

A Study on the Influence of Higher-order Thinking on English Grammar Learning -A Case Study of Chinese College Students

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Abstract. This article aims to investigate the influence of Chinese college students' use of higher-order thinking on English grammar learning. By reviewing relevant literature, it is found that higher-order thinking can promote the cultivation of college students' thinking ability. This mode of thinking is currently highly discussed in China and the world. In China, educators have developed several teaching programs that introduce higher-order thinking based on the status of education in Chinese universities and policies. However, through investigation, it is found that Chinese college students still lack the cultivation of higher-order thinking. To better introduce higher-order thinking to Chinese college students, deepen the study of higher-order thinking, and improve the diversified application of higher-order thinking. This study explores the use of higher-order thinking to learn English grammar and concludes that higher-order thinking can help Chinese college students learn English grammar, which complements the relationship between higher-order thinking and English grammar.

Keywords: Higher-order thinking; Chinese college students; English grammar.

1. Introduction

Higher-order thinking is the core of higher-order ability. It refers to the thinking mode of integrating information by forming relevant network systems, criticizing norms by logic, and analyzing and solving problems. In learning, higher-order thinking is used for self-regulation, criticism and creation, and new solutions are created [1]. In the 1960s, American psychologist Bloom, a foreign scholar, stratified educational goals from low to high when studying educational goals, which were memorization, understanding, application, analysis, synthesis and evaluation, and defined the last three goals as higher-order thinking ability [2].

Higher-order thinking is one of the necessary abilities for college students to adapt to society. Having higher-order thinking ability can help college students to study and live better. However, nowadays, college students lack high-order thinking ability seriously. Basic exam-oriented education leads some Chinese college students to still maintain traditional thinking, which not only affects daily learning, but also affects future employment and development [3]. Colleges and universities need to introduce higher-order thinking into teaching, cultivate college students' Higher-order thinking ability, and improve the logical way of college students' thinking.

China mentioned in the 'National Education Reform and Development of Long-term Planning Programs' that it is necessary to improve the quality of higher education and promote the cultivation of innovative talents. As college students, they should strengthen the cultivation of their higher-order thinking ability, achieve deep learning, reinforce the cultivation of logical thinking, and get new understanding and perception in learning [3].

As an important part of English learning, English grammar is the basis of English listening, speaking, reading and writing. Grammar can help students learn English more deeply, and link the various parts of grammar. Therefore, it is very important to master English grammar when learning English [1]. However, the knowledge points of English grammar are fragmented, and it is necessary to connect the knowledge points in a certain way so that students can have a knowledge framework and learn grammar better.

Higher-order thinking is an important way of thinking for learning English grammar, so this study will explore the influence of Chinese college students 'Higher-order thinking on English grammar learning '.

2. Method

2.1. Study Object

The questionnaire object of this study is Chinese college students, regardless of province, grade, gender, etc.

Through the questionnaire, 5 college students were randomly selected for interviews.

2.2. Questionnaire and Interview Outline Design

According to the literature 'study on the cultivation of Higher-order thinking ability in high school physics teaching', the questionnaire 'Analysis of the current situation of Higher-order thinking ability in high school students 'physics learning' was adapted, and the questions related to high school physics in the questionnaire were changed to questions related to English grammar [4]. The questionnaire is divided into four parts, which is based on the classification of Higher-order thinking ability and the application of English grammar, with a total of 25 questions.

2.3. Questionnaire Distribution and Recovery

The questionnaire is distributed to college students in all regions of China in the form of 'Questionnaire Star'. A total of 100 questionnaires were distributed, 100 were recovered, and 0 were invalid.

3. Result

To ensure the accuracy of the study, the study used the Cronbach's alpha coefficient to test the reliability of the questionnaire. According to the three dimensions of high-order thinking analysis, evaluation and creation in the content of the questionnaire, they were calculated respectively. The overall Cronbach's coefficient of the questionnaire is 0.983, which shows that the consistency coefficient of the questionnaire has reached an acceptable level and can be used as a measurement tool. As Table 1 shows the Cronbach's Alpha coefficients of different dimensions in the questionnaire were greater than 0.5 for each data.

Table 1. Consistent reliability coefficient of the questionnaire statistic

	Analyze	Evaluate	Create
Cronbach's Alpha	0.967	0.947	0.917

First, it is necessary to study the influence of higher-order thinking on learning English grammar. It is demanded to understand the frequency of higher-order thinking used by Chinese college students at this stage. After analyzing the questionnaire data, it is found that the average value of each question is between 2.12 and 2.34, less than 2.5, which shows that college students lack the use of higher-order thinking at the present stage. Through interviews, it is learned that few students systematically understand and learn 'higher-order thinking', but only can analyze problems related to higher-order thinking.

According to the questionnaire analysis, more than half of college students will use 'higher-order thinking' to learn English grammar. The questionnaire shows that college students use the most in the dimension of analytical ability in 'higher-order thinking'. It is concluded that it is very important for college students to analyze grammatical knowledge, grammatical structure and other related knowledge when they learn English grammar.

To study the influence of higher-order thinking on learning English grammar, the relevant data of three dimensions of analysis, evaluation and creation in the questionnaire are analyzed respectively.

In the analysis of this dimension in higher-order thinking, more than 50 % of college students use higher-order thinking when learning English grammar. In the interview, the author interviewed the question 'When encountering the grammatical analysis English long and difficult sentences, I am good at combing its ideas'. The interviewees believe that the so-called long and difficult sentences are adding a lot of 'decoration' to the trunk of the sentence. Like the expansion in Chinese, if the subject of the sentence is found, most of the meaning of the sentence can be understood. The remaining part may indicate the state of the action, the identity of the subject, etc., which can be regarded as a further detailed understanding of the sentence. The interviewer conducted a detailed analysis of long and difficult sentences and gave examples. For instance, 'That's a lie that we have perpetuated, and it fosters commonness.' 'That's a lie' is the main clause, 'that we have perpetuated,' is the attributive clause. The analytical ability in higher-order thinking is very important for learning English grammar. Each knowledge point of grammar can be linked and applied to the practice of the topic.

Secondly, it is also very important to judge the correctness of grammar knowledge points and summarize the stage of learning. Table 2 is the evaluation dimension of higher-order thinking in the questionnaire. It can be seen from the diagram that less than 15 % of the students never evaluate their grammar learning when learning English grammar, while the rest of the students use the ability of 'evaluation' when learning English grammar.

Table 2. Higher-order thinking evaluation dimension questionnaire data

	Always	Usual	Seldom	Occasional	Never
1	30%	41%	10%	10%	9%
2	33%	34%	16%	8%	9%
3	36%	33%	16%	10%	5%
4	37%	37%	8%	7%	11%
5	31%	38%	12%	11%	8%
6	28%	44%	13%	9%	6%
7	29%	40%	15%	12%	4%

Through interviews, it is learned that students who use the ability of 'evaluation' are accustomed to analyzing first and then judging, so that they will not have a preconceived mindset for a sentence, which will lead to incorrect translation. Some special cases will be judged. For example, if there are some 'marker words' in some grammatical concepts in the sentence, the college student will first determine a general direction of understanding, such as 'negative sentence', 'emphasis sentence', etc., and then make a detailed analysis and judgment. Evaluation is helpful for college students to learn English grammar.

Finally, this study also investigates the dimension of 'creation'. Creation means that college students put forward new grammatical knowledge questions and produce new original works in the process of learning English grammar. Table 3 is the relevant data of the 'creation' dimension in the questionnaire. It can be seen from the data that more than half of college students are in a state of low creativity. College students could 'create', but they cannot fully apply it to English grammar learning.

Table 3. Higher-order thinking creation dimension questionnaire data

	Always	Usual	Seldom	Occasional	Never
1	31%	41%	11%	9%	8%
2	22%	48%	11%	12%	7%
3	30%	41%	11%	10%	8%
4	28%	43%	11%	12%	6%
5	33%	39%	12%	8%	8%

Through interviews, college students think that when learning English grammar, they will compare English sentences with Chinese sentences to better remember. They will read repeatedly, apply grammar knowledge points to practice, deepen their mastery and premonition of English grammar. Another college student learned grammar by introducing the context of grammar points, and the effect was remarkable. Therefore, creation is helpful for college students to learn English grammar.

In addition, this study investigates whether 'Chinese college students' use of higher-order thinking to learn English grammar is helpful to the learning of other subjects'. The study found that college students will apply the learning methods created by learning English grammar to other disciplines. For example, the analysis of long and difficult sentences in English grammar is also applicable to the analysis of Chinese sentences, which will have a deeper understanding of both disciplines. Therefore, it can be seen whether Chinese college students' use of higher-order thinking to learn English grammar is helpful to the study of other subjects.

4. Discussion

According to the result, it is found that college students use of higher-order thinking is helpful to English grammar learning, and teachers will involve a small amount of higher-order thinking ability training in the classroom. However, at present, Chinese college students generally lack the cultivation of higher-order thinking ability, and its influencing factors also involve many aspects [5]. Through questionnaires and interviews, it is concluded that some college students use higher-order thinking more in junior and senior high schools, but rarely in college learning. Chinese universities should strengthen the introduction of higher-order thinking in college teaching, so that Chinese college students can learn more easily in college subjects. Cultivating higher-order thinking ability is more conducive to the future employment of college students. Strengthen the cultivation of college students' logical thinking.

5. Conclusion

This study investigates the influence of higher-order thinking on Chinese college students' English grammar learning by means of questionnaires and interviews. It is concluded that higher-order thinking is helpful for Chinese college students to learn English grammar. This study complements the study loopholes in the relationship between higher-order thinking and English grammar, and provides data for the study of the introduction of higher-order thinking into Chinese universities.

There are some deficiencies in this study. First, the number of people filling in the questionnaire is small, which cannot represent all college students in China, but can only represent a part. There will be regional and other related factors. The second is to collect a small range of people, most of whom are students of Shanghai Jian Qiao University, due to the level of education will have an impact on the results.

This study questionnaire does not set grade, gender and other related variables. In the later study, it can be more detailed and more accurate to study the influence of higher-order thinking on Chinese college students' English grammar learning. Advanced thinking has always been a hot topic. How to better introduce higher-order thinking into the classroom needs further study.

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