

A Study of Metacognitive Strategies in Web-based English Autonomous Learning

Yang Cao⁺

Department of Humanity, Law and Economics, Northwestern Polytechnical University, Xi'an, Shannxi, China

Abstract. This study reports on a survey which investigated the relationship among autonomous learning, metacognitive strategy training and English achievement in web-based environment. Collected data in the forms of tests, interview and questionnaires before and after the experiment were analyzed. The results showed that metacognitive strategy training had a significant positive effect in English learning. As expected, the experimental class had better performance than the controlled class in the learning outcome, and their ability in self-monitor and evaluation had been raised. Conclusion was that metacognitive training should be integrated in web-based English autonomous learning.

Keywords: Metacognitive Strategy; Web-based English Teaching; Autonomous Learning; English Learning.

1. Introduction

Since last several decades, English language teaching has experienced many changes and different methodologies. It is believed that new technology, particularly computer network, has the potential to increase learner autonomy when used appropriately. The development of autonomous ability should be based on an awareness of personal learning strategies, styles and experiences and the learning task. If learners are asked to become more autonomous, they must become aware of what kinds of strategies are available to them, understand how to organize, monitor, and evaluate them systematically and effectively. Theoretically, these skills are called metacognition.

This paper first introduces the research background. Then the paper explains the data collection procedure for the questionnaire, and analyzes the results of the teaching experiment. Based on the analysis results, the paper discusses the problems non-English major students have in their web-based English learning and provides suggestions for English teachers.

2. Theoretical Background

Metacognition refers to "one's knowledge concerning one's own cognitive process and products or anything related to them" [1], or "a person's cognition about cognition"[2]. Metacognitive strategies is to promote language learning by strategy training. Ellis holds that metacognitive strategies make use of knowledge about cognitive processes and attempt to regulate language learning by means of planning, monitoring and evaluation [3]. The employment of the three metacognitive strategies (planning, monitoring and evaluation) in learning is referred to as learner autonomy in language learning [4]. The key idea behind learner autonomy is that education should foster the learner's capacity for independent thinking and responsibility for learning [5].

⁺ Corresponding author. Tel.: +86-13891951923; fax: +86-29-88491484.
E-mail address : caoyang@nwpu.edu.cn

Since the end of the last century, “autonomy” has been a popular focus for discussion in foreign language teaching. For definition of learner autonomy, it has been explained in various ways concerning language learning. The most popular one is that of Holec, who defines autonomy as “the ability of taking charge of one’s own learning”[6]. This provided the theoretical framework for the future research in the field. Learner autonomy is “essentially a matter of the learner’s psychological relation to the process and content of learning---a capacity for detachment, critical reflection, decision-making and independent action”[7]. From the definition, it is clear that the core kept unchanged although the definitions were various, “autonomy” means learner should be responsible for his own learning. Compared to western students, Chinese students are more dependent on teacher and class, and teacher mainly follow textbook. This traditional teaching and learning do not seem a promising ground for the development of learner autonomy. So how to develop learner autonomy in china arouse many researcher’s interest.

Over the last several decades the far-reaching effects of the technological revolution have been increasingly felt in the foreign language classroom. In China, most English classes still follow the traditional teacher-centered teaching style where both teachers and students do not have much autonomy. However, there is a close relationship between web-based language learning and autonomous learning. The power of web-based language learning and teaching is to introduce new types of input from both a quantitative and a qualitative view with the role of computer as tutor and as tool [8]. Ward & Newlands points out the reason students enjoy web-based environment is the “richer and more effective leaning resources and a more flexible pace of learning” [9]. It can be concluded that web-based environment provides a more relaxed and colorful learning environment. Therefore, web-based learning environment can provide a promising background and natural context for autonomous learning and increase of learning motivation.

As for the relationship between learner autonomy and metacognition, much research work has been done. Some past studies imply that metacognitive strategies used in language teaching can be effective in developing the learners' meta-knowledge, in fostering their ability to plan, monitor and evaluate their own learning, and promoting learner autonomy [10,11], but some scholars found with experiments that metacognitive strategies in language learning did not produce the desired results [12]. The present study focuses on the effects and development of metacognitive strategies in web-based English autonomous learning environment.

3. Methodology

3.1. Subjects

The study was conducted in a national key university in northwestern city in China. This study involves a survey of three classes of non-English major students from different academic departments. One class is controlled class: Gc (56 students), another class is experimental class: Ge (60 students), the last class is G3 (25 persons). The students in Gc and Ge are required to use web-based system to support their English learning. The learning schedule for every week is as follows: Two hours of intensive reading class which is taught in multimedia classroom, the textbook used is “New College English”; Two hours of listening and speaking class which is taught in digital language lab, the textbook is “New Horizon College English, Viewing, Listening & Speaking: A Multimedia Approach”. Four hours autonomous learning, students do online autonomous learning job for both intensive reading and listening and speaking. The difference is that there are some metacognitive awareness training, metacognitive strategy and monitor training for Ge class, while Gc class has no training. The experiment lasts for 16 weeks.

3.2. Instruments

Three kinds of data collection instruments are used in this study: two English proficiency tests, questionnaire and interviews. The questionnaire contains 10 statements concerning attitudes toward metacognitive strategies and English autonomous learning in web-based environment. The students were asked to circle an appropriate response on a 5-point Likert scale ranging from 1 “Strongly agree” to 5 “Strongly disagree” for each of 10 statements.

3.3. Procedures

This is a classroom-based study; the study is divided into four stages:

- Pre-English proficiency test for Ge and Gc, and interview. In order to guarantee the reliability of the two tests, the test was conducted first to G3. the t-test for those two test paper ($P > 0.05$) shows the high reliability of the two test paper.
- Teaching experiment, autonomous learning integrated with metacognitive strategies and computer use provide a framework to conduct the teaching experiment.
- Post-English proficiency test for Ge and Gc, to see if any changes happened in those two classes after introducing metacognitive training.
- The conduction of the questionnaire, to assess students' responses and attitudes toward the experiment.

4. Results and Discussion

4.1. The analysis of the Mean

The number of the students in Ge and Gc class are more than 30, so z test analysis of the mean of pre-test and post-test for two classes is conducted.

Table 1. z Test of two samples

	Variable 1 (Ge)	Variable 2 (Gc)
Mean	70.896	65.365
Covariance	18.263	19.519
z	5.358	

We can know from the results in table 1, $z=5.358 > 1.96$, that there is a significant difference of the two sample Ge and Gc. It shows that metacognitive ability is highly correlated with test scores. We can conclude from the experiment results that the training of metacognitive ability has a direct effect for the learning outcome.

4.2. The analysis of the questionnaire results

Table 2 lists the results of the questionnaire, the items in table 2 are as follows: (1) I have clear learning goal.(2) I can make the detailed learning plan based on my learning goal. (3). I can check my learning and adjust my learning strategy based on learning effects. (4). I think that the web-based English autonomous learning is better than the traditional English learning. (5). I can allocate the online learning time reasonably. (6). I often discuss some problems with my teachers and classmates online by email or BBS. (7). I think that there are abundant listening and speaking resources online. (8). I spend about 5 hours every week to have autonomous learning after class. (9). I can finish the learning task based on my plan. (10). Compared with new learning mode, the new learning mode is more suitable for me.

Table 2. The results of the questionnaire

Item	1	2	3	4	5	6	7	8	9	10
Mean	2.10	2.56	3.52	2.53	3.26	3.35	1.76	3.23	2.56	2.76
Std.Deviation	0.76	1.03	1.21	0.56	1.22	1.03	0.64	0.86	1.06	1.15

We can know from the results in table 2 that students have clear learning goal and make plan by themselves (the mean of item 1,2 is below 3), however, the interview shows that most students don't put them into practice. The mean of item 3 that is 3.52 indicates that students are lack of ability of self-control and self-adjustment. Although many students agree the advantages of the web-based English autonomous learning (the mean of item 4 and 7 is 2.53 and 1.76 respectively), the problems still exist while using online resources (item 5 and 6 are above 3), and the results in interview also confirm this point. Students in the interview mentioned that it's difficult to focus on study facing various kinds of online information. Some students are addicted to online chatting and games because of low self-control ability. The questionnaire and interview show that the web-based learning environment may increase students' study interest efficiencies and broaden students' knowledge by providing abundant resources. It has changed the teacher-centered teaching pattern which has been the dominated teaching pattern for a long run in China. But the students who adapt to traditional learning are lack of metacognitive strategy training, it will lead to the failure of the

planning, monitoring and evaluation in autonomous learning, especially for those “field-dependent” students. So it may cause final failure.

5. Conclusion

The major findings presented in this paper are as follows:

- The study shows the metacognitive strategies do positively correlate with students’ performances on English tests. Many other researches present the consistent conclusion. Normally, an autonomous learner is expected to have good language performance, Metacognitive strategy is an effective way to foster learner autonomy. Both the qualitative and quantitative data can confirm it. The experimental class makes a significant improvement compared with the controlled class. Their ability in monitoring learning process and evaluation of learning outcome is better than the comparison group.
- The purpose of both traditional and web-based English learning is to provide a space in which the facilitation of learning can take place. In this study, it is found that web-based English autonomous learning can create an ideal environment for the students to learn English effectively.
- It is known that language learning is a slow and long process, what really counts is to teach the students how to learn and help them to form correct and sufficient learning strategies. This study demonstrates that students are becoming more and more conscious about their learning and how they are learning. They are on the way to be autonomous learners.

With the study and experiment, some implications are as follows:

- In China, most students are not efficient autonomous learners. In order to carry out autonomous learning, learners would develop ability related to self-management, self-monitoring and self-evaluation. Therefore, students are expected to develop their metacognitive ability, which will help them become more aware of the importance of autonomous learning and metacognitive strategy in language learning.
- To develop autonomous learning, teachers will play an important role in teaching how to cultivate students’ metacognitive awareness. Learner autonomy is formed by the students in the process of language learning with the guidance from the skilled teachers. So, qualified teachers are important in developing learner autonomy.

6. References

- [1] J. H. Flavell. Metacognitive Aspects of Problem Solving. In L. B. Resnick (eds.). *The Nature of Intelligence*. Hillsdale, N. J. Erlbaum, 1976.
- [2] H. M. Wellman. The Origins of Metacognition. In D. L. Forrest-Pressley, G.E. Mackinnon & T.G. Waller (eds.). *Metacognition, Cognition, and Human Performance*. New York: Academic Press, 1985.
- [3] R. Ellis. *The Study of Second Language Acquisition*, Oxford University Press, 1994, pp.529-560.
- [4] A. L. Wenden. Metacognitive Knowledge and Language Learning. *Applied Linguistics*, 19/4: 1998, pp.515-537
- [5] E. Broady. & M. Kenning. Learner Autonomy: An Introduction to the Issues. *Promoting Learner Autonomy in University Language Teaching*. 1996, pp.9-21
- [6] H. Holec, *Autonomy and Foreign Language Learning*. Oxford: Pergamon Press, 1981.
- [7] D. Little, *Learner Autonomy: Definitions, Issues and Problems*. Dublin: Authentik, 1991.
- [8] M. Warschauer, Computer-assisted language learning: an introduction. In S. Fotos(ed.). *Multimedia Language Teaching*, Tokyo: Logos International, pp.3-20.
- [9] M. Ward and D. Newlands, “Use of the web in undergraduate teaching,” *Computers & Education*, 31, 1998, pp.171-84.
- [10] J. M. O’Malley. & A.U. Chamot. *Learning Strategies in Second Language Acquisition*. Shanghai: Shanghai Foreign Language Education Press, 1990.
- [11] Ji, K. L.. Metacognitive strategies training in foreign languages learning. *Foreign Language World* 2, 2002.
- [12] D.Q. Wang & L.S. Zou. Monitoring of Metacognitive Strategy Training. *CELEA Journal* 28/3: 2005. pp.3-13.