

# Chinese University Students' Metacognitive Strategy Use in Language Acquisition: A Flipped Learning Perspective

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## ABSTRACT

Since the introduction of flipped learning, it has drawn much attention and enjoyed increasing popularity. This study attempts to investigate Chinese English majors' metacognitive strategy use in a flipped environment and the influencing factors of metacognitive strategy use. Thirty-five subjects were asked to study the assigned online course video lectures out of class and participate in activities demanding the application of acquired knowledge. Students' metacognitive strategy use and factors influencing their use were analyzed based on the data collected from written reflections, interviews, and classroom observations. Findings indicate that 1) planning, self-monitoring, self-evaluation, directed attention, and selective attention are students' main employed metacognitive strategies in and out of the flipped classroom; 2) factors influencing students' metacognitive strategy use consist of students' desired learning outcomes and group learning; and 3) students' self-control over learning pace in the flipped context further motivates their use of diverse metacognitive strategies.

## KEYWORDS

Chinese University Students, Flipped Learning, Influencing Factors, Language Acquisition, Metacognitive Strategy Use

## INTRODUCTION

Generally, teachers play a primary role in lecturing in the traditional university education in China, because lecturing is the main teaching method. Teachers' off-line lectures are the primary source of students' knowledge. This form of teaching has been widely studied in different aspects. Some researchers (McCarthy & Anderson, 2000) have reached the conclusion that lecturing may lead to students' passive knowledge acquisition because of their superficial processing of information. Recently, the pedagogical trend has been promoting the idea of student-centeredness. Among the different student-centered learning pedagogies, flipped instruction, which was first introduced in 2012 by Jon Bergmann and Aaron Sams, has been paid much attention to and enjoyed a growing amount of popularity. However, due to the teaching and learning context in China, the test-based education system usually leads English teachers to primarily adopt teacher-centered and exam-oriented instruction (Mermelstein, 2015; Samir, et. al., 2020; Zhong, 2019). This explains why flipped learning studies

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on English acquisition conducted in China commonly demonstrate that many students state that learning becomes challenging when getting accustomed to flipped learning, which was not as secure and comfortable as compared with teacher-centered learning (Hao, 2016; Chen Hsieh, Wu, & Marek, 2017). Qualitative studies on flipped learning in this context are limited, so a greater understanding of students' learning performance in the flipped context is useful for educators.

In flipped learning, students have access to their learning content out of the class and discuss it with partners or apply the out-of-class acquired knowledge to the new content in the in-class activities. The new inverted learning approach has aroused researchers' interest in exploring its effects on learning. Up to now, scholars (Day & Foley, 2006; Ruddick, 2012; Azamat, et. al., 2018) have conducted empirical experiments investigating students' positive perceptions of the approach and their challenges encountered in the process of its implementation (Talbert, 2012; Teimziti, et. al., 2019). Besides, the advantages of flipped learning (Adnan, 2017; Sletten, 2017; Tokmak, et. al., 2019; Zhong & Qing, 2019) have been broadly explored, among which the definite advantages such as learners' learning flexibility and self-control over their learning pace have commonly been found. In order to gain the desired learning outcomes, students, guided by their own self-control of learning pace, commonly employ metacognitive strategies to monitor and regulate learning, such as deciding on the time, the place and the way they should handle the learning materials (Joao, et. al., 2018; Yilmaz & Baydas, 2017; Manganello, et. al. 2021).

Metacognitive strategies, regarded as learners' conscious mental activities modulating their learning by planning, monitoring and evaluating (Cohen & Upton, 2006), are of vital importance in language acquisition because they are closely related to better learning results (Mokhtari & Reichard, 2002; Purpura, 1997). Learners with metacognitive strategies are conscious of their learning pace and methods, and it is more likely that they employ proper strategies to plan, monitor and evaluate their language learning (Zhang & Goh, 2006). In flipped learning, where students are given more control of the out-of-class learning content, the metacognitive strategy employment seems to be important. Many scholars have attached great importance to the instruction of metacognitive strategies in the hope of advancing students' language acquisition (Macaro, 2001; Vandergrift, 2003). Nevertheless, students' use of metacognitive strategies in flipped learning remains unclear. Thus, it is necessary to understand students' use of metacognitive strategies, and possible underlying factors that influence students' metacognitive strategy use in the flipped learning context, before the instruction of any metacognitive strategy. Adopting a qualitative analysis, the present study aims to investigate Chinese university students' use of metacognitive strategies in and out of the flipped classroom, and examine possible underlying factors which influence students' metacognitive strategy use.

## FLIPPED CLASSROOM AND METACOGNITIVE STRATEGIES

Flipped learning (sometimes also called *inverted learning*) is a specific type of blended learning (itself defined as "the blend or mixture of any two instructional technologies" (Caner, 2012, p. 24)) where teachers usually recommend online learning videos which are created by themselves or selected from some website for learners to study out of class, in order that more class time is set for students to apply their learned knowledge to practice through assigned interactive activities, like student presentations, group discussions, or problem-solution activities (Yilmaz & Baydas, 2017). Lage, Platt and Treglia (2000, p.32) define it as events traditionally taking place in the classroom now taking place out of the classroom and vice versa. Bishop and Verleger (2013) put forward a more narrow and restricted definition of flipped learning. They stated that the flipped learning should consist of two elements, that is, individual student's out-of-class computer-based instruction and in-class interactive group learning activities. A number of empirical studies have revealed the primary advantages of flipped learning. The first is that learning is self-paced and self-managed (Kim, et. al., 2014) because outside of class, students have easy access to the teaching materials - usually a video recorded lecture. Flexibility and accessibility means that learners can have more free time to customize their own learning context

and have more control over their own learning pace than they could in traditional instruction (Bruff, et. al., 2013). The second advantage is that classroom interactions are increased. In flipped learning, the teacher-to-student and student-to-student interactive activities are often more active and attentive (Adnan, 2017; Bergmann & Sams, 2012) because the increased interaction opportunities can make students actively engage in the classroom learning (Sletten, 2017). The third is that the desired learning outcomes are effectively achieved due to the abundant class time, which transforms the students from passive listening to active thinking, group discussion and group sharing (Kong, 2014).

However, the implementation of flipped learning also meets some challenges. Berrett (2012) and Enfield (2013) find that it is time-consuming for teachers to get prepared for a flipped classroom. Berrett (2012) finds that students are more in favor of the traditional and passive learning approach in which knowledge and information are presented directly, which does not involve many cognitive strategies.

According to Flavell, metacognition is “knowledge and cognition about cognitive phenomena” (1979, p. 906), which consists of three components, that is, metacognitive knowledge, metacognitive experience and metacognitive strategies. Accordingly, metacognitive knowledge exploits one’s consciousness, metacognitive experience is associated with one’s cognitive or affective experiences and metacognitive strategies are categorized as actions taken by learners to promote learning (Cohen, 2011). O’Malley & Chamot (1990, p. 137) define metacognitive strategies as “thinking about the learning process, planning for learning, monitoring the learning task, and evaluating how well one has learned”. All these strategies can be employed to assist learners in managing, directing, regulating, or guiding their learning (Wenden, 1998, p. 519). According to O’Malley and Chamot (1990), metacognitive strategies can be classified into planning strategy, self-monitoring strategy, self-evaluation strategy, selective attention strategy, and directed attention strategy, among which planning, self-monitoring and self-evaluation are of great importance, in that planning strategy includes learning goal setting, action plan decision, and learning resource allocation (Meijer, et. al., 2006). Self-monitoring strategy is comprehended as the consciousness of task understanding and the checks on one’s learning progress (Pintrich 2004), and self-evaluation strategy involves its effectiveness on learners’ learning based on their own self-judgement (Meijer et al., 2006). What’s more, among all the metacognitive strategies, self-monitoring strategy is perceived as a strong predictor of learners’ academic performances not only in specific language abilities, such as reading (Azevedo, et. al., 2004), but also with innovative instruction approaches, for example, flipped learning (Jovanovic, et. al., 2017). Likewise, self-evaluation strategy is also perceived to be relevant to learners’ learning outcomes (Vidal, 2010). Hung (2009) and Morales & Mena (2016) further investigated the positive connection between learner autonomy and self-evaluation strategy. In studies on students’ writing levels, planning strategy is broadly discussed and the conclusion of positive correlation between students’ sentence length and writing speed is also reached (Limpo & Alves, 2018).

Anderson (2002) argues that the use of metacognitive strategy plays a crucial role in language acquisition because it can inspire one’s thinking and result in more profound learning and ameliorated performance. Metacognitive strategies, utilized in the traditional classrooms, have been reported to be related to successful learners, which means that successful learners are able to apply more metacognitive strategies to learning than other strategies (Huang, 2012). Besides, students’ test results, or learning outcomes, also have positive correlation with the number of metacognitive strategies used (Phakiti, 2003). As for studies on metacognitive strategy use in foreign language learning, two directions exist. Some researchers have investigated learners’ use of metacognitive strategy for specific language skills, like reading or listening (Goh, 2002; Vandergrift, 1997; Block, 1986, 1992; Cohen & Upton, 2006; Phakiti, 2003, 2006, 2016; Zhang, Goh, & Kunnan, 2014). They conclude that students’ reading or listening performance has positive correlation with the number of metacognitive strategies used. Other scholars (Dabarera, et. al., 2014; Macaro, 2001) have made attempts to examine the effectiveness of metacognitive strategy instruction on learners’ language performance and they also reported the positive results.

However, studies investigating the effectiveness of flipped learning on students' metacognitive strategy use have come to inconsistent conclusions. For instance, van Vliet, et. al. (2015) did a quasi-experiment and concluded that flipped learning promoted students' metacognition through the amended strategies, such as critical thinking. Hsu and Hsieh (2014) further argued that blended learning fostered students' active employment of metacognitive strategies. However, Yong, Levy and Lape (2015) concluded that there existed an insignificant discrepancy in the number of used metacognitive strategies between the traditional learning and flipped learning. Since there exist inconsistent results in the previous researches, it seems to be crucial to investigate how students learn in the context of flipped learning, but this kind of research is limited. Given this, the present experiment was thus conducted.

## RESEARCH DESIGN

### Research Questions

In order to examine and understand Chinese English majors' metacognitive strategy employment in flipped learning, the study aimed to answer the following questions:

1. What metacognitive strategies do Chinese English majors use in the context of flipped learning?
2. What are the underlying factors that influence students' use of metacognitive strategies in language acquisition?

### Subjects

35 junior English majors with at least 12 years' experience of studying English, from a normal university in China, were involved in this research. Their age ranged from 20-21 years. When they were in junior and senior middle schools, all the subjects were required to learn English as a compulsory course. They chose English as their major when they got the admission to further their study in the normal university. All the 35 students took the advanced English reading course as the required course and accounted for instances of their use of metacognitive strategies in their written reflections, 12 of whom were more expressive in their written accounts compared with the rest of the students and were selected to be the interviewees in the study due to their awareness of metacognitive strategy use, which could aid the researcher to get richer data when they were interviewed and reach the study goal. In order to know the homogeneity of the subjects, MTELP (Michigan Test of English Language Proficiency) was conducted to identify the participants' English language proficiency. In the process of data collection, their proficiency levels ranged from C (from TEM-4<sup>®</sup> 60 to 69) to B (from TEM-4<sup>®</sup> 70 to 79) (TEM is the short form of Test for English Majors-Band 4) according to the National Advisory Committee on Teaching English Language to Majors in Higher Education. Among the 12 subjects, three were males and nine were females. Their proficiency levels are shown in Table 1.

### Research Procedure

This research was done in a 17-week required course for junior English majors at a normal university in China with a class that met twice a week, each lasting 90 minutes (a total of 51 hours class time). The purpose of this course was to help students advance their English proficiency and get an ideal score on TEM-8<sup>®</sup> (Test for English Major-Band 8 in the fourth year in university). The course focused on advanced listening and reading skills, grammar concepts, English-Chinese or Chinese-English translation and various writing styles. Course materials were a textbook with units focusing on specific topics, supplemented by ten mock TEM-8<sup>®</sup> practice tests and some selected online lectures from MOOC (Massive Open Online Course) platforms. The lectures were selected to focus on listening, reading, translation, writing skills and grammar concepts. Table 2 demonstrates detailed information. These selected online video lectures from the MOOC platforms revealed a property that the instructors

**Table 1. Students' proficiency levels**

Student number	Student's pseudonym	TEM-4 level
1	Anita	C
2	Ruby	C
3	Devin	B
4	Lorraine	C
5	Kevin	C
6	Crystal	B
7	Lucinda	B
8	Monica	C
9	Sherry	C
10	Peggy	C
11	Wendy	B
12	Edward	B

**Table 2. MOOC platforms used in the course**

Number	MOOC platform	Course name	Source of course	URL
1	I-course	Advanced English writing	Xi'an International Studies University	<a href="http://www.icourse163.org/course/SEU-1462660161?from=searchPage">www.icourse163.org/course/SEU-1462660161?from=searchPage</a>
2	Future Learn	Learning Online: Learning and Collaborating	University of Leeds	<a href="https://www.futurelearn.com/courses/learning-and-collaborating">https://www.futurelearn.com/courses/learning-and-collaborating</a>
3	Coursera	Learn English: Intermediate Grammar	University of California, Irvine	<a href="https://www.coursera.org/specializations/intermediate-grammar">https://www.coursera.org/specializations/intermediate-grammar</a>
4	I-course	Translation in Practice	Nanjing University	<a href="https://www.icourse163.org/course/NJU-1002331010?from=searchPage">https://www.icourse163.org/course/NJU-1002331010?from=searchPage</a>
5	Coursera	Academic listening and Note-taking	University of California, Irvine	<a href="https://www.coursera.org/learn/note-taking">https://www.coursera.org/learn/note-taking</a>
6	I-course	Advanced English Reading	Peking University	<a href="https://www.icourse163.org/course/PKU-1462118161?from=searchPage">https://www.icourse163.org/course/PKU-1462118161?from=searchPage</a>

used vivid skits and specific examples to help students deeply understand and master the language skills and complicated grammar concepts (Shen, et. al., 2017).

The course was made up of two major parts: (1) the teacher gave the out-of-class assignments including the selected online lectures from the MOOC platforms, listening, reading, translation, writing and proofreading exercises associated with the online lectures, and mock TEM-8® tests; (2)

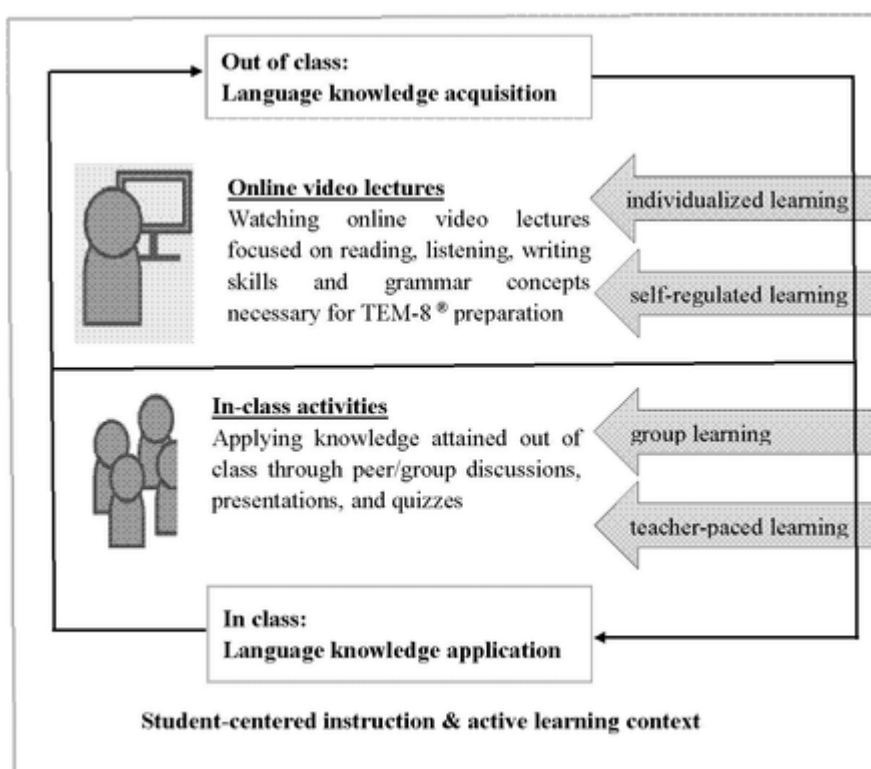
the in-class activities aiming at helping students to use what they learned out of class with peers in discussion, individual/group presentations and tests. The teacher would provide students with further explanation for more difficult or challenging points or test items. In order to make group discussions go smoothly during learning, when the semester began, the teacher required the whole class to form seven different groups, each consisting of five students.

Participants were asked to preview the online lectures to learn the language skills and grammar concepts before they came to class. To guarantee students' previewing of the course content, they had to fulfil one or more of the relevant activities in class: (1) group discussion for clarifying points from the video lectures, (2) a short quiz to assess students' understanding of the focused skills or grammar concepts, (3) a presentation given by appointed groups to sum up what had been acquired in the previous weeks. After the quizzes or group discussions, the teacher would further illustrate the difficult/complicated points or help students solve the problems raised during group discussions. The whole framework for the research is shown in Figure 1.

### *Data Collection and Analysis*

The data collected for answering the research questions in this study are made up of three components: participants' weekly submitted written reflections, classroom observations, and two semi-structured interviews. The weekly written reflections and interviews were designed for getting data of students' metacognitive strategy use based on the course schedule, in-class and out-of-class learning tasks and activities. The students' written reflections derived from the direction that was restated every week. The prompt for written reports was just general and non-directive in that learners' free reflections were more authentic and of great value for the research. Questions for interviews were designed to

Figure 1. Framework and procedure of the research



obtain participants' use of metacognitive strategies for in-class language learning as well as the out-of-class task completion processes.

In the 3<sup>rd</sup> week, a pre-test, consisting of 70 questions, covering the number of all the official TEM-8® test items, was conducted. From the 4<sup>th</sup> week on, given the participants were presumably familiar with learning before sitting in the classroom through online lectures (Yilmaz & Baydas, 2017), they were all asked to present their written reflections. Students presented their written reflections either on PowerPoint or on a personal response sheet. In the 7<sup>th</sup>-9<sup>th</sup> weeks, 12 participants were interviewed with the semi-structured questions. Five of the 12 students were further invited to participate in the following interviews in the 10<sup>th</sup>-12<sup>th</sup> weeks to illustrate unclear details. All the interviews lasted roughly 30 minutes, were conducted in the students' native language (Chinese) for clear point expressing, were audio-recorded and soon transcribed into English. Aside from the written reflections and interviews, classroom observations were also implemented to get data. Five sessions of the course instruction (during the 12<sup>th</sup>-16<sup>th</sup> weeks) were videotaped for observing participants' group activities and interactions with the teacher. In the 16<sup>th</sup> week, a post-test was conducted, in which the same number of test questions as the pre-test was used. The research procedure is shown in Table 3.

Considering the complicated character of this research, we employed case studies and a qualitative approach to investigate the participants' metacognitive strategy use in the context of flipped learning. In order to have a clear and thorough understanding of students' metacognitive strategy use, all interview data were transcribed word by word and data from the written reflections were coded for analysis, whose procedure covered three stages. Firstly, based on O'Malley and Chamot's (1990) metacognitive strategy classification, the author marked the strategies in the interview and written reflection data, and categorized them into in-class learning or out-of-class learning. Secondly, the author repeatedly checked the data in the hope of finding the underlying factors which facilitated students' use of metacognitive strategies. Finally, we made constant comparison and contrast among all the data in order to get recurring themes. The inter-rater reliability to code interview data was  $r=0.86$ .

**Table 3. Research procedure**

Week number	Items
1st-2nd week	Preparation for the research
3 <sup>rd</sup> week	pre-test
4 <sup>th</sup> week	written reflection
5 <sup>th</sup> week	written reflection
6 <sup>th</sup> week	written reflection
7 <sup>th</sup> week	written reflection, semi-structured interviews
8 <sup>th</sup> week	written reflection, semi-structured interviews
9 <sup>th</sup> week	written reflection, semi-structured interviews
10 <sup>th</sup> week	written reflection, follow-up semi-structured interviews
11 <sup>th</sup> week	written reflection, follow-up semi-structured interviews
12 <sup>th</sup> week	written reflection, follow-up semi-structured interviews, classroom observations
13 <sup>th</sup> week	written reflection, classroom observations
14 <sup>th</sup> week	written reflection, classroom observations
15 <sup>th</sup> week	written reflection, classroom observations
16 <sup>th</sup> week	classroom observations, post-test
17 <sup>th</sup> week	Analysis of data

## RESULTS AND DISCUSSION

### Students' Use of Metacognitive Strategies

In flipped learning, the students mainly employed five major metacognitive strategies for in-class learning activities as well as out-of-class learning activities, which were planning strategy, self-monitoring strategy, self-evaluation strategy, selective attention strategy and directed attention strategy. According to the interview data, the number of times each strategy was used by each participant are presented in Table 4.

In order to facilitate in-class learning, students mainly used planning strategy, self-monitoring strategy and self-evaluation strategy. To be specific, students employed planning strategy to set a target for their in-class performance and out-of-class learning outcome, and self-monitoring strategy to monitor their learning attitude/attention in class, learning process (their understanding of the instructor's explanation or fulfilment of a group assignment), and emotion/their feelings in class. They applied self-evaluation strategy to examine their learning effectiveness.

For example, both Wendy and Anita said that they often planned their video lecture watching time one or two days ahead of class time because the clear memory of the video lectures can help achieve their set in-class goal - that they were able to successfully participate in group discussion or complete quizzes in class. Besides, some students would evaluate their understanding and remembering of the language skills and grammar points which they just learned. From classroom observations, we found that the participants were fully active in group discussion, which was a crucial component of flipped learning, attempting to fulfil a task together. This was obvious evidence supporting the data collected from interviews in which students claimed that they usually monitored their in-class learning state.

As for the out-of-class tasks, like video-taped lectures and written and translation practice tests, metacognitive strategies such as planning, self-monitoring, self-evaluation, selective attention and directed attention were frequently utilized, most of which were used for completing the video lecture watching task, which was another crucial element of flipped learning. Specifically, planning strategy was employed before video watching when students were determined to get involved in the tasks.

Table 4. Number of times of each strategy was used by each student

Student number	Student's pseudonym	planning	Self-monitoring	Self-evaluation	Directed attention	Selected attention	Total
1	Anita	3	4	7	3	4	21
2	Ruby	3	5	2	1	4	15
3	Devin	5	1	3	2	4	15
4	Lorraine	1	2	4	0	2	9
5	Kevin	6	4	0	1	2	13
6	Crystal	1	4	4	0	1	10
7	Lucinda	1	2	1	2	1	7
8	Monica	3	3	3	1	2	12
9	Sherry	5	2	6	1	3	17
10	Peggy	3	3	4	1	3	14
11	Wendy	9	4	2	3	2	20
12	Edward	2	1	2	2	1	8
total		42	35	38	17	29	161
percentage		26%	22%	24%	10%	18%	



They usually made decisions on the time, frequency, and environment for finishing their out-of-class assignments and setting goals like getting rid of the habit of their over-reliance on English captions to assist them to achieve better learning effectiveness. Apart from this, there were other planning strategies expressed in the written reflections. For instance, Devin stated that she had made a daily schedule to do a certain amount of homework, and Lucinda said that she usually gave herself a deadline to complete the assigned homework. Furthermore, they also searched for other online resources, that is, other video-taped lectures, to facilitate their better understanding of the assigned video lectures. In order to achieve this, self-monitoring strategy was utilized. For example, they monitored their understanding of the lecture content, their learning strategies and feelings in the process of watching. In order to monitor their understanding, some participants would pause and put forward questions for themselves, while others just chose to ponder the content and evaluate how well they comprehended it. Self-monitoring strategy was also used to evaluate students' language ability in the process of learning. Apart from planning and self-monitoring, students as well employed self-evaluation strategy after completing the task of watching video lectures or test practices to evaluate their comprehension of the content, that is, to assess their learning approach and English ability. In evaluating their learning approach, participants usually thought of the issue whether the amount of practice was enough or whether the being-used strategy was helpful enough to facilitate their language acquisition. Sherry's written reflection obviously exemplified the use of self-evaluation strategy. Originally, she had thought of her strong possession of note-taking competence, but taped-video lectures made her have the intention of reflecting on her language skills:

*I thought that I had a good mastery of note-taking skill, but after learning the video lectures, I found that there were other skills which I had not mastered, so I discussed them with my group members, and looked for different resources to get information and strengthen my listening ability. (Sherry's written reflection)*

Finally, participants applied directed attention strategies to learning out of class, such as speaking to themselves to deal with out-of-class tasks in the hope of staying focused during watching the online lectures. Every time they watched the online videos, a certain number of students chose to focus on some parts of the lectures which they found vital by taking notes on the content. This is evidently a sign of the selective attention strategy use.

In the whole process of language learning, we found that students sometimes had no separation of the use of in-class and out-of-class metacognitive learning strategy. In other words, students employed some metacognitive strategies in the whole learning. For instance, they applied self-evaluation strategy to the reflection on their learning strategy use and the general progress in English acquisition, and this frequently occurred both in and out of the classroom learning.

Just as the intervention study done by van Vliet et al. (2015) reported, students involved in the flipped learning showed an increase in the use of metacognitive strategies such as planning, monitoring, evaluation (in the current study, "critical thinking" is termed) and so on, compared with those engaged in traditional learning. Enfield (2013) and Kim et al. (2014) argued that students often positively assess their own ability to control and manage their time and learning condition out of the class. When students are able to greatly control their learning pace, they appear to have the ability to practice using more metacognitive strategies in the process of learning.

The directed attention and selective attention strategies were the two metacognitive strategies employed for learning out of class but not for learning in class. It was not reasonable to state that students utilized neither of the two strategies in class just because they did not consider the use of them. Nevertheless, it might be that students were more conscious of the necessity to employ these two strategies to complete the out-of-class tasks like video lecture watching in the flipped learning. For instance, Peggy used the selective attention strategy to concentrate on some elements which she considered important.

*Sometimes, when I forgot some important concepts, I would watch the online video lectures again, but just for the what-I-thought important part, so as to have a clearer memory. Similarly, if I found some parts “strange”, I would go back and watch that part a second time. (Peggy’s response in the interview)*

## **Underlying Factors Influencing Students’ Use of Metacognitive Strategies**

Based on the qualitative analysis of the data, two underlying factors, that is, desired learning outcomes and group learning, were found, which affected students’ use of metacognitive strategies.

### ***Desired Learning Outcomes***

One significant factor that had an influence on students’ use of metacognitive strategies was their desired learning outcomes like the expectation of self-fulfillment in language learning and the goal of the desired scores of in-class quizzes or on the TEM-8® test. This factor facilitated students’ use of metacognitive strategies such as planning strategy, self-monitoring strategy, self-evaluation strategy, and directed attention strategy. Two aspects demonstrated the students’ expectation of self-fulfillment, that is, (1) setting future goals that demanded a high level of their English proficiency, (2) their expectation of a better English learning. Some students had a strong desire for achieving a certain level of English proficiency which would be a necessity for their further postgraduate study. This prompted their employment of planning and self-evaluation strategies, like determining to complete the assigned tasks and deciding on the time of completion, assessing their language acquisition approaches and evaluating their understanding of the online video lectures. Wendy’s response in the interview illustrates the time management of her video assignment completion.

*I would complete my video watching assignments on the same day as when they were assigned by the teacher because there would be some unexpected events which might occur...because I have an aspiration of advancing my English learning...English is my major; it is important for my future study or profession, and I want to strengthen my overall language skills and improve my English during the undergraduate time. (Wendy’s response in the interview)*

Wendy was well aware of her future, so she desired to improve her language abilities for success in future studies or profession, which encouraged her to have good time management for finishing assignments. Other students expected to have better language learning outcomes; therefore, they applied the planning strategy to their time and environment management to fulfil their homework assignment and used the self-evaluation strategy to evaluate their progress in learning. For instance, at the beginning, Anita and Kevin finished their homework several days before coming to class. Later, when Anita wanted to ask questions during the group discussion in class, which she had taken down while watching the lectures, she found that she had nearly forgotten the reason why she had the questions. Not remembering the reason made her combine the strategy to complete her homework assignments with note-taking skills, so as to remember the questions well and discuss them with peers in class. Kevin also adjusted his homework assignment finishing time so that he could have enough time to digest the pre-learned information before coming to class next time. For example, when answering the question of his planning for his previous week assignments, Kevin responded in his 5<sup>th</sup> week written account that he would finish them at weekends, which was two days earlier than the class time. But, in the interview, Kevin said that he usually delayed his homework assignments till the day just before the class because of other coursework. However, he admitted several times that he found that “this plan does not work, for the time is too tight. I have to spare some time to digest the information”. From what has been stated, it is clearly seen that Anita and Kevin planned time for completing their homework, which is a strategy selected to assist them to have a better learning in class. Apart from the planning strategy, learners employed the self-evaluation strategy while

watching the assigned online lectures. For example, students would assess their language abilities by self-examination of their dependence on the lectures' English captions, which could be reset as on or off while watching.

Students' desired test outcome is another aspect related to self-fulfillment in flipped learning. Students had a high expectation to achieve their targeted score goal in the test, which also motivated their use of the other two strategies, that is, time arrangement strategy for homework assignments and plan of effective learning approaches, and self-evaluation strategy to evaluate their learning approaches. For example, in the interview, Sherry gave her explanation of the time arrangement for test practices: "although the day for the TEM-8® is in next March, I need to do more practices during the course time and I usually do the assignment at the same time of day at which the TEM-8® is given...therefore, I can get accustomed to the test taking conditions."

Participants' desires for good learning and the achievement of a targeted language learning proficiency can be regarded as a common goal. Compared with the traditional instruction context, however, participants in the flipped learning context are entitled to have more free time and space to reach the course content. That is to say, students have more control of their learning pace because they can pause, rewind or re-watch the pre-taped video lectures whenever they think there is a need, and they can also decide on the time they feel appropriate for learning (Enfield, 2013; Cresap, 2015). The learning flexibility and control of their learning pace might influence students' use of metacognitive strategies during learning.

### Group Learning

Group learning, the second factor, facilitated students' use of their planning, self-monitoring, and self-evaluation strategies in and out of the class in flipped learning. In other words, in the hope of being successfully involved in group discussions or fulfil their presentations/tasks, students were aware that they had to get well prepared for each class. Before coming to the class, students were individually ready for the time arrangement, which made them determined to watch online lectures. During watching, they usually monitored and evaluated their understanding of the content of the lectures. Then, when it was the classroom time, they often monitored their attitudes towards the in-class language learning and evaluated their comprehension of the newly obtained information through group discussions. For instance, by group discussions, Monica came to know that her mastery of the reading skills was not thorough enough when another student presented his understanding to her. Consequently, she decided that she should make sure of her own understanding when she was learning online next time.

*The flipped learning approach pushes students to be more active in learning, which means, uh, because after each self-learning of the online lectures, the teacher always requires every student to present their understanding and discuss (it) in the group, then we can have a deeper understanding (of the content) ... thus, we have to think about the content and get ready for the explanation with our own words... therefore, I should be attentive every time I watch the online lectures, in order that I can make sure that I understand the video first. (Monica's response in the interview)*

Similarly, several students gave the same response by stating that, in order to get the information well understood and explain it with their own words, they would evaluate their information digestion carefully in class time before group discussion.

Other than the chance of learning from or with group members, partner pressure seemed to be another factor which stimulates students' use of metacognitive strategies. When interviewed, Lorraine, for instance, directly pointed out her worry of not being able to get involved in discussion, "if I cannot participate in the discussion, maybe the group members will think that I have not been working hard. There does exist this kind of outside pressure." Students usually assessed their comprehension of the video content before coming to class because they had the willingness to be cooperative and helpful in

group discussion. Their motivation of the out-of-class metacognitive strategy use arises from both the peers' established positive examples and the fear of the peers' negative evaluation of their learning.

Group activity or peer interaction has been regarded as a primary strength and a favorable component for learners in flipped learning (Israel, 2015; Bruff et al., 2013). In the process of discussion, students have to express their understanding, tackle cognitive conflicts through justifying obvious differences and finally co-construct shared knowledge with group members (Choi, et. al., 2005). Potentially, this process is helpful to motivate students to employ the proper metacognitive strategy to assist them to develop successful discussions. What's more, the interview data clearly reveal that peers had an important role in the process of flipped learning and stimulated students' metacognitive strategy use. Moreover, while some participants accounted their expectation of discussion activities, others stated their concerns of peer pressure as what has been discussed above. Such peer pressure has a positive impact because learners hope to be capable of being engaged in the group discussion and meeting their partners' expectations, especially in Chinese universities, which demonstrate collectivist cultures, where the pursuit of interdependence is highly valued.

## CONCLUSION

Metacognitive strategies have an important role in language acquisition because they can regulate learners' learning process (Vandergrift, 1999). In the context of flipped learning, students are entitled to have more time and space to learn independently out of class and apply learned knowledge to group discussion and quizzes in class. In order to understand students' use of metacognitive strategies in flipped learning, the present study investigated Chinese EFL learners' use of metacognitive strategies in the flipped instruction by adopting a multiple case study. In the 17-week semester, we gathered data needed for analysis from students' written accounts, semi-structured interviews, and classroom observations. Findings showed that Chinese university English majors employed a variety of metacognitive strategies, such as planning, self-monitoring, self-evaluation, selective attention and directed attention to foster their language learning, and desired learning outcomes and group learning were the two influencing factors which affect students' use of metacognitive strategies in language acquisition.

Although students' directed and selective attention strategy use was found in out-of-class learning in the context of flipped learning, the in-class learning conditions found no such kind of use. Therefore, in order to better understand the influence of the flipped instruction pedagogy, researches like comparing students' use of metacognitive strategy in the flipped learning context versus the conventional classroom teaching are needed to be done in the future. What's more, the present study just focused on the Chinese university students' use of metacognitive strategy in the flipped learning, a comparison between the Eastern and Western learning contexts concerning students' metacognitive strategy use would certainly shed light on research into flipped learning across cultures.

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## Conflicts of Interest

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