A Case Study of Formation of Mandarin-English College Students' Metacognition

Wei Zhou

Department of Foreign Languages, South-west Petroleum University (SWPU), No.8 Xindu Avenue, Chengdu, Sichuan, China

Abstract—The present study provides both quantitative and qualitative analysis of the formation of language learners' metacognition as the Mandarin-English college students in China. I hypothesized that language learning will be promoted by intervention of course teaching if students are trained to become more aware of and skillful at the use of metacognition strategies and other learning strategies that can be used in the language learning process. 3 of 115 freshmen from department of foreign language in Southwest Petroleum University are chosen to be subjects of the study. The result carries out to examine the intervention of strategy course on the formation of metacognition of English major freshmen in their language learning. The conclusions obtained from pre-interviews and post-interview have indicated that the subjects' metacognition knowledge and metacognitive strategy use in language learning are conflicting. After the course, the metacognition of the subjects increased.

Index Terms—metacognition, learning strategy, formation of metacognition

I. INTRODUCTION

Along with the developing of education in China, metacognitive strategies has been viewed as an important aspect of learning strategy, which is more and more commonly used now, especially for language learning in colleges and universities. Research and theory in second language learning strongly suggest that good language learners use a variety of strategies to assist them in gaining command over new language skills (Oxford, 1990). Therefore, the learners should use learning strategies to facilitate the acquisition, storage, or retrieval of information (Rigney 1978, Dansereau in press). Metacognitive strategy is one kind of the learning strategies, which belongs to metacognition category.

J. H. Flavell (1976) first used the word metacognition, and he defined metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them, e.g., the learning-relevant properties of information or data.

Scriven (1967) pointed out that formative assessment is a range of formal and informal assessment procedures employed by teachers during the learning process in order to modify teaching and learning activities to improve student attainment. It typically involves qualitative feedback (rather than scores) for both student and teacher that focus on the details of content and performance (Bloom, 1968). Henri Holec (1981) mentions that autonomy learning is the ability to take charge of learners' learning, and the learners should evaluate themselves after learning. This paper is willing to find out that the metacognitive strategies can help learners to form and develop their metacognition in autonomous learning strategy course.

The purpose is to utilize metacognitive strategies to evaluate the improving of students' metacognition in autonomous learning during the process of the strategy-based instructions course for language learners. It focuses on the process how the subjects form and develop their metacognition step by step in the intervention of the strategy training course.

This article addresses the following research questions:

1. What's the initial metacognition of the subjects? What is their attitude towards the course?
2. Is there any formation of metacognition through the intervention of the 8-week course? What does it represent?
3. What is the final metacognition of the subjects, what is subject's reflection about the course?

II. METHODOLOGY

The study is based on the data of 3 students who are chosen from 115 English major freshmen in the autonomous learning strategy course. 1 The students had been classified into 9 groups and each group had one assistant to help the teacher to observe and supervise students. All 3 subjects are in the same group. Students had been classified into groups by the assistants (also the counsellor) based on a discrepancy in performance between scores of English of University Entrance Examination and achievement of first year's study (first semester rank).

The average score of English of University Entrance Examination is 116 points (full score is 150 points), 34 students' score was below the average, which was between 90 and 115; 68 students' score was between 116 and 129, which was mid of upper level; 13 students' score was above the average, which was between 130 and full score 150. I chose one student as subject from each level (below average, medium, and above average), Long was in above average level, Yao

was in "Medium" level, and Chai was in below average level. As for subject Long, she was curious about the new course. In the pre-interview, she was showing great interest in theory of metacognition and strategies of autonomous learning. Subject Yao was a bit interested into the new assessment, and she seemed suspicious about the strategies of autonomous learning. Subject Chai was negative about the formative assessment and he seemed not to believe in the learning strategies, which could improve his studying. Three students, in this group, were chosen as subjects with totally different attitude about autonomous learning strategy course.

In order to investigate the validity and feasibility of study, the data of the study were collected through classroom observation by assistant, reflective dairy of every unit and the interview before the course and after end of the course. Before the course, the subjects were required to do the pre-interview before the course by assistant. The observations were used to record the academic performance of students in class to assess if there was formation of metacognition and progress or not. The reflective dairy were required that everyone in the class should hand in after one unit was finished. After the course was over, the assistant had an interview with every student in the group with the required questions.

The pre-interview was about to get the general knowledge of initial metacognition of each subject and it was used to assist source of classroom observation to assess if the subjects had formed metacognition. All the interview questions were based on the Schraw & Dennison's (1994) Metacognitive Awareness Inventory (questions are modified version of Appendix A). The post-interview was the last step of the procedure that the assistant could have a brief knowledge of subjects' formation of metacognition after this course.

In order to assess the developing of student by their performance in class, the assistant should observe and record students' performances in class: (a) class attendance record, (b) if he/she listened to the teacher carefully, (c) if he/she finished reflective dairy, (d) if he/she caught on the pedagogical-thinking of the teacher. The classroom observation was a form of ongoing assessment (Cheng, 2002). An observation checklist (see Appendix C, Weber, 1999) could be used to assess the students' learning progress, including activity participation (attendance, reliability, initiative and effort), small group work (self-confidence, involvement, cooperation and enthusiasm), study habits (Organization, efficiency and diligence) and attitudes (positive, negative and suspicious).

The reflective dairy were required that students in the class should handed in after a unit was finished. And the content of reflection should include three parts: (a) the most intriguing point of the unit, (b) the muddiest point of the unit, (c) achieve the unit goal or not.

III. RESULTS AND DISCUSSION

A. Pre-interview Analysis

I have applied the questions based on the Schraw & Dennison's (1994) Metacognitive Awareness Inventory (MAI) and required the students to answer the questions of Appendix B (modified version of Appendix), which made by Gao li (2007) and is also combined with classroom observation by student assistants (see 3.2). These five questions were chose because planning and monitoring were the first step of being awareness of metacognition.

Question 1: *Did you ask yourself periodically if you were meeting your goals*? (Monitoring)

1. Long showed great concern about setting goal; she often asked herself periodically to whatever she achieved the goals setting by herself, which indicates that she has a basic knowledge of metacognition.

2. About the same question, Yao was a little confused. According to her words, it she had an unclear goals. And the goal is setting a little higher than her ability, which means that she has a sense of metacognition, but it's not a good system.

3. The last subject, Chai. From the interview, it can be known that he also had a goal, which is too difficult to finish. So, he always failed in the exam, etc. It shows that he has no knowledge about setting goal.

Based on what I have discussed above, it implied that three subjects have different knowledge of metacognition, Long has the highest level of metacognition among 3 subjects, at the beginning of the autonomous learning strategy class.

Combined with pre-interview and classroom observation by assistant, the subject Long was an extroverted girl that could easily jump into the conversation when meeting new friends. During the course, Long showed a great interest in theory of metacognition and autonomous learning strategy course, especially the intellectual curiosity about reflective dairy that was totally different with the normal assessment in China. Her attitude towards the course was open-minded and positive. Yao was interested in practical application than theoretical foundation. She was easily absent-minded during the lecture except when the teacher mentioned some interesting contents. Yao's attitude towards the course was neutral. Chai was very interested in how the teacher assessed the learners' achievement without paper test. He was still filled with doubts attitude towards the course. Based on his reflective diary in first unit, he mentioned he did not like this course and he determined that it was useless for him.

TABLE 1
LEARNERS' ATTITUDE

Subjects	attitude
Long	Open-minded, positive
Yao	Acceptable
Chai	Negative, resistant

Question 2, 3, 4, 5:

Did you organize your time to best accomplish the goals? (Monitoring)
Did you consider several alternatives to a problem before you begin the project? (Planning)
Did you ask yourself if you have considered all options when solving a problem? (Planning)
Did you think of several ways to solve a problem and choose the best one? (Planning)

1. Long was more than an open-oriented learner. She liked to gather many information and experience before making a decision. She said that sometimes it took her too much time and the result was not as expected. It can be known that she makes plans and uses strategies consciously but sometimes the result is less than satisfactory. Here is the plan she made to do self-assessing each week:

TABLE 2
LEARNING PLAN OF LONG

	Morning	afternoon
Monday	a. Memorize at least 20 new words,	a. Finish my homework,
Tuesday		b. Review the lessons
Wednesday	b. read an English passage aloud for at least 10 times,	c. practice English listening at least 30minutes,
Thursday	c. preview the lessons	
Friday		

Table 2 indicates that she can organize her time to best accomplish her goals. Each listed item is reasonable and she also manages some entertaining activities alternately. It means that she is good at managing her learning. But some items are not specific. For example, she plans to "practice her listening skills", "Memorize vocabularies" and "read English passage aloud", but she does not give specific practicing materials. And she does not mention what kind of book she read. On the other hand, she schedules the learning hours for each curriculum, which shows that Long has the ability to make her schedule.

2. On the contrary, Yao seldom prepared for the problems. She always let the nature takes its course and did not spend enough time on her study. It indicates that she may use strategy in her learning. Her plan for study is:

TABLE 3
LEARNING PLAN OF YAO

	Morning-from/to	Afternoon- from/to
Monday	Library (listening)	Lessons
Tuesday	Lessons	Lessons
Wednesday	Lessons	Library(homework)
Thursday	Lessons	Library (comprehension)
Friday	Lessons	Library (reading novels)

Compared with Long's plan list, Yao's was much simpler and with no specific learning hours. She did not schedule how to enforce each item and how long it takes each time. It shows that her schedule is too general to stick it out. Besides, she forgets the to-do list at first, and hand in her homework next class.

3. Subject Chai, he mentioned that he took action before thinking. And he has a low tolerance for ambiguity. It means that he seldom set plans in his studying.

TABLE 4
LEARNING PLAN OF CHAI

	Morning-from/to	Afternoon-from /to
Monday	20 vocabulary	Reading some novels
Tuesday	Listening 30 minutes	Grammar
Wednesday	Vocabulary	grammar
Thursday	Vocabulary	grammar
Friday	Vocabulary	grammar

According to the chart, the plans from Wednesday to Friday are repeatedly and unwise. The repeated arrangement would reduce the learning efficiency. In addition, he ignores the courses periods. That means he doesn't pay enough attention to his studying plan.

Wen Qiufang (1996) mentioned that a complete and efficient plan has four aspects, including what to do, when to do, how to do and why to do. All the three subjects do not follow the principle perfectly. Long did not mention the practicing materials and how to do the exercises; Yao just listed what to do and when to do, but both of the two are not specific, and she forgets the specific practice materials as well. Chai's plan is not reasonable because the school time and self-learning time are conflicting.

According to the analysis of question 2 to question 5, the three subjects have different timing senses. Long scheduled different learning hours for different curriculums. She allocated her time for each language learning practices in order to reach the goal of practices. Yao does not mention the practice hours of each part. Most of Chai's self-learning hours are conflicted with his class hours. Yao and Chai did not do well in setting plans. Based on the different learning plans, the conclusion can be drawn that Long's metacognition level is higher than other two subjects. Yao and Chai need to

improve their metacognition. As we mentioned above, the metacognition of the three subjects can be seen in the following chart:

TABLE 5
SUBJECTS' METACOGNITION

Subjects	Metacognition	
	Initial Metacognition	Planning
Long	has basic knowledge of metacognition	Shows great concern about planning, but still is lack of details about learning materials
Yao	Has a sense of metacognition, but not a good system	Schedule is too general to stick, and time organization is not reasonable enough to follow
Chai	Almost has no idea of metacognition,	the whole plan is full of conflicts in implementing time

B. Classroom Observation

I should observe both students (subjects) and teacher closely to gather valuable information. Moreover, I should take chances to talk to students about their attitude towards the course and if their formation of metacognition improved.

Question 6: *Did you take note and underline the key knowledge?* (Declarative knowledge)

1. Long was the only one who wrote down the notes every class till the end. She always listened to the teacher carefully. She concentrated on teacher lecture no matter when is checked. Long said that she has the habit of underlining the key content that the teacher emphasized. The notes can help her to memorize the content of the course much easier. It indicates that she knew how to use some skills or strategies to improve her learning.

2. Yao did not have the habit of keeping notes. She complained that the teacher demonstrated the PPT so fast that she could only scribble down several broken words. After that, she stopped noting. But she would write down the key vocabulary that the teacher repeatedly stressed.

3. Chai just did not like taking notes. He had the same problem as Yao in note taking. Because of his slow copying speed, in most cases, he could not write down the useful information, and if he missed it then he gave up.

Question 7: *Did you learn more when you were interested in the topic?* (Information management strategy)

1. Long mentioned that if someone hope to achieve something he or she should set a goal first. Based on the examples, she thought that people should have a goal first, and then must stick to their goals in a proper way. It implies that she knows what she is doing and everything she has done is to reach her goal.

2. Yao thought the optimism is the most important part. Helen Keller's story tells people that the optimistic mood help her to achieve her success and Helen never gives up even she lost her sight and voice in a young age.

3. Chai said that the shock resistance capability was essential. *Journey to the West,* the four characters conquered eighty-one trials to acquire Buddhist Scriptures. He confessed that he could not endure too much pressure in the field of learning.

All of them are very active when discussion, because they are interested in the topic. It indicates that when the topic or the learning content attracts the learners' attention, it will mobilize their initiative and willingness and then raise ability of autonomous learning.

Question 8, 9:

Did you preview before we begin a project? (Planning)

Did you summarize what I've learned after you finish? (Evaluation)

1. Long always previewed before the teacher began the new unit. She would look the vocabulary up in dictionary and write down the meanings on the book. After one unit's learning, she wrote the reflective dairy about what she has learned in class. It indicates that she has the basic knowledge of metacognition on planning.

2. Yao mentioned that she was the member of Student Union; she would like to preview the new unit by scanning if she had enough time. Although she wrote the reflective dairy but she did not think about the content seriously. It shows that she has knowledge of metacognition on planning but she cannot follow it all the time.

3. According to the inspection result, Chai hardly preview the content of new unit. He thought that it did not have impact on his language learning whether preview or not. It indicates that he ignores the importance of metacognition strategy use.

According to the observation of the assistants, Long, at beginning of the course, she previews the new chapter autonomously, which we can tell from her book noting that vocabulary are marked and labeled with Chinese explanation. And then after one unit accomplished, she does not only finish her reflective dairy which is required, also she does extra summary about what she achieved and failed. It indicates that she has ability to evaluate herself about her own learning effect. Combined with what we mentioned before, Long does well in information management strategy (IMS), including note-taking and underlining the important information. As for Yao, through the classroom observation and book checking, she seldom previews the new chapter of course, and sometimes she just scans the content before the class begins if she has enough time. It indicates that Yao's metacognition may not form a system yet but she has some knowledge of reading strategy and she has a little awareness to use the strategies on purpose. Based on the reflective dairies we get from her, she says: "I never know what is the suitable way (learning methods) for me; I have understood the learner preferences, but I do not see it clearly that which kind of characteristics I am. Etc.", it indicates that she

could not summarize what she has learned after finish. Compared with two other subjects, Long and Yao, the last subject Chai argued that it is not necessary for him to preview the new chapter because the outcome was the same. And he mentioned in his first reflective dairy like: "but now, I feel a little bit sad, because no matter how studious am I, I cannot improve", which indicates that the subject is confused about how to learn and he does not notice that the improvement of metacognition (i.e. know about and using strategies) can improve his study even if he takes part in this course for weeks.

In conclusion, Long has better awareness of metacognitive regulation and knowledge of metacognition than other two subjects. And both Long and Yao have an improvement of their metacognition in different categories to varying degrees, and Chai improves less than the two (see Table 6).

TABLE 6
THE INITIAL METACOGNITION OF SUBJECTS

Subjects	Metacognition			
	Knowledge of cognition	Regulation of cognition		
	Declarative knowledge	Planning	IMS	Evaluation
Long	has knowledge about ability as a learner and strategy	Previews before course	Take notes every course, underline the importance	Summarize after finish autonomously
Yao	has a little knowledge about being a learner, has some basic idea of strategy	Sometimes Previews before course	Only can scribble down some broken words, write the key words	Only summarize when it is required
Chai	has little knowledge about being a learner, has no idea of strategies	Never preview	Cannot copy down the useful information and then give up when miss too much	Only summarize when it is required and do not take it seriously

C. Reflective Dairy

It is required that the reflective dairy should be handed in before the new unit begins. The data indicates that the three subjects have different metacognition at first, for instance:

In the future, I will learn by taking notes to stay focused on what the teacher is saying and take part in class discussion more actively which is suitable to my learning style. (Long)

I have learned English for many years, but I never know what the suitable way is for me. I don't even know which way I am using. (Yao)

Honestly, I don't love this class, sometimes I think it's just waste time .but I think everything happen for reason, I will go for it. (Chai)

As we mentioned above, the three subjects have different metacognitions, the fragments of their first reflective dairy and pre-interview supplement each other.

After one weeks' intervention of course, for example:

Though through the test I found that my AQ is higher than the average level, but I know I am a person who can easily give up a thing because it is hard or inconvenient, I must pay more attention to the cultivation of perseverance. (Long)

It surprised me that I had such a low score of Adversity Quotient (AQ). I really felt a little depression about the result. But to be honest I know that I deserve it. (Yao)

My total AQ score is above the average level, but the score of control part is not enough. (Chai)

1. Long said that she could learn more when the topic was appealing, and the interests motivated her to learn hard. As for Adversity Quotient, her point was 152, above the average. She demanded herself to take action every day to move in the direction of her goal even if it was just a small step. It indicates that Long is not afraid of challenges and problems, and she stays positive outlook when encountering difficulties. She is willing to change the present condition of her study.

2. Yao mentioned she was unconfident so that she did not want to accept challenge. Her Adversity Quotient point was 94, the lowest score of her group. Her words in reflective dairy indicate that she realizes her weakness but she did not take practical actions to set plans to improve.

3. Chai's Adversity Quotient point was 142, just like Long, above the average, but not enough in control part. He could not stick to his goal when the challenge or problem is too difficult.

According to the AQ questionnaire completion, the three subjects could understand the meaning and significance of new information Adversity Quotient. The findings indicate that different individuals have different competence and metacognition, and also have different degrees of metacognition formation.

In Unit 3, the content is about memory and vocabulary. The teacher mentioned some methods to memorize the vocabulary. And we can tell the different attitude towards this strategy course which would influence the learning effect of the course (to see Table 6 that the varying degrees of improvement of metacognition). And the questions list is as follows:

Question 1, 2:

Are you good at remembering information? (Declarative knowledge)

Are you aware of what strategies you use when you create art? (Procedural knowledge)

All of the subjects thought that memorizing vocabulary by finding the contacts between words is very interesting. For instance:

However, after I finished the learning of this chapter, I found that it's not the English words themselves but the way which we chosen to memories those words that made us bore and made our learning process result less. At the same time, this method is not able to be applied to all the words. (Long)

There are so many ways to remember words, and remembering words can be very interesting. If you find the right way, you will not feel that difficult to do it. It's hard to say which the best way is; everyone has his own advantages and disadvantages, so everyone has a best way just for himself. I can remember those words according to a story instead of letters. It really attracted me. (Yao)

Actually, this unit could help me, but, I am not sure. I will try to find out the suit way. I think the way to remember new words by creating contacts among different words, is very interesting. (Chai)

As usual, all of the three subjects memorize new words by rote before the teacher introduces a new method of memorizing, sketching. Sketching is to connect the vocabularies by making up a story with logic relation. But none of them like it. Chai thought sketching is interesting method but he still wanted to find a suitable way for himself. He said vocabulary memorizing was a big problem. Long mentioned that the method was too lengthy and tiring. She tried once but the result was not very efficient. Yao confessed that she had seldom memorized vocabulary.

It indicates that the three subjects are not very clear about what strategies they use. They cannot clearly point them out but Long begins to be aware of advantages of using strategy.

The lecture of unit 4 to unit 7 is the four skills in language learning: listening, speaking, reading and writing. Listening and speaking play important roles in people's communication activities.

Question 3, 4, 5:

*Did you know exactly the purpose of language activities, such as "I understand which skill is acquired to practice"? (*Planning*)*

Did you encourage yourself to speak English even when you are afraid of making a mistake?

Can you motivate yourself to learn when you need to? (Conditional knowledge)

The three subjects refer to the specific condition of their listening and speaking competence, for example:

Thought it makes me pretty frustrating, I have to admit the fact that my spoken English is poor. I was told that I always speak English with Sichuan accent and I find that it's kind of difficult for me to tell the stress. (Long)

For me, maybe I did worse in listening. I cannot concentrate on too many words, in another words, I'm lack of patience. To be honest, I always lost in thought while others are talking. So I will miss the point they want to express. It's really not a good habit, so I'm trying to get rid of that. (Yao)

After unit 4, I found when we cannot listen clearly; I will express it by my way that I used to think about and by my experiences. The game was very interesting. It makes me understand our weakness of listening. But still I don't know how to handle it. Next time, I will try to describe the word I don't know, and I will use my body language. And I should open my mouth. (Chai)

1. Long said that she felt self-abased about her dumb English. Nonetheless, she listed out the reasons why she was a poor speaker. And then she worked out the plan to solve the problems. It indicates that she does self assessing and use efficient strategy to draw up a plan.

2. Yao was unconfident in speaking, but her pronounce was standard. She only mentioned her poor performance in listening and speaking. She almost did not mention her plans or solution to overcome her weaknesses. It indicates that Yao cannot organize her studying very well.

3. Compared with other two subjects, Chai had some same problems, including limited vocabulary, difficulty in finding proper words to express and so on. And he indicated that he will change the condition, he would find a solution.

To sum up, the three subjects are lacking in organization to various degree.

Both Long and Yao mentioned the weaknesses of their listening and speaking skills, however, they do not come up with useful solutions to improve their situation. It indicates that the three subjects do not adjust their learning method effectively.

Question 6, 7, 8:

*Did you use relevant instructional books and reference books? (*Debugging strategies*)*

*Did you stop and go back over new information that is not clear? (*Debugging strategies*)*

Are you good at organizing learning content? (Declarative knowledge)

The following fragments are the reflective dairies of Unit 6 reading, the assistant required three subjects to talk about how they read. Here are the fragments:

Scarlett is vanity and selfish, wants to be the center of everybody's life and enjoys letting men to quarrel from jealousy for her, which makes me disgusted. (Long)

The book Little Prince tells a simple story about the little prince from a little planet. The little prince is just a child, so he sees the world in a child's pure vision. He asks simple questions, criticizes the wrong things. He thinks the adults are all strange, so he dislikes adults. (Yao)

GONE WITH THE WIND is my best love. I love Scarlett, even though she loves money, and she missed her true love, maybe I felt pity for her, but I love her persevere , she is very wisdom, even though faced the war, she still had ways to make her live better. I though she is a great woman. (Chai)

1. Long's favorite book was *Gone with the wind,* she understood the novel very well, her comment was focused on the main character Scarlett, including her family background, complicated personality and her eventful life. She had a good grasp of the point of the book that it has two plotlines. As indicated by her reflective dairy, due to the profundity of the book, Long must use reference books to help her understand the in-depth meaning of the book. It shows that Long use strategy when reading.

2. Yao mentioned she was always absent-minded while reading so that it often took her a longer time than normal. And she always focused on the vocabulary. It can be known that Yao begins to use strategies to help her improve her reading. She stops consciously to figure out the confusing parts or words of the reading materials.

3. Chai mentioned that he could not read a paragraph with new word, when there was one, he must stopped to look up dictionary immediately. So it took too much time and the interruption by the unknown words reduced his interest to continue reading. It shows that he still has no big changes about his learning methods.

And then the following Unit 7 focuses on the writing skills.

Question 9:

Did you try to translate new information from one project to the next? (*Information Management Strategies*)

From this book, I also learned a lot about writing. In the past, usually, writers create two kinds of characters: the good ones and the bad ones. But in the reality there is no absolute good people or absolute bad people, everyone can be regard as a combination of angel and evil. (Long)

If you are writing a professional article, you should use some technical words. Another point is you should arrange your general idea before you write, or you may run away from your main idea, that's the mistake I always make. (Yao)

Writing is a hard job. I have problem. When I wrote I found that I am lack of words, in English can't describe the picture in my mind, I cannot express what I thought, but I have confidence. I believe I can overcome this .so work hard. (Chai)

1. According to the sentence Long mentioned in her reflective dairy: "This theory also can be applied to our own writing", we can tell she did not just reading a book, she also drew inference from the book. It indicates that she summarizes after she finished reading and she combines the theory with practices. But she also mentioned she never do extra-practices after class.

2. Yao gave some tips about writing, but all of them were general. She did not mention what methods she used in her writing. And she seldom used the new sentence pattern, and also she tried to avoid using complex sentence because she thought it was unnecessary. It indicates that she chooses learning strategy optionally.

3. Chai thought it was hard for him to do writing assignments. He still struggled with vocabulary because he could not express his thought by proper words. He mentioned that he would overcome it but he did not have any plans. It indicates that, unlike Long, he shows no concern of setting plans to conquer his learning problems.

As we mentioned above, the different conditions of listening, speaking, reading and writing among subjects are clear. Through weeks' learning, it brings about some changes in metacognition of three subjects.

The goal of unit 8 is to understand the teamwork and found your own position in a team in order to achieve the common goal. Here there are:

What a brick is to a building, a member is to a team. In a team, each individual member has their own abilities, each of them has his own position and each of them is essential. I decided to have a change, I will pay more attention to the cultivation of being a leader, learn to be independent, and make decisions by myself, I think this personality would be very helpful in my further development.(Long).

Group is important for every member, and each member is important to a group. Each member has a different role in a group. Only when everyone in group join the work, will the group run fluently. Just like a machine, a machine would break up if any part of it stops working. (Yao).

After this part, I get some massage. I have the quality of a leader, I used not to be like this, maybe I am just a little stubborn, ok , I have strong desire of control, and I am always a decision-maker, but I am not born in this way, actually, I have no choices. (Chai).

Long mentioned that "*I found myself have difficulty positioning myself in various teams because I am engaged in different teams on different occasion, as in my family, school or class, and dorm and there is more than one role for me to play in different situation.*", it indicates that she knew exactly what role she should play in different groups and situations, and she said "*I will pay more attention to the cultivation of being a leader, learn to be independent, and make decisions by myself*", it means that she tried to learn how to be a good leader in order to   improve herself in her further learning.

Yao listed the key point of being work together, she mentioned that "*as a part of a group, we should take a good use of everybody's advantages and avoid their disadvantages*", it means that she knew the importance to find one's position in a team, but she does not mention to her own position at all. It indicates that she has the knowledge of positioning in group, but she does not find out which role is the fittest one for her.

According the questionnaire the subjects did in class, Subject Chai was a closure-oriented type in learner preference, he was action taker and decision makers, after this unit, he confirm himself as a leader. Based on his words, it can be found that Chai knew his positioning in a group and he did great job.

Long had already built up a metacognition system. She had basic knowledge of setting goal, and can schedule her learning plan list. It can be found that she has an initial metacognition at first place. We can tell her metacognition gradually forms from her performance during strategy course. From Unit 4 to Unit 7, Long's metacognition formation is progressing; she uses many strategies to improve her four skills. Indeed her metacognition system is not consummate.

As for Yao, she possessed some metacognition knowledge but her metacognition formation was not systematic. She had knowledge of setting goals but the learning plan was lack of details about timing and learning materials. In view of the performance of four skills of language learning, it can be concluded that Yao's condition is not stable. We can tell that she does not have very obvious formation of metacognition; however, she does not try to continue improving. Compared with Long, Yao's metacognition is in embryo. Her process of forming condition is slower than Long.

The last subject Chai had been dubious about the learning strategy course and formative assessment till now. He was the worst among the three subjects because he did not cooperate with teacher and assistants. His attitude towards the course was still suspicious after weeks' intervention of the course. According to his performance in and out of class, we can tell that he does not actively answer teacher's classroom question, and during the group discussion he seldom make statement to other group members initiatively. And he does not take reflective dairy seriously and his words are disorder and unsystematic. His forming condition is the slowest of all.

We can see their forming in following:

TABLE 7.1
THE FORMATION OF KNOWLEDGE OF COGNITION OF SUBJECTS

Subject	Knowledge of cognition		
	Declarative knowledge	Procedural knowledge	Conditional knowledge
Long	Good at organizing learning content (based on Table 1), know more about herself as a learner	Has knowledge about how to implement the procedure (i.e. strategies) in some categories (speaking, listening, reading, does not know how to memorize vocabulary)	Encourages herself to speak out loud in public; based on the interview, she can motivate herself to learn when she needs to; does not have a clear knowledge about why to use strategies
Yao	Has a little knowledge about organizing learning content (based on Table 2), know about learning preference of herself	Has knowledge about how to implement the procedure (i.e. strategies) in some categories (speaking, listening, reading, do not know how to memorize vocabularies)and rarely actions	Afraid of making mistake when speaking; has a little knowledge about why and when to use strategies
Chai	Has almost no knowledge about organizing learning content (based on Table 3)	Has knowledge about how to implement the procedure (i.e. strategies) in some categories (speaking, reading, does not know how to memorize vocabularies)and has a little actions	Cannot motivate himself to learn when he needs to, has a little knowledge about when to use strategies but has no actions

TABLE 7.2
THE FORMATION OF REGULATION OF COGNITION OF SUBJECTS

Subject	Regulation of cognition		
	Planning	Debugging strategies	Information Management Strategies
Long	Knows exactly the purpose of language activities	uses instructional books and reference books when cannot understand the learning content and stops and goes back over new information when it is not clear	Transforms the new information into her own knowledge
Yao	Knows a little about purpose of language activities	Searches on the internet when cannot understand the learning content, and skip over when the new information is not clear	Tries to process information but only in the surface
Chai	Knows a little about purpose of language activities	Looks up in dictionary when there appears the vocabularies and waste times	Almost no actions

D. Post Interview

The analysis of subjects' classroom observation and reflective dairy on formation of learners' metacognition reveal that the three subjects have improvement in their metacognition after the intervention of autonomous learning strategy course. Four questions are listed as an interview guide after the discussion with teachers and other assistants participating the autonomous learning strategy course.

Question 1, 2, 3, 4:

Did you pause regularly to check your understanding? (Monitoring)

Did you ask yourself questions about how well you are doing while you are learning something new? (Monitoring)

Did you ask yourself if there was an easier way to do things after you finish a task? (Evaluation)

Did you know how well you did once you finish the artwork? (Evaluation)

Long mentioned that she sometimes checked her understanding before she took the autonomous learning strategy course. After the course, she usually stopped and checked if she understood the content of textbook. And she also

monitored herself how well she learnt when she was learning something new, for example, about this autonomous learning strategy course. Compared with Long, Yao did a little less than her. She sometimes monitored her learning process and evaluated herself in order to improve. Chai was doing well at monitoring part, he mentioned that he had to make sure he understood each word of one sentence of the textbook and then he continued. But he never asked himself whether he achieved or not.

To sum up, it indicates that Long does a good job in monitoring and evaluating, Yao does not pay more attention to these two parts, and as for Chai, he does well in monitoring part, but ignore the evaluating parts.

1. First Semester Rank

I collected the data of final average score of major language course of first semester.

TABLE 12
FINAL AVERAGE SCORE OF SUBJECTS (MAJOR COURSE)

Subjects	Average Score(full mark 100)
Long	81.6
Yao	73.8
Chai	74.2

The conclusion can be shown that Long is the best of three subjects on formation of metacognition; she has a systematic knowledge of metacognitive awareness, cognition and regulation. And for Yao and Chai, they both do not smoothly accomplish the tasks to achieve metacognitive knowledge and regulation.

IV. CONCLUSIONS

This study was based on the autonomous learning strategy course. I did the metacognitive strategy training for 8 weeks to English freshmen to cultivate their autonomous learning ability by improving their metacognition and strategy-using.

This article aims to find out that the using of metacognitive strategy could contribute to improving of metacognition and cultivating the autonomous learning ability.

The initial learning level and metacognition of freshmen of English major are disparate when they just enter college in 2011. This paper emphasizes the importance of formation of metacognition and the using of metacognitive strategy. This study tests the application of intervention of *The Course Book of Strategy-Based Instructions of Language Learners* to Language teaching and learning in college. This research adopts the experiment to prove the metacognitive strategy affects the learners' metacognition. The result from the interview, classroom observation and reflective dairies proved that there were different effects of applying strategies on the student's language learning. The major findings of this study can be summed up as follows:

First, autonomous learning strategy course can improve learners' metacognition and learning level more effectively than the traditional teaching methods and summative assessment.

Second, the autonomous learning strategy course using does affect the learners' formation of metacognition, no matter positive or negative. According to the post-interview, the data indicates that the three chosen subject's metacognition improved.

To sum up, autonomous learning strategy course is supposed to be adopted in college language teaching. But it demands teacher's design and so many assistant's help, and it's hard to make the implementation proper to promote language teaching and learning.

Just as strategy training should be integrated into regular classroom activities and taught explicitly (Oxford, 1990; 2003), it can be summarized from the results above that a teacher should attach importance to metacognitive strategy training, which is systematically integrated in regular class in order to develop students' awareness of metacognitive strategy and boost students' application of metacognitive strategy.

First, formative assessment should be designed through the teaching materials, the content of the assessment should be close to the students and the actual level of students should be considered. Also, when designing the feedback intervention, the teachers should consider the situation of different individual.

Second, in the process of implementing assessment, the result of assessment should be fair.

According to the time limit, this study focuses on the performance in class, attitude towards the course and reflective dairy.

However, based on the limitation of the research, there still remain many questions about formation of metacognition and totally different effect on individual of language learning. It is expected that further study should focus on the specific methods in China.

Through the present study, it is necessary to give the feedback intervention to freshmen to guide them to learn strategically. On the basis of data, the metacognitive level of freshmen in foreign language department improves during the autonomous learning strategy course.

Conflicts of Interest: The authors declare no conflict of interest.

APPENDIX A

Items of Metacognitive Awareness Inventory by Gregory Schraw and Rayne Sperling Dennison (1994), University of Nebraska.
1. I ask myself periodically if I am meeting my goals. (M)
2. I consider several alternatives to a problem before I begin the project. (M)
3. I try to use strategies that have worked in the past. (PK)
4. I place myself while learning in order to have enough time. (P)
5. I understand my intellectual strengths and weaknesses. (DK)
6. I think about what I really need to learn before I begin a task. (P)
7. I know how well I did once I finish the artwork. (E)
8. I set specific goals before I begin creating the project. (P)
9. I slow down when I encounter important information. (IMS)
10. I know what kind of information is most important when I learn. (DK)
11. I ask myself if I have considered all options when solving a problem. (M)
12. I am good at organizing information. (DK)
13. I consciously focus my attention on important information. (IMS)
14. I have a specific purpose for each strategy I use. (PK)
15. I learn best when I know something about the topic. (CK)
16. I know what the teacher expects me to learn. (DK)
17. I am good at remembering information. (DK)
18. I use different learning strategies depending on the project. (CK)
19. I ask myself if there was an easier way to do things after I finish a task. (E)
20. I have control over how well I learn. (DK)
21. I periodically review to help me understand important relationships. (M)
22. I ask myself questions about the material before I begin the project. (P)
23. I think of several ways to solve a problem and choose the best one. (P)
24. I summarize what I've learned after I finish. (E)
25. I ask others for help when I don't understand something. (DS)
26. I can motivate myself to learn when I need to. (CK)
27. I am aware of what strategies I use when I create art. (PK)
28. I find myself analyzing the usefulness of strategies while I create art. (M)
29. I use my intellectual strengths to compensate for my weaknesses. (CK)
30. I focus on the meaning and significance of new information. (IMS)
31. I create my own examples to make information more meaningful. (IMS)
32. I am a good judge of how well I understand something. (DK)
33. I find myself using helpful learning strategies automatically. (PK)
34. I find myself pausing regularly to check my understanding. (M)
35. I know when each strategy I use will be most effective. (CK)
36. I ask myself how well I accomplished my goals once I'm finished. (E)
37. I draw pictures or diagrams to help me understand while learning. (IMS)
38. I ask myself if I have considered all options after I solve a problem. (E)
39. I try to translate new information from one project to the next. (IMS)
40. I change strategies when I fail to understand. (DS)
41. I use the organizational structure of the lesson to help me create art. (IMS)
42. I read instructions carefully before I begin a project. (P)
43. I ask myself what I am learning is related to what I already know. (IMS)
44. I re- evaluate my assumptions when I get confused. (DS)
45. I organize my time to best accomplish my goals. (P)
46. I learn more when I am interested in the topic. (DK)
47. I try to break big projects down into smaller steps. (IMS)
48. I focus on overall meaning rather than specifics. (IMS)
49. I ask myself questions about how well I am doing while I am learning something new. (M)
50. I ask myself if I learned as much as I could have once I finish a project. (E)
51. I stop and go back over new information that is not clear. (DS)
52. I stop and think when I get confused. (DS)
Note: DK – declarative knowledge; PK – procedural knowledge; CK – conditional knowledge; P – planning; M-monitoring; IMS – information management strategies; DS – debugging strategies; E - evaluation

APPENDIX B

Items of Metacognitive Awareness Inventory revised by Gao li (2007), SWPU.

1. 我很楚自己的学习能力，如记忆力，学习语言自己有何优势。
2. 我知道语言学习的重点是什么。
3. 我善于组织学习内容。
4. 我对感兴趣的内容学得更好。
5. 学习时，我能意识到自己具体用了那些策略。
6. 我会根据自己的学习情况调整我的学习策略。
7. 我很清楚每种策略如何有效使用。
8. 学习英语时， 我会定期反问自己是否达到目标。
9. 我会定期反思是否达到了好的学习效果。
10. 阅读时，我会停下来想想自己是否已经理解已读的内容。
11. 我很清楚各种英语活动的目的，比如我了解某项听力任务需要锻炼哪方面技巧。
12. 我尽量注意自己的语言错误并弄清楚出错原因。
13. 课前我会自觉进行预习，以大体了解要学的内容。
14. 我会合理安排好时间坚持学习，而不仅仅是有考试压力才用功。
15. 我会计划英语学习目标，如计划自己的学期目标，达到什么水平。
16. 每学完一个新的单元，我会进行总结。
17. 完成一阶段或一学期的学习后， 我会反思自己学习有无进步，学习策略是否有效。
18. 阅读时遇到重要信息，我会放慢速度。
19. 我尽可能把学习任务分成小的步骤进行。
20. 我会做好笔记，把重点知识梳理出来。
21. 我会利用课文结构，图表等类似方法帮助我理解学习内容。
22. 我会使用各种方法尽可能多的使用英语。
23. 我会看相关指导书，参考书，或请教他人帮助我更好地学习英语。
24. 我会从自己的语言错误中汲取教训，避免再出错。

APPENDIX C

Assistant Observation Checklist
(Adapted from Ellen Weber, 1999)

Date Name		Excellent	Good	Needing much Improvement
Activity Participation	Attendance			
	Reliability			
	Initiative			
	Effort			
Attitude	Positive			
	Helpful			
	Attentive			
	Caring			
Study habits	Organization			
	Effort			
	Efficiency			
	Diligence			
Small-group work	Cooperation			
	Involvement			
	Self-confidence			
	Enthusiasm			

REFERENCES

[1] Ajzen, I. & M. Fishbein. (1980). Understanding attitudes and predicting social behaviour (2 vols.). Englewood Cliffs, NJ: Prentice-Hall.
[2] Bloom, Benjamin S. (1968). Learning for mastery. Instruction and Curriculum. Regional Education Laboratory for the Carolinas and Virginia, Topical Papers and Reprints, Number 1.
[3] Cheng Xiaotang, Zheng Min. (2002). English Learning Strategies: from theory to practice. Beijing: Foreign Language Teaching and Research Press, 35-51.

[4]   Flavell, J. H. (1976). Metacognitive Aspects of Problem Solving. In L. B. Resnick(ed.). *The nature of intelligence*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 231-235.
[5]   Gao li. (2007). A Study on the Effect of Learning Strategy Training on Learners' Metacognition. Master's Thesis, South-west Petroleum University, Sichuan, China.
[6]   Holec, H. (1981). Autonomy and Foreign Language Learning. Oxford Pergamon, Janus Book Pub/Alemany Pr, 1-65.
[7]   Oxford, R. L. (1990). Language Learning Strategies: What Every Teacher Should Know. Boston: Heinle& Heinle, 1-57.
[8]   Schraw, G. & Dennison, R.S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, 19: 460–475.
[9]   Scriven, M. (1967). The methodology of evaluation. In R. W. Tyler, R. M. Gagné, & M. Scriven (Eds.), *Perspectives of curriculum evaluation.* Chicago, IL: Rand McNally, 39-83.
[10]   Wen Qiufang. (1996). On English Learning Strategies. Shanghai: Shanghai Foreign Language Education Press, 55-159.

Wei Zhou was born in Sichuan, China in 1987, received her Master degree in Southwest Petroleum University, China in 2013.She is currently an assistant teacher in the School of Foreign Languages, Southwest Petroleum University, Sichuan, China. Her research interests include psycholinguistics and applied linguistics.