocabulary are the two basic elements for building a language edifice. Grammar reflects the internal laws of the structural organization of the language edifice. Language teaching is inseparable from grammar teaching.

Grammar plays an important role in English teaching throughout the senior high school stage in China. Although some people once proposed to lessen the importance of grammar, grammar teaching is still an important part of English teaching. Its status and role cannot be ignored. In terms of empirical and practical research on SLA, no topic has received more attention than grammar teaching, and perceptions about grammar and its role in SLA are at the heart of various second language pedagogies [6]. Zhang emphasized in his "A New English Grammar Course Book" that grammar is the organizational law of language, which gives language structural form, while vocabulary is the building material of language, which gives language meaning through grammar [7]. According to Liu, English learning is a comprehensive process, including five aspects: listening, speaking, reading, writing, and translation. Grammar is one of the most important aspects. When expressing English, the rational use of grammar rules can ensure the adaptation and accuracy of these five parts in the

context, so grammar teaching is very important in English teaching [8]. Understanding grammar is extremely important for learning a language. It can help students understand and use language faster and better, help improve students' academic performance, and lay the foundation for students to communicate in English in the future [5].

2.2 Definition and Characteristics of the Inductive Method

The inductive method means that teachers first present authentic language materials to students, and then students summarize the rules reflecting a language phenomenon after observing, analyzing, and synthesizing language phenomena. The inductive method is student-centered, requiring them to observe language phenomena, compare and analyze the differences of the phenomena, and finally summarize the rules. Students discover rules through their own thinking, and they are often impressed. Using the inductive method to teach grammar, students can conclude their own observation and analysis of example sentences, which is conducive to the full understanding and mastery of knowledge points and can also improve their ability to analyze and solve problems. On the other hand, it also cultivates students' logical thinking ability, interest in learning, and self-confidence. According to Wang, the utilize of inductive method can not only encourage students' thought processes and their enthusiasm of learning, but also make the grammar lessons contextualized. Whereas there are still some advantages. Grammar instruction is more difficult and time-consuming. Grammar is not explicitly taught. Also, some laws are difficult to instill [4]. The following is an example of the inductive method:

By creating a situation, the teacher writes the following sentences: (Come here. /Go there. Open the door./ Close the window./ Stand up, please./ Sit down, please./ Don't look out of the window. / Don't be late.) on the blackboard to inspire students to think about the common points of the above sentences, and try to summarize the usage of imperative sentences.

2.3 Definition and Characteristics of the Deductive Method

As Mei once declared that the deductive method is the opposite of the inductive method, in which the teacher first explains a language rule, then gives an example, and then the students apply the rule by doing exercises. Using the deductive method to teach grammar, teachers explain the grammar rules clearly, and students can easily understand the content of the rules [9]. Students learn grammar rules first, then experience their real usage through specific examples, and then combine them with corresponding exercises, which will deepen their impressions and help consolidate knowledge points. Therefore, it is necessary to apply the deductive method to English grammar teaching. On the one hand, teachers can save teaching time; on the other hand, because students have more time to practice and practice, they can improve learning efficiency and cultivate innovative learning abilities. Meanwhile, since writing accuracy is the primary criterion for success on academic tests, this method can help students feel more confident. When teaching a challenging grammar structure, this approach can be effective [4]. Here is an example of the deductive method:

Step 1. Demonstrate the definition of present perfect tense directly to the students

Step 2. Introduce and show the basic structure on the blackboard or PPT:

Step 3. Explain the basic usage of the present perfect tense

① It refers to the influence or result of an action in the past on the present.

Eg. He has read the book.

② It means that the actions that happened in the past continue to the present, and may continue.

Usually used with adverbs expressing a period of time.

Eg. He has worked here for 30 years.

Step 4. Exercise

3. Research data comparison

The comparison is going to be divided into three parts.

3.1 Pre-test Questionnaire data comparison

The first part is the data of the questionnaire before the experiments. First of all, starting with the attitudes towards grammar teaching. According to the data from two parallel classes from a high school in Ulanhot, Xing'an Meng [10], two natures in the first grade of the first grade of the No. 1 middle school in Yuncheng County, Shandong Province [11]. The two experiment classes from the high school in Ulanhot are from the 30 classes, and one is class 10, the other one is class 18. Han wanted to figure out which method do the students prefer and which way is more effective. The experiment classes also divided into two classes in the No.1 middle school. There are 120 students and split into two class, one is the experimental class using the inductive method, the other is the control class which use the deductive method for teaching. it can be seen that:

Table 1. The Result of the Question One of the No. 1 Middle School in Yuncheng County, Shandong Province [10]

Do you think English grammar is important?

Numbers of Students	Very important	Just so so	Not important
120	86.67%	7.5%	5.83%

Table 2. The Results of Question Two of the High School in Ulanhot, Xing'an Meng [10]

Are you interested in English grammar?

Class	Very interested	Interested	Just so so	Not interested	Dislike
10	12%	35%	25%	18%	10%
18	15%	36%	28%	10%	11%

Table 3. The Result of the Question Two Of the No. 1 Middle School in Yuncheng County, Shandong Province [11]

Are you interested in English grammar?

Numbers of Students	Very interested	Just so so	Not interested
120	17.5%	39.17%	43.33%

The analysis of the data: According to table 1, it is clear that about 86.67% students think English grammar teaching is very important. However, about 57% to 59% students in table 2 are below the interested level toward English grammar learning and about 83.5% students in table 3. Therefore, it can be found that more than half of the students are bored with English grammar learning, even though most of them think English grammar learning plays a vital role in their studies.

Secondly, it comes to the difficulty of grammar teaching and current situation of grammar teaching method.

Table 4. The Result of the Question Four of the No. 1 Middle School in Yuncheng County, Shandong Province [11]

Do you think it is difficult to learning English grammar?

Numbers of Students	Very difficult	Medium	Very difficult
120	69.17%	14.17%	16.67%

Table 5. The Results of Question One of the High School in Ulanhot, Xing'an Meng [10]
1. How do you feel about your command of English grammar?

Class	Very good	Good	Not bad	Poor	Very poor
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10	5%	35%	40%	10%	10%
18	7%	38%	36%	8%	11%

According to table 4 and 5, about 69.17% students think learning English grammar is very difficult and about 60% and 55% students feel their command of English grammar is not good enough.

Table 6. The Results of Question Four
of the High School in Ulanhot, Xing'an Meng [10]

4. Do you learn new English grammar under the guidance of the teacher or you do it depending on your own comprehension?

Class	Always the former	Most the former	Average	Most the latter	Always the latter
10	38%	36%	11%	13%	2%
18	40%	37%	12%	10%	1%

Table 7. The Results of Question Five
of the High School in Ulanhot, Xing'an Meng [10]

5. When teaching new English grammar, will your teacher give you the rules directly or he/she will let you conclude the rules with many examples?

Class	Always the former	Most the former	Average	Most the latter	Always the latter
10	40%	37%	13%	8%	2%
18	43%	35%	11%	10%	1%

Table 8. The Result of the Question Eight
of the No. 1 Middle School in Yuncheng County, Shandong Province [11]

8. In grammar teaching, the methods used by your teacher mainly include: (multiple choice)	Percentage
First clarify grammar rules, then give examples	94.17%
The teacher mainly explains, and the students answer the teacher's questions while taking notes.	92.33%
Explain grammar knowledge and learn grammar rules in some specific contexts and situations	27.5%
Teachers first explain grammar knowledge, and then let students use the rules through dialogues, group activities, speeches, etc.	24.17%
After explaining grammar knowledge, design language activity tasks, so that students can practice grammar knowledge in task activities	35%
It is up to students to summarize and generalize grammar rules from example sentences that demonstrate the target grammar	10.5%

From table 6, 7, 8, the percentage of students who learn English grammar under the guidance of the teachers instead of learning by themselves accounted for 74% and the proportion of students whose teachers always teach the grammar rules for them directly reach to 77% and 78% percent. Meanwhile, the other school has a similar situation in that most of the students learning grammar through the direct description or demonstration from their teachers. It accounted for the highest position about 94.17% and 92.33%. It can be concluded that the deductive method which is taught in

the process of “Rule-example-practice” is the most common way of teaching English grammar. In connection with the above mentioned, more than half of the students think that grammar learning is boring, indicating that deductive teaching is not conducive to improving students' enthusiasm for learning.

3.2 Student Class Performance Comparison

Table 9. Teaching the grammar of stressed sentences using inductive and deductive methods [11]

Class	Actively raise hand (number)	Actively answer the question (number)	Condition	Time
Experimental Class (inductive method)	34	16	excited, active	30 minutes for discussion and summary
Control Class (deductive method)	17	5	The atmosphere is dull, and the enthusiasm for learning is not high	25 minutes for demonstration and 15 minutes for exercises

Table 10. Teaching the grammar of attributive clause using inductive and deductive methods [11]

Class	Actively raise hand (number)	Actively answer the question (number)	Condition
Experimental Class (inductive method)	19	9	The classroom atmosphere is not active when simple grammar is taught, and students are hesitant to answer questions and lack confidence
Control Class (deductive method)	14	5	Students focus on taking notes and less participation in class

From Table 9 and 10, it can be concluded that when teaching simple grammar, the use of inductive teaching method can better cultivate students' enthusiasm and interest in learning, the high level of classroom participation, and the frequent interaction between teachers and students, and the classroom atmosphere is active, but some students with poor self-discipline will take advantage of the When talking in class discussions, it requires a higher ability for teachers to control the discipline and tempo of the classroom. On the contrary, when using the deductive method to teach simple sentence patterns, it is not conducive to the mobilization of students' enthusiasm for learning, the classroom atmosphere is easy to be dull, and the students are in a state of passively accepting knowledge. However, when teaching complex sentence patterns, it will save time and make it easier for students to understand the knowledge points of complex sentence patterns.

3.3 Test Score Comparison

This part is going to list the comparative changes in the test scores of the students in the experimental class and the control class before and after the experiment. The first experiment was

conducted by Duan [21]. The research object is two classes on the first grader of Wujiang Shengze Middle School in Jiangsu Province. There are 108 students in Class 4 and Class 9 in total. The target grammar point is the attributive clause. Before the experiment, Duan collected 20 multiple-choice questions about attributive clauses in the college entrance examination in previous years to test his students' current mastery and this score is used as the raw score. After corrections, the original score of the class 9 was 3.83; the original score of class 4 was 2.64. Then class 4 was taught in inductive method while class 9 was taught in the deductive method. In the first post-test was taken immediately after the class, Duan let his students do 20 multiple-choice questions of attributive clauses. In the end, it was concluded that the post-test score of class 9 was 11.35, and the boost was 7.52; the post-test score of class 4 was 9.47, and the progress was 6.83. From the perspective of short-term memory, the deductive method is obviously more effective in improving scores [21]. The second post-test: three days after the new lesson, Duan let the students do 20 multiple-choice questions of attributive clauses again. After correction, it is concluded that the second post-test score of class 9 is 11.85, it is 0.5 point higher than the first pro-test; The score of class 4 is 12.15, and it is 2.68 marks better the first one. From the perspective of long-term memory, the teaching effect of induction is better.

4. Western-related studies

According to Nunan, Oshima and Hogue, They underlined the need for teachers to use both inductive and deductive strategies in English grammar teaching [12,13]. As for Wong, his study proved that the benefits of deductive instruction are greater for weaker students [14]. In Habibi's view, in light of academic norms and environment, it is clear from the description of both techniques that both are valid in the learning process. It is the duty of the teacher to make an effort to provide opportunities for students to interact and pick up grammar in a second language [15]. From Vogel and Carrol's research which used a questionnaire method to assess students' preferences and the relationship between preferences and performance. Performance in both cases was measured using pre-test, post-test and questionnaire. Research has found that students learn better through deductive methods [16]. In addition, the empirical study which was done by Simin in 2013 showed that the deductive method is more beneficial than the inductive method for English learners to learn grammar items in a short period of time [17]. By contrast, many researchers such as Haight, Seliger and so on, they both consider that teaching grammar through inductive method is more effectively [18,19] What's more, Hashemi puts forward several points that need to be paid attention to in constructing an effective grammar teaching model. He considers that avoid separating grammatical form and communication context is a good idea. To reinforce learning, employ a variety of grammatical teaching strategies. Teachers can create their own texts and tailor their instruction to the needs of the classroom and their students' learning. Also the teachers should continue to assist students in using the rules they have learned to convey fresh meanings and demonstrate how the rule is applied so that the learner has a clear knowledge of how it functions. Verify that the pupils comprehend the rules and how they should be applied. Offer plenty of opportunities and settings for practical rule practice [20].

5. Conclusion

According to the data comparison on the authentic experiments of two senior high school students on grammar learning, several conclusions can be drawn. Firstly, most students are dissatisfied with the current grammar teaching method, think that the current grammar teaching classroom atmosphere is dull and the grammar classroom is monotonous, and hope that the grammar teaching method will have innovation. High school students who are in adolescence tend to have sensory stimulation of the eyes and hearing, are more inclined to gain language and cultural experience and communication in the learning of grammar knowledge, and have a strong desire and idea for cultural learning and communication. However, it lacks the psychological construction of self-restraint and self-motivation.

It is hoped that teachers can use various methods to enrich and activate the classroom and give themselves more space and time to think, and at the same time, teachers can summarize and summarize grammar rules as before. Secondly, both inductive and deductive methods have their own merits in grammar teaching in high school. Compared with relatively simple and intuitive grammar forms such as stressed sentence patterns, the effect of grammar teaching by the inductive method is obviously better than that of the deductive method. For more complex and tedious grammatical phenomena such as attributive clauses and noun clauses in high school, the deductive method is used for classroom teaching, but the class hours are shorter, and the student's grades are relatively better. Therefore, in future classroom grammar teaching, simple and intuitive grammar items can be used for inductive grammar teaching, while for more complex grammar, the traditional deductive method is still the main grammar teaching method. The inductive method improved the autonomy and enthusiasm of students in learning. But for certain complex grammar content, the inductive method is not as effective as the deductive method.

In summary, a conclusion can be drawn that inductive and deductive teaching methods both have their own advantages and disadvantages. Whether and to what extent grammar should be taught depends on certain variables in language teaching/language context. And the teaching method should be constantly improved and innovated.

In addition, this paper is lack of the actual teaching by the author. Instead, it is only the comparison of existing practical examples of other scholars. Therefore, in the future, it is necessary to put the theory into practice and personal experience can better contribute to the improvement and perfection of Chinese grammar teaching.

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