

# Research on the Use of Metacognitive Strategies of Liberal Arts and Science English Majors

Guirong Pan

Foreign Languages School  
Qingdao Agricultural University  
e-mail: willa@qau.edu.cn

Yafei Chen

Foreign Languages School  
Qingdao Agricultural University

**Abstract**—By using questionnaire survey and interview method, this paper studies the difference in the use of Metacognitive Strategies by liberal arts students and science students in their English learning, and it also investigates the relationship between the use of Metacognitive Strategies and their performance in TEM-4. It is concluded that both liberal arts students and science students have some metacognitive awareness; however, compared with science students, liberal arts students have much more metacognitive awareness. Besides, the metacognitive strategies have some influence on students' academic performance, and liberal arts students perform better than science students in English learning.

**Keywords**—Metacognitive Strategies; English performance; liberal arts students; science students; English learning

## 1. INTRODUCTION

Different learners apply different strategies in their English learning. Accordingly, the liberal arts students and science students adopt different learning methods and strategies, and thus their performances are different accordingly. To some degree, there is some association between their performance and the division of liberal arts and science which leads to different learning strategies and logic ability. Therefore, it is worthwhile to research the influence of division of liberal arts and science on students' learning performance.

The division of liberal arts and science is one of the most important educational systems that implements in mainland China, Hong Kong, Taiwan and other countries and regions in the world. This educational system has its rationality and it helps to cultivate a considerable number of professionals for China's development. However, what is for sure is that the division of liberal arts and science has a great impact on students' learning method and strategies which influence their English learning.

Based on some linguistic theories, this paper attempts to research the difference of the use of Metacognitive Strategies between liberal arts students and science students, and to investigate the influence of Metacognitive Strategies on the students' English learning and to reveal the relationship between the use and students' English performance.

## II. LITERATURE REVIEW

Learning strategies are specific methods of learning information that help learners to learn and remember things. In

1966, Aaron Caton published the book *The Method of Inference in Foreign Language Study*, which was the first to discuss learner's strategy. Oxford (1989) points out that learning strategies are "behaviors or actions which learners use to make language learning more successful, self-directed, and enjoyable".

In 1985, Michael O'Malley and Anna Chamot studied about 24 strategies employed by learners of English as a second language in the United States. According to O'Malley et al. (1985), these learning strategies can be categorized under three main groups as listed below: cognitive strategies, metacognitive strategies and social /affective strategies.

Among these strategies, metacognitive strategies may be thought of as core strategies because they are applicable to a variety of learning tasks. Yang (2009) indicates that one of the distinctive features differentiating successful listeners from unsuccessful ones is their use of metacognitive strategies.

Metacognition is defined as "cognition about cognition", or "knowing about knowing". Metacognition is deliberate, planned, intentional, goal-directed and future-oriented mental processing that can be used to accomplish cognitive tasks (Flavell, 1971).

In China, the study of learning strategy began in the early 1990s. In 1996, Professor Wen Qiufang published the book *English Learning Strategy*, which highlighted China's current study in the field of learning strategy. Besides, Liu Huijun (2004), Ding Yi (2006) and many other scholars also made in-depth studies. They pointed out that the frequency of the Metacognitive Strategies is related to the performance in language learning.

## III. QUESTIONNAIRE SURVEY

In order to investigate the use of Metacognitive Strategies by English majors, a questionnaire survey was conducted on 26th December, 2012 at Qingdao Agricultural University. The subjects were 60 seniors of English major, including 43 liberal arts students and 17 science students.

Based on Oxford (1990) SILL, all questions were designed to address the following questions:

·What is the level of the English major students' use of the metacognitive strategies?

·Is there any difference in the use of Metacognitive Strategies between liberal arts students and science students?

·Is there any relationship between the pass rate of TEM-4 and the use of the Metacognitive Strategies?

The questions are divided into three groups based on the classification of the metacognitive strategies: Planning for learning (1—5), Monitoring of one's production or comprehension (6---10), Evaluating of learning after an activity is completed (11---15).

#### IV. DATA ANALYSIS

In the present study, metacognitive strategies are composed of three distinct, but interrelated strategies: planning, monitoring and evaluating. According to the classification, the following analysis of results can be divided into different parts.

##### A. Planning for Learning Scale

According to Kluwe (1982: 212), metacognitive planning strategy helps to allocate resources to the current task, to

determine the order of steps to be taken to complete the task and to set the intensity or the speed at which one should work on the task.

The data in Table 1 illustrates that both liberal arts students and science students have some metacognitive awareness in English learning. For these five questions, liberal arts students who choose never are much less than science students. While students answered always are much more than science students. Compared with science students, the liberal arts students have much more awareness of planning for learning. That is to say, the liberal arts students are more capable of making plans for their learning so as to achieve their learning goals.

But for Question 5, it can be seen that the percentages of students who always use modern media to enlarge their vocabulary for both the groups have no significant differences. However, the percentage of students who never use this method for science students is higher than that of liberal students.

TABLE 1

Questions		Never		Sometimes		Always	
		L	S	L	S	L	S
1.	I make plans of learning for myself.	6.4%	15.5%	40.4%	53.8%	53.2%	30.7%
2.	I make cards to remember new English words.	40.4%	76.9%	38.3%	15.4%	21.3%	7.7%
3.	I do some preparation before dictation.	4.2%	15.4%	57.5%	23.1%	38.3%	61.5%
4	I pick out a group of words which share commonparts for memory.	10.6%	15.4%	31.9%	38.5%	57.5%	46.1
5	I read magazine or watch English TV regularly to enlarge vocabulary.	2.1%	7.7%	21.3%	15.4%	76.6%	76.9%

##### B. Self-Monitoring Scale

Monitoring strategy is the action to check, monitor and evaluate the thinking and performance. According to Oxford (2008), self-monitoring refers to identifying errors in understanding or producing the new language, determining which ones are important (those that cause serious confusion or offense), tracking the source of important errors, and trying to eliminate such errors.

By using monitoring strategy, students can keep themselves on track to meet their aims. Whether it is the setting of goals, adjustment of plans, selection and organization of materials, processing of information, evaluation of products or use of strategy, it is through self-monitoring that analysis and judgment are made, and instruction is given. (Dong, Qi & Zhou, Yong, 1994).

From all questions in Table 2, it can be seen that majority of both liberal arts students and science student have the awareness of self-monitoring. Through comparison of the data of two different groups, we can realize that the liberal arts students have more awareness of self-monitoring, but the difference is not so large as in Part I.

For Question 9, nearly half of science students never examine their progress regularly, while the percentage for liberal arts students is less than one third. What's more, the percentage of science students who answer "Never" is almost as twice as that of liberal arts students.

Intrestingly, from Questions 10, both liberal arts students do not very much like to study always together with their classmates, the rate is only 19.1% for L group, while the S group is 15.4%. But the percentage of science students who never study together with their classmate is more than twice than that of liberal arts students.

##### C. Self-Evaluation Scale

Self-evaluating strategy refers to evaluating one's own progress in the new language, for instance, by checking to see whether one is reading faster and understanding more than one month or six months ago, or whether one is understanding a greater percentage of each conversation. In the field of language learning, evaluating the outcomes of activities is a good way for the students to correct their mistakes and to give up improper methods, thus they can adopt the most suitable method for themselves.

TABLE 2

Questions		Never		Sometimes		Always	
		<i>L</i>	<i>S</i>	<i>L</i>	<i>S</i>	<i>L</i>	<i>S</i>
6	I tried different ways to learn English, and find the most suitable way for myself through comparison.	4.3%	7.7%	25.5%	23.1%	70.2%	69.2%
7	I can realize the meaning of words by dividing them into several parts.	4.3%	6.7%	19.1%	31.8%	76.6%	61.5%
8	When meet a new word, I would think whether I know its antonym and synonym.	8.5%	15.4%	31.9%	23.1%	59.6%	61.5%
9	I examine my study result and progress regularly.	23.4%	46.2%	48.9%	30.7%	27.7%	23.1%
10	I study together with my classmates to find my deficiency.	12.6%	30.8%	68.1%	53.8%	19.1%	15.4%

TABLE 3

Questions		Never		Sometimes		Always	
		<i>L</i>	<i>S</i>	<i>L</i>	<i>S</i>	<i>L</i>	<i>S</i>
11.	In order to remember a new word, I will read it again and again.	2.1%	15.4%	31.9%	38.5%	66.0%	46.1%
12	In order to remember a new word, I will write it again and again.	2.3%	7.7%	23.2%	23.1%	74.5%	69.2%
13.	I guess the meaning of unfamiliar English words based on common sense and familiar knowledge.	0%	0%	14.9%	15.4%	85.1%	84.6%
14	When I cannot think of a word during a conversation, I use gestures.	10.6%	23.1%	38.3%	30.8%	51.1%	46.1%
15.	When I have questions and problems, I ask my teachers or classmates for help.	17.0%	15.4%	34.1%	53.8%	48.9%	30.8%

From Table 3, we can see that majority of both liberal arts students and science students choose “Sometimes” or “Always”, and which indicate that both the two groups of students have the metacognitive awareness of self-evaluating. Furthermore, based on the data of Questions 11-14, we can conclude that the liberal arts students pay more attention to the self-evaluating strategy.

The data of Question 13 demonstrates that about 85% of the science students and liberal arts students use this strategy to guess the meaning of new words.

However, there still exists an exception. For example, as for Question 15, it can be found that there are more liberal arts students who never ask suggestions from teacher or classmate when meeting a problem than science student. But the disparity is not very obvious.

#### D. Pass Rate of TEM-4

TEM-4, Test for English Majors, covers all aspects of basic skills in learning English, including listening, speaking, reading, writing and translation. By researching and comparing the pass rate of TEM-4 of liberal art students and science students, the English performance and comprehensive level of liberal arts students and science students can be concluded. And on this basis, the influence of Metacognitive Strategies on performance of English majors can be further discussed and revealed.

From Table 4, it can be seen that there are 39 students who pass the TEM-4 among all the 43 liberal arts students, and that

there are 13 students who pass the TEM-4 among all the 17 science students. We can see both liberal arts student and science students have good performances in this examination.

However, there exist gaps between the performances of liberal arts students and science students. The pass rate of TEM-4 of liberal arts students is 90.70 percent, and the pass rate of science students is 76.47 percent. Based on the comparison and analysis, it can be concluded that the performance of liberal arts students in TEM-4 is obviously better than that of science students. And to some degree, this result reveals that the liberal arts students’ proficiency and mastery of English are better than that of science students.

#### V. INTERVIEW

In order to further investigate the use of the metacognitive strategies, to know the influence of these Metacognitive Strategies on students’ academic performance; four students from the 60 subjects were interviewed about these questions in more detail. These four students all won scholarship this year, including two liberal arts students and two science students.

The questions in this interview included:

- Have they ever heard of the Metacognitive Strategies before?
- What’s their own strategy in English learning?
- What’s their performance in TEM-4?

TABLE 4

Group	Number of Passes	Pass Rate
Liberal Arts Students	39/43	90.70%
Science Students	13/17	76.47%

Student Yu is a science student and she is a typical student who crams before exams. She admitted that she really failed several exams because of her aimlessness. When talking about learning strategies, Yu said that she never paid any attention to learning strategies. She admitted that maybe she used some strategies in learning, but she did not realize herself. She said that she was trying to change her bad habit and to make plans for learning. Besides, she said that English movies and songs were good learning resources, and she learned a lot when seeing English movies. When it came to TEM-4, Yu said that the result was a big surprise to her, because she passed the pass line by a narrow margin.

Another science student Zhang said that she always compared different learning methods. She said that when she was a freshman, no matter how hard she studied; she still could not achieve excellent results. Later she adjusted her learning strategy and finally found the most suitable method for herself. Her score in TEM-4 was 75. She admitted it was the suitable method that made her improve a lot gradually.

Student Wang, a liberal student, said that when being a freshman, she even planned to give up the English major because of her poor English score. However, later she made detailed plans for learning and worked hard stick to schedule. When preparing TEM-4, everyday she tried her best to follow teachers' suggestions and used scientific learning strategy to recite new words. Finally her hard work paid off. She passed the TEM-4 successfully and her score was 66. Since then she continued to study hard with the aim of achieving greater progress and becoming a top student. She got a much higher score in TEM-8 than that of TEM-4. She said that she owed her progress to detailed plans.

The other liberal art student Chen, she has won the first prize in National English Contest for College Students for twice owing to her terrific performance. When she was a freshman, her spoken English was quite poor. Gradually her spoken English improved a lot and successfully passed both the TEM-4 oral test and TEM-8 oral test. In particular, Chen's score of TEM-4 was the highest among her classmates, and she was the only one whose score reached 80. Among these four students, she was the only one who had heard of the metacognitive strategies when she was in high school. Since then she paid much attention to these strategies and applied them into her practice. She admitted that she really benefited a lot from these strategies. She said that she always made learning plans regularly and summarized the experiences and lessons in time. Furthermore, she attached great importance to self-monitoring, and she paid much attention to reflect her performance periodically. At last, she said that she always asked the teachers' suggestions and exchanged learning experience and opinions with her classmates.

From the interview, we can see that all these four students have used some Metacognitive Strategies in their learning, whether or not they are conscious of it. It is obvious that they all benefit quite a lot from the metacognitive strategies. In particular, Student Chen's example well illustrates this point. To some degree, the metacognitive strategies really play a positive role in her English learning, and her excellent academic performance largely depends on the effective learning strategies.

## VI. CONCLUSION

According to Liu Huijun (2004), the frequency of use of metacognitive strategies is positively correlated to the performance in English learning. If we combine the data of the use of metacognitive strategies, the pass rate of TEM-4 and the information that obtained from the interview together, it can be found that there exist some differences in the use of learning strategies between liberal arts students and science student, and that since liberal arts students have a little more metacognitive awareness and employ more metacognitive strategies in their English learning, in general, their average performances in English learning are better than that of science students. Further, it can be concluded that the use of Metacognitive Strategies has some impact on the English learning and that these strategies are of much help to improve the performance of students in English learning. The above analysis demonstrates that the results of research are consistent with the related theory.

Wen Qiufang (2004) emphasized that successful learners are thoughtful and aware of themselves in relation to the learning process. Therefore, metacognitive awareness is a necessary and essential focus in learning to regulate learning.

However, the design of this research has some limitations. The number of the subjects is limited and the questions in the survey are not all-inclusive, the statistic data is not complete. In addition, because of the limitation of the conditions, the research method and the statistical analysis are too simple. Besides, there still exists some exceptions, for instance, some science students who do not use metacognitive strategies can still get good performance in English learning and conversely, some students who have much metacognitive awareness can not achieve excellent performance. Of course, these design limitations imply that caution must be heeded when interpreting the findings from the studies. Out of consideration of these circumstances, there are significant improvements still to be made. Future studies should increase the number of the subjects, improve the research method and investigate the change of students over time.

## REFERENCES

- [1] Anderson, N. J. 1991. Individual Differences in Strategy Use in Second Language Reading and Testing, *Modern Language Journal*, [J]. 75, 460-472.
- [2] Flavell, J.H. 1971. First Discussant's Comments: What is Memory Development the Development of?, *Human Development* [M]14, 272-278.
- [3] Kluwe, R.H. 1982. *Cognitive Knowledge and Executive Control: Metacognition, Human Mind* [J]. New York: Springer, 201-224.

- [4] O'Malley, J. M., Chamot, A. U., Stewner-Manzanares, G., Russo, R., & Kupper, L. 1985. Learning Strategy Applications with Students of English as a Second Language, TESOL Quarterly, [J] 19, 285-296.
- [5] Oxford, R. L. 1989. Use of language learning strategies: A synthesis of studies with implications for strategy training. System, [J]. 17, 235-247.
- [6] Oxford, R.L. 2008, Language Learning Strategies: What Every Teacher Should Know [M]. Beijing: World Publishing Corporation.
- [7] Palincsar, A.S. & A. L. Brown. 1984. Reciprocal Teaching of Comprehension-Fostering and Comprehension-Monitoring Activities Cognition and Instruction [J]. 1/2: 117-175
- [8] Yang, C. 2009. *A Study of Metacognitive Strategies Employed by English Listeners*, *International Education Studies*. [J]. 2(4), 134-139.
- [9] Williams, M. & R.L. Burden, 2000, Psychology for Language Teachers: a Social Constructivist Approach [M]. Beijing: Foreign Language Teaching and Research Press.
- [10] Ding Yi. 2006. A Comparison of Learning Strategies Used by Good learners and Poor learners of English Vocabulary. [J] Foreign Language Research Vol. 100. No. 6. P47-50
- [11] Li Zhongying. Chinese ESL learners's Strategy Inventory for Language Learning—An Empirical Study [J]. Foreign Language Education. Vol 23. No. 1 P42-48.
- [12] Liu Huijun. 2004. The Relationship Between Metacognitive Strategies and English Reading [J]. Foreign Languages and Their Teaching. 2004. No. 12. Serial No. 189. P24-26.
- [13] Wen Qiufang. 2004. Doubt on Effectiveness Study of Foreign Language learning Strategies [J]. Foreign Language World No. 2. 2004. P2-7