

Original Article

A Survey on the use of Meta-cognitive Strategies in English Vocabulary Learning in Senior High School

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Abstract - To explore the situation of using meta-cognitive strategies in English vocabulary learning of senior high school students with different educational experiences of urban or rural backgrounds. This paper randomly surveys 129 students from senior one in Chengdu through questionnaires. Results can be concluded as follows: 1) in general, the condition on the use of meta-cognitive strategies of senior students in Chengdu when they learn English vocabulary and the frequency of the use of four types of strategies is at the same level with no significant difference. Only the evaluation strategies are used slightly more frequently than the other three. 2) There is no significant difference in the use of meta-cognitive strategies because of different gender in the process of vocabulary learning. But girls use planning strategies a little bit more frequently than boys, and as for selective attention strategies, boys use them more often than girls. 3) Also, there are no significant differences in metacognitive strategies for senior students in Chengdu who are experiencing different educational backgrounds in vocabulary learning.

Keywords - Senior high school students, Vocabulary learning, Meta-cognitive strategies.

1. Introduction

Vocabulary is the foundation of language learning, and the quality of vocabulary mastery of students will affect their language level in the process of whole English learning (Liu, 2012). The accumulation of vocabulary is the key to the formation of good language knowledge of English learners, which also should be an important and difficult point to be concerned about in the English learning process of high school students. The vocabulary learning of senior high school students in constructing the new meaning of the old vocabulary and the new meaning of new vocabulary is a meaning construction process of understanding and using the vocabulary (Luo, 2015). It is a complex process of brain thinking; meanwhile, the number of vocabularies students should master is numerous. The 2017 edition of English Curriculum Standards for General High School contains 3,000 words that high school student should master. It proposes that 200 words can be added to the vocabulary according to the actual situation of each school. All these numbers do not contain phrases and set structures that should be mastered (Ministry of Education of the People's Republic of China, 2018). It can be seen that the vocabulary of high school students is a rigid requirement of English learning in high school. Also, the high quality of vocabulary learning is inseparable from the rational use of strategies. Meta-cognitive strategies are significant in all types of learning strategies and important in discussing vocabulary learning. Many studies at home and abroad show that the use of meta-cognitive strategies can improve the quality of students' vocabulary learning (Xin, 2019, Hou, 2018, Chen & Wang, 2014, Li, 2008).

The author distributes 129 questionnaires through WeChat and other network channels and investigates 129 senior students in Chengdu based on the situation above. On the one hand, this paper aims to discuss the overall use of metacognitive strategies of senior high school students in English vocabulary learning and explore differences in using metacognitive strategies for high school students experiencing different educational backgrounds. On the other hand, it expects to provide scientific and reliable advice for English vocabulary teaching based on the investigation.

2. Literature Review

Each researcher has a unique view of meta-cognitive strategies. The first scholar to propose meta-cognitive strategies was Flavell, who divided meta-cognition into knowledge and experience. Later Brown proposed a relatively streamlined concept based on him and divided meta-cognition into cognitive knowledge and cognitive regulation (Yu, 2018). The later research of Chinese scholars was based on the foundation of foreign research, which was a kind of inheritance and expansion to a certain degree. Dong Qi (1989) proposed that meta-cognition consists of three levels referred to as metacognitive knowledge, meta-cognitive experience, and meta-cognitive evaluation. Regarding the classification of meta-cognitive strategies, O'Malley and Chamot (1990) divided it into planning, selective attention, monitoring, and evaluation strategies.

As for the meta-cognitive Strategies and English Learning research, there are 5259 records in CNKI with meta-cognitive strategy and English as search keywords. Research on metacognitive strategies and English learning can be roughly divided into three stages, including these



articles. The first stage is from 1996 to 2002. Also, it is a slow beginning stage. From 2002 to 2012, the second stage is the rapid prosperity stage. From 2012 to the present, it is the mature cooling stage. the number of studies peaked in 2013. Using meta-cognitive strategies alone from the perspective of vocabulary learning, the number of articles was only 82. Liu Xinyu (2020) studied the differences in meta-cognitive strategy usage in vocabulary learning among high school students from differences between gender and English levels. Guo Xiaojuan(2017) focused on the factors that influence the practical differences of meta-cognitive strategies in students' vocabulary learning. Scholars such as Chen Yanzhu (2020), Lin Chunlong(2016), and Bai Jiayu(2016) focused on cultivating the effectiveness of students' vocabulary learning through metacognitive strategies. Huang Lei(2017), Xu Shengbing(2008), and others focused on the strategic use of high school students in rural and urban and rural areas.

To summarise, the study on using meta-cognitive strategies in vocabulary learning in high school students is a relatively mature research direction with rich perspectives. However, using metacognitive strategies in vocabulary learning among high school students with differences in urban and rural educational backgrounds in primary and middle schools is insufficient attention. Therefore, this paper used the questionnaire conducted on 129 high school students from a middle school in Chengdu and took the students' urban and rural educational background differences as the starting point. The data analysis by IBM SPSS Statistics 26 software is expected to inform English vocabulary teaching for students facing differences in urban and rural educational backgrounds.

3. Research Methodology

3.1. Research Questions

This study investigates the current condition of using metacognitive strategies in vocabulary learning by senior high school students in Chengdu and discusses the difference between different students with urban and rural educational backgrounds when they used meta-cognitive strategies in vocabulary learning. At the same time, this paper aims to provide corresponding enlightenment for senior high school English teachers facing students with different educational backgrounds through investigation. It also is expected to provide scientific help for students of different educational backgrounds to learn. Therefore, the three main research issues are as the followings:

- What is the general situation of using metacognitive strategies of senior students in Chengdu in English vocabulary learning?
- What are the differences in using metacognitive strategies between different gender in English vocabulary learning?
- What are the differences in using metacognitive strategies in English vocabulary learning for students with different educational backgrounds?

3.2. Research Participants

This paper focuses on exploring the differences in using meta-cognitive strategies by senior high school students who experience different educational backgrounds when learning vocabulary. Therefore, 129 senior students in Chengdu are selected as the survey objects. The choice of these subjects is mainly for the following considerations:

On the one hand, students of senior one are unique because this stage is the connection between middle school and high school. Students are also the most directly influenced by their former educational backgrounds. Therefore, students in senior one can be more intuitively reflected by the impact of their past educational backgrounds on their current learning. Moreover, senior students have experienced many years of foreign language learning, developed mature thinking patterns, and have learning habits. As a result, both the use of strategies and the filling of the questionnaire can ensure relative authenticity.

On the other hand, taking the population structure of the city of Chengdu, which is the capital of Sichuan, and gathering a large number of migrant workers from surrounding areas into consideration, the author chose students from it as investigating subjects. Consequently, students experiencing different educational backgrounds may be more than in other cities of Sichuan province. The larger the number of survey subjects is, the more favorable the questionnaire can be collected.

3.3. Research Instruments

129 questionnaires are distributed to 129 students of senior one. The questionnaire is adapted from Guo Xiaojuan's dissertation, A Study on Meta-cognitive Strategies used in English Vocabulary Learning. The classification of meta-cognitive strategies adopted by this questionnaire referred to the method of O'Mally and Chamot(1990). This questionnaire consists of two parts. The first part is collecting personal information, including gender and educational background. The second part includes 20 items to investigate the general situation of the use of meta-cognitive strategies in students' vocabulary learning which is divided into four dimensions: planning strategy (from items 1 to 5), selective attention (from items 6 to 10), monitoring strategy (from item 11 to 15), and evaluation strategy (from item 16 to 20). the questionnaire uses the 5-point Likert Scale with five grades to represent the difference in a personal situation. in this part, 1 represents completely unfit to the realistic situation. 2 represents it is usually unfit to one's situation. 3 means it sometimes fits the situation. 4 means it is usually fitting to the situation, and 5 means it completely fit. After completing the questionnaire design, a small trial survey is conducted. Then the reliability and validity analysis is conducted by the software called IBM SPSS Statistics 26. the Alpha coefficient indicates the reliability of the questionnaire. As shown in Table 1, the Alpha coefficient is

0.965, greater than 0.6, indicating that the questionnaire has sufficient reliability. Regarding the validity of the questionnaire, Bartlett's Test of Spherical and KMO values were concerned. As is shown in Table 2, the KMO value is 0.880, which is greater than 0.6, indicating the good validity of this questionnaire.

Table 1. The reliability statistics of the questionnaire, the validity statistics of the questionnaire

The Reliability Statistics of the Questionnaire	
Cronbach's Alpha	Items
.965	20

Table 2. The Validity Statistics of the Questionnaire

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.880
Bartlett's Test of Sphericity	Approx. Chi-Square	612.434
	Df	6
	Sig.	.000

3.4. Data Collection and Analysis

Regarding the data collection, this study mainly uses questionnaires to explore the general situation of using meta-cognitive strategies in English vocabulary learning for senior high school students in Chengdu. The questionnaire is distributed and collected through WeChat and other network platforms. A total of 129 valid questionnaires are recovered. After completing the data collection, all the data are compared and analyzed by the software IBM SPSS Statistics 26 to observe differences in metacognitive strategies for high school students in vocabulary learning when they experience different educational backgrounds.

4. Results and Discussion

4.1. Analysis of the Questionnaire

The data analysis in this study is mainly represented by the mean value, which shows the frequency of the use of the meta-cognitive strategies of students based on the method of Oxford(1990). Its five-level classification analysis just echoed the 5-point Likert Scale's classification. When the mean value is between 4.5 and 5.0, it indicates a very high

frequency of strategy use. The number is between 3.5 to 4.4, which shows that the strategy was often used. When it is between 2.5 to 3.4, it indicates the strategy is sometimes used. Then from 1.5 to 2.4 meant that the strategy was rarely used. The strategy is never used if the mean value is between 1.0 and 1.4. the following data analysis is performed based on this classification.

4.2. Analysis of the First Question

The first question of this study is to find out the general situation on using meta-cognitive strategies when senior high school students learn vocabulary. The results are shown in Table 3. The mean value of metacognitive strategies in the vocabulary learning of students participating in this survey is 3.84, located in the range from 3.5 to 4.4, indicating that the general condition of the use of meta-cognitive strategies involved in the survey was good, and there is still some room for improvement. However, as for the four subitems belonging to meta-cognitive strategies, there are no significant differences in the frequency of each strategy used by students. Only the evaluation strategy frequency is slightly higher than the other three strategies. According to the survey, senior high school students in Chengdu use meta-cognitive strategies well when learning English vocabulary.

The second concern of this study is whether gender influenced the use of meta-cognitive strategies when senior high school students learned vocabulary. The results are shown in Table 4. There are 129 students involved in this investigation, including 61 boys and 68 girls. The mean value of metacognitive strategies in students' vocabulary learning participating in this survey for girls is 3.86. for boys is 3.81, indicating that girls' frequency of metacognitive strategies is slightly higher than boys. Still, there is no obvious difference between boys and girls in general. As for the four subitems, girls use planning and monitoring strategies more frequently than boys, and there is no obvious difference between men and women when they use the other two strategies. When looking at the second number after the decimal point, the frequency of strategies used by boys is slightly higher than by girls. Therefore, according to the survey, gender differences among senior high school students in Chengdu have little impact on meta-cognitive strategies.

Table 3. The report of the general situation

	Meta-cognitive strategies	Planning strategies	Selective attention strategies	Monitoring strategies	Evaluating strategies
N	129	129	129	129	129
Min	1.50	1.20	1.20	1.20	1.20
Max	4.65	5.00	4.80	5.00	4.80
Mean	3.8403	3.8062	3.8233	3.8217	3.9101
SD	.90956	.95162	.97424	.98750	.91650

4.3. Analysis of the Second Question

Table 4. The Report of Different Genders

Gender		Meta-cognitive strategies	Planning strategies	Selective attention strategies	Monitoring strategies	Evaluating strategies
Male	N	61	61	61	61	61
	Mean	3.8180	3.7475	3.8328	3.7770	3.9148
	SD	.92493	.95142	1.03033	1.00803	.90293
Female	N	68	68	68	68	68
	Mean	3.8603	3.8588	3.8147	3.8618	3.9059
	SD	.90197	.95577	.92869	.97445	.93520
Total	N	129	129	129	129	129
	Mean	3.8403	3.8062	3.8233	3.8217	3.9101
	SD	.90956	.95162	.97424	.98750	.91650

4.4. Analysis of the Third Question

Table 5. The report of different educational backgrounds

Educational background		Meta-cognitive strategies	Planning strategies	Selective attention strategies	Monitoring strategies	Evaluating strategies
Rural area	N	64	64	64	64	64
	Mean	3.8383	3.8313	3.8281	3.8000	3.8938
	SD	.92224	.98704	.99578	.97264	.92443
Urban area	N	65	65	65	65	65
	Mean	3.8423	3.7815	3.8185	3.8431	3.9262
	SD	.90408	.92244	.96029	1.00902	.91554
Total	N	129	129	129	129	129
	Mean	3.8403	3.8062	3.8233	3.8217	3.9101
	SD	.90956	.95162	.97424	.98750	.91650
Sig.		.980	.768	.955	.805	.842

The third concern of this study is whether different educational backgrounds influenced the use of meta-cognitive strategies when senior high school students learned vocabulary. The results are shown in Table 5. of the students participating in this survey, 64 had a rural educational background, and 65 had an urban educational background. The mean value of metacognitive strategies in the vocabulary learning of students participating in this survey for those from rural areas is 3.83, and for those from urban areas is 3.84, indicating that the previous educational background does not impact the frequency of students' strategies. As for the four subitems, rural students use planning and evaluation strategies more frequently than urban students, while the frequency of selective attention and monitoring strategies is lower. But there was no significant difference. Also, picture 5 shows us the p-value of the significance test (minimum alpha values rejecting the null hypothesis). All the numbers were more than 0.05, indicating that there was no significant difference in the use of meta-cognitive strategies when students experienced different educational backgrounds in vocabulary learning either from the perspective of the general situation of the use of meta-cognitive strategies or from the perspective of the four subitems alone.

In the traditional impression, rural education is not as good as urban education because of the unequal power of teachers, teaching environment and software and hardware facilities of the school. Therefore, in solidified thinking, senior students who experienced rural educational backgrounds should have a lower frequency of using metacognitive strategies than those with an urban educational background when learning vocabulary. However, according to the survey results, the difference in educational background did not impact the application of strategies for students. The possible reasons are as follows. First, it is very convenient for students, even in rural areas, to get learning materials from the Internet to develop the technology. That is to say, the development of the Internet has greatly made education fairer in any place (Yu&Ye,2017, Tian, 2021). Therefore, the educational resources between urban and rural areas are relatively equal. As far as English vocabulary learning is concerned, students are beneficial from many types of apps which help them remember vocabulary on the Internet. Its clocking function can urge students to learn vocabulary (Zhang,2022).

Moreover, online education's rapid rise and development make current education more open and fair(Zhao, 2020). Front-line teachers also release teaching videos through online platforms. Therefore, students with a rural educational background or an urban educational background can get the necessary school education and self-choice high-quality online education. Finally, implementing the rural revitalization strategy in China also greatly promotes education(Du&Liu, 2019, Hao, 2021). Rural revitalization aims to revitalize all aspects of the countryside and improve the quality of life of the rural people. It is beneficial to education, which is stimulated by it as well(Yuan&Jiang, 2021). Therefore, implementing rural revitalization will inevitably bring fresh soil and inject fresh blood into the development of rural education. Therefore, in the survey, urban and rural education backgrounds did not bring obvious differences to senior high school students using meta-cognitive strategies in vocabulary learning.

4.5. Teaching Advice

4.5.1. Understand Students and Teach them According to their Aptitude

According to the statistical results of this questionnaire, the general situation of the frequency of metacognitive strategies for high school students in Chengdu was relatively high. But looking at each item's maximum and minimum value alone is very different. Ensuring a high mean shows that most of the students involved in the survey learn vocabulary frequently using meta-cognitive strategies, and some in relatively high frequency. Teachers can still guide students in the class to ensure all students are familiar with using strategies. Also, teachers should focus on the correlation among students' meta-strategies use, student vocabulary mastery and their English scores. In addition, students with a low frequency of metacognitive strategies should be observed individually, and teachers should explore whether the low frequency of use of their metacognitive strategies positively correlates with their mastery of vocabulary and their performance in English study. After all, strategy is not an omnipotent key to vocabulary learning. If it is a positive correlation, teachers need to develop the habit of students with low frequency of using strategies through individual conversations. If it is negatively related or does not have any relation, teachers should respect students' learning styles.

4.5.2. Respect for the Students and Make Overall Education Possible

The latter two questions of this study focused on the impact of gender differences and differences in junior education experiences on the frequency of metacognitive strategies when students learn vocabulary. From the data analysis perspective, gender differences and educational experience in junior high school have little impact on students' use of meta-cognitive strategies to learn vocabulary.

The details show that girls use planning and monitoring strategies slightly higher than boys in each sub-project. Moreover, students of rural educational backgrounds use planning strategies and evaluation strategies more frequently than those students with urban educational backgrounds. In contrast, selective attention and monitoring strategies' frequency is slightly less. But there was no significant difference. Therefore, when facing a class with students who have also experienced urban and rural educational backgrounds, teachers do not have to pay too much attention to the educational background of students' experience. In other words, teachers should pay more attention to overall and equal teaching to promote the fairness of classroom education. Secondly, students will not divide into some small groups because of their educational backgrounds without the extensive attention of their teachers, which is more conducive to class unity.

5. Conclusion

Meta-cognitive strategies are very important in all learning strategies. When learning vocabulary, reasonable and effective meta-cognitive strategies will improve students' English performance. Meta-cognitive strategies show students' planning and monitoring of knowledge learning. This study investigated metacognitive strategies among 129 senior students in Chengdu. First of all, Chengdu's senior high school students used meta-cognitive strategies at a high frequency when learning vocabulary. There was no obvious difference in the frequency of each strategy under the classification. Then, from the perspective of gender difference, meta-cognitive strategies were used slightly more frequently in girls than in boys, but there was no significant difference in students. It showed that gender difference has little impact on meta-cognitive strategy in senior high school students in Chengdu. Finally, from the perspective of educational background in middle school, the previous educational background did not impact the frequency of students' use of strategies. Therefore, in teaching, especially when faced with differences in urban and rural education, teachers can understand the students and teach students following their aptitude. We should also follow the overall education and respect students' experience.

There are still some deficiencies in this study. Firstly, on the one hand, the subjects of this study were relatively small because there were only 129 students. On the other hand, Chengdu has superior development in Sichuan province. So, the findings of this study could not apply to other places broadly. Secondly, due to research conditions limitations, this paper did not focus on the correlation between students' English scores and the use of meta-cognitive strategies. If the study of this project continues later, the scope and the number of surveys can be expanded.

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