Effects of MST (Metacognitive Strategy Training) on Academic Reading Comprehension of Chinese EFL Students

ZHANG Lian, Sirinthorn Seepho

Suranaree University of Technology, Nakhon Ratchasima, Thailand

Metacognitive strategies are important for successful second/foreign language readers. The aim of the study was to explore the effects of MST (metacognitive strategy training) on academic reading comprehension of Chinese university EFL (English as a foreign language) students. Data gathered from the reading comprehension test, questionnaire, students' journal, and semi-structured interview were either quantitatively or qualitatively analyzed. It was found that the MST has positive effects on the reading comprehension in several ways and the students generally held positive attitudes towards MST incorporated into the regular EFL reading curriculum.

Keywords: MST (metacognitive strategy training), academic reading comprehension, Chinese university students

Introduction

In the age of globalization, reading in second or foreign language settings continues to play an increasingly important role. Eskey (2005) has pointed out that many students of EFL (English as a foreign language) rarely need to speak the language in their day-to-day lives but many need to read it in order to "access the wealth of information" (p. 563) recorded exclusively in English. In relation to reading, particular to university students, Levine, Ferenz, and Reves (2000) stated that the ability to read academic texts is considered one of the most important skills that university students of ESL (English as a second language) or EFL need to acquire. Reading for academic purposes is in-depth comprehension, which is often associated with the requirement to perform identifiable cognitive and procedural tasks such as taking a test, writing a paper or giving a speech (Shih, 1992). Students need reading skill in order to search for information that they need for their academic purposes and the text type of the ESL academic reading is mostly expository (HUANG, 2006). However, reading proficiency in an L2 (second language) does not develop as fully or easily as it apparently does in one's L1 (first language) due to the complexity inherent in the reading process. As Grabe and Stoller (2002) mentioned, reading is one of the most difficult skills to develop to a high level of proficiency for ESL learners. Many learners have difficulties in understanding what they read, in particular, comprehending academic texts (Snow, 2002). In addition, Dreyer and Nel (2003) pointed out many students enter higher education underprepared for the reading demands that are placed upon them.

Reading is an active, constructive, and meaning-making process, one's awareness and control of these

---

ZHANG Lian, Ph.D. candidate of School of Foreign Languages, Suranaree University of Technology; associate professor of the College of Foreign Languages, Guizhou University.

Sirinthorn Seepho, Ph.D., lecturer of School of Foreign Languages, Suranaree University of Technology, Thailand.

cognitive processes is metacognition and it is a critical tool to successful reading (Alvermann & Phelps, 2002). Metacognitive processes have been understood to play an essential part in achieving comprehension (Phan, 2006). The use of metacognitive strategies in the reading process has been generally supported as a valuable aid for its cognitive, social, and linguistic benefits.

Many studies (Brown, 1980; Carrell, 1989; Carrell, Pharis, & Liberote, 1989; Garner & Alexander, 1989; Chamot & O'Malley, 1990; Dhieb-Henia, 2003) have addressed the positive effects of utilizing metacognitive strategies in the reading process. While such process-oriented studies in L2 research have increased our knowledge of the metacognitive process of students in ESL training programs, but they are not conducted in the Chinese context. An obvious gap in most of the previous empirical studies on MST (metacognitive strategy training) is that metacognitive strategies were not trained in a systematic manner. For instance, Palincsar and Brown (1984) taught poor readers to monitor their comprehension by summarizing, questioning, clarifying, and predicting. Carrell, Pharis, and Liberote (1989) focused on training in two strategies: semantic mapping and the Experience-Text-Relationship method, which involved activating background knowledge, reading texts against the activated background knowledge, and checking comprehension. Muñiz-Swicegood (1994) trained bilingual students to use the strategy for self-questioning. LIU (2010) trained the strategies for planning, selective attention, monitoring, and evaluating, but she adopted Pearson and Dole's (1987) five-step method, which targets isolated strategies. That is the students were trained to use strategies one by one. Moreover, little empirical research has been done to investigate readers at advanced levels of reading instruction, and it is at this stage of acquisition where more reading research is needed. In addition, it is worth knowing the students' attitudes toward metacognitive strategy training. It could inform us about the reasons they liked or disliked the training so that we can improve it for future training and hence gain more collaboration in the learning process. The gap in literature leads to the exploration of the following research questions: (1) Does MST have any effects on students' academic reading comprehension? If so, what are the effects? (2) What are the students' attitudes towards the MST in academic reading comprehension?

Method

Participants

The setting for the present study was a comprehensive university in southwest China. A total of 58 third-year English major undergraduate students at Guizhou University, China, participated in this study. The students were from two intact classes. They were randomly designated as one experimental group (N = 33) and one control group (N = 25). Among the experimental group, high and low proficiency group is respectively identified. All of them were high school graduates and were currently pursuing a bachelor degree. In China, English is compulsory for all the middle school students, which means all of the third-year undergraduate students have learned English for at least eight years (six years in the middle school and two years in the university). The students were classified as advanced EFL learners for two reasons. First, according to the National Curriculum for College English Majors of Higher Education in the People's Republic of China (2000), third-year English major undergraduate students were at the advanced level. Second, the participants in the present study were in advanced level since they had already finished Basic Reading Course and the Comprehensive Reading Course and successfully passed the exam. In principle, according to Bamford and Richard (2004), advanced language

learners are those who already have a basic knowledge of and are literate in the foreign language.

Instruments

The instruments used in the study were RCT (Reading Comprehension Test), the questionnaire, the students' journal, and the semi-structured interview. In order to address the first question, which concerns the effects of MST on reading comprehension, students' reading achievement was assessed by the RCT. To address the second research question, which concerns the students' attitudes towards the MST, the questionnaire, students' journals, and semi-structured interviews were employed.

Data Collection and Data Analysis

Notes. ⬭ = metacognitive reading process; ⌐¦⌐ = metacognitive activities in academic reading comprehension (Adapted from Chamot & O'Malley, 1990).
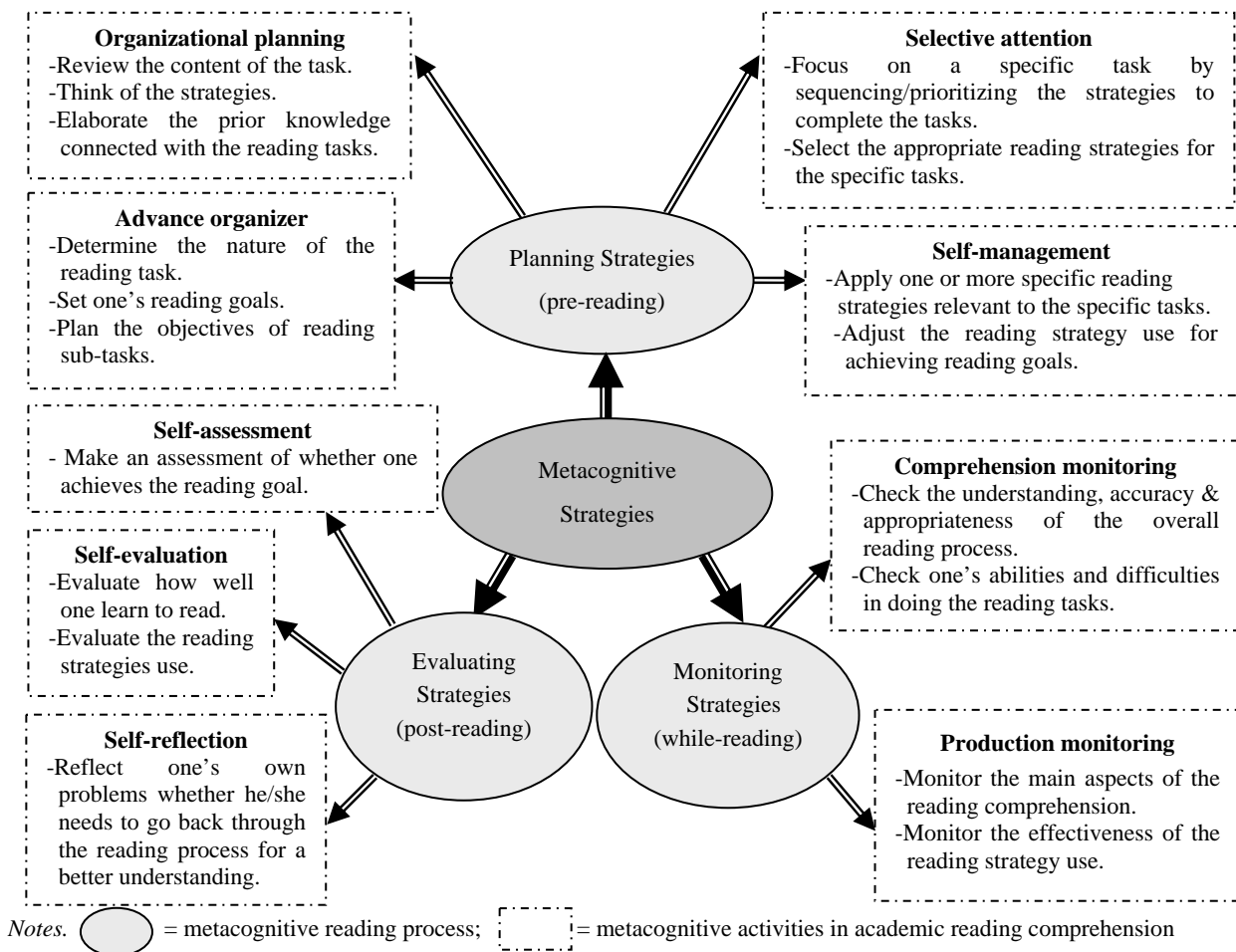
Figure 1. MSTARC (Metacognitive Strategy Training Model of Academic Reading Comprehension).

The data collection procedure is delineated as follows: First, the two intact classes were randomly assigned to experimental group and control group and pretested by RCT to decide if there were significant differences among them before the intervention. Next, the researcher applied the MST treatment to the experimental group while the control group received the regular reading instruction. Figure 1 showed the MST model used in this study. Insights from the research mentioned above point out the need to incorporate metacognitive strategies into reading practice because they allow readers to reflect on their problems and look for appropriate strategies to accomplish their

reading goal. The present study combined explicit ways of encouraging basic metacognitive components: planning, monitoring, and evaluating with individual reading strategies based on the previous studies (Chamot & O'Malley, 1990, 1996; Wenden, 1999). In addition, the participants in the experimental group were told to record their reactions in their reading journals three times during the 18-week training.

At the end of the 18-week period, the two groups of students took the posttest. After that, the experimental group completed the questionnaire aiming at exploring the students' attitudes towards MST. To ascertain whether any additional variables played a role in reading comprehension, a semi-structured interview was conducted a week after the posttest with 10 students randomly chosen from the experimental group. Chinese was used for better understanding and convenience. The data obtained from the RCT and questionnaire were quantitatively analyzed using descriptive statistics and those from journals and semi-structured interview were qualitatively analyzed.

Results and Discussion

The Reading Comprehension Test

The participants' scores on the pretest and posttest were compared in order to verify if there were any improvements in the students' reading comprehension, thus to examine the effects of the pedagogical intervention. Descriptive statistics were used to get an overall picture of the students' performance. As shown in Table 1, it was found that the reading comprehension of experimental group was higher than the control group.

Table 1

Descriptive Statistics for the Results From the Pretest and Posttest

Group (N = 58)	Tests	Mean	SD (Std. Deviation)
Control group (N = 25)	Pretest	18.26	3.104
	Posttest	19.86	3.132
Experimental group (N = 33)	Pretest	18.62	3.057
	Posttest	23.58	3.526

To find the effectiveness of explicit metacognitive strategy training of the experimental group and compare the improvement with their counterparts in the control group, both groups took the same posttest after the training. The test results of the two groups were compared using independent samples *t*-test statistical procedure. The results in Table 2 showed that the mean scores of the experimental group (Mean = 23.58, SD = 3.526) was significantly ($p < 0.01$) different from the control group (Mean = 19.86, SD = 3.132). In other words, while there was not any significant difference between control and experimental group in terms of reading skills at the beginning of the study, the experimental group surpassed the control group at the end of the experiment.

Table 2

Independent-Samples T-test in Reading Comprehension

Group	N	Mean	SD	*t*	*p*
Control group	25	19.86	3.132	-4.208	0.001[*]
Experimental group	33	23.58	3.526		

Note. [*] Significant at 0.01 level ($p < 0.01$).

With regard to the improvement of the experimental group, paired *t*-test was used to perform the comparison of the pretest and posttest, thus to verify the effectiveness of pedagogical intervention on the EFL learners. Table 3 illustrated the results of the paired sample *t*-test in reading comprehension of experimental group before and after MST. The results showed that the mean scores (before Mean = 18.62 and after Mean = 23.58) training demonstrated significant difference. It can be concluded that MST was effective and had strong effects on the experimental group.

Table 3

Paired-Samples T-test in Reading Comprehension of Experimental Group

Experimental Group	N	Mean	SD	*t*	*p*
Before training	33	18.62	9.336	-3.760	0.001[*]
After training	33	23.58	8.373		

Note. [*] Significant at 0.01 level (*p* < 0.01).

In sum, all the quantitative data pointed out the fact that the students who received MST in reading did indeed benefit from it. What this study also confirms was that the MST empowered advanced level students in heighten their academic reading ability with the practicality of the metacognitive reading strategy use.

Questionnaire

The questionnaire was conducted with all the 33 students when they finished the posttest. The first part contained 5-point Likert-scale questions that arranged from "strongly agree" to "strongly disagree". The students' responses were coded and analyzed by SPSS (Statistical Package for the Social Sciences) 15.0. The percentage of the students' responses was illustrated in the Table 4 below.

Table 4

Students' Responses on the Questionnaire (N = 33)

Content	Frequency/Percentage of the respondents					
	Strongly agree	Agree	Undecided	Strongly disagree	Disagree	Average
(1) I am satisfied with the MST in reading.	9.1%	60.6%	18.2%	9.1%	3.0%	3.64
(2) The MST in reading improves my reading comprehension.	24.2%	42.4%	15.2%	12.1%	6.1%	3.67
(3) I can use more metacognitive reading strategies before, while and after reading.	18.2%	51.5%	12.1%	9.1%	9.1%	3.60
(4) I know clearly when, how and why to use metacognitive strategies in my reading comprehension.	21.2%	39.4%	12.1%	21.2%	6.1%	3.48
(5) I will join such kind of training in the future if I have chance.	12.1%	60.6%%	15.1%	9.1%	3.0%	3.70

The quantitative analysis of the data elicited through the questionnaire revealed that more than half of the students were satisfied with the MST in reading. Of the five questions, the greatest proportion of respondents (72.7%) would like to join the MST in the future and also, 69.7% students felt they could use more reading strategies than before. Meanwhile, 66.6% students showed a tendency towards the positive agreeing with statement number 2 that the MST in reading improves their reading comprehension. Equally important, 15.2% chose "undecided" and 12.1% "disagree" and 6.1%"strongly disagree" as their response to this question. The least proportion of respondents (60.6%) thought they knew clearly when, how, and why to use metacognitive

strategies in their reading comprehension.

It was found that the students had the highest average score on item 5 ($\overline{x}$ = 3.70) and followed by item 2 ($\overline{x}$ = 3.67), which means that many students thought that the MST could improve their reading comprehension and would join such kind of training in the future. While the students had the lowest average score on item 4 ($\overline{x}$ = 3.48) which is the most important and difficult part in MST.

Students' Journal

The purpose of the students' journal was to obtain information about the potential changes of the students' attitudes over the pedagogical intervention. Sixty pieces of the students' journal were collected for qualitative analysis. The students were allowed to write either in Chinese or English as long as they felt comfortable. It turned out that most of the journal entries (N = 60) were written in Chinese, which the researcher translated into English. Table 5 shows the students' attitudes demonstrated in the three entries of journal.

Table 5

Frequency of the Students' Attitude Over the Treatment (N = 60)

Group	Feedback	Positive	Neutral	Negative	Total
High proficiency	Entry 1	6	2	2	10
	Entry 2	7	2	1	10
	Entry 3	8	1	1	10
Low proficiency	Entry 1	4	3	3	10
	Entry 2	5	2	3	10
	Entry 3	7	2	1	10

From Table 5 above, it can be found that the number of the students who held the positive attitude increased from the entry 1 to entry 3, and the number of students who held the neutral and negative attitudes decreased; some of them changed their attitudes from neutral or negative to positive. More details can be seen from their journal entries.

The First Journal Entry

The first journal entry was conducted when the students finished studying Text I of Unit Two, *The Fine Art of Putting Things Off*. As shown in Table 5, 20 journal entries were used for qualitative analysis. Six students from the high proficiency and four from the low proficiency group had positive attitudes. They reported that MST helped them improve their reading comprehension. One student (HP5) stated, "I think the MST is helpful because it made me know how to read the text efficiently and solve the problems" (ZHANG, personal communication, 2009). Meanwhile, since the MST just began, some students who held the negative attitudes, they doubted whether it can work or not for improving their reading comprehension. It was found that five students demonstrated negative attitudes, two from the high proficiency group, and three from the low proficiency group. Student HP2 stated: "It is because I could not concentrate on reading if I think about the strategies". Similarly, student LP10 stated: "I'm sorry I have to say the MST is not useful for my reading comprehension, time is limited I have to pay attention to reading itself" (ZHANG, personal communication, 2009). Equally important, two high proficiency students held the neutral attitude they were very cautious in expressing their attitude towards the MST. These students believed MST might be useful but some doubts still existed. The typical comment was like:

"I think MST may be well worth, but I am not sure, I am still learning to use the strategies in my reading comprehension" (HP7, 2009).

The Second Journal Entry

When the training has gone half way through, 20 journal entries were submitted for qualitative analysis. First, the results revealed that one student (HP6) changed her attitude from negative to the positive. She stated, "I gradually get used to use the reading strategies, it makes me read more purposefully and effectively, after MST, I become more confident in my reading" (ZHANG, personal communication, 2009). It clearly showed that after the students tried several times of using metacognitive strategies and experienced the positive results such as better comprehension, more correct answers, they felt more confident with reading. Second, one student (LP4) changed her attitude from neutral to positive, he stated, "MST changed my way of reading, and I found the way I read before is not effective, I learn a lot of useful reading skills and strategies. Before I only focus on vocabulary, in fact, both are needed for better comprehension" (ZHANG, personal communication, 2009). This indicated that MST provided a new angle for the students to reflect their effectiveness of their reading comprehension, they benefited from it which increased their reading motivation. Third, three students in the low proficiency group continued her negative attitudes towards the training. As LP10 (2009) claimed, "MST might be effective for reading, but I feel difficult to use them in my reading process, my reading has not been improved". It was in line with Anderson (1991), low proficiency readers might know strategies are useful but they did not have enough linguistic knowledge to build on. The low proficiency students need more time and effort to become strategic readers.

The Third Journal Entry

Twenty journal entries were qualitatively analyzed after the students had finished reading course. Firstly, the results revealed that two students from low proficiency group changed their attitude to positive from negative. Like one of them said, "I take a long time to change my way of reading and gradually get used to the metacognitive strategies, I can not deny that MST can help me" (ZHANG, personal communication, 2009). It showed that students' metacognitive strategies need time and effort to be cultivated and involved many factors especially for the low proficiency students. Their change of the attitude supported that MST was effective in promoting students' reading comprehension if conducted properly. Students were becoming more positive in strategy use as the MST went along since they were aware of that these strategies can make them strategic and successful readers. Secondly, for the high proficiency students, no change from the negative to positive, but one student (HP8) changed her attitude from neutral to positive. Her statement was interesting, "I am a person who is reluctant to make quick decision for something, I found that MST is useful but I need wait until last minute to show my opinion, so I always keep neutral" (ZHANG, personal communication, 2009). Thirdly, still two students, one from the high and one from the low proficiency group, finally had the negative attitudes towards the MST. One (2009) came from the low proficiency group said, "I don't like the training, I spent a lot of time on that, but nothing improved, it is time wasting for me". It showed that MST might help most of the students but nothing can solve all the problems, the same as MST.

In short, the data from the questionnaire and the students' written feedback were analyzed to find the students' attitudes towards the MST. The analysis of the students' responses suggested that they had varied

attitudes towards the reading tasks. That more than half of students were satisfied with the MST indicated that it had a positive effect on learners' attitudes, which is in essence the ultimate objective of this study.

Semi-structured Interview

An analysis of the students' responses to the interview suggested that they had varied attitudes towards the MST. More than half of the students were satisfied with the MST which indicated that it had a positive effect on learners' attitudes, which is in essence the ultimate objective of this study. Based on the interview guided questions, the interviewees shared their attitudes towards the MST.

Students' responses to question number 1 "What do you like/dislike most about the MST? Why/Why not?" and number 2 "How do you think the MST will help/not help you improve your reading comprehension?" provided more insights to understand why MST had or did not have effects on reading comprehension. The responses were summarized in Table 6.

Table 6

Likes and Dislikes Towards MST

Likes	Reasons	Dislikes	Reasons
Systematic training	Learn the strategies systematically.	Task type	Only multiple choice, boring.
Explicit teaching	Easy to understand and learn.	Text type	Only expository.
Reflective journals	Help find the reading problems.		
Vocabulary instruction	Help to acquire the strategies.		
Metacognitive strategy questionnaire	Help make clearer about one's strategy use.		

The Likes towards the MST mentioned above showed the students' appreciation how MST facilitated their reading comprehension. It is not surprising that students felt benefits from the MST thus held the positive attitudes towards it. One student (HP3) (2009) showed her likeness to the MST, "I love the MST, it gives me a lot, my reading ability has been improved". Another (LP5) (2009) was fond of journal writing, "Before MST, I never evaluate my reading comprehension, but now I find a good way to improve my reading that is writing journals after reading, it's valuable and helpful to do it". It is found that if the students liked, they felt helpful in some aspects to improve their reading comprehension. All the items of the Likes should be considered and items of Dislikes should be avoided when conducting a MST to enhance the effectiveness of the training.

The informants' responses to question number 5 "In the future, will you apply metacognitive strategies in reading? Why?" were consistent to their responses to question number 1 and 2. It was found that all the students tended to apply metacognitive strategies in their reading. Student HP10 (2009) said: "I am sure that I will use metacognitive strategy in my reading in the future, why not? It helps me a lot. I think any strategic reader should use it…". Once students acquired the metacognitive strategy use, they benefited from it for their academic reading comprehension.

The answers to the question number 3 "Do you have any problems applying the metacognitive strategies in reading? If any, what are they?" were various. The problems mentioned were concerning with application of each strategy in their planning, monitoring or evaluation process. The following problems ranked the first five: (1) inadequate vocabulary; (2) difficulties in using some strategies, such as inferring, predicting etc.; (3) lack of time and practice; (4) inability in evaluating; and (5) lack of motivation.

It was evident that vocabulary was regarded as a major problem that the students had in their strategy using and reading comprehension. LP2 said: "Reading strategies are useful, but for me, enlarging my vocabulary is also very important since I usually get confused by the difficult words which sometimes can not be solved by strategies" (ZHANG, personal communication, 2009). It clearly showed that the combination of the strategy training and vocabulary instruction is the right way for MST. Neglecting in any aspect would lead to the inefficiency of the training since language problem and reading problem was closely related to promote better reading comprehension.

In short, the students reported their problems concerning their application of the metacognitive strategy use in reading, which the researchers could take into consideration when proposing a teaching model of metacognitive strategy training in reading classrooms.

In their responses to question number 4 "Do you have suggestions with the MST? If any, what are they?", students made some suggestions about the MST in reading. Cited below are some representative examples of students' suggestions (see Examples 1-3).

Example (1) More task type should be applied.

(2) Various text types should be used.

(3) MST should begin earlier.

The results were in line with students' responses in question number 1, what the students disliked, they gave suggestions for the MST. HP5 (2009) stated: "… The reading materials should be more varied and there should be more argumentative texts thus to trigger our thinking". Suggestions were also given to the task type. LP3: "More tasks should be involved to suit our reading ability and interest. And more importantly, we should practice the reading strategies for various tasks in order to use it effectively" (ZHANG, personal communication, 2009). Equally important, some students suggested that the MST should begin in their first reading course in the university too. In summary, data derived from the questionnaire, the journal, and semi-structured interview were analyzed to conclude the picture of students' attitudes towards the MST.

Conclusions and Implications

The present study was conducted to examine the effects of metacognitive strategy training on EFL students' academic reading comprehension and to explore their attitudes towards the training. The research findings proved that the MST was effective in enhancing the students' academic reading comprehension, and the students generally had positive attitudes toward it. This study contributes to the research on MST by providing an applicable training model for EFL learners in Chinese context. The training model proved to be effective in improving the students' use of metacognitive strategies and provided empirical support for other research findings of that are crucial for EFL academic reading, while revealing some significant views.

Firstly, the implementation of MST should be as earlier as possible since the independent use of metacognitive strategies develops gradually through experience (Dhieb-Henia, 2003). Data from the students' interview confirmed that the explicit MST should begin at an earlier stage in students' reading ability development rather than at an advanced stage. This supported the findings of Foorman, Breier and Fletcher (2003). It is also highly suggested the metacognitive strategy can be embedded in the daily reading teaching and started at the beginning of the reading teaching course, thus the students' metacognitive strategy awareness can

be effectively promoted and it will lead them to be autonomous readers.

Secondly, MST should be implemented in a systematic manner by the explicit instruction. The instruction of the whole set of strategy is more successful than separate individual strategy training. Teachers can help learners become more aware of metacognitive strategies through explicit instruction so that they can self-control their own learning process (Harris & Graham, 1996; Butler & Winnie, 1998). The findings from this study are directly beneficial to other researchers aiming at developing students' L2 reading abilities with different language proficiency levels as well as teachers' L2 reading instructional methods.

Thirdly, self-reflection is effective for the students to be aware of their strengths or weaknesses. Data from the interview displayed the students' preference towards the reflective journals. In this case, journal writing can play an important role as an appropriate tool in encouraging students to think about their own reading process and consider ways of improving their reading ability. The students are motivated when they experience the success through self-reflection. Padgett (2000) suggested that engaging students in journal writing could be a way to increase the students' interest in the reading task.

Fourthly, more attention should be paid to the vocabulary in EFL reading. Similar to EFL learners in other culture, Chinese EFL learners reported having problems with vocabulary. Data from the interview supported this. Students believed that the more vocabulary they have, the more effective they acquire the strategies. It is important, therefore, to provide systematic instruction to develop vocabulary in terms of quantity and quality. In this case, EFL teaching may have to provide more opportunities dealing with new vocabulary words.

Finally, in terms of the research method, quantitative and qualitative data triangulation should be applied to design MST. This study triangulated data collection techniques including pretest, posttest, students' written feedback, questionnaire, and interview. Triangulation through multiple measures enabled the researcher to verify the research findings and contributed to a better understanding of the effects of MST on EFL students' reading comprehension.

In addition, given a large number of EFL readers worldwide, further research toward developing a comprehensive picture of EFL academic reading would be timely. The picture could be completed with research on academic EFL reading that involves students of different proficiency level, studying in different disciplines, and having different backgrounds other than Chinese. All in all, although metacognitive reading strategy training may not solve all the problems that Chinese university learners have in English reading comprehension, it does have some impacts on students' metacognitive reading strategy awareness and their reading ability. The results of this study provide a number of different areas of interest for future investigation.

References

Alvermann, D. E., & Phelps, S. F. (2002). *Content reading and literacy* (3rd ed.). New York: A Pearson Education Company.

Anderson, N. J. (1991). Individual differences in strategy use in second language reading and testing. *The Modern Language Journal, 75,* 460-472.

Bamford, J., & Richard, R. D. (2004). *Extensive reading activities for teaching language*. New York: Cambridge University Press.

Brown, A. L. (1980). Metacognitive development and reading. In R. J. Spiro, B. C. Bruce, & Brewer, W. F. (Eds.), *Theoretical issues in reading comprehension* (pp. 453-481). Hillsdale, N.J.: Lawrence Erlbaum Associates.

Butler, D. L., & Winnie, P. H. (1998). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research, 65,* 245-281.

Carrell, P. L. (1989). Metacognitive awareness and second language reading. *The Modern Language Journal, 73*(2), 121-134.

Carrell, P. L., Pharis, B. G., & Liberote, J. C. (1989). Metacognitive strategy training for ESL reading. *TESOL Quarterly, 23*(4), 647-678.

Chamot, A. U., & O'Malley, J. M. (1990). *Learning strategies in second language acquisition*. Oxford: Oxford University Press.

Chamot, A. U., & O'Malley, J. M. (1996). Implementing the cognitive academic language learning approach (CALLA). In R. L. Oxford (Ed.), *Language learning strategies around the world: Cross-cultural perspectives* (pp. 167-174). Honolulu, H.I.: University of Hawaii Press.

Dhieb-Henia, N. (2003). Evaluating the effectiveness of metacognitive strategy training for reading research articles in an ESP context. *English for Specific Purposes, 22*(4), 387-417.

Dreyer, C., & Nel, C. (2003). Teaching reading strategies and reading comprehension within a technology-enhanced learning environment. *System, 31*(3), 349-365.

Eskey, D. E. (2005). Reading in a second language. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (pp. 563-580). Mahwah, N.J.: Lawrence Erlbaum Associates.

Foorman, B. R., Breier, J. L., & Fletcher, J. M. (2003). Interventions aimed at improving reading success: An evidence-based approach. *Developmental Neuropsychology, 24,* 613-639.

Garner, R., & Alexander, P. A. (1989). Metacognition: Answered and unanswered questions. *Educational Psychologist, 24*(2), 143-158.

Grabe, W., & Stoller, F. (2002). *Teaching and researching reading*. Harlow: Longman.

Harris, K. R., & Graham, S. (1996). *Making the writing process work: Strategies for composition and self-regulation* (2nd ed.). Cambridge: Brookline Books.

HUANG, S. C. (2006). Reading English for academic purposes: What situational factors may motivate learners to read? *System, 34*(3), 31-383.

Levine, A., Ferenz, O., & Reves, T. (2000). EFL academic reading and modern technology: How can we turn our students into independent critical readers?. *Teaching English as a Second or Foreign Language Journal, 4*(4). Retrieved from http://www-writing. Berkeley.edu/TESL-EJ/ej16/al.html

LIU, J. (2010). Language learning strategies and its training model. *International Education Studies, 3*(3), 100-104.

Muñiz-Swicegood, M. (1994). The effects of metacognitive reading strategy training on the reading performance and student reading analysis strategies of third grade bilingual students. *Bilingual Research Journal, 18*(1-2), 83-97.

National curriculum for English majors of higher education in P.R.C. (2000). Shanghai: Shanghai Foreign Language Education Press.

Padgett, A. (2000). *Journal writing in the elementary school: Word processor vs. paper and pencil. ERIC Digest*. Washington, D.C.: ERIC Clearinghouse on Languages and Linguistics.

Palincsar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 1*(2), 117-176.

Pearson, P. D., & Dole, J. A. (1987). Explicit comprehension instruction: A review of research and a new conceptualization of learning. *Elementary School Journal, 88,* 151-165.

Phan, N. (2006). *Effective reading*. Retrieved from http://www.asian-efl-journal.com/pta_october_06_np.php

Shih, M. (1992). Beyond comprehension exercises in the ESL academic reading class. *TESOL Quarterly, 26,* 289-318.

Snow, C. (2002). *Reading for understanding: Toward an R & D program in reading comprehension*. Santa Monica, C.A.: Rand Education.

Wenden, A. L. (1999). An introduction to metacognitive knowledge and beliefs in language learning: Beyond the basic. *System, 27,* 435-441.