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Vocabulary-Learning Strategies of Students Learning Chinese as a Foreign Language in an Intensive-Training Setting

Yan Wang
University of San Francisco, ywang153@usfca.edu

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VOCABULARY-LEARNING STRATEGIES OF STUDENTS LEARNING CHINESE AS A
FOREIGN LANGUAGE IN AN INTENSIVE-TRAINING SETTING

A Dissertation Presented
to
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Doctor of Education

by
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THE UNIVERSITY OF SAN FRANCISCO

Dissertation Abstract

Vocabulary-Learning Strategies of Students Learning Chinese as a Foreign Language in
an Intensive-Training Setting

Compared with the research on vocabulary-learning strategies in the field of
teaching English as a second or a foreign language, the research on the strategy use of
Chinese-as-a-foreign-language (CFL) students, especially CFL students in an intensive-
training setting, is scarce. The relationship between CFL students' vocabulary-learning-
strategy use and their learning outcomes remains underresearched. Therefore, this
mixed-methods study was conducted to investigate the strategy use of CFL students in
learning Chinese vocabulary words in an intensive language program and its relationship
to students' learning outcomes.

A total of 137 beginning to advanced students enrolled in the program
participated in the study. The strategy use of the students was measured by a 50-item
questionnaire, and students' learning outcomes were measured by their end-of-semester
II Proficiency Progress Test, which includes a listening and a reading test. Interviews
with nine participants of different grade-point-averages (GPAs; high, middle, and low)
were conducted to gain a better understanding of the strategy use for more-successful and
less-successful students.

Descriptive data analysis revealed that the students in this study used 20 strategies
commonly in their vocabulary learning. Of the 20 strategies, most of them were
cognitive strategies and metacognitive strategies, and the majority of the commonly-used
cognitive strategies were orthographic-knowledge-based strategies. The qualitative

findings indicated that students with higher GPAs used more strategies and that certain patterns of strategy use differentiated more-successful students from less-successful students. Pearson product-moment correlation analyses revealed that several strategies involving learning and using vocabulary words in an authentic context had a positive and statistically significant association with students' listening scores and reading scores, whereas several strategies focusing on decontextualized memorization of vocabulary words had a negative and statistically significant association with students' listening scores. Two orthographic-knowledge-based strategies were found to be correlated positively with students' reading scores.

The findings of the study suggest that orthographic-knowledge-based strategies and metacognitive strategies such as selective attention are essential for CFL students in vocabulary learning. Strategies involving learning and using Chinese vocabulary words in an authentic context are important for CFL students to develop higher language proficiency. Research and pedagogical implications are drawn based on the findings.

This dissertation, written under the direction of the candidate's dissertation committee and approved by the members of the committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements for the degree of Doctoral of Education. The content and research methodologies presented in this work represent the work of the candidate alone.

Yan Wang   8 May 2018
Candidate   Date

Dissertation Committee

Dr. Patricia Busk   8 May 2018
Chairperson

Dr. Robert Burns   8 May 2018

Dr. Sedique Popal   8 May 2018

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CHAPTER I

STATEMENT OF THE PROBLEM

Vocabulary has been considered to be the core element of foreign-language learning (Coady & Huckin, 1997; Nation, 2001; Read, 2000; Teng, 2016). Vocabulary skills are related closely to almost all aspects of a learner's second-language (L2) proficiency, and a large vocabulary is essential for learners to use a second language successfully (Meara, 1980; Nation, 2001; Schmitt, 2000). Studies on the relationship between vocabulary and learners' proficiency have provided empirical evidence that statistically significant positive correlations exist between students' vocabulary knowledge and their reading comprehension (Qian, 1999, 2002), listening comprehension (Stæhr, 2009; Teng, 2016), and the quality of their written work (Daller & Phelan, 2007).

The importance of vocabulary acquisition also is well reflected in the studies conducted to investigate the percentage of lexical items in spoken or written discourses that a learner needs to know in order to understand the discourses. Take English as a second (ESL) or as a foreign language (EFL) for example. Researchers previously thought that around 95% coverage was sufficient to understand a written text (Laufer, 1989), but a more recent study found that 98% coverage was needed for unassisted comprehension of a fiction text (Hu & Nation, 2000). The current evidence suggests that 6,000 to 7,000 word families (e.g., the root form, inflections, and regular derivations of a word) are required to understand spoken discourses if 98% coverage is needed. A reader would need 8,000 to 9,000 word families to read a range of authentic texts such as novels or newspapers for unassisted comprehension if 98% coverage is needed (Nation, 2006).

The statistics of the aforementioned studies suggest that learning a larger number of lexical items is a great challenge for foreign-language learners. Schmitt (2008) pointed out that vocabulary sizes of learners in several research studies (e.g., Laufer, 2000) typically fell short of the size requirements reported above. Learners, however, are not likely to develop adequate vocabulary simply through their engagement in language tasks that focus on either linguistic aspects or communication. Rather, "a more proactive, principle approach" (Schmitt, 2008, p. 333) should be taken in promoting vocabulary learning, and one component of such an approach is using vocabulary-learning strategies. Indeed, the techniques and strategies that learners use when they learn vocabulary words have been gaining much attention since the 1980s (e.g., O'Malley & Chamot, 1990; Oxford, 1990; Rubin, 1981; Schmitt, 1997). Researchers hope to achieve a thorough understanding of the complex learning process and to explore new ways to support learners in their second- or foreign-language acquisition through the investigation of learners' strategy use in their vocabulary acquisition and its relationship to learning outcomes and learner proficiency.

Several empirical studies on learners' vocabulary-strategy use have shed light on the connection between strategy use and language achievement (Lai, 2016). The major findings of these studies include that successful learners use different types of strategies than their less successful peers (Ahmed, 1989; Barcroft, 2009; Fan, 2003; Gu, 2010; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Lawson & Hogben, 1996; Sanaoui, 1995) and use those strategies more frequently (Ahmed, 1989; Kojic-Sabo & Lightbown, 1999; Lawson & Hogben, 1996), that there is a strong positive relationship between students' strategy use and the learning outcomes as measured by vocabulary tests or

proficiency tests (Barcroft, 2009; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Teng, 2015), and that vocabulary-learning strategies predict students' vocabulary development (Gu, 2010; Lai, 2016; Teng, 2015). The majority of the studies on vocabulary-learning strategies have been conducted in the area of ESL and EFL, whereas little research has been conducted regarding the vocabulary-learning strategies of less commonly taught foreign languages such as Chinese.

In the Chinese written language, words consist of Chinese characters and "learning characters cannot be separated from learning words, and learning both characters and words contributes to learning vocabulary" (Shen & Xu, 2015, p. 83). Therefore, the concept of vocabulary-learning strategies in this study encompassed the strategies for learning Chinese characters as well as the strategies for learning Chinese vocabulary words. For students whose first language uses an alphabetical system such as English, it is particularly challenging for them to learn Chinese characters (Shen, 2005; Sung, 2012, 2014). The linguistic complexity of Chinese characters, such as the lack of sound-to-script correspondence, the large number of characters with the same pronunciation but different graphic representations, and the irregularity of strokes, poses a great challenge for English speakers learning Chinese (Shen, 2005). The challenge of learning Chinese words by English speakers is evident in the study of Shen (2009), which showed that after the completion of 3rd-year Chinese classes in college, the students' average number of known words from the 8,500-word corpus was 2,229. The slow progress in vocabulary building became a hindrance for students to develop their other language skills (Shen, 2009). To help students learning Chinese as a foreign language

(CFL) to expand their vocabulary repertoire, effective vocabulary-learning strategies are needed to inform vocabulary instruction in a Chinese language class.

Compared with the research in the vocabulary-learning strategies of ESL or EFL learners, the number of studies (e.g., Ke, 1998; Shen, 2005; Shen & Ke, 2007; Sung, 2014; Wang, 1998) conducted on the vocabulary-learning strategies of CFL learners is relatively small. Among the studies on Chinese vocabulary-learning strategies, the majority focused on the strategies that learners use in encoding Chinese characters (e.g., Ke, 1998; Shen & Ke, 2007), some identified the character-learning strategies commonly used by CFL students (Shen, 2005; Sung, 2012, 2014), and a few investigated the relationship between character-learning strategies and students' learning outcome as measured by a vocabulary test (e.g., Sung, 2014). The endeavor of these studies provided useful information on Chinese character-learning strategies; however, whether there is a relationship between students' strategy use and their learning outcomes as measured by tests other than vocabulary tests and whether more successful and less-successful students use strategies differently is unclear. Therefore, the current study was conducted to provide data on these aspects regarding Chinese vocabulary-learning strategies.

Purpose of the Study

Learning Chinese characters, the constituents of the written Chinese words, has posed a great challenge for CFL learners. A limited number of studies (e.g., Ke, 1998; Shen, 2005) have been conducted to investigate the vocabulary-strategy use of CFL learners; however, the findings generated from these studies were far from being sufficient to understand how CFL learners' vocabulary-strategy use is related to their learning outcomes. Therefore, the purpose of this study was to investigate the strategy

use of CFL students in learning Chinese vocabulary words and its relationship to students' learning outcomes.

To this end, the study first identified the vocabulary-learning strategies commonly used by the CFL students in a military language institute. The study then investigated whether students of varying grade-point-averages (GPAs), high, middle, and low, used strategies differently. The study also examined the relationship between students' vocabulary-strategy use and their learning outcomes as measured by their proficiency tests in listening and reading. By investigating the Chinese vocabulary-learning strategies of the CFL learners in the Chinese Basic Course, a 64-week intensive-language-training program, this study was expected to generate findings that contribute to the existing literature on vocabulary-learning strategies as well as inform the teaching practice of CFL teachers.

Significance of the Study

This study was significant for two reasons. First, the study expanded the current literature on Chinese vocabulary-learning strategies by examining the strategy use of CFL students in an intensive-language-training setting. Prior research on Chinese characters or Chinese vocabulary-learning strategies mostly have been conducted in nonintensive-language-learning settings such as Chinese language programs in universities in the US, where students receive on average 4 to 5 hours of language training weekly, while studying other subjects. The current study was conducted in an intensive-language-training setting, where students receive 6 hours of language training on a daily basis for a total of 64 weeks and that is the only subject they are studying. The findings from this study and the prior studies could inform CFL instructors what

vocabulary-learning strategies are used commonly by students in different learning contexts. Accordingly, the CFL instructors could select the most relevant strategies to teach to their students depending on specific learning situations.

Second, this study provided important information for Chinese language programs that intend to incorporate vocabulary-strategy instruction into their curriculums. The educational movement toward learner centeredness (Nunan,1988; Wenden, 2002) has called for strategy instruction in a language-teaching curriculum. The focus of language instruction has shifted toward the needs of individual learners, and the learners are encouraged to take more responsibility for their learning and become autonomous by learning how to learn a language (Cohen, 2000). As Cohen (2000) pointed out, however, learners often do not develop adequate mastery of various strategies on their own, and explicit strategy training is necessary to help the language learners become more aware of and proficient with a wide variety of strategies so that they can use the strategies consistently during the learning process. The findings of the current study provide CFL instructors much needed information in designing a strategy-instruction curriculum, such as what Chinese vocabulary-learning strategies are more useful for students' skill development in listening or reading and what strategies generally are found lacking in less-successful students and, therefore, should be emphasized in the study plan for these students.

Theoretical Framework

Oxford's (1990) language-learning-strategy theory served as the theoretical framework of this study. The important theoretical underpinnings of Oxford's (1990)

theory were learner autonomy and self-regulation. Oxford (1999) defined learner

autonomy as the

> (a) ability and willingness to perform a language task without assistance, with
> adaptability related to the situational demands, with transferability to other
> relevant contexts, and with reflection, accompanied by (b) relevant action (the
> use, usually conscious and intentional, of appropriate learning strategies)
> reflecting both ability and willingness. (pp. 110-111)

According to Oxford (1999), language-learning strategies reflect the learner's

degree of autonomy and are mechanisms by which the learner develops still greater

autonomy. The concept of autonomy in the foreign- and second-language field is often

known as self-regulation in the psychology field, which is an important component of the

sociocultural theory of Russian psychologist Lev Vygotsky (1978, 1986). Vygotsky's

(1978, 1986) theory emphasized the importance of metacognition and insisted that

education should be concerned with learning to learn, developing learners' skills and

strategies to continue to learn. In doing so, educators make learning experience

meaningful and relevant to the learner's life and relate the learning experience to the

development of the learner as a whole person (Williams & Burden, 1997).

In addition, Vygotsky's (1978, 1986) theory emphasized the social aspects of

learning such as learning from teachers or more capable peers. The theory postulated that

the goal of learning is to develop an independent, self-regulated, problem-solving

individual with the help of someone (e.g., teachers, parents, or more competent peers)

who can provide the learner the assistance needed for solving the problem. Self-

regulation was viewed as the process during which the learner plans, guides, and

monitors his or her attention and behavior. The behaviors involved in this process are

commonly referred to by educators as metacognitive learning strategies (Oxford, 1999).

Learners internalize metacognitive strategies thorough interacting with more competent people in the learning environment. Similarly, when interacting with more competent people, the learner internalizes cognitive learning strategies such as analyzing, synthesizing, and evaluating (Oxford, 1999).

Oxford's (1990) language-learning-strategy theory differentiates between direct and indirect learning strategies. Direct strategies are defined as the ones that directly involve the language being learned and indirect strategies as those that do not involve directly the target language but are considered to be helpful for learning the language. Direct strategies are further subcategorized into memory, cognitive, and compensation strategies, and indirect strategies are subdivided into metacognitive, affective, and social categories.

According to Oxford's (1990) categorization system, memory strategies involve remembering and retrieving information and relating new material to existing knowledge. Examples of memory strategies include creating mental linkages or applying images and sounds in remembering a new word. Social strategies improve language learning through interacting with other people and managing discourse. Cognitive strategies manipulate the reception and production of language, for example, repeating a word verbally or creating word lists. Metacognitive strategies involve a conscious overview of the learning process through planning, monitoring, and evaluating one's learning. Compensation strategies are used to overcome deficiencies in knowledge of the language (e.g., guessing unknown meaning while listening and reading). Affective strategies involve feelings, attitudes, and motivations related to learning. The model of Oxford's (1990) language-learning-strategy theory, shown in Figure 1, was used in this study to

define the vocabulary-learning strategies and interpret the findings of the study. The two strategy categories, compensation and affective, did not apply to the classification of Chinese vocabulary learning strategies in the current study; therefore, only four strategy categories, cognitive, memory, metacognitive, and social, were used to classify Chinese vocabulary-learning strategies.
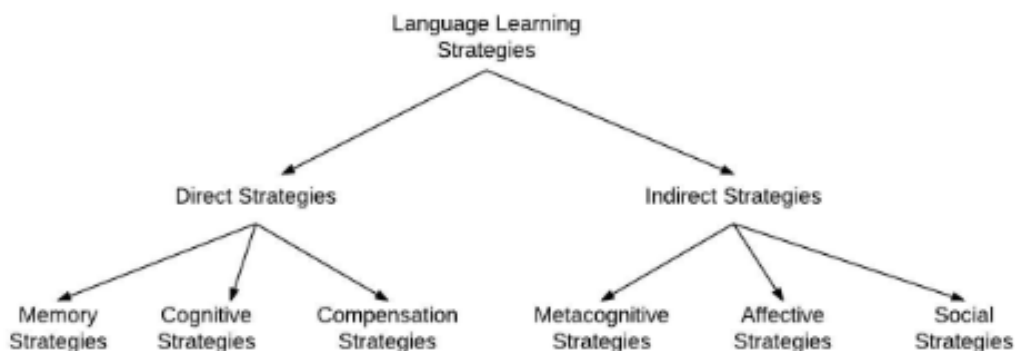
Figure 1. Oxford's (1990) language-learning strategy taxonomy

Background and Need

Along with the growing political and economic status of China in the international communities, Mandarin Chinese has been identified as a critical foreign language in the US, and the number of students interested in learning Chinese has been increasing rapidly, which is reflected in the statistics from enrollments in languages other than English in United States institutions of higher education. For example, there were 412 institutions offering Chinese language programs in 1990, and this number doubled by the year 2013, reaching 866. In terms of number of students, in 1960, there were only 679 students enrolled in Chinese, and this number has been increasing annually since then. By the end of the year of 2013, the enrollment had risen to 61,055 (Furman, Goldberg, & Lusin, 2015).

The increasing enrollment of CFL students in the US has made the indepth investigation of Chinese vocabulary-learning strategies more important than ever, as the unique orthographic and phonological features of the Chinese language are likely to pose great challenges for English-speaking students. Unlike the alphabetical writing system of English in which each letter approximately encodes a phoneme, Chinese is a logographic language in that a character corresponds to a sound and meaning at the level of syllable (Sun, 2006). A Chinese word usually consists of one or more characters and to acquire a Chinese word means the mastery of the three aspects of the word: shape (character), pronunciation, and meaning. Each character is formed in a three-tier manner: stroke, radical, and character. The smallest units of characters are strokes, and the strokes are configured in different ways to form radicals, which are combined with other radicals to form different characters.

In addition, unlike English, Chinese generally is considered to be an orthographically deep language, which means that there is a lack of one-to-one correspondence between the sound and the script of the Chinese words (Katz & Feldman, 1983). In learning English, a learner usually can predict the pronunciation based on the spelling of a word. In the case of Chinese, even though some characters have phonetic components that cue the pronunciation of the characters, as the Chinese language has evolved, many characters are no longer pronounced the same as their phonetic components.

As far as phonology is concerned, one major challenge for English-speaking students lies in the fact that Chinese is a tonal language. The spoken language of Chinese has four tones and one neutral tone, and tones are used to differentiate meanings. For

example, without tones, the four characters 妈 (ma with the first tone, mother), 麻 (ma with the second tone, num), 马 (ma with the third tone, horse), and 骂 (ma with the fourth tone, scold) all sound the same. The lack of tone feature in English makes it particularly hard for English-speaking learners to acquire fully the tone skills and this challenge is summarized in the study of Wang, Perfetti, and Liu (2003). According to the researchers, even after studying Chinese for a semester, U.S. college students still encounter great difficulty in acquiring tone skills. Relying on tones to distinguish meanings also results in a large number of homophones in Chinese. For instance, typing in the electronic dictionary the sound "li" with the second tone, a learner will see several characters with this pronunciation such as 离 (to depart), 黎 (dawn), 梨 (pear), 蓠 (fence), 犁 (to plow). Learners need to use their character knowledge and appropriate context to determine the meaning of homophones (Sung, 2012, 2014).

Due to the previously mentioned orthographic and phonological features, learning Chinese vocabulary words remains a great challenge for alphabetical learners such as native English speakers. Shen (2009) reported that after the completion of 3rd-year Chinese classes in college, the students' average number of known words from the 8,500-word corpus was 2,229. The slow progress in vocabulary building became a hindrance for students to develop their other language skills. Xing (2003) observed that some of the students in advanced-level classes still had not found effective strategies to study Chinese reading and writing. Many of them had difficulty applying high-level vocabulary in their conversions, and instead they kept using the low-level vocabulary that they learned in the beginning of the course.

   In fact, whether it is learning Chinese or other languages as a foreign or second language, learners are not likely to achieve higher levels of language proficiency without mastery of a large vocabulary. As Meara (1980) pointed out, "learners themselves readily admit that they experience considerable difficulty with vocabulary, and once they have got over the initial states of acquiring their second language, most learners identify the acquisition of vocabulary as their greatest single source of problems" (p. 100). Meara's (1980) conclusion is well supported by a series of studies investigating the diverse aspects of vocabulary knowledge and the relationship between vocabulary knowledge and learners' language proficiency. These studies investigated vocabulary breadth knowledge as well as the depth of vocabulary knowledge. Vocabulary breadth knowledge refers to "the number of words the meaning of which one has at least some superficial knowledge" (Qian, 2002, p. 515). The depth of vocabulary knowledge means how well one knows about a word (Nation, 2001). These empirical studies (Ehsanzadeh, 2012; Nation, 2013; Schmitt, 2008; Stæhr, 2008; Teng, 2016) all found strong and statistically significant relationships between the breadth and depth of vocabulary and learners' language proficiency. For example, some studies documented a strong and statistically significant relationship between vocabulary knowledge and reading comprehension (Ehsanzadeh, 2012; Qian, 2002; Stæhr, 2008). Other studies revealed the important role that vocabulary knowledge plays in students' listening proficiency (Nation, 2013; Schmitt, 2008), and according to these studies, learners need to recognize at least 95% of the total running words to have adequate listening-comprehension scores.

   The aforementioned studies provided empirical evidence highlighting the importance of vocabulary knowledge for learners in second-language acquisition (SLA).

The mastery of the full range of word-knowledge aspects requires that the word will have to be met in many different contexts, which entails the necessity for the learner to employ different learning strategies to create such contexts, such as looking up new words in the dictionary and reading the example sentences with the words or using new words in a conversation with a native speaker. In addition, as Schmitt (2008) argued, "students need the willingness to be active learners over a long period of time, for without this, they are unlikely to achieve any substantial vocabulary size, regardless of the quality of instruction" (p. 333). When students have effective vocabulary-learning strategies from which they can choose freely, they are more likely to become active learners and achieve better learning outcomes in their vocabulary acquisition.

Therefore, along with the research exploring the relationship between learners' vocabulary knowledge and their language proficiency, vocabulary-learning strategies also started to draw greater attention in vocabulary-acquisition studies. Several taxonomies have been developed to categorize and describe the vocabulary-learning strategies used by ESL or EFL learners (Fan, 2003; Gu & Johnson,1996; Nation, 2001; Schmitt, 1997). Many of these taxonomies have drawn upon Oxford's (1990) commonly used taxonomy of language-learning strategies, which included six categories: metacognitive strategies, cognitive strategies, memory strategies, social strategies, compensation strategies, and affective strategies.

The establishment of vocabulary-learning-strategies taxonomies provided useful tools for researchers to further explore learners' vocabulary-strategy use and their learning outcomes. The findings of several empirical studies have shed light on the relationship between students' vocabulary-strategy use and their overall language success

(Lai, 2016). The general findings of these studies include but are not limited to the following: successful learners use a variety of strategies (Ahmed, 1989; Fan, 2003; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Lawson & Hogben, 1996), there is a strong positive relationship between students' strategy use and the learning outcomes as measured by vocabulary tests or proficiency tests (Barcroft, 2009; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Teng, 2015), more-successful learners use strategies differently than less-successful learners (Ahmed, 1989; Fan, 2003; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Lai, 2016; Lawson & Hogben, 1996; Sanaoui, 1995), and higher-achievement learners use more strategies than lower-achievement learners (Ahmed, 1989; Fan, 2003; Gu, 1994; Lawson & Hogben, 1996; Schmitt, 1997).

Although previous studies have reached no consensus regarding which individual strategies or strategy types are related closely to better learning achievement, some studies (e.g., Ahmed, 1989; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Lai, 2016; Sanaoui, 1995; Teng, 2015) have found that certain strategy patterns differentiate more-proficient learners from less-proficient learners (Lai, 2016). For example, Gu and Johnson (1996) concluded that metacognitive self-regulation is crucial in vocabulary learning. Kojic-Sabo and Lightbown (1999) reported that learner impendence and time spent in learning and practicing vocabulary were most-closely related to successful vocabulary learning and overall language achievement. Teng (2015) found that indirect strategies such as self-planning and self-monitoring had a high level of correlation with students' vocabulary knowledge. The findings generated from these studies have important pedagogical implications for second-language vocabulary teaching and learning.

Compared with the research on vocabulary-learning strategies in ESL or EFL, the research on Chinese vocabulary-learning strategies is rather limited in both scope and depth. Among the studies on Chinese vocabulary-learning strategies, some focused on identifying the strategies commonly used by CFL learners (Grenfell & Harris, 2015; Ke, 1996, 1998; McGinnis, 1999; Shen, 2005; Wang, 1998; Wang & Leland, 2011; Winke & Abbuhl, 2007; Zahradníková, 2016), some investigated the effectiveness of individual strategies such as the strategy of using semantic radical knowledge to encode characters (Everson & Ke, 1997; Gamage, 2003; Guan, Liu, Chan, Ye, & Perfetti, 2011; Hayes, 1988; Shen, 2004; Taft & Chung, 1999), and others examined the relationship between strategy use and learning outcomes (Ke, 1998; Sung, 2012, 2014). The major findings of these studies include that cognitive strategies that are orthographic-knowledge-based (e.g., applying radical knowledge when learning new characters) are used commonly by students in learning Chinese vocabulary words (Grenfell & Harris, 2015; Ke, 1998; Shen, 2005; Zahradníková, 2016), that using orthographic-knowledge-based strategies effectively can facilitate students' vocabulary learning (Ke, 1998; Shen, 2004; Shen & Ke, 2007; Sung, 2012, 2014; Taft &Chung 1999; Xu, Chang, & Perfetti, 2014), that input and output strategies that create opportunities to learn and use vocabulary in context are perceived helpful by learners (Wang & Leland 2011; Winke & Abbuhl, 2007), that phonological strategies (e.g., saying a character while writing it) increase students' level of phonological comprehension of the words heard (Sung, 2014), but they are underused by learners (Hayes, 1988; Ke, 1996; Zahradníková, 2016), and that metacognitive strategies related to systematic reviewing and previewing of vocabulary words play an important role in vocabulary learning (Shen, 2005).

Even though the findings of these studies provided important information regarding CFL learners' strategy use in learning vocabulary words, the relationship between CFL learners' vocabulary-strategy use and their learning outcomes remains underresearched. Only three published studies investigated this relationship, and the studies all took place in a nonintensive language setting. One study was conducted by Ke (1998) who sought the relationship between students' strategy use and their performance in character recognition and production. The study found that learning strategies associated with practicing characters in the context of vocabulary items and with associating new characters with known characters in terms of graphic structure were the two strategies with the largest statistically significant effect on character recognition after controlling for site, explaining 6.65% of the variation on the scores of the Chinese character recognition. The strategy of learning character components (semantic radical and phonetic radicals) was found to predict students' character production, explaining an additional 3.04% of the variation in the scores of character production after controlling for site.

Another study was conducted by Sung (2014), who replicated her earlier study conducted in 2012. The study identified 20 most-frequently used strategies that had averages higher than 3.5 on a 5-point Likert-type scale. The principal-component analysis along with Varimax rotation conducted on these 20 strategies resulted in three components. Component 1 was defined by the five strategies related to the phonetic aspects of characters, Component 2 was defined by the four strategies related to remembering a character's or a word's graphic information and its association with its sounds. Component 3 was defined by the three strategies used to practice and review

how a character or a word is written and used. The three components together explained 44% of the variance among the student ratings of strategies. The results of the multiple regression analyses where students' strategy use was regressed onto their Chinese character performance showed that the participants using certain phonological strategies more frequently performed better on the phonological-comprehension part of the test, whereas the participants using orthographic strategies more-frequently performed better on the graphic comprehension, graphic production, and phonological production parts of the test.

Both Ke's (1998) study and Sung's (2014) study provided important empirical evidence on what strategies are effective for learners' vocabulary acquisition in learning Chinese. Both studies, however, used only vocabulary tests to measure students' learning outcomes, and they were conducted in a nonintensive learning environment. In addition, there was a lack of research on whether more-successful and less-successful students use strategies differently in learning Chinese vocabulary words. Given the importance of vocabulary knowledge in CFL students' language-proficiency development and the need to understand the role that vocabulary-learning strategies play in CFL students' learning outcomes, further studies on Chinese vocabulary-learning strategies, specifically CFL students' vocabulary-strategy use in an intensive-language-training setting and its relationship to students' learning outcomes, were merited.

To this end, the current study was conducted to answer the following research questions:

1. What learning strategies are commonly used by Chinese-as-a-foreign-language students in learning Chinese vocabulary words?

2. To what extent do learners of different GPAs (high, middle, and low) vary

in their strategy use?

3. To what extent is there a relationship between students' strategy use and their learning outcomes as measured by their listening and reading proficiency-test scores?

Definition of Terms

The following is a list of the definitions for the terms used in the study. There may be different definitions for these terms, but the definitions provided here are the ones that apply to the study.

The *Chinese Vocabulary Learning Strategies Questionnaire* (CVLSQ) was administered to collect information on students' strategy use in learning Chinese vocabulary words in this study. The CVLSQ is a 5-point Likert-type scale that measures the frequency of CFL students' strategy use with 5 representing "*Always or almost always true of me,*" 4 "*Generally true of me,*" 3 "*Somewhat true of me,*" 2 "*Generally not true of me,*" and 1 "*Never or almost never true of me.*" The questionnaire, adapted from Shen's (2005) *Character Learning Strategy Inventory*, has 50 items that are classified into four strategy categories: (a) cognitive strategies, (b) memory strategies, (c) metacognitive strategies, and (d) social strategies.

Cognitive Strategies are the strategies that learners use to manipulate the reception and production of language (Oxford, 1990). Examples of cognitive strategies that CFL students use in learning Chinese vocabulary words include saying the Chinese character (or word) aloud or silently to oneself when writing it and using new words in e-mail or journal writing. Cognitive strategies that CFL students in this study used in learning Chinese vocabulary words were measured by 23 items of the CVLSQ.

Language-learning strategies are "the specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (Oxford, 1990, p. 8); therefore, Chinese vocabulary-learning strategies are such specific actions that the learners take in learning Chinese vocabulary words.

Memory strategies involve remembering and retrieving information though relating new material to existing knowledge or organizing mental information and transforming it in a way that makes it memorable (Oxford, 1990). Examples of memory strategies that CFL students use in learning Chinese vocabulary words include making a story of the character (or word) and connecting the new word to one's personal experience. Memory strategies that CFL students use in learning Chinese vocabulary were measured by 12 items of the CVLSQ.

Metacognitive strategies involve a conscious overview of the learning process through planning, monitoring, and evaluating one's learning (Oxford, 1990). Examples of metacognitive strategies that CFL students use in learning Chinese vocabulary words include reviewing the words learned on a regular basis and summarizing one's progress in vocabulary learning periodically. Metacognitive strategies that CFL students use in learning Chinese vocabulary words were measured by 10 items of the CVLSQ.

Orthographically deep language refers to a language that lacks regular sound to script correspondence within its writing system. For example, among alphabetic languages, English and French are considered to be orthographically deep languages, whereas Spanish and German are considered to be orthographically shallow languages. Chinese is also an orthographically deep language (Katz & Feldman, 1983).

Pinyin is a phonetic transcription system that uses Romanized spelling to assist students in learning pronunciation of Chinese characters. It is used commonly in Chinese textbooks for both first- and second-language learners. Diacritical signs marked above the vowels of a pinyin indicate the tone of the word. The same syllable with different tones is represented by different characters with different meanings (Lee & Kalyuga, 2011). For example, ma with first tone (妈, mā) means "mother" but with third tone (马, mǎ) means "horse."

Social strategies improve language learning through interacting with other people and managing discourse (Oxford, 1990). Examples of social strategies that CFL students use in learning Chinese vocabulary words include discussing with other students the methods of learning characters (or words) and practicing using words by interacting with others such as one's teachers, classmates, or friends. Social strategies that CFL students use in learning Chinese vocabulary were measured by 5 items of CVLSQ.

The Proficiency Progress Test (PROFIPT) is a test that the students in this study take at the end of Semester II to gauge their language proficiency in listening and reading. PROFIPT includes a listening test and a reading test, each of which has 60 multiple-choice items. Students' scores are the number of the correct answers that they choose, so the minimum possible score for a student is 0 and the maximum possible score is 60, as there is a total of 60 questions.

Summary

Given the importance of vocabulary for students' overall language proficiency, a considerable amount of research has been conducted to examine the role that vocabulary-learning strategies play in students' second-language learning. The majority of the

studies on vocabulary-learning strategies have been conducted in the area of teaching English as a second language (ESL) or foreign language (EFL), whereas much less research has been conducted regarding the vocabulary-learning strategies of CFL learners, and the relationship between CFL learners' vocabulary-strategy use and their learning outcomes remained underresearched. Moreover, previous research on Chinese vocabulary-learning strategies was conducted mainly in a nonintensive-learning setting. Therefore, the current study was conducted to investigate the strategy use of CFL learners and its relationship to the learning outcomes in an intensive-training setting in order to better understand the role that vocabulary-learning strategies play in CFL students' learning of the Chinese language. Literature relevant to the current study is synthesized and summarized in Chapter II. The research design of the study is described in Chapter III, the results of the data analyses are presented in Chapter IV, and the findings interpreted in Chapter V.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study was to investigate the strategy use of Chinese-as-a-foreign-language (CFL) students in learning Chinese vocabulary words and its relationship to students' learning outcomes. This chapter provides an overview of the literature that serves as the theoretical foundation and background for the current study. The chapter is divided into six parts: (a) language-learning strategies, (b) vocabulary acquisition: breadth and depth of vocabulary knowledge, (c) second-language vocabulary development, (d) research on vocabulary-learning strategies, (e) unique features of Chinese characters, and (f) research on Chinese-vocabulary-learning strategies.

Language-Learning Strategies

As an important branch of research on language-learning strategies, the classification of strategies and the methods used in the research on vocabulary-learning strategies are similar to these used in research on language-learning strategies. Addressed in this section are (a) the classification of language-learning strategies, (b) the need for research on language-learning strategies in the framework of second-language-learning theories, and (c) the findings of major studies on the relationship between language-learning strategies and learner proficiency.

Classifications of second-language-learning strategies

Since the 1970s, researchers in second-language acquisition increasingly have become interested in understanding individual differences in language learners. One individual difference variable, second-language learning strategy, has been researched extensively to understand better how languages are learned (e.g., Gu, 2005; Hsiao &

Oxford, 2002; Nyikos & Oxford, 1993). Language-learning strategies, according to Oxford (1990), are "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (p. 8). Various language-learning strategies have been identified and classified in different systems. Among the various classification systems, the ones proposed by Rubin (1981), O'Malley and Chamot (1990), and Oxford (1990) have been influential in the research of language-learning strategies.

Rubin's (1981) dichotomy classification system categorized learning strategies into two broad types of strategies called direct and indirect strategies. Rubin (1981) reported six direct strategies along with two indirect strategies. The six direct strategies are clarification (or verification), monitoring, memorization, guessing (or inductive inferencing), deductive reasoning, and practice. The two indirect strategies are creating opportunities for practicing and employing production tricks. O'Malley and Chamot (1990) distinguished three broad types of learning strategies: cognitive, metacognitive, and social/affective. Metacognitive strategies include advance organizers, selective attention, self-management, planning, self-monitoring, and self-evaluation. Cognitive strategies refer to repetition, organization, inferencing, summarizing, deduction, imagery, transfer, and elaboration. Social/affective strategies are cooperation, questioning for clarification, and self-talk.

Oxford (1990) further developed Rubin's (1981) direct and indirect dichotomy by making the operational definition concrete. She defined direct strategies as the ones that directly involve the language being learned and indirect strategies as those that do not involve directly the target language but are nevertheless helpful for learners to learn the

language. In Oxford's (1990) classification system, direct strategies are subcategorized into memory, cognitive, and compensation strategies, and indirect strategies are subdivided into metacognitive, affective, and social categories. Oxford's (1990) direct strategies are presented in Table 1 and indirect strategies in Table 2.

Table 1

Direct Strategies: Memory, Cognitive, and Compensation Strategies (Oxford, 1990)

Memory Strategies	Cognitive Strategies	Compensation Strategies
A. Creating mental linkages:	A. Practicing:	A. Guessing intelligently:
1. Grouping	1. Repeating	1. Using linguistic clues
2. Associating or elaborating	2. Formally practicing with sounds and writing systems	2. Using other clues
3. Placing new words into a context	3. Recognizing and using formulas and patterns	B. Overcoming limitation in speaking and writing:
B. Applying images and sounds:	4. Recombining	1. Switching to the mother tongue
1. Using imagery	5. Practicing naturalistically	2. Getting help
2. Semantic mapping		3. Using mime or gesture
3. Using keywords	B. Receiving and sending messages:	4. Avoiding communication partially or totally
4. Representing sounds in memory	1. Getting the idea quickly	5. Selecting the topic
	2. Using resources for receiving and sending messages	6. Adjusting or approximating the message
C. Reviewing well:		7. Coining words
1. Structured reviewing		8. Using a circumlocution or synonym
	C. Analyzing and reasoning:	
D. Employing action:	1. Reasoning deductively	
1. Using physical response or sensation	2. Analyzing expressions	
2. Using mechanical techniques	3. Analyzing contrastively (across languages)	
	4. Translating	
	5. Transferring	
	D. Creating structure for input and output:	
	1. Taking notes	
	2. Summarizing	
	3. Highlighting	

Table 2

Indirect Strategies: Metacognitive, Affective, and Social Strategies (Oxford, 1990)

Metacognitive Strategies	Affective Strategies	Social Strategies
A. Centering your learning: 1. Overview and linking with already known materials 2. Paying attention 3. Delaying speech production to focus on listening B. Arranging and planning your learning: 1. Finding out about language learning 2. Organizing 3. Setting goals and objectives 4. Identifying the purpose of a language task (purposeful listening, reading, speaking, or writing) 5. Planning for a language task 6. Seeking practice opportunities C. Evaluating your learning: 1. Self-monitoring 2. Self-evaluating	A. Lowering your anxiety 1. Using progressive relaxation, deep breathing, or meditation 2. Using music 3. Using laughter B. Encouraging yourself: 1. Making positive statements 2. Taking risks wisely 3. Rewarding yourself C. Taking your emotional temperature: 1. Listening to your body 2. Using a checklist 3. Writing a language learning diary 4. Discussing your feelings with someone else	A. Asking questions: 1. Asking for clarification or verification 2. Asking for correction B. Cooperating with others: 1. Cooperating with others 2. Cooperating with proficient users of the new language C. Empathizing with others: 1. Developing cultural understanding 2. Becoming aware of others' thoughts and feelings

Based on her classification system, Oxford (1990) developed the *Strategy Inventory for Language Learning (SILL)*. Since its development, the *SILL* has been used to assess the learning-strategy use of more than 10,000 learners worldwide and has been translated into a number of languages such as Arabic, Chinese, French, and German. Compared with Rubin's (1981) and O'Malley and Chamot's (1990) classification

systems, Oxford's (1990) classification is concrete and comprehensive. In addition, empirical studies provided further evidence to support Oxford's (1990) classification system as a valid and valuable tool in language-learning strategy research. Through a confirmatory factor analysis, Hsiao and Oxford (2002) compared classification theories of language-learning strategies. The researchers conducted confirmatory factor analysis of the data collected from 517 college English-as-a-foreign-language (EFL) learners whose strategy use was measured by the *Strategy Inventory for Language Learning* (Oxford, 1900). The results indicated that of the strategy theories examined, Oxford's (1990) six-factor strategy taxonomy was the most consistent with learners' strategy use. Therefore, the taxonomy was used as the basis for developing the instrument for the current study to measure learners' strategy use in learning Chinese vocabulary.

Language-learning strategies and second-language-learning theories

Prior to the 1970s, when the cognitive theory of learning caught the attention of second-language-acquisition (SLA) researchers, second-language-learning theories and models had been constructed predominately from a linguistic perspective with little attention paid to how students use language-learning strategies (Purpura, 1999). Late in the 19th century, the Grammar Translation Method was the prevalent teaching method in second- and foreign-language teaching. The Grammar Translation Method mainly focused on explanation of grammatical rules and translation exercises. Vocabulary typically was taught or learned out of context, and there was little emphasis on listening and speaking skills. As Griffiths (2013) pointed out, grammar-translation theory tended to assume that learning would happen naturally if students follow the method, and there was little or no consideration of what students might do to improve their own learning.

In the late 1940s and 1950s, the Audiolingual Method, a method originally developed to produce military linguists with conversation fluency in the target language at a relatively fast pace, caught the attention of language educators (Brown, 2014). Grounded in behaviorist theories, the Audiolingual Method had the underlying assumption that language learning is also the process of habit forming on a stimulus, response, and reinforcement basis. Accordingly, pronunciation and pattern drills, repetition, and substitution exercises comprised the main learning activities of the Audiolingual Method (Brown, 2014). As with the Grammar Translation Method, the Audiolingual Method paid little attention to what contribution learners can make in the learning process (Griffiths, 2013).

In late 1970s and early 1980s, Krashen (1976, 1977, 1985) proposed five hypotheses that had a great effect on second- and foreign-language methodology. In two of his hypotheses, the Acquisition-Learning Hypothesis and the Monitor Hypothesis, he argued that adult learners' fluency was due to what they *acquired*, not what they *learned*. Conscious learning had limited usefulness in learners' language development, which must be acquired naturally through communication in the target language. Monitoring one's output and other explicit or intentional learning should be avoided largely as they may hinder acquisition. Based on Krashen's (1976, 1977, 1985) theories, strategies have a nonsignificant role to play in language acquisition (Griffiths, 2013).

Since 1970, studies conducted in the domains of cognitive psychology and psycholinguistics have sparked the research interest in understanding second-language acquisition from a cognitive approach. The cognitive theory postulates memory as functioning in two stages: working memory and long-term memory. Working memory is

characterized by its limited capacity in processing incoming information, and conscious effort is needed to maximize the capacity. In contrast, long-term memory is large in capacity and operates in parallel fashion (Miller, 1956).

The theories of a few cognitive psychologists gained the attention of those investigating language learning, such as Ausubel's (1968) learning theory, Atkinson and Shiffrin's (1968) multistore model of memory, and Weinstein and Mayer's (1986) four-stage encoding process. Ausubel's theory (1968) focused on meaningful learning. According to his theory, meaningful learning occurs when the new information is integrated into the existing cognitive structure and such information is stored in the long-term memory so that it can be retrieved later when needed. Atkinson and Shiffrin's (1968) multistore model of memory explains how human memory works. According to this model, human memory has three structural components: a sensory register, a short-term store, and a long-term store. Stimulus input enters the sensory memory through sense organs, and the information carried by the stimulus is kept in the sensory register. If the information is attended to, it will be transferred to the short-term store. Otherwise, the information decays and is lost. If the information is rehearsed actively (e.g., through repetition) in the short-term store, it will be transferred into the long-term store. The information held in the long-term store can be transferred back to the short-term store for use.

Weinstein and Mayer (1986) proposed a four-stage encoding process that involves selection, acquisition, construction, and integration. In the stage of selection, learners focus their attention on specific information that they receive through sense receptors and select the information of their interest to transfer into working memory. During

acquisition, the selected information is transferred from working memory into long-term memory for permanent storage. In the construction stage, learners actively build connections between ideas and concepts in working memory and long-term memory. Finally, learners integrate the new information with the existing knowledge and store the integrated information in long-term memory for later retrieval.

The cognitive theories cited above inspired new research directions in the language-acquisition research. Second-language acquisition researchers started to examine the language-learning process from a cognitive perspective. Instead of focusing on learning itself, researchers now started to focus on individual differences such as the use of learning strategies to determine how individual learners approach learning and what contributions learners can make in the learning process (Takač, 2008). Several second-language-acquisition models and theories that were based on the cognitive theories highlighted the role of language-learning strategies in the process of learning (e.g., Anderson, 1995; Bialystok, 1978; Ellis, 1995; McLaughlin, 1987; Selinker, 1972; Skehan, 2000). Notable examples include Bialystok's (1978) second-language-learning model, McLaughlin's (1987) information-processing model, and Skehan's (2000) model of individual differences in language learning.

Bialystok (1978) was one of the first theorists who recognized the important role that learning strategies play in the process of second-language learning (Takač, 2008). The language-learning model that she proposed was organized on three levels: input, knowledge, and output. Input accounts for two language-learning experiences: formal classroom learning experience and encountering the language in a communicative setting such as meeting the native speakers of the target language. At the knowledge level, three

sources of knowledge within the individual learners were differentiated: general knowledge of the world or knowledge of languages other than the target language, explicit linguistic knowledge of the target language, and implicit linguistic knowledge acquired through the unconscious mastery of the target language. Output comprises the comprehension and production of the target language. In this model, language-learning strategies (practicing, monitoring, and inferencing) connect the various knowledge sources to each other and to the learning outcomes. For example, when learning a grammatical feature in the classroom setting, learners' explicit linguistic knowledge of the grammatical feature can become implicit through a strategy of formal practicing (e.g., using the grammatical feature in a sentence or in a writing task).

McLaughlin's (1987) information-processing model also emphasized the important role of language-learning strategies in learners' language-learning process. This model views language learning as the acquisition of a complex cognitive skill, which involves the mastery of various component subskills. How well learners can handle a language task is limited by both the task difficulty and their information processing ability. Learners can extend this capacity through two ways: *automatization* and *restructuring*. Automatization can be achieved by repeated practice of the subskills of the task through controlled processing. The automatization of the component subskills leads to learners' fluent performance of the task. Restructuring occurs when learners go beyond the mastery of the components of the task and "link previously isolated procedures into a unified representational framework" (McLaughlin, 1987, p. 137). Restructuring, the modification of knowledge organizational structures, "can be facilitated by the flexible use of learning strategies" (Takač, 2008, p. 37).

Skehan's (2000) model of individual differences in language learning incorporated four categories of individual differences: modality preference (visual, auditory, or kinesthetic), foreign-language aptitude, learning style, and learning strategies. The model addresses the degrees to which the four categories of individual differences are amenable to change through instruction. According to this model, language aptitude and modality are comparatively inflexible features, and learning strategies are the most amenable to change of all features. Skehan's (2000) model provided a good theoretical rationale for strategy-training programs. In addition, the findings from studies on the effects of strategy training on learning outcomes (e.g., Plonsky, 2011) provided empirical evidence demonstrating the importance of language-learning strategies for learner's second-language learning.

The second-language learning theories presented above provided a strong theoretical rationale for conducting the current research. Bialystok's (1978) model highlights the importance of using cognitive strategies to manipulate input and output information to connect learners' various knowledge sources to each other and the importance of using metacognitive strategies to plan, monitor, and evaluate one's learning. McLaughlin's (1987) information-processing model supports that memory strategies help increase the number of information chunks learners can process automatically by relating the new information to their prior knowledge. The usefulness of these strategies was examined in the current study to better understand the role of learning strategies in Chinese-as-a-foreign-language (CFL) students' learning of Chinese vocabulary words. In addition, Skehan's (2000) model showed that it is promising to help less successful learners to become more efficient in their learning by teaching them

the strategies that help good learners succeed. The precondition to providing such strategy training is to identify the strategies associated with better performance, which also was the aim of the current research.

Language-learning strategies and learner proficiency

The ultimate goal of research on language-learning strategies is to gain a better understanding of the role that strategy use plays in learners' proficiency. Many of the early studies on language-learning strategies primarily focused on identifying the strategies used by successful learners. The underlying assumptions of this line of research was that learners' strategies contribute to their success in learning and that these strategies can be taught to unsuccessful learners to help them improve. The seminal studies in this area of research include the three studies conducted by Rubin (1975), Stern (1975), and Naiman, Frohlich, Stern, and Todesco (1978).

Rubin (1975) was among the first to suggest that "good language learners" might process information in such a way as to contribute to their success. By means of observing students in classrooms, talking to good language learners, and eliciting observations from teachers, Rubin (1975) identified seven strategies characteristic of good language learners: (a) having a high level of tolerance for ambiguity and willingness to guess or infer by using contextual clues, (b) having the strong motivation to communicate or to learn from a communication, (c) managing inhibitions (e.g., willingness to appear foolish if such behavior results in communication), (d) attending to form in addition to focusing on communication, (e) seeking opportunities to practice the language, (f) monitoring one's own speech and the speech of others, and (g) attending to meaning.

Stern's study (1975) produced a list of 10 language-learning strategies used by good language learners: (a) planning, (b) taking an active approach to the learning task, (c) taking a tolerant approach to the target language, (d) knowing how to tackle a language, (e) developing the new language into an ordered system and revising it progressively, (f) constant searching for meaning, (g) willingness to practice the language, (h) using the language for real communicative purposes, (i) self-monitoring, and (j) developing the target language into a separate reference system and learning to think in the target language. Naiman et al. (1978) investigated the strategies that were common to "good language learners" by conducting semistructured interviews with 34 successful graduate students, many of whom were multilingual. Five major strategies were identified to be common to the successful students: (a) actively involving oneself in language learning by seeking and creating learning opportunities, (b) viewing the language as a system, (c) using the language as a means of communication and interaction, (d) actively coping with the affective demands of learning a language, and (e) monitoring one's second-language performance and making adjustments as needed. Even though the three studies merely generated lists of strategies that were characteristic of "good language learners" and little attempt had been made to classify the strategies into typologies, the studies are important in that they sparked subsequent research interest in language-learning strategies, shifting the research focus in second- or foreign-language education from examining the methods of teaching to investigating the processes of learning (Purpura, 1999).

In a more recent qualitative study on language-learning strategies, Gan, Humphreys, and Hamp-Lyons (2004) investigated the individual difference factors that

contribute to the variability observed in the learning outcomes of successful and unsuccessful English-as-a-foreign-language (EFL) students in Chinese universities, and one such factor was learning strategies. The data were collected through interviews, diaries, and follow-up e-mail correspondence with nine successful and nine unsuccessful second-year EFL students at two Chinese mainland universities. The findings revealed that, even though both the successful and the unsuccessful students used similar cognitive and metacognitive strategies, successful students used a greater variety of strategies and made more sophisticated use of the strategies. Specifically, the successful students previewed lessons in a more consistent and methodological manner by following a well-structured sequence of steps. In addition, the successful students were able to set specific language-learning goals, evaluate their learning strategies, and take the initiative to create learning and practice opportunities. These important metacognitive strategies were lacking in the unsuccessful students.

Moving beyond qualitative methods, a considerable amount of research explored the relationship between learners' strategy use and their language proficiency by means of statistical procedures in the hope of identifying the strategies used by effective learners and gaining a better understanding of the role that strategies play in learners' proficiency (e.g., Bruen, 2001; Green & Oxford, 1995; Griffiths, 2003; Lai, 2009). One of the early quantitative studies on language-learning strategies was that of Politzer and McGroarty (1985). They investigated the learning behaviors and performance of 37 Asian-American and Hispanic-American students enrolled in an 8-week ESL course at a U.S. university. The researchers developed a 51-item questionnaire to measure students' learning behaviors and strategies, which were divided into three categories: classroom behavior,

individual study behavior, and social interaction outside of the classroom. The researchers correlated students' learning behavior scale scores and their gains on four test measures. The adjusted gain scores over the 8 weeks were found to be unrelated to the three learning behavior categories. The gains, however, were found to be related to some specific strategy items within the three categories. For example, gains on the listening comprehension test were correlated positively with asking questions for clarification. Politzer and McGrorty's (1985) study provided useful information for subsequent researchers interested in quantitatively examining the relationships between learning strategies and proficiency using a questionnaire format (Purpura, 1999).

Many subsequent studies used similar research methods to explore the relationship between the strategy use of second-language learners and their language proficiency. Using Oxford's (1990) *SILL* or its modified version, these studies measured learners' strategy use and identified the most- and the-least-frequently-used strategies. The studies also looked into the relationship between students' strategy use and their language proficiency by conducting either analysis of variance (e.g., Bremner,1998; Park, 1997; Philips, 1991), which treated proficiency level as the independent variable and strategy use as the dependent variable or vice versa, or multiple regression analysis (e.g., Park, 1997). Students' proficiency was measured by either scores on the Test of English as a Foreign Language (TOFEL; e.g., Park, 1997; Philips, 1991), composite scores of spoken, written, and discrete-item language tests (Bremner,1998), oral exam scores (Bruen, 2001), or university placement test scores (Lai, 2009). The students were divided into high-, medium-, or low-proficiency groups based on their scores from the tests mentioned previously. The findings of these studies are summarized in Table 3.

Table 3

Studies on Language-Strategy Use and Learner Proficiency

Study	Participants and frequency of strategy use	Relationship between strategy use and proficiency
Philips (1991)	ESL students in US (n = 138) Most Frequent: metacognitive (M = 3.70, SD = .50) social strategies (M = 3.65, SD = .67) Least frequent: affective (M = 3.12, SD = .56) mnemonic strategies (M = 3.00, SD = .55)	1. Midscore group showed a statistically significant higher level of strategy use than both the high-score and the low-score group. 2. Higher-level students used metacognitive strategies (e.g., I have clear goals for improving my English skills) to a greater degree than less-proficient students.
Park (1997)	EFL students in Korea (n = 332) Most frequent: metacognitive strategies (M = 3.50, SD = .57) Least frequent: affective strategies (M = 2.91, SD = .58)	1. TOEFL mean of the high-strategy group was statistically significantly higher than that of the middle-strategy group, which was again statistically significantly higher than that of low-strategy group. 2. All six categories of language-learning strategies as well as total language-learning strategies were statistically significantly correlated with the TOEFL scores. 3. Cognitive (β = .24) and social (β = .16) strategies were more predictive of the TOEFL scores than the other four categories of language-learning strategies, accounting for 13% (R^2 = .13, F [2, 325] = 24.24) of the variance in the TOEFL scores.
Bremner (1998)	ESL students in Hong Kong (n =149) Most frequent: compensation (M = 3.36, SD = .52) metacognitive strategies (M = 3.12, SD = .70)	1. Students of higher language proficiency had higher use of cognitive and compensation strategies, and students of lower proficiency had higher use of affective strategies.

Table 3 (continued)

Study	Participants and frequency of strategy use	Relationship between strategy use and proficiency
Bremner (1998)	Least frequent: affective ($M = 2.76$, $SD = .52$) memory strategies ($M = 2.85$, $SD = .48$)	2. Eleven strategies, nine of which were from the cognitive category, were associated with higher proficiency. Many of these nine strategies were seen to involve active use of language (e.g., I write notes, messages, letters, or reports in English).
Bruen (2001)	Irish students learning German ($n = 100$) Ten "success" strategies belong to the categories of metacognitive strategies and cognitive strategies.	1. Statistically significant positive correlations existed between the total number of learning strategies employed, the overall frequency with which they were employed, and oral proficiency ($r = .26$ and $r = .28$, respectively). 2. The qualitative finding (interviews) indicated that students of higher proficiency use language learning strategies in a more systematic and purposeful manner and apply the strategies to a broader range of learning situations and tasks.
Lai (2009)	EFL students in Taiwan ($n = 418$) Most frequent: compensation strategies ($M = 3.09$, $SD = .62$) Least frequent: affective strategies ($M = 2.73$, $SD = .61$)	1. More proficient students used strategies ($M = 3.09$, $SD = .42$) more frequently than the midlevel students ($M = 2.86$, $SD = .45$) and the lower-level students ($M = 2.47$, $SD = .42$). 2. The more proficient students used metacognitive and cognitive strategies most frequently and memory strategies least frequently. In contrast, the less proficient students preferred social and memory strategies to metacognitive and cognitive strategies.

As can be seen from Table 3, the general findings from the studies, which were conducted in different learning contexts, show that unsuccessful students tend to use fewer strategies and use strategies less frequently in comparison with their more successful peers. For example, Bruen (2001) found that statistically significant positive correlations existed between the total number of learning strategies that the students employed, the overall frequency with which they were employed, and the students' oral

proficiency. Lai (2009) found that more proficient students used strategies more frequently than the midlevel and lower-level students. In addition, the findings in general indicate that successful students use metacognitive strategies more frequently than less-successful students (Bruen, 2001; Lai, 2009; Philips, 1991), and metacognitive and cognitive strategies providing authentic use of language are associated with higher language proficiency (Bruen, 2001; Lai, 2009; Park 1997; Bremner, 1998). Further, affective strategies were found to be underused by learners across several studies (Bremner, 1998; Lai, 2009; Park, 1997; Philips, 1991). The current study drew on these studies for the research design and the interpretation of findings.

<p style="text-align:center">***Summary***</p>

Various language-learning strategies have been identified and classified in different systems, among which Oxford's (1990) classification system has become used widely in language-learning strategy research. Based on her classification system, Oxford (1990) developed the *Strategy Inventory for Language Learning (SILL)*. Since its development, the *SILL* has been used to assess language-learning strategies in many studies (e.g., Park, 1997; Lai, 2009), and the findings of these studies provided empirical evidence regarding the relationship between language learner's strategy use and proficiency, indicating that certain strategies such as metacognitive strategies are associated with higher performance (e.g., Bruen, 2001; Lai, 2009; Philips, 1991). The current study referred to Oxford's (1990) taxonomy and the *SILL* in developing the instrument to measure learners' strategy use in learning Chinese vocabulary words. Considering that many items in *SILL* (Oxford, 1990) are indeed strategies used to learn vocabulary, it is a reasonable assumption that a certain correlation exists between CFL

students' strategy use in learning vocabulary and their learning outcomes and that successful learners differ from their less-successful peers in their use of vocabulary-learning strategies, which were the two aspects that the current study explored.

Vocabulary Acquisition: Breadth and Depth of Vocabulary Knowledge

To understand how vocabulary-learning strategies aid students' learning, having an indepth knowledge of second-language vocabulary acquisition is essential. The research on vocabulary acquisition distinguishes two dimensions of vocabulary knowledge: *size* or *breadth* of knowledge (Read, 2000) and *depth* of knowledge (Haastrup & Henriksen, 2000; Nation, 2001). *Breadth* of vocabulary knowledge refers to the quantity or number of words that learners know at a particular level of proficiency (Nation, 2001), or more specifically, "the number of words the meaning of which one has at least some superficial knowledge" (Qian, 2002, p. 515). D*epth* of vocabulary knowledge refers to how well one knows about a lexical item (Nation, 2001).

Breadth of vocabulary knowledge and language proficiency

Breadth knowledge, or the size of vocabulary, is essential for the comprehension of spoken and written discourses. This dimension of vocabulary knowledge often is measured by tests that require a learner to identify a synonym for a given word on a multiple-choice test, match words with definitions, or provide L1 translation for a given word. One of the most widely used measures of the size of English vocabulary knowledge is Nation's (1983, 1990) Vocabulary Levels Test. The test uses a word-meaning matching format and includes words representing different word-frequency levels, ranging from high-frequency words (2,000-word level) to low-frequency words (10,000-word level).

Studies have been conducted to investigate the percentage of lexical items that a learner needs to know in order to understand a spoken or written discourse. Previously around 95% coverage was thought to be sufficient for adequate reading comprehension (Laufer, 1989), but a more recent study suggested a higher percentage of 98% is needed (Hu & Nation, 2000). According to Nation (2006), readers would need 8,000 to 9,000 word families to read authentic texts such as novels or newspapers if 98% coverage is needed.

Regarding the number of words needed to understand spoken discourse, Stæhr (2009) suggested that the most-frequent 2,000 word families in English provide learners with a lexical coverage of 90% of the listening input texts and if a degree of comprehension of the text input higher than 70% is required, then learners need 98% lexical coverage, equivalent to a vocabulary size of a least 5,000 word families. This conclusion reinforces the findings of Nation (2006), which suggest that 2,000 to 3,000 word families are required to understand spoken discourse if 90% coverage is required or between 6,000 to 7,000 word families if 98% coverage is needed.

The statistics of these studies suggest that mastering a large number of lexical items is particularly important for being a proficient learner of a second or foreign language. The research on the relationship between breadth of vocabulary knowledge and L2 language proficiency (Laufer, 1992; Qian, 1999, 2002; Stæhr, 2008) provided further empirical evidence that vocabulary size is a good indicator of learners' language proficiency in a second or foreign language. In a study with 92 first-year university students whose first language was either Hebrew or Arabic, Laufer (1992) found a statistically significant and moderate correlation of .50 between the participants' ($n = 91$)

scores on the Vocabulary Levels Test (Nation, 1983) and reading comprehension. In addition, Qian's (1999) study with 74 Korean and Chinese ESL students found a statistically significant and strong correlation of .78 between the participants' scores on the Vocabulary Levels Test (Nation, 1983, 1990) and their reading-comprehension scores. In another study by Qian (2002) with 217 ESL students from the University of Toronto, a statistically significant and strong correlation of .74 was found between the students' scores on the Vocabulary Levels Test (Nation, 1983) and their scores on an early version of the Test-of-English-as-a-Foreign-Language (TOEFL) reading-comprehension subtest.

Stæhr (2009) investigated the relationship between vocabulary knowledge and listening comprehension in a study that had 115 advanced Danish learners of English as a foreign language (EFL) as the participants. The study found a strong statistically significant correlation ($r = .70$) between vocabulary size and listening comprehension. In another study with 88 Danish learners of English from lower-secondary education, Stæhr (2008) investigated the relationship between learners' vocabulary size and their reading, listening, and writing skills in EFL. The study found that learners' receptive vocabulary size was strongly statistically significantly associated with their reading ($r = .83$) and writing abilities ($r = .73$) and moderately statistically significantly associated with their listening ability ($r = .69$). Teng's (2016) study, which included 88 university EFL students, also found a statistically significant correlation of .70 between the students' scores on the Vocabulary Size Test (Nation & Beglar, 2007) and their scores on a standardized listening-comprehension test. The findings of the previously mentioned studies are summarized in the table below (Table 4). In behavioral sciences, a correlation

of .50 generally is considered to be indicating a "large correlational effect size" (Cohen, 1988, p. 80), although this relation is contingent on sample size and the distribution of variables. All the correlation coefficients listed in Table 4 are equal to or greater than .50, indicating that vocabulary size is a good predictor of ESL and EFL learners' language proficiency.

Table 4

Correlations Between Vocabulary Size and Language Proficiency

Studies	Measures of IV (Vocabulary Size)	DV	r
Laufer (1992)	Vocabulary Levels Test (Nation, 1983)	RC	.50
Qian (1999)	Vocabulary Levels Test (Nation, 1983, 1990)	RC	.78
Qian (2002)	Vocabulary Levels Test (Nation, 1983)	RC	.74
Stæhr (2008)	Vocabulary Levels Test (Schmitt, Schmitt & Clapham, 2001)	RC LC Writing	.83 .73 .69
Stæhr (2009)	Vocabulary Levels Test (Schmitt et al., 2001)	LC	.70
Teng (2016)	Vocabulary Size Test (Nation & Beglar, 2007)	LC	.70

Note. RC = reading comprehension; LC = listening comprehension; DV = dependent variable

Depth of vocabulary knowledge and language proficiency

Nation (2001, p. 27) provided a detailed description of the range of word-knowledge aspects that the learner needs to master in order to use the lexical items appropriately. According to him, knowing a word involves knowing not only its form (including spoken form, written form, and word parts) but also its meaning (including concept, reference, and associations) and use (including grammatical functions,

collocations, and constraints on use). Building on Nation's (1990) definition of depth of

vocabulary knowledge, Qian (1999) proposed a framework that identifies the various

aspects composing depth of vocabulary knowledge:

1. Pronunciation and spelling: how different forms of the word are pronounced and spelled;
2. Morphological properties: the word's stem, its capability of inflection, derivation, and other word formation devices, and its possible parts of speech;
3. Syntactic properties: the word's possible positions and its syntagmatic relations, including collocational relations, with other words in a sentence;
4. Meaning: not only identification of the denotative meaning of a word in context, but also, where applicable, knowledge of connotations, as well as polysemy, antonym, synonymy, and other paradigmatic relations the word may have;
5. Register, or discourse features: including possible adherence to a stylistic, social, or regional variety, and the field, mode, and manner of discourse concerning the application of the word;
6. Frequency of the word in the language, or whether this word is a commonly used word or one that appears only in some specialized texts (p. 284).

Therefore, to know a lexical item entails that a learner needs to have various kinds

of knowledge about a word, including the word's pronunciation, spelling, register,

stylistic, and morphological features as well as the syntactic and semantic relationships

that this word has with other words such as collocational meanings and the knowledge of

synonyms, antonyms, and hyponyms. A widely-used measure of depth of vocabulary

knowledge is the Word Associates Test (WAT) developed by Read (1993). The WAT

uses a multiple-choice test format, and it measures depth of vocabulary knowledge

through means of word associations based on three relationships among words in the

mental lexicon: paradigmatic (meaning), syntagmatic (collocation), and lexical

progression (a process of lexical building). The WAT has been used in a number of

lexical studies to measure depth of vocabulary knowledge (Qian, 1999, 2002).

Although breadth and depth of vocabulary knowledge have been found to correlate with each other, they are considered two distinct dimensions of vocabulary knowledge (Qian, 2002). The findings of several studies (Ehsanzadeh, 2012; Qian 1999, 2002; Teng, 2014, 2016) suggest that depth of vocabulary knowledge has an equal if not a more important role in ESL and EFL students' language-learning outcomes. For example, Stæhr (2009) found that depth of vocabulary knowledge (measured by a test similar to the Word Associates Test) was statistically significantly correlated ($r = .65$) with listening comprehension (measured by a listening test from the Cambridge certificate of proficiency in English) and that the dimensions of depth and breadth of vocabulary knowledge together could predict half of the variance in the listening scores. Qian (1999) found that depth of vocabulary knowledge made a more important and unique contribution to the prediction of the ESL students' scores on academic reading beyond the prediction provided by scores on vocabulary size, adding a noticeable 11% of explained variance in reading comprehension. In comparison, breadth of vocabulary knowledge added only 3% of explained variance in reading comprehension over and above the prediction already provided by depth of vocabulary knowledge. Similarly, Teng (2016) found that in the multiple-regression-analysis model, depth of vocabulary knowledge added to the breadth of vocabulary knowledge explained an additional 28% of the variance in the listening-comprehension success, whereas breadth of vocabulary knowledge added to depth of vocabulary knowledge contributed only an additional 9% of the variance in listening comprehension.

Given the importance of breadth and depth of vocabulary knowledge for students' language proficiency, the current study examined the strategies that CFL students use to

study vocabulary words (e.g., writing words repeatedly to memorize them) in isolation, which are helpful for students to develop their breadth of vocabulary knowledge. More importantly, the study examined the strategies that students use to study vocabulary words in larger context (e.g., using new words in e-mail or journal writing), as many aspects of the depth knowledge of vocabulary (e.g., the morphological and syntactic properties of words) have to be acquired through learning words in larger context such as sentences and paragraphs.

Summary

Research shows that both dimensions of vocabulary knowledge, breadth knowledge and depth knowledge, are good indicators of learners' second-language proficiency (Laufer, 1992; Qian, 1999, 2002; Stæhr, 2008, 2009; Teng, 2016). The two dimensions are inseparable in the learning process, and as Schmitt (2008) argued, even though the form-meaning matching is the first lexical aspect that must be acquired and, although important and possibly sufficient to allow recognition, a learner needs to know much more about lexical items, particularly when the lexical items are used productively. Therefore, learners should not assume that they can acquire adequate lexical items simply through learning with language activities that focus on communication. Rather, "a more proactive, principled approach" (p. 333) should be taken in promoting vocabulary learning, and one component of such an approach is using vocabulary-learning strategies. Considering the challenges of learning Chinese characters, it is of great importance to investigate the vocabulary-learning strategies of CFL learners so as to identify useful strategies that can help the CFL learners effectively increase their breadth as well as depth knowledge of Chinese vocabulary words.

Second-Language Vocabulary Development

As presented above, knowing an L2 word involves the knowledge of different aspects of the word, including its phonological, orthographic, morphological, syntactic, and semantic properties. Words become interconnected along these aspects of word knowledge, forming a complex web of connections. Researchers of the mental lexicon most often discuss word relations along two types of relationship: paradigmatic and syntagmatic. Paradigmatic relationships refer to semantic relationships such as hyponyms (lexical items within the same semantic field), synonyms, antonyms, and homophones (lexical items with the same form but different meanings). Syntagmatic relations, however, refer to the relationship that determines whether two or more words can co-occur in a sentence (Qian, 1999; Takač, 2008).

The primary function of words, which is meaning communication within discourse, is realized through syntagmatic relationships (Gu, 2005). Gu (2005) argued that the knowledge of syntagmatic relations of words especially is critical in the development of foreign-language vocabulary, as memorizing one meaning of a word is relatively easy, but both the knowledge of the word's syntactic properties and its collocations are needed in order to put the word into the appropriate place in a sentence. In fact, even though the lack of knowledge of paradigmatic relationships commonly is observed among beginning or ineffective learners, more often than not the knowledge of syntagmatic relations is what distinguishes successful learners from unsuccessful ones (Gu, 1994). Ideally, knowledge of a lexical item would include all of the above-mentioned dimensions. In reality, however, for an L2 learner to develop complete word knowledge all at once, particularly when the learner is trying to acquire a large vocabulary, is unlikely. The complexity involved in mastering complete word

knowledge determines the incremental nature of vocabulary development of second-language learners. As Aitchison (1990) pointed out, "words are learned within particular contexts and are only gradually extended to their full range of meanings" (p. 20). The learner starts with a partial understanding of a word and gradually develops the native-like mastery of the word through the repeated use of the word within different contexts. Gu (1994) also contended the same argument that the least a learner should know about a word when learning it is its phonological and orthographic form, one referential meaning, and its basic syntactic characteristics. With such basic knowledge of the word, even if other meanings or layers of meanings of the word are still unknown to the learner, the learner should be able to understand the word or guess its related meanings in natural context.

Meanwhile, learners' vocabulary development cannot simply stop at the level of acquiring the basic knowledge of words. To develop a high level of proficiency, the learner needs not only to acquire a large vocabulary but also to develop the depth of vocabulary knowledge and to establish paradigmatic and syntagmatic relationships among words, which takes a long time and great effort. As Meara (1996) rightly observed,

> A vocabulary of 30-40 words can be efficiently handled by treating it as an unconnected list of discrete items. Bigger vocabularies, on the other hand, will contain subsets of words which are linked together on either semantic or morphological grounds, and these linkages must make it inefficient to treat the vocabulary as a simple list. At the very least, some sort of network structure must develop in a larger vocabulary which reflects these relationships between the component items of the total vocabulary. Presumably, what makes it difficult to acquire a large vocabulary is that it takes time and effort for these connections to develop, and for a properly organized lexicon to emerge. (p. 34)

Therefore, learners cannot simply rely upon rote memorization to develop a large vocabulary. They need various vocabulary-learning strategies to help them establish linkages among the words in the intricate web of vocabulary system. Relating the new words to the words that they have learned and using semantic grouping to compare the similarity and differences between words are two examples. In addition, the role that memory plays in vocabulary learning further complicates the learner's vocabulary development process, making the learning strategies even more necessary for effective vocabulary learning.

Two memory models, the forgetting curve of Ebbinghaus (1913) and the depth of processing theory (Craik & Lockhart, 1972), provided a theoretical basis for the need to use vocabulary-learning strategies for better learning outcomes (Gu, 2005). Ebbinghaus's (1913) forgetting curve hypothesized the decline of memory retention over time. When learning new information, most of it is forgotten quickly, but a plateau is reached about an hour later, after which the process of forgetting slows down. Ebbinghaus's (1913) forgetting curve suggested that newly-learned materials will soon be forgotten unless they are reviewed consciously at longer and longer intervals. Thornbury (2002) proposed a list of principles that facilitate the transfer of the newly learned information into long-term memory. They include repeated encounters with a vocabulary word, cognitive depth involved in processing the word, personalization, use of mnemonics, and conscious attention necessary to remember a lexical item.

The second memory model is depth of processing theory, which was proposed by Craik and Lockhart (1972). The theory assumes a close relationship between the cognitive depth of mental activity and the memory result. More specifically, the

retention of an item in long-term memory depends on the type of attention and processing given to the item. Craik and Lockhart (1972) posited in their theory that there are two types of rehearsal strategies exist during verbal memory rehearsal. The first type uses rote and repetitive rehearsal strategies that result in shallow processing of information. The second type involves meaningful rehearsal strategies that result in a deeper semantic processing of information.

The depth of processing theory was tested empirically in Craik and Tulving's (1975) study. In their study, the researchers asked the participants different questions about certain words so that the participants were induced to process words to different depths. Questions about the physical structure of the word were used to induce shallow levels of encoding. For example, is the word in capital letters? Intermediate levels of encoding were achieved by asking questions about rhymes (e.g., does the word rhyme with "cat"?), and deep-level encoding was induced by asking whether the word fit into a given semantic category (e.g., is the word a type of fish?) or sentence structure (e.g., does the word fit into the following sentence: I met a ____ in the supermarket?). The study found that deeper encoding took more time to accomplish but was associated with higher performance in the subsequent recall or recognition test of the words.

The two memory models presented above provided a theoretical rationale for the necessity of employing various strategies to enhance vocabulary learning. Strategies such as reviewing words at regular intervals will help learners to combat the forgetting problems theorized in Ebbinghaus's (1913) forgetting-curve theory, and strategies such as putting words into semantic groups and using words in context will induce the deeper level of semantic processing that results in the better retention of the words. Second-

language learners' vocabulary development is an incremental process, during which they need various strategies to facilitate their acquisition of different aspects of the vocabulary knowledge. Therefore, rather than focus on a few individual strategies, the current study focused on understanding how CFL learners use various strategies to help them establish linkages among the words in the intricate web of the Chinese vocabulary system to facilitate their vocabulary acquisition.

Research on Vocabulary-Learning Strategies

The research on vocabulary-learning strategies, particularly in the ESL or EFL field, has been productive since the 1980s. A considerable number of studies primarily focused on the relationship between strategy use and learner proficiency. A synthesis of the major studies on vocabulary-learning strategies in non-Chinese L2 settings is provided below, as these studies constitute the research framework and methods for research on Chinese vocabulary-learning strategies, which is an area that started relatively late in comparison to the ESL and EFL vocabulary-learning-strategy research.

Taxonomy of vocabulary-learning strategies

Classifying vocabulary-learning strategies is a necessary step in investigating the relationship between strategy use and learner proficiency. Several taxonomies have been developed to categorize and describe the vocabulary-learning strategies used by ESL and EFL learners. Ahmed (1989) was one of the first scholars who made the attempt to classify vocabulary-learning strategies. His classification system consisted of two categories: macrostrategies and microstrategies. Macrostrategies included memorization, practice, notetaking, and using different information sources. Microstrategies included specific behaviors within each of the macrostrategies.

Gu and Johnson (1996) provided one of the most comprehensive lists of vocabulary- learning strategies. In their study, which examined the vocabulary-strategy use of the Chinese learners of English, they developed a vocabulary-learning questionnaire that consisted of 108 items. The questionnaire included three sections: vocabulary learning beliefs, metacognitive strategies, and cognitive strategies. Another comprehensive list of vocabulary-learning strategies was developed by Schmitt (1997). The classification systems of Gu and Johnson (1996) and Schmitt (1997) are presented in Table 5.

Table 5

Summary of Two Taxonomies of Vocabulary-Learning Strategies

Researcher	Major Categories	Subcategories
Gu & Johnson (1996)	Metacognitive Strategies	Selective attention (7 items) Self-initiation (5 items)
	Cognitive Strategies	Guessing strategies (12 items) Dictionary strategies (17 items) Note-taking strategies (9 items) Memory strategies: rehearsal (12 items) Memory strategies: encoding (24 items) Activation strategies (5 items)
Schmitt (1997)	Discovery strategies	Determination strategies (9 items) Social strategies (5 items)
	Consolidation strategies	Social strategies (3 items) Memory strategies (27 items) Cognitive strategies (9 items) Metacognitive strategies (5 items)

As shown in the table above, based on the findings of the vocabulary-learning strategies used by English learners in Japan, Schmitt (1997) proposed a typology that included 58 strategies. The 58 strategies were organized into four categories based on

Oxford's (1990) taxonomy of language-learning strategies: social strategies, memory strategies, cognitive strategies, and metacognitive strategies. Due to the lack of the category in Oxford's (1990) taxonomy that would refer to strategies used by learners in discovering new words' meaning without involving other people, Schmitt (1997) introduced a new category: determination strategies. The resulting taxonomy of vocabulary-learning strategies consisted of five groups of strategies under two main categories: discovery strategies (strategies used to discover the meaning of a new word) and consolidation strategies (strategies used to keep the meaning of a word in memory). The current research drew on the classification systems of Schmitt (1997) and Gu and Johnson (1996) in developing an instrument measuring CFL learners' strategy use in learning Chinese vocabulary words.

Vocabulary-strategy use and learner proficiency

Many studies on vocabulary-learning strategies investigated the effects of individual vocabulary-learning strategies on vocabulary-learning outcomes. For example, the superiority of mnemonic strategies over mechanical strategies such as memorization and repetition has been tested empirically (e.g., Atkinson, 1975; Cohen & Aphek, 1980; Pressley, Levin, Kuiper, Bryant, & Michener, 1982; Rodriguez & Sadoski, 2000; Sagarra & Alba, 2006), and comprehensive reviews exist on the effectiveness of mnemonic strategies in learning foreign-language vocabulary words (Hulstijin, 1997; Nation, 1982). As Gu (2005) argued, however, vocabulary learning is a dynamic process that involves the use of a wide array of strategies and the learning outcomes most likely depend on consistent combination of a variety of strategies rather than the use of

individual strategies. Therefore, a learner-oriented approach would reveal more indepth information on what strategy patterns are associated with higher proficiency.

Ahmed (1989) was among the first to focus on learners and their learning process in L2 vocabulary acquisition. Using a think-aloud task, direct observation, and an interview, the researcher examined the strategy use of 300 Sudanese English learners. Analyses indicated that the students used a total of 38 microstrategies that could be categorized into six macrostrategy types. A cluster analysis of the participants' choice of strategies resulted in five clusters with three clusters dominated by good learners whose achievement was determined by scholastic records (Cluster 1, 3, and 4) and two clusters dominated by underachievers (Cluster 2 and 5). The common characteristics of good learners included that they had greater awareness of what they could learn about new words and that they preferred to use context to facilitate their learning. In contrast, the underachievers from Clusters 2 and 5 were more passive in their strategy use in that they used fewer strategies, seldom used dictionaries, tended to ignore unknown words, made little use of context to facilitate their learning, and lacked the ability to relate the new words to previously-learned words.

Lawson and Hogben (1996) employed a think-aloud technique to examine how 15 Australian first-year students learned L2 Italian nouns. The researchers provided the information for the word-learning task to the students on index cards with an Italian word and an example sentence written on the front and with the English definition of the word and related words written on the back. The study found that the majority of the strategies that students used involved some form of repetition of new words and their meanings (e.g., a simple reading of the English definition provided). Meanwhile, the students paid

little attention to the physical or grammatical features of the new words, and they did not use many elaborative acquisition procedures. Even though they were used infrequently, the two complex elaboration strategies, the paraphrase strategy ($r = .62$) and the mnemonic strategy ($r = .52$), were found to be strongly, positively, and statistically significantly related to recall of meaning. The findings of the study, however, should be interpreted with caution due to its small sample size ($n = 15$) as correlation coefficients based on small samples (<30) are not stable and can vary widely.

The study also found a statistically significant strong positive correlation ($r = .83$) between students' overall frequency of strategy use and their recall test scores, suggesting that those students employing many strategies for word learning tend to recall more word definitions than those students using fewer strategies. Therefore, Lawson and Hogben (1996) came to the conclusion that "the single feature most obviously distinguishing the two groups is the total amount of strategy use: The high-scoring group recorded more than twice the number of word-by-strategy instances" (p. 123). Moreover, the successful students not only used more strategies on average but also employed a wider variety of procedures and used them more consistently than their less successful peers. The finding of Lawson and Hogben (1996) is consistent with that of Ahmed (1989), who concluded that good learners used more strategies, and they relied more on different strategy types than did poor learners.

Sanaoui (1992, 1995) investigated how adult learners approached the task of vocabulary learning and what mnemonic techniques they used for better retention of the L2 lexical items that they were learning. Three studies were conducted for the research purposes, including an exploratory study with 50 beginning and advanced English-as-a-

second-language (ESL) learners, 4 case studies of ESL learners, and 8 cases studies of French-as-a-second-language learners. Data were collected through interviewing students about their daily written notes on their approaches to learning vocabulary and examining the materials that they used for learning vocabulary (e.g., dictionary, class notes, and teachers' handouts).

The research identified the following mnemonic procedures that students used to retain lexical items: writing, immediate repetition, spaced repetition, using the lexical item, contextual associations, linguistic associations (e.g., connecting the word with a familiar item in the L2), imagery, and talking about the lexical item with someone. The research also identified two distinct approaches to vocabulary learning in an L2: a structured and an unstructured approach. These two approaches differed in the extent to which learners engaged in the following activities: independent study, self-initiated learning activities, recording lexical items that they were learning, reviewing such records, and practicing using vocabulary items outside their L2 class.

Sanaoui (1992) examined the relationship between learners' approaches to vocabulary learning and their lexical knowledge as measured by a vocabulary test. The researcher administered a questionnaire to 74 students learning French in Vancouver. Based on their responses, the students were identified as following a structured approach if they met the following criteria: (a) spending 3 or more hours per week on independent language study, (b) engaging in 3 or more self-initiated learning activities, (c) keeping extensive records of vocabulary items they were learning, (d) reviewing those records occasionally or often, and (e) practicing new words through activities outside classroom as well as classroom-related activities. Students whose study habits matched none of the

criteria were put into the category of following an unstructured approach. Students'

performance in a vocabulary test was then compared with the approach they used. The

results indicated that learners with a structured approach were more successful in

retaining the new vocabulary items than the learners who had an unstructured approach.

This finding suggests that helping learners gain control over processes for managing their

learning of lexical items is essential for vocabulary learning and teaching in L2

classrooms.

Kojic-Sabo and Lightbown (1999) examined students' approaches to vocabulary

learning and their relationship to success. They administered a questionnaire, adapted

from Sanaoui's (1992) work, to 47 ESL and 43 EFL learners. The questionnaire

measured the amount of time that the students spent on learning vocabulary, the extent to

which they engaged in self-initiated activities to encounter and practice vocabulary items,

the type of vocabulary activities that they did on a regular basis, the amount of time they

spent on notetaking and reviewing and the elaborateness of their notetaking and

reviewing efforts, and the frequency and elaborateness with which they used dictionaries.

The two groups exhibited statistically significant differences in the use of strategies

reflecting learner dependence, $F[1, 89] = 5.97$, $\eta^2 = .06$, and the strategy of reviewing

$F[1, 89] = 5.32$, $\eta^2 = .05$, with small measures of practical importance. Meanwhile, the

two groups strikingly were similar in their notetaking efforts.

Cluster analysis was used to investigate whether students can be grouped

according to the vocabulary strategy or set of vocabulary strategies that dominated their

approach. The analysis resulted in eight profiles of approaches to vocabulary learning.

One cluster had high scores on all strategies and another showed little use of strategies

overall. The majority of the learners were in the clusters that showed clear preferences

for certain types of strategies. Analyses also were conducted to assess the relationship

between students' strategy use and their learning outcomes as measured by a yes-or-no

test assessing students' knowledge of academic vocabulary and a cloze test assessing

general language proficiency. The results suggested a strong relationship between the

amount of strategy use and students' levels of success in learning. When the use of

particular strategies by learners of more- or less-successful clusters were compared, the

two measures, learner independence and time, were related most closely to success in

vocabulary learning and higher overall language proficiency. The findings of the study

were in agreement with those of Sanaoui (1992), both showing that frequent and that

elaborate strategy use are associated with higher levels of achievement.

Fan (2003) investigated the frequency of use, perceived usefulness, and actual

usefulness of second-language vocabulary strategies of Hong Kong leaners. The

participants of the study included 1,067 new students from seven universities. To collect

data, a questionnaire with 60 vocabulary learning strategies and a vocabulary test was

mailed to the participants. Analysis of variance and multiple regression were used for

data analysis. The findings of the study indicated that the students used or considered

useful of the strategies for reviewing and consolidating their knowledge of known words

and they had a preference for using dictionaries.

The findings suggested that discrepancy existed between the frequency of use and

the perceived usefulness of vocabulary-learning strategies. For example, management

strategies were perceived to be useful, but they were not used frequently by the learners.

The study also found that the high-scoring group in the vocabulary test planned their

vocabulary learning and encountered new words both inside and outside class statistically significantly more often than the intermediate- and low-scoring groups, and they used guessing and dictionary strategy statistically significantly more often than the other two groups. In addition, compared with the more-proficient students, the less-proficient students were more likely to rely on repetition strategies and association strategies in their vocabulary learning.

Gu and Johnson (1996) investigated the vocabulary-learning strategies used by Chinese university students and the relationship between their strategy use and their outcomes in learning English. The participants were 850 non-English majors from Beijing Normal University. The participants completed a vocabulary-learning questionnaire, and the researchers correlated the responses of the questionnaire with the results of their vocabulary tests and a proficiency test. Multiple regression analyses were conducted to investigate what strategies best predict the vocabulary test and proficiency test scores. Finally, the researchers conducted a cluster analysis to classify learners according to their strategies and learning outcomes. The major findings of the study include the following: (a) self-initiation and selective attention, two metacognitive strategies, were positive predictors of students' general language proficiency; (b) contextual guessing, skillful use of dictionaries, notetaking, paying attention to word formation, contextual encoding, and activation of newly-learned words positively correlated with the two test scores; (c) rote memorization was the strongest negative predictor of the two test scores; and (d) strategies used for vocabulary retention only had stronger association with vocabulary size than general language proficiency.

Barcroft (2009) examined the strategies used by students during an intentional vocabulary-learning activity and assessed the relationship between strategy use and students' vocabulary performance. One hundred and twenty native speakers of English learning Spanish were asked to study 24 Spanish words. After the learning phase, two posttests were administered to measure students' vocabulary recall. One test is a picture-to-L2 recall test that required the participants to write target Spanish words when presented with pictures. The other test is an L2-to-L1 test that required the participants to write English translations of the target Spanish words when presented with the Spanish words. The study found that a mnemonic technique (associating an L2 word with its meaning using idiosyncratic associations making sense only to learner himself or herself) produced the higher word recall. In addition, L2 word-to-picture association also resulted in statistically significantly higher recall as compared with L2-to-L1 translation and repetition. The strategies associated with highest word recall were used much less often than L2-to-L1 translation and repetition, suggesting that the frequently used strategies are not effective necessarily. Correlational analyses revealed that statistically significant positive correlations exist between the number of strategies that learners reported using and their target word recall ($r = .33$ for picture-to-L2 recall and $r = .23$ for L2-to-L1 recall), which is congruent with the findings of many early studies on the relation between strategy use and learning outcomes (e.g., Ahmed, 1989; Lawson & Hogben, 1996).

Similar findings were evident in more recent studies (Lai 2016; Teng, 2015). Teng (2015) investigated the relationship between students' strategy use and the depth and breadth of their vocabulary knowledge. A total of 145 EFL low-proficiency students

completed a questionnaire on their vocabulary-learning strategies, and the breadth and

depth of vocabulary knowledge were measured by two vocabulary tests. The result

indicated that students' strategy use was correlated statistically significantly and

positively with breadth ($r = .65$) and depth ($r = .77$) of vocabulary knowledge. The use

of indirect strategies (e.g., self-planning, self-monitoring, and self-evaluating) had a

higher level of correlation with breadth and depth of vocabulary knowledge. Teng's

(2015) findings were in line with those of the previous research (Gu & Johnson, 1996;

Kojic-Sabo & Lightbown's, 1999; Sanaoui 1992) regarding the importance of

metacognitive strategies (e.g., self-awareness, self-monitoring, organization, and active

involvement of the learner in the vocabulary-acquisition process) for vocabulary learning.

In a more recent study, Lai (2016) identified English-as-a-foreign-language (EFL)

students' use of vocabulary consolidation strategies and explored the relationship

between their strategy use and vocabulary-learning outcomes. The study included 218

students from five freshman English classes at a university in Taiwan. A questionnaire

was used to measure students' use of vocabulary-consolidation strategies. Students'

vocabulary size, short-term vocabulary retention, and long-term vocabulary retention

were measured by a vocabulary levels test, a posttest, and a delayed-recall test,

respectively. The participants were divided into three groups (high-, mid-, and low-level)

of roughly equal size based on their performance in the three tests. One-way analysis of

variance was conducted to examine the differences between the three groups in their

overall strategy use. Statistically significant differences were observed between two

groups when vocabulary levels test was used for dividing groups with midlevel group (M

$= 2.95$, $SD = .43$) using strategies statistically significantly more often than low-level

students (M = 2.74, SD = .48). The study, however, found no statistically significant differences between high-, mid-, low-level groups when the participants were divided into the three groups according to their performance in the posttest and in the delayed-recall test.

The study found that the memory strategies that involved analytical and organization skills (e.g., "Connect a word to its synonyms and antonyms" and "Group words together to study them") were associated with larger vocabulary size. These memory strategies all involved deeper levels of processing and the manipulation of lexical items; therefore, the finding of the study provided further empirical evidence supporting the assumption that learning activities encouraging deep processing contribute to a strong and more durable memory (Hulstijin & Laufer, 2001; Schmitt, 2000). Another finding of the study is that the students used some learning strategies (e.g., "Connect the word to a personal experience," "Paraphrase the word's meaning," and "Use semantic feature grids") relatively infrequently; however, the evidence reveals that the use of these strategies differentiated the more-proficient learners from the less-proficient learners in their long-term retention of lexical items.

As can be seen from the studies reviewed above, the research on the relationship between learners' strategy use and learning outcomes as well as learner proficiency has been conducted mainly in the field of ESL or EFL. There is a lack of research on such relationships in less commonly taught foreign languages such as Chinese. Furthermore, even though the studies reviewed, in general, found that more frequent use of strategies is associated with higher performance, the findings have not been consistent. Lai's (2016) study, for example, found little evidence establishing the relationship between strategy

use and students' short-term retention and long-term retention of vocabulary words. For the previously mentioned reasons, research such as the current study was needed to expand the literature on vocabulary-learning-strategies research and to further explore the relationship between learners' vocabulary-learning-strategy use and learning outcomes.

Summary

Two comprehensive lists of vocabulary-learning strategies have been developed by Gu and Johnson (1996) and Schimitt (1997), respectively. The current research drew on these strategies in developing an instrument measuring CFL learners' strategy use in learning Chinese vocabulary words. Major studies on vocabulary-learning strategies conducted in non-Chinese L2 settings also were reviewed in detail. These studies, although conducted in different time periods and in different learning context, yielded some important findings regarding the relation between strategy use and learner proficiency. The common findings of the studies include that successful learners employed a wider variety of procedures in strategy use and used them more consistently and appropriately than their less successful peers (e.g., Ahmed, 1989; Lawson & Hogben, 1996; Sanaoui, 1992, 1995); strategies involving deep processing of information and authentic use of vocabulary in context and metacognitive strategies were associated with higher performance (e.g., Barcroft, 2009; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Lai, 2016; Sanaoui, 1992); and the frequently-used strategies were not necessarily effective (e.g., Barcroft, 2009; Fan, 2003). In general, the studies reviewed suggested that strategy use is associated both quantitatively and qualitatively with higher language proficiency. It was a logical assumption that such relationship exists in learning Chinese as a foreign language. Further studies were needed to assess this relationship so

that CFL teachers could incorporate the effective strategies into teaching to help learners achieve better learning outcomes in their vocabulary learning.

Unique Features of Chinese characters

For English learners of Chinese, the linguistic distance between the alphabetical language and the logographic language has posed great challenges for them in learning Chinese vocabulary words. Therefore, to better understand what strategies are effective for Chinese vocabulary acquisition, knowledge of the unique features of Chinese characters, specifically the orthographic and the phonological properties of Chinese characters, is necessary.

Orthographic features of Chinese characters

A Chinese written word can consist of one character or a combination of more than one character. The meaning of a Chinese word often bears some relation to its constituent characters. For example, the character 箱(box) is used in the following combinations to form different words: 邮箱(mail +box = mailbox), 冰箱(ice + box = refrigerator), and 烤箱 (roast + box = oven); however, it should be pointed out that the meaning of a word is not always the addition of the meaning of its constituent characters. For example, the meaning of the word 小说 (novel) cannot be derived directly from the addition of the meaning of its constituent characters 小(small) 说 (talk). Approximately 56,000 words in Mandarin Chinese were formed by different combinations of only 5,144 characters (Project Team, 2008), so the learning of Chinese words in fact encompasses the learning of Chinese characters. For this reason, the study examines the strategies for learning Chinese as well the strategies for learning Chinese vocabulary words.

Strokes are the basic building materials for characters in the sense that they are combined in different ways to form radicals, which are "the smallest orthographic units within a character that have semantic or phonetic functions" (Xu, Chang, & Perfetti, 2014, p. 774). For example, the character 明 (bright) consists of two radicals 日 and 月 and both radicals have four strokes. Among all radicals, some can stand alone and have their own pronunciation, thus forming single characters. For example, 日 (sun), pronounced as "ri," is a character when standing alone but is called a radical when appearing in the character 晴. Other radicals are no longer stand-alone integral characters in modern Chinese, and instead they only appear in characters as a component, such as the radical 钅 (metal) in the character 铁 (iron). These radicals have no pronunciation, but they often provide cues for the meaning of the whole characters in which they appear (Shen & Ke, 2007). The visual complexity of a character depends on how many strokes that the character contains (Shen, 2004). According to Huang and Liao (1981), the number of strokes in a given character can be as few as one and as many as 30.

Depending on the orthographic units contained, Chinese characters fall into one of the following two categories: integral characters and compound characters. Integral characters have only one orthographic unit such as 日 (sun). Integral characters are meaning based, and there is no sound-script correspondence for them. Modern Chinese has approximately 280 integral characters, and 256 of them are used commonly (Bie, 2009). Compound characters consist of two or more distinct radical components (Shen, 2004; Shen & Ke, 2007). Radical components of compound characters are categorized normally into two types: semantic radicals (often referred to as radicals) and phonetic radicals (often labeled as phonetics). For example, the compound character 明 (bright)

has two semantic radicals, 日 and 月. The character 晴 (sunny), pronounced as "qing"

consists of the semantic radical 日 (sun) and the phonetic radical 青, which is also

pronounced as "qing" with a different tone. Zhang's work (as cited in Shen & Xu, 2015)

shows that 90% of the characters are semantic-phonetic compounds with a meaning

radical and a phonetic radical.

There are regularities of semantic and phonetic radicals in Chinese characters.

Semantic radicals usually occupy the left (75%) or top (15%) position of a character.

Commonly-used characters are formed with about 200 semantic radicals, and each

semantic radical can form on average about 20 compound characters (Feldman & Siok,

1999a). Although the semantic radical does not specify the precise meaning of a

compound, the interpretation of the radical generally is consistent with the meaning of the

whole character (Feldman & Siok, 1999b; Shen & Ke, 2007). Take the character 烤, for

example. The semantic radical 火 (fire) suggests the meaning of the character 烤 (to

roast).

Phonetic radicals, which usually occupy the right position of a character, provide

cues to the pronunciation of the characters, for example, the characters 晴，情，请，

清，氰，蜻 all contain the same phonetical radial "青," which is pronounced as "qing."

All these characters are also pronounced as "qing" with different tones. Compared with

semantic radicals, the usefulness of phonetical radicals is much more limited. As Shen

and Ke (2007) pointed out, "Although not all compounds containing semantic radicals

are morphologically transparent, the reliability of semantic radicals cueing the meaning

of compound characters is much higher than phonetic radicals cueing the pronunciation

of compound characters" (p. 98). In fact, according to Yin and Butterworth (1992), only 36% of the phonetic radicals still represent reliably the pronunciation of the characters in modern Chinese. Also the phonetic radicals in the low-frequency characters tend to indicate the pronunciation of the characters more reliably than the phonetic radicals in the high-frequency characters.

Due to the unique orthographic features of the Chinese characters, students need strategies that are specific to the Chinese language to learn Chinese vocabulary words. Examples of these strategies include relating a new character to a learned one that has the same radical, grouping together characters with the same semantic radicals or the same phonetic radical, and creating stories according to the constituent characters of the new word. The effectiveness of these strategies were examined along with generic vocabulary-learning strategies that are commonly used in learning other languages (e.g., connecting a word to its synonym or antonym) in the current study.

Phonological features of Chinese characters

English is an alphabetical language with its writing system roughly representing its sound system, whereas the Chinese sound system and its writing system are independent of each other due to the lack of an obvious sound-script correspondence (Shen, 2004; Xu & Padilla, 2013). Even though some Chinese characters contain phonetic components that indicate the pronunciation of the characters, as mentioned previously, the phonetic components are not very useful because only 36% of them still reliably represent the pronunciation of the characters in modern Chinese (Yin & Butterworth, 1992). Therefore, Pinyin, a modern phonetic transcription system, is used to help learners in learning pronunciation of characters (Lee & Kalyuga, 2011).

Moreover, the tonal system of the Chinese language (Mandarin Chinese) adds further complexity to the learning of Chinese for English speakers. The Chinese language is a tonal language, as the pitch contour of a syllable is used to distinguish meaning. There are four basic tones and a neutral tone that is weak and short compared with other tones. The tonal system of the Chinese language often is illustrated with the diagram in Figure 2, which gives a visual representation of the four tones in Chinese with a scale of five pitch levels.
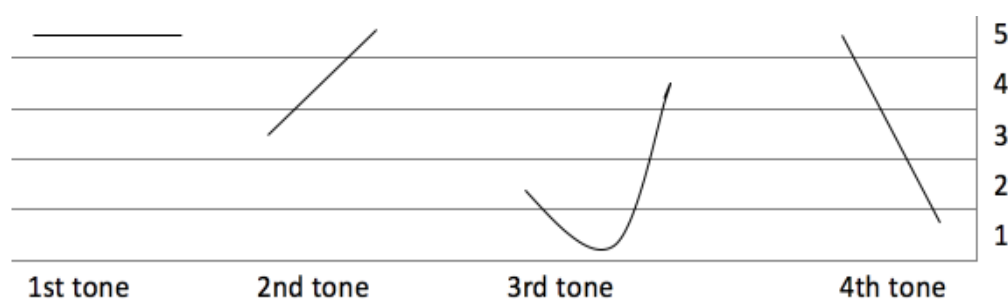
Figure 2. The four tones in Chinese

As can be seen from the diagram, the first tone is a sound that is high and level. The second tone rises from a lower pitch to a higher pitch. The third tone falls before rising again; however, this rise of pitch normally is heard only when the third-tone syllable is pronounced in isolation or when it is used at the end of a sentence. The fourth tone starts with a high pitch and quickly falls. Neutral tone is relatively short and weak, and is pronounced lightly. It is not marked on the diagram above because it does not have an obvious pitch contour. A syllable in Chinese with different tones are represented by different characters with different meanings. The classical example used to describe this linguistic feature of Chinese is the syllable "ma," which can be represented by any one of the following characters depending on the tones: 妈 (mā, first tone, mother), 麻

(má, second tone, numb) , 马 (mǎ, third tone, horse) , 骂 (mà, fourth tone, scold) , and 吗

(ma, neutral tone, a question marker). The phonological features of the Chinese language

have determined the importance of phonology-related strategies (e.g., associating the

sound of the character with its shape and meaning and saying the character aloud while

writing it repeatedly) in learning the Chinese vocabulary characters or words, and the

usefulness of these strategies were examined in the current study.

The cognitive processing of Chinese characters

The unique features of Chinese characters determine that Chinese-specific

vocabulary-learning strategies are needed for efficient learning of Chinese words. To

understand what Chinese-specific vocabulary strategies can best facilitate learning, some

conceptual understanding of how Chinese characters are processed cognitively is

necessary. Several studies on the cognitive processing of Chinese characters have

focused primarily on how the phonetic, graphic, and semantic properties of a character

are activated in the recognition of the character when it is presented visually (Shen,

2005).

Perfetti and Zhang (1995a, 1995b) proposed an *identification-with-phonology*

hypothesis. According to this hypothesis, during the processing of Chinese characters,

similar to the processing of English words, phonological information is activated at the

same moment that a character's orthographic information is identified (Shen, 2005). This

hypothesis was supported in a series of empirical experiments that investigated the role of

phonological knowledge in the recognition of both single- and two-character words

(Perfetti & Tan, 1998; Perfetti & Zhang, 1995a, 1995b; Tan & Perfetti, 1997). The

findings of these studies suggest that the vocabulary-learning strategies intended to

associate the sound, the shape, and the meaning of characters, such as repeating the sound when the character is first introduced, saying the character and visualizing it, and saying the character when writing it, are important for learners of Chinese.

Some studies (e.g., Taft, 1985; Taft & Zhu, 1997) proposed an interactive-activation model to explain the morphological processing of Chinese characters. According to this model, word-level processing is effected by the components of word compounds. For example, a two-character word consists of the following three levels of components: stroke, radical, and character. Learners can recognize a Chinese word through the activation of the information from these three levels (Shen, 2005). From a cognitive-load-theory perspective, radicals play an important role in the interactive-activation model. New Chinese characters could be learning materials with very high levels of element interactivity for novice learners because they tend to process these vocabulary items at a very low level of chunking—for example, by stroke (Lee & Kalyuga, 2011). "With the development of expertise, the size of a person's chunks increases: many interacting elements for a novice become encapsulated into a single element for an expert" (Kalyuga, 2011, p. 2).

As novices learn more characters, they may notice that many new characters contain familiar radicals and realize that they can process these radicals as "chunks" rather than as strokes (Taft & Chung, 1999). For example, when first learning the character 桔 (orange), novice learners may need to process the 10 strokes of this character as 10 separate information elements. After learners have acquired the radicals 木, 士, and 口, they may process three chunks of information instead of 10 information elements when learning the character, which greatly reduces the intrinsic load in learning

the character 桔 (Lee & Kalyuga, 2011). Cognitive-load theory thus provided a theoretical rationale for the need to use radical knowledge for effective learning of Chinese characters.

Summary

The challenges that CSL and CFL students are faced with in learning Chinese vocabulary words have been detailed in the section above. Due to the linguistic distance between English and Chinese, even though many of the vocabulary-learning strategies used for learning English or other alphabetical languages also can be used in learning Chinese as foreign language, some strategies may not be applicable for learning Chinese vocabulary. In fact, Bell's (1995) study of her experience of learning Chinese, to a certain degree, lent support to the argument that the strategies used for learning English may not work for learning Chinese. The researcher reported that she found the learning experience stressful, and she believed that one of the reasons causing difficulty in her learning was that she used the same strategies and approaches for L2 literacy as had given her success in her L1 literacy. In fact, the unique orthographic and phonological features of the Chinese language have determined the necessity of using Chinese-specific strategies in addition to general-vocabulary learning strategies. By collecting data from English-speaking CFL learners, the current study shed light on how the Chinese-specific as well as general vocabulary-learning strategies relate to students' language proficiency and their learning outcomes.

Research on Chinese-Vocabulary-Learning Strategies

Compared with the studies on English-vocabulary-learning strategies, there is a much smaller number of studies conducted on Chinese-vocabulary-learning strategies.

The research on Chinese-vocabulary-learning strategies has been influenced by existing research on ESL- and EFL-language-learning strategies, particularly vocabulary-learning strategies. The major studies on Chinese-vocabulary-learning strategies are presented to provide an overall view of what has been known regarding CFL learners' strategy use in learning Chinese vocabulary words and its relation to learner proficiency.

Classification of Chinese-vocabulary-learning strategies

Even though many early studies generated lists of vocabulary-learning strategies of students learning Chinese as a foreign language, no attempt had been made to classify the learning strategies identified in the studies until Shen's (2005) study. Using an approach similar to that of Oxford (1990), Shen (2005) constructed a character-strategy inventory that included 59 strategies. The character-strategy inventory was administered to 32 students to measure what strategies were used commonly by learners. Out of the 59 strategies, 30 were identified to be the most-commonly-used strategies. Of these 30 strategies, 25 were cognitive strategies, the strategies that students used during their cognitive processing of characters (e.g., strategies used for enhancing attention and comprehension of characters and their retrieval). The other five were metacognitive strategies, that is, strategies used actively to monitor, plan, evaluate, and assess one's own learning (Shen, 2005).

Through a factor analysis with Varimax rotation, Shen (2005) further identified 8 factors among the 30 commonly-used strategies. Learning characters through orthographic knowledge loaded heavily on Factor 1 and included strategies such as relating the new character to the previously-learned characters with similar graphic structures and utilizing the semantic and phonetic information in radicals (the semantic

and phonetic components of Chinese characters) to facilitate learning. Factor 2

represented strategies that were related to structured preview and review. Strategies that

allowed learners to memorize the newly-learned characters effectively (e.g., creating

mental linkages among the sound, form, and shape of a character) were represented by

Factor 3. Factor 4 represented cognitive strategies that students used to process

characters at the initial stage of learning the characters (e.g., listening carefully to

pronunciation and tone). Memorization strategies that used the sound as a cue to

remember the shape and meaning of a character were represented by Factor 5. Factor 6

represented strategies that students used to seek references to understand the new

characters such as relating them to one's native language, and Factor 7 involved

strategies used for enhancing retention of newly-learned characters through aural input

such as listening to native speakers. Strategies of using the new words in different

written and spoken contexts were represented by Factor 8.

Winke and Abbuhl (2007) proposed a new Chinese-vocabulary-learning-strategy

classification system based on Long's (1996) *interaction hypothesis*. The taxonomy

includes three categories of strategies: input-based strategies, output-based strategies, and

cognition-based strategies including metacognitive strategies. Input-based strategies are

the ones that the learner uses to seek oral or written input to learn vocabulary items such

as listening to a radio program. Output-based strategies have the common characteristic

that the learner produces the target language either through speaking or writing.

Cognition-based strategies involve "learner-internal activities" (Winke & Abbuhl, 2007,

p. 700) such as planning and reflecting their learning. The classification system of Winke

and Abbuhl (2007) offered researchers a new way to conceptualize language-learning

strategies in the framework of a relatively established theory of second-language acquisition; however, the cognition-based strategies included in their taxonomy left out many important Chinese-specific cognitive strategies that were included in the character-strategy inventory of Shen (2005). In addition, because most of the input-based strategies and output-based strategies listed in the taxonomy of Winke and Abbuhl (2007) also were included in the character-strategy inventory of Shen (2005), the current study developed a Chinese vocabulary-learning-strategy questionnaire based on the character-strategy inventory of Shen (2005) to identify the strategies commonly used by the students in the Chinese Basic Course at the research site.

Frequently-used Chinese-vocabulary-learning strategies

Several studies investigated what vocabulary-learning strategies are frequently used by nonnative learners of Chinese. Wang's (1998) survey suggested that repeatedly copying characters is a strategy frequently used by students. Over half of the students in the study admitted that they tried to use characters whenever they could in tests, quizzes, homework, or classes but not beyond, indicating that metacognitive strategies such as previewing and reviewing were underused. In addition, the students tended to treat a characters as a whole instead of decomposing the character and using its components such as semantic radical to help them learn the character.

McGinnis (1999) examined the character-learning strategies of 29 first-year college CFL learners, who self-reported their character-learning strategies during a 5-week summer immersion program. The results of the study indicated that rote repetition and creating idiosyncratic stories about the characters based on their shape and look were two strategies frequently used by the students. In addition, using character components

for character learning was not a strategy preferred by the students. Using a similar

approach, Ke (1998) collected data from daily-classroom-learning activities, but his study

yielded findings inconsistent with that of McGinnis' (1999). Ke (1998) found that the

students in his study considered radical knowledge more useful than self-created

idiosyncratic stories. It is worth noticing, however, that the students in Ke's study (1998)

had longer study length than the students in McGinnis's study (1999). The possible

reason accounting for the inconsistence previously mentioned was that the longer the

students were in the program, the more radicals they knew and the more likely they were

to consider radical knowledge useful for learning Chinese characters.

Shen (2005) conducted probably the most-comprehensive investigation of

Chinese-character learning strategies among nonnative speakers of Chinese. The study

identified 59 strategies that students used to learn Chinese characters. Among the 59

strategies, 30 strategies, including 25 cognitive strategies and 5 metacognitive strategies,

were used commonly by the students. The study also found that among the cognitive

strategies, orthographic-knowledge-based strategies (e.g., paying attention to stroke order

and grouping words of similar shape together) were considered to be most useful by the

students and that this trend became stronger as the learning level of the students

increased. The researcher pointed out that the students in the study used fewer

metacognitive strategies than cognitive strategies. Shen's (2005) findings further

confirmed the usefulness of orthographic-knowledge-based strategies (e.g., using radical

knowledge for learning new characters) in learning Chinese characters.

Two recent studies (Grenfell & Harris, 2015; Zahradníková, 2016) also found

orthographic-knowledge-based strategies to be strategies frequently used by learners.

Grenfell and Harris (2015) investigated the strategies that adolescent learners of Chinese as a foreign language used to memorize characters. Using a "think-aloud" method, the researchers identified the strategies used by 10 students, and among the 34 strategies identified, 20 strategies were considered to be Chinese specific. The researchers then administered a questionnaire with these 34 strategies to 190 adolescent students, and 13 strategies were identified to be most frequently used. Over half of the most-frequently-used strategies were Chinese specific and many of them were orthographic-knowledge-based strategies. The findings of the study suggested that students do need to develop new ways of memorizing the characters.

Zahradníková (2016) investigated the mnemonic strategies that first-year Chinese-language students use in learning Chinese characters. Fifty Czech students were asked to keep a record of the mnemonic techniques that they used to memorized individual characters, and 10 most-frequently-used basic strategies were identified, including story (28.2%), radical (19.9%), imagination (19.9%), component comparison (8.3%), word (7.2%), similarity (4.0%), drawing (2.4%), emotions (2.3%), etymology (2.3%), and pronunciation (1.7%). These basic strategies were used either individually or in combination, and the majority of these strategies involved the attention to graphic features of the characters and the use of semantic-radical knowledge to assist character learning. For example, using the strategy of imagination, students associated the part of the character or the whole character with an object, symbol, number, or letter of the alphabet based on their visual resemblance. Using the strategy of similarity, students related a new character to a known character with similar graphic structure. Using the strategy of radical and component comparison, students memorized a new character

based on the meaning of its semantic radical or related a new character to a known character with the same semantic radicals.

The findings of the previously mentioned studies (Grenfell & Harris, 2015; Ke, 1998; Shen, 2005; Wang, 1998) highlighted the importance of orthographic-knowledge-based strategies and metacognitive strategies such as previewing and reviewing. These strategies alone, however, are not sufficient for a good mastery of Chinese vocabulary because words should be learned in proper context. As Nation (2001) pointed out, in learning vocabulary, "well-chosen contexts can provide information about grammatical features of the word, typical collocates, situation of use and finer aspects of meaning" (pp. 241–242). A few studies found learning and using Chinese characters and words in meaningful contexts is equally, if not more, important in the acquisition of Chinese vocabulary words. For example, Winke and Abbuhl (2007) found that it was important for learners to use input-based strategies (e.g., listening to new words in context) and output-based strategies (e.g., using the new words in conversations) to put the learning of Chinese words in context for more effective Chinese-vocabulary learning.

The study of Wang and Leland (2011) also reached the same conclusion as that of Winke and Abbuhl (2007) regarding the importance of using input-based strategies and output-based strategies that create meaningful and authentic contexts for learning Chinese words. Wang and Leland (2011) investigated what beginning learners of Chinese perceived as helpful in learning to recognize characters. Using a grounded-theory methodology, the researchers collected data through reflective journals and a survey from 13 participants taking the first-semester Chinese course at a U.S. university. A major finding of the study was that using characters in context strongly supported the learning

of meaning and pronunciation. Participants unanimously agreed with the usefulness of

pronouncing characters in texts to remember their pronunciation. Even though the input

and output strategies are perceived to be useful, they are not necessarily the strategies

most-frequently used by students. Sung (2014), for example, found a lack of strategies to

practice or orally review Chinese characters, and the students in her study made little use

of input and output strategies such as watching TV and using the new words in the

conversation. She argued that as the novice participants' character knowledge increases,

it is desirable and necessary for learners to use the strategies that provide them

opportunities to "test their language hypothesis and promote authentic interaction in both

oral and written form" (Sung, 2014, p. 48).

The studies identifying the commonly-used strategies shed some light on

understanding Chinese-as-a-foreign-language (CFL) learners' strategy use. These

studies, however, investigated the strategy use of the learners without distinguishing their

proficiency levels, thus leaving it unclear whether students of higher proficiency use

strategies in a similar manner as students of lower proficiency. Considering that evidence

has been found that different patterns of strategy use exist between students of higher

proficiency and lower proficiency in learning English vocabulary (Ahmed, 1989; Fan,

2003; Kojic-Sabo & Lightbown, 1999; Lai, 2016; Sanaoui, 1992, 1995), it is meaningful

and necessary to investigate whether such differences hold true in the case of learning

Chinese-vocabulary words, as understanding the differences in strategy use between

students of higher and lower proficiency will provide a more comprehensive picture of

the role that strategies play in CFL students' vocabulary-learning process. Therefore,

whether students of varying proficiency levels use strategies differently was one of the research questions that the current study sought to answer.

The effectiveness of individual strategies

A few studies (Gamage, 2003; Guan, Liu, Chan, Ye, & Perfetti 2011; Hayes, 1988; Ke, 1996, 1998; Shen, 2004; Taft & Chung, 1999; Zahradníková, 2016) focused on the effects of individual strategies in learning Chinese characters such as using the knowledge of semantic radicals for learning characters. Taft and Chung (1999), for example, investigated whether knowledge of the internal structure of Chinese compound characters facilitated beginning learners in memorizing those characters in a Chinese-as-foreign-language (CFL) setting. In the study, the participants, who had never learned any Chinese before, were presented with 24 compound characters that contained semantic radicals. They found that receiving radical instruction before the presentation of characters, at the first presentation of characters, and at the third presentation of characters all yielded better recall than receiving no radical instruction at all. The group of the participants who received radical instruction at the first presentation of characters outperformed all other groups, suggesting that it is important to highlight the radicals when a character is first presented to learners.

Shen (2004) investigated how different encoding strategies effect retention of Chinese characters or words. Sixteen nonnative college students from a second-year Chinese class participated in the study. The researcher selected 30 two-character words, which were matched closely to ensure they were of similar learning difficulty and divided the words into three groups of 10 words each. The three groups of words were assigned randomly to three experimental conditions. For condition 1 (student self-generated

elaboration), students were shown 10 words and asked to memorize these words using their own elaboration methods. For condition 2 (instructor-generated elaboration), the instructor explained the etymology of the words when necessary, analyzed the radicals, and showed how words were used in context. For condition 3 (rote memorization), the instructor repeatedly showed the words using the overhead projector and had students pronounce the words and provide the meaning in English when they saw the words. Recall tests were given to the students at 20-minute and 48-hour intervals.

Analysis of variance results indicated that deep processing (student self-generated elaboration and instructor-guided elaboration) resulted in better recall of sound and meaning of words than shallow processing (rote memorization). A statistically significant interaction was found for both pronunciation and meaning recall at the two time intervals. The instructor-guided elaboration resulted in better retention of word pronunciation and meaning than self-generated elaboration at the 20-minute recall interval, but such advantages disappeared at the 48-hour interval. In reviewing students' written description of the elaboration strategies that they used, the researcher found that all students used strategies that were based more or less on either their existing radical knowledge or on a context to encode new words. Even though the results of the study indicated that orthographic-knowledge-based strategies (elaboration using the phonological, graphemic, and semantic aspects of radicals) were effective for students' learning of Chinese words, due to the small sample size of the study ($n = 16$), the results of study should be interpreted with caution.

Two studies provided empirical evidence regarding the importance of phonological strategies in encoding Chinese characters (Gamage, 2003; Hayes, 1988).

One of these studies (Gamage, 2003) was about the strategies of learning kanji, the adopted logographic Chinese characters in the modern Japanese writing system. Even though Kanji and Chinese characters do differ in terms of pronunciation and meaning of individual characters, the findings of studies on Kanji is considered applicable to the learning of Chinese characters due to the logographic nature of both systems. Gamage's (2003) study investigated the differences in the perceptions of Kanji-learning strategies among character-background (e.g., Korean learners of Japanese) and alphabetical-background learners (e.g., English) through a self-report survey. The participants were 116 2nd-year undergraduate students learning Japanese at a university in Australia. The study found that alphabetic-background learners used visual strategies such as "picture association to kanji" t (114) = 1.98, η^2 = .03 and "repeated writing" t (114) = 1.99, η^2 = .03 more than the character-background learners, whereas character-background learners prefer to use phonological strategies such as "grouping kanji with similar pronunciation" t (114) = 1.99, η^2 = .03, "grouping kanji with similar phonetic radicals" t (114) = 1.98, η^2 = .03, and "reading aloud while writing kanji" t (114) = 1.98, η^2 = .03.

Hayes (1988) investigated the encoding strategies that native speakers (n = 17) as well as nonnative learners (n = 17) of Chinese use in encoding characters. Two experiments, which involved two word-recognition tests, were conducted based on the theory that the predominant processing strategies that the participants used would be revealed by the types of errors that they made on the tests.

The study had a 2x3 factorial design with proficiency (native vs. nonnative) and strategy (phonology, graphic, and semantic) as the independent variables, and the average numbers of errors made by the participants over the three levels of processing strategy as

the dependent variable. The results of analysis of variance showed that the native

speakers made statistically significantly more phonological errors than nonnative

speakers, suggesting that native speakers relied upon phonological strategies to hold

decontextualized characters in their short-term memory. In contrast, nonnative beginning

learners of Chinese used both phonological and graphic strategies in encoding Chinese

characters at word level. At the sentence level, the nonnative speakers made statistically

significantly more graphic errors than native speakers, indicating that they used more

graphic strategies than native speakers at the sentence-level reading. In addition, the

nonnative speakers made statistically significantly more graphic errors than either the

phonological errors or semantic errors.

The findings of both studies suggest that when processing characters,

alphabetical-background learners tended to pay much more attention to the visual

characteristics of the characters, neglecting the important phonological strategies that

could be very useful for them. The phonological strategies, as shown in both studies, are

an essential component in the process of character encoding for learners with a character

background or native speakers of Chinese. Everson's (1998) study provided further

evidence highlighting the important role that phonological strategies play in CFL

learners' vocabulary learning. In the study, 20 beginning CFL learners were shown 46

two-character words on a computer screen, and they were asked to pronounce the words

as soon as the words appeared on the screen. The Pearson product-moment correlation to

assess the relationship between the correctly pronounced and correctly identified words

suggested a very strong relationship between knowing a word's meaning and knowing its

pronunciation ($r = .96$). More specifically, when the participants knew the meaning of a

word, there was a mean probability of 91.4% that they knew the pronunciation of the word, whereas participants could identify the meaning of a word without knowing its pronunciation on average only 8.6% of the time.

Notwithstanding the important role that phonological strategies play in students' learning of Chinese characters, such strategies might not be valued by beginning CFL students (Ke, 1998; Zahradníková, 2016). Ke (1998) looked into the perception of CFL students on the effectiveness of various strategies for learning Chinese characters. He concluded that the role of sound did not appear to be valuable for the participants. The overwhelmingly majority of the participants disagreed that paying attention to the sounds while writing characters was more effective than paying attention to the meaning while writing characters. The majority of the participants also disagreed that associating new characters with known characters in terms of sounds was more effective than in terms of graphic structure. Possibly, as Ke (1998) suggested, beginning CFL students "perceived Chinese characters as primarily visual representations without phonological components" (p. 106). Also it is possible that dealing with the graphic features of a larger amount of Chinese characters in the initial stage of learning is so overwhelming that students have limited cognitive resources available for attending to the phonological features of the characters.

Zahradníková (2016) reached similar conclusions to the study of Ke (1998). The findings of his study suggested that students used phonetic strategies to a limited extent. For example, students paid much attention to building up their knowledge in semantic radicals while ignoring phonetic radicals. In fact, they often treated the phonetical radical in a character as a semantic component to create stories to help them better memorize a

character; for example, to memorize the character 骂, they would create such a story: two mouths above a horse, as 口 is semantic radical meaning mouth whereas 马 is often a semantic radical meaning "horse." In the character 骂, however, 马 functions as a phonetical radical rather than a semantic radical. The researcher proposed two possible reasons accounting for the findings: one being that phonetic radicals often do not indicate reliably the pronunciation of characters, and the other being that beginning students have not mastered enough characters for them to make the full use of phonetic radicals to assist their learning. As students' proficiency increases, they are more likely to utilize phonological strategies to assist their learning. Everson and Ke (1997), for example, found that advanced learners of Chinese used the following phonological strategies excessively when performing a silent reading task: muttering, lip movement, and reading aloud.

In addition to phonological strategies, handwriting Chinese characters also is an important strategy that deserves attention. The study of Guan, Liu, Chan, Ye, and Perfetti (2011) tested in adult learners of Chinese the hypothesis that learning to write words may strengthen orthographic representations and thus support word-specific recognition process. The researchers conducted two experiments. In the first experiment, they compared the effects of two character-learning conditions: one involved reading only and the other involved handwriting practices. Experiment 1 found a handwriting effect on the retrieval of English meaning, with handwriting leading to a statistically significant higher gain from pretest to posttest in the meaning task (.36) than did reading only (.30), $F(1, 58) = 12.7$, $\eta^2 = .19$, a large measure of practical importance. The handwriting effect also was found on the orthographic-knowledge tests, with the

handwriting condition producing higher proportions of accurate responses than the reading condition. In the second experiment, the researchers added an alphabetic (pinyin) typing tutor so that one group received writing training only and the other group received both writing training and Pinyin typing training. The effects of writing found in Experiment 1 on orthographic-form recognition and orthography-semantics association were replicated in Experiment 2. The findings also showed that Pinyin typing supported phonological representations and the character-phonology link.

Chinese-vocabulary-strategy use and learning outcomes

The studies reviewed above either identified strategies that students frequently used to learn Chinese characters and words or examined the effectiveness of individual strategies in encoding Chinese characters. Relatively few studies have investigated the relationship between overall strategy use and learning outcomes. One early attempt was made by Ke (1998), who sought the relationship between students' strategy use and their performance in character recognition and production. In his study, 223 beginning CFL learners from different institutes in the United States participated in the study. A survey was administered to collect data on students' perceptions of the effectiveness of various approaches to learning Chinese characters, and the participants also completed a character-recognition task and a character-production task. Eventually, 150 students' data from seven institutions were used for data analysis. The results indicated that the learning strategies involving practicing characters in the context of vocabulary items and associating new characters with known characters in terms of graphic structure were the two strategies with the largest statistically significant effect on character recognition after controlling for site, explaining 6.65% of the variation on the scores of the Chinese

character recognition. The strategy of learning character components (radical and phonetical radicals) was found to predict students' character production, explaining an additional 3.04% of the variation on the scores of character production after controlling for site.

Another study that deserves attention is Sung's (2012) investigation of the strategy use of 74 U.S. college learners in learning Chinese characters and its relationship to the students' character-learning performance. The researcher used Shen's (2005) *Character Strategy Inventory* to measure students' strategy use, and students' character-learning performance was measured by the grade average of 10 lesson-vocabulary quizzes. The study identified seven strategies that were used most frequently by the students. A principal-component analysis was conducted with Varimax rotation on these seven strategies, and the analysis revealed two components with eigenvalues exceeding 1. Four strategies related to learning Chinese characters through stroke order and orthographic knowledge loaded heavily on Component 1. Three strategies involving the use of phonological information and semantic information of characters to facilitate learning loaded heavily on Component 2. A multiple regression analysis was conducted to examine the relationship between strategy use and students' character performance. The result showed that linear trends exist only for Component 1. The stroke-knowledge-based and orthographic-knowledge-based strategies accounted for 6.8% of the variance in the participants' character-learning performance.

Sung's (2012) study is important in that it is one of the first attempts to examine the relationship between students' strategy use in learning Chinese characters and their learning outcomes using principal component analysis; however, the findings of her study

were weakened due to her small sample size ($n = 74$) used for principal-component analysis. Another limitation of the study, as Sung (2012) acknowledged, was that the vocabulary quizzes only measured students' orthographic production-based performance (e.g., writing a character that the teacher read aloud). Other correlations might exist between the commonly-used strategies and phonological comprehension, orthographic comprehension, or phonological production.

To address the limitations mentioned above, Sung (2014) replicated the study that she conducted in 2012, and she used a different instrument to assess students' character performance. She designed a vocabulary quiz that measured the four dimensions of students' knowledge of the characters (words) tested: phonological comprehension (understanding the meaning of a word when hearing it), graphic comprehension (understanding the meaning of a word when seeing it), phonological production (being able to say a word aloud when seeing it), and graphic production (being able to write the characters for a word when being provided its English equivalent). There were 88 first-year U.S. college learners participating in the study. The study identified 20 most-frequently-used strategies that had average scores higher than 3.5 on the 5-point Likert-type scale. The researcher then conducted principal-component analysis with Varimax rotation on these 20 strategies, which resulted in three components. The five strategies related to the phonetic aspects of characters loaded heavily on Component 1. Four strategies related to remembering a character's or making connection between a word's graphic information and its sound loaded heavily on Component 2. Loading heavily on Component 3 were the three strategies used to review characters and practice using words in context. The three components together explained 44% of the variance in students'

frequency of strategy-use responses. The results of the multiple-regression analyses showed that the participants using certain phonological strategies more-frequently performed better on the phonological comprehension part of the test, whereas the participants using orthographic strategies from Component 2 more-frequently performed better on the graphic comprehension, graphic production, and phonological production parts of the test. The two studies by Sung (2012, 2014) have provided important information about what strategies are effective for learners' vocabulary acquisition in learning Chinese; however, the studies also are weakened by the limitation of using small sample sizes for principal-component analysis.

The studies of Ke (1998) and Sung (2012, 2014) examined the relationship between learners' strategy use and learning outcomes using vocabulary tests only. Vocabulary tests tend to provide limited context for the words tested and the lack of larger context might not reveal how strategies focusing on learning and using vocabulary in context help students with their vocabulary learning. Therefore, the current study took a step further to examine the relationship between learners' strategy use and their learning outcomes as measured by listening and reading proficiency tests. In addition, neither of the studies has investigated what strategy patterns distinguish more-successful learners from the less-successful learners, which was another focus of the current study.

Summary

Second-language-learning strategy has been researched extensively since the 1970s to better understand how languages are learned (e.g., Cohen, 1998; Hsiao & Oxford, 2002; Nyikos & Oxford, 1993; Rubin, 1975; Stein, 1975). Using Oxford's (1990) *Strategy Inventory for Language Learning (SILL)*, several studies (Bruen, 2001;

Brenmer, 1998; Lai, 2009; Park, 1997; Philips, 1991) investigated the relationship

between learners' strategy use and language proficiency. In general, the studies found

that successful students demonstrated a greater level of strategy use or more-appropriate

application of strategies to specific learning tasks, whereas unsuccessful students'

strategy use was limited in scope in comparison, and they often applied the strategies in

an inappropriate and ineffective manner when they were using the same strategies as

successful learners. In addition, certain strategy-use patterns such as the use of

metacognitive strategies and cognitive strategies providing authentic use of language

distinguished more-successful students from less-successful students. Similar conclusions

(Ahmed, 1989; Barcroft, 2009; Fan, 2003; Gu & Johnson, 1996; Kojic-Sabo &

Lightbown, 1999; Lawson & Hogben, 1996; Sanaoui, 1992, 1995) were reached in the

studies examining the relationship between learners' strategy use in vocabulary learning

and learner proficiency.

Most studies on the relationship between strategy use in learning vocabulary and

learning outcomes have been conducted in the English-as-a-second-language (ESL) or

English-as-a-foreign-language (EFL) area; however, there was a lack of research on this

relationship in less-commonly taught foreign languages such as Chinese. In fact, only

three published studies specifically investigated the relationship between the strategy use

of Chinese-as-a-foreign-language (CFL) learners and learning outcomes (Ke, 1998; Sung,

2012, 2014). In these three studies, learning outcomes were measured by vocabulary

tests only. In addition, no studies have investigated what strategy patterns distinguish

more-successful CFL learners from their less-successful peers. To better understand the

relationship between CFL learners' strategy use and language-learning outcomes, the

current study took a step further, examining the relationship between CFL learners'

strategy use and learning outcomes as measured by a proficiency test. The strategy use of

learners of different grade point averages also were examined quantitatively and

qualitatively to determine whether any differences exist between students of different

GPAs (high, middle, and low) in terms of strategy.

CHAPTER III

METHODOLOGY

The purpose of this study was to investigate the strategy use of Chinese-as-a-foreign-language (CFL) students in learning Chinese vocabulary words and its relationship to students' learning outcomes. The strategy use of the CFL students and its relationship to their learning outcomes were examined using a mixed-methods study. The research design, data-collection procedure, and data-analysis procedure of the study are provided in this chapter. The following subsections contain the details of the research design, a description of the study setting and participants, protection of human subjects, instrumentation, the pilot study, the procedures for data collection, the data analyses, and the limitations of the study.

Research Design

The research was a mixed-methods study with a quantitative descriptive component and a qualitative interview component. Students' strategy use was measured using a 50-item questionnaire. Both demographic information and the information on students' strategy use were collected through the administration of the *Chinese Vocabulary Learning Strategy Questionnaire* (CVLSQ; Appendix A). Students' learning outcomes were measured by their end-of-semester II Proficiency Progress Test (PROFIPT). PROFIPT includes a listening test and a reading test, each of which has 60 multiple-choice items. Descriptive data were analyzed to identify the strategies commonly used by the students. Based on their grade point averages (GPAs), students were divided into three groups (high, middle, and low), and a chi-square test was

conducted to examine whether students with different GPAs vary in their overall strategy use.

To better understand what relationship exists between students' strategy use and their GPAs and what distinguishes more-successful students from less-successful students in terms of strategy use in vocabulary learning, interviews also were used to investigate the aspects of the relationship that might not be revealed with a quantitative approach. As Ushioda (2001) pointed out, a qualitative approach has the potential to provide different perspectives on the phenomena under investigation. Moreover, "the openness of qualitative inquiry allows the researcher to approach the inherent complexity of social interaction and to do justice to that complexity, to respect it in its own right" (Glesene & Peshkin, 1992, p. 7). Therefore, indepth interviews were conducted with nine students who had completed the questionnaire to further examine the relation between students' strategy use and their success in learning. Among the nine students, three were from the high-GPA group, three from the middle-GPA group, and three from the low-GPA group. The quantitative approach, supplemented by the qualitative investigation method, provided a more comprehensive picture that depicted the complex relationship of strategy use and success in learning, hence enabling the researcher to gain a better understanding of the strategy behaviors of more-successful students and less-successful students.

The relationship between students' strategy use and their language outcomes was examined by correlating students' strategy use and their end-of-semester II Proficiency Progress Test (PROFIPT) using Pearson product-moment correlation and Kendall's tau-b. At the time of data collection, however, not all of the students had taken their end-of-

semester II PROFIPT. Due to this reason, only the data of the students who had

completed the end-of-semester II PROFIPT were included in this part of analysis.

Setting and Participants

The target population comprised students studying Chinese in the Chinese Basic

Course at a military language institute, a United States Department of Defense

educational and research institute. The institution is located in the West coast of the

United States, and it offers foreign-language instruction in over two dozen foreign

languages to students selected from the four branches of the military. All the language

courses at this language institution follow the same instructional schedule, which extends

throughout the year; however, the length of the courses varies depending on the difficulty

level of the languages. Students study 6 hours per day, 5 days a week with the exception

of holidays.

The Chinese Basic Course is a 64-week language program, and the course

consists of three semesters, with each semester lasting for 20 to 24 weeks. Due to the

rotating enrollment system employed at the school where the research was conducted, at

a given time, different classes may be at different instructional weeks even if they are all

in the same semester. At the end of Semester II, all the students are expected to take an

end-of-semester II Proficiency Progress Test (PROFIPT), which gauges their language

proficiency in listening and in reading. The PROFIPT scores are not calculated into

students' GPA. A team-teaching instructional model is adopted to ensure accountability

and small student-to-teacher ratio (1 to 2). Students are assigned to different teaching

teams as soon as they are enrolled in the program, and they study with the same teaching

team for the entire 64 weeks. Each teaching team has a team leader, who is in charge of

making teaching schedules and coordinating administrative tasks related to student matters.

The learning materials for the course were developed by the school curriculum-development teams, which comprised teachers with extensive experience in teaching Chinese as a foreign language. Semester I materials are mostly nonauthentic, and they are organized by communicative functions such as ordering food and making an appointment with a doctor. Semester II and Semester III materials are organized by topics such as society, culture, and politics. The lessons in the textbooks throughout the three semesters follow a similar structure with the following main components: presentation, grammar and usage, using Chinese in context, and a vocabulary list. Vocabulary learning is stressed throughout the course, and vocabulary quizzes often are given before students learn a new lesson to ensure that they preview the new lessons. Typically, students study the vocabulary on their own, but some teams may include classes explicitly teaching new vocabulary at the beginning of the course. Students are expected to master approximately 1,200 words by the end of Semester I, 3,200 words by the end of Semester II, and 5,000 words by the end of Semester III.

A total of 137 students, ranging from 19 to 35 years of age, participated in this study ($N = 137$). At the time when the data were collected, all the participants were enrolled in the Chinese Basic Course, and the participants comprised students from the beginning (Semester I) to the advanced levels (Semester III). The majority of the participants were male students. Approximately 90% of the participants were European American, and approximately 10% of the students consisted of African American, Hispanic American, and Asian American students. The demographic data for the

participants, including their gender, age, GPA, first language, and week of instruction in

the program are provided in Table 6.

Table 6

Demographic Data for the Participants

Demographic	f	%
Gender		
Male	105	77
Female	32	23
Age		
Under 20	33	24
20-25	70	51
26-30	24	18
Above 30	10	7
GPA		
3.0 or under	37	27
3.0-3.6	64	47
3.6 or above	36	26
First Language		
English	129	94
Others	8	6
Week of Instruction		
Week 15	27	19
Week 25	20	15
Week 36	23	17
Week 46	40	29
Week 56	20	15
Week 60	7	5

The data of all the participants were used in examining the strategies commonly

used by the students and the strategy use of students with different GPAs (high, middle,

and low). At the time of data collection for the current study, however, not all the

students had completed their end-of-semester II Proficiency Progress Test (PROFIPT).

Therefore, only the data of the students who had completed PROFIPT were used for the

investigation of the relationship between students' strategy use and their learning

outcomes.

Recruitment

Purposive samples were solicited through visiting students' classrooms during their after-class time. Specifically, I visited the classes in the Chinese Basic Course during their after-class time. During the meeting with the students, I explained briefly to them the purpose of my visit and the nature of the study and then provided them the consent form and questionnaire if they were interested in participating in the study. They were instructed to return the questionnaire and the signed consent form within a week of receiving the questionnaire. They had the option to give their questionnaire responses to me when I stopped by their classrooms, or they could leave their responses with one of their teachers who was willing to help collect the questionnaire responses. Participants for interviews were identified through the questionnaire responses, which included one question about their willingness to participate in a follow-up interview. The identified candidates were then contacted for interviews.

Protection of Human Subjects

The study ensured protection of human subjects by following Standard 8: Ethical Principles Concerning Research and Publication (American Psychological Association, 2012). Approval to conduct research was obtained from the research site and from the Institutional Review Board for the Protection of Human Subjects (IRBPHS) at the University of San Francisco prior to contacting the research participants. All information obtained during the course of this study was kept confidential, and participants for the study were recruited on a completely voluntary basis. A consent form was provided to each participant during the briefings, and the consent form informed the participants of the purpose of the study and provided the participants the following information

regarding their participation: (a) they may withdraw from the study at any time, (b) all the information obtained from the study would be kept confidential, (c) there were no known risks associated with their participation in the study, and (d) they would not receive compensation for participating in the study, but they would receive the benefits of reflecting on their vocabulary learning strategies and expanding their vocabulary-learning-strategy repertoire. Participants were required to sign the consent form in order to be admitted to the study and informed consent was assumed for the duration of the study.

Data were collected by using paper-and-pen questionnaires and were kept confidential. Any data that made it possible to identify individual participant information were not included in the questionnaire, and the questionnaire was filled out anonymously. In order to link participants' strategy scores and their proficiency-test scores as well as the interview data, a master list of participants was created. Each name on the list was assigned a number. The questionnaire responses were coded with numbers to ensure that the participants could fill out the survey anonymously, and at the same time the questionnaire could be linked with the participants' proficiency-test scores and the interview data. The hard copies of the questionnaire responses were kept in a locked file cabinet, and the data related to the study were stored in a password-protected computer to ensure the security of the data. The master list of participants was kept separately from the rest of the research data as a security precaution. Only I had access to the response data and any lists generated from the data-collection process including the master list. The master list was destroyed after the students' strategy scores and their proficiency-test

scores were linked. Identifiable data will be destroyed 3 years after the completion of the research project.

Instrumentation

This study was intended to examine CFL students' strategy use in learning Chinese vocabulary words and its relationship to students' learning outcomes, using mixed methods with a quantitative descriptive component and a qualitative interview component. Participants' strategy use was measured by a self-report questionnaire, the *Chinese Vocabulary Learning Strategy Questionnaire* (CVLSQ; Appendix A), which was adapted primarily from Shen's (2005) *Character Learning Strategy Inventory*. Students' learning outcomes were measured by the Proficiency Progress Test (PROFIPT) that students take at the end of Semester II, including a listening test and a reading test. The following section provides detailed information about the two instruments, the CVLSQ and the PROFIPT, regarding the development of the instruments and the establishment of the reliability and validity evidence for the scores obtained from the instruments. The interview questions also are introduced.

Chinese Vocabulary Learning Strategy Questionnaire

The CVLSQ consisted of two parts: Part A and Part B. Part A of the questionnaire collected students' demographic information and other important information relevant to the study, including gender, age, previous foreign-language learning experience, instructional levels in the program, and current GPA. Part B of the questionnaire contained 50 items that measured students' strategy use.

Development of CVLSQ

The CVLSQ was adapted primarily from Shen's (2005) *Character Learning Strategy Inventory*, which is a 5-point Likert-type scale that measures the frequency of strategy use with 5 representing "*Always or almost always true of me*" and 1 representing "*Never or almost never true of me.*" Shen (2005) constructed the strategy inventory based on the information obtained from a semistructured questionnaire designed to elicit character-learning strategies used by students on an everyday basis. From the students' written responses, a total of 176 strategies (including repeated items) used by students in learning characters or words were identified. The removal of repeated items and items used by fewer than 5% of participants resulted in the 59-item strategy questionnaire.

A total of 41 strategies in the CVLSQ were adapted from the *Character Learning Strategy Inventory*, especially from the eight factors that Shen identified through a factor analysis. Some strategies from *Character Learning Strategy Inventory* were not included in the CVLSQ for the following two reasons. One reason was that some items were similar, and there was no need to include all of them in the CVLSQ. For example, the strategy "I find out how new characters (or words) are used in conversation" overlapped with the strategy "I pay attention to how the character (or word) is used in context," so only the latter was retained in the CVLSQ. The second reason was that several strategy items did not fit the learning context of the current study, such as "using the new words in the Chinese corner (or Japanese Conversation hour) or any other social activities." "The Chinese corner (or Japanese Conversation hour)" was specific to the learning context in which Shen's (2005) study was conducted.

Three general vocabulary-learning-strategy items similar to the memory strategies in Schmitt's (1997) vocabulary-strategy taxonomy were added ("I organize new words into theme-based and topic-related categories," "I connect the new word to my personal experience," and "I connect a word to its synonym or antonym"), as these strategies promote deep processing of vocabulary words and such deep processing has been tested empirically to facilitate students' vocabulary learning (Gu, 2005). One strategy item was added to reflect the unique learning situation in the Chinese Basic Course: "I use vocabulary learning software or other apps such as Pleco to improve my vocabulary." Five strategy items (3 metacognitive strategies and 2 social strategies), similar to the strategies from Oxford's (1990) *Strategy Inventory of Language Learning* (SILL), were added to the CVLSQ, as these strategies are important for students studying in an intensive-training setting based on the observation of experienced teachers at the site where the study was conducted. The previously mentioned adjustments resulted in the 50 strategy items in the CVLSQ.

In addition to compiling a list of strategies, the strategies in the CVLSQ also were organized according to Oxford's (1990) framework, which was reviewed in detail in the literature review section. Her system consists of six strategy groups: memory, cognitive, compensation, metacognitive, social, and affective. Because two categories, compensation and affective, did not apply to vocabulary learning, in the current study, the strategies items were organized into four categories instead of six as in Oxford's strategy system: Cognitive, Memory, Metacognitive, and Social (Appendix B). Cognitive strategies enable learners to manipulate the reception and production of language. Memory strategies involve remembering and retrieving information though relating new

material to existing knowledge or organizing mental information and transforming it in a way that makes it memorable. Metacognitive Strategies involve a conscious overview of the learning process through planning, monitoring, and evaluating one's learning. Social strategies improve language learning through interacting with other people and managing discourse. Items 1 to 23 were cognitive, items 24 to 35 were memory, items 36 to 45 were metacognitive, and items 46 to 50 were social. Students' strategy use across these four categories as well as their use of individual strategies were correlated with their proficiency-test scores in listening and reading.

Validity and reliability of CVLSQ

Several measures were taken to assess the validity evidence of the CVLSQ. First, items in the CVLSQ were chosen in such a way that they were in accordance with the survey specification drawn up through a thorough examination of the subject domain (Anastasi & Urbina, 1997). Specifically, when compiling strategies for the CVLSQ, I drew on the previous research to determine which items to include in the questionnaire. The CVLSQ was adapted primarily from Shen's (2005) *Character Learning Strategy Inventory*, which has been used in two other studies (Sung, 2012, 2014) investigating the strategy use of CFL students in learning Chinese characters. Moreover, to decide which items from Shen's (2005) questionnaire to include in the CVLSQ and which items to add to the CVLSQ, I referred to the items measuring vocabulary-learning strategies in Oxford's (1990) *Strategy Inventory of Language Learning* (SILL), the most widely used assessment of language-learning strategies. A large number of studies have used or adapted the SILL to investigate language learners' strategy use or the relationship between strategy use and other variables such as learning styles and proficiency level

(e.g., Bremner, 1998; Bruen, 2001; Lai, 2009; Park, 1997, etc.). I also referred to Schmitt's (1997) *Taxonomy of Vocabulary Learning Strategies* to decide what general vocabulary-learning strategies to include in the CVLSQ. Schmitt's (1997) taxonomy has been used widely in vocabulary research (e.g., Catalán, 2003; Kudo, 1999; Schmitt et al., 2001; Yeh & Wang, 2004) and is regarded as an instrument with reliability evidence (Catalán, 2003; Kudo, 1999).

In addition to drawing on the previous research for the selection of items for the CVLSQ, an expert panel was formed to review the questionnaire. These experts reviewed the items in the CVLSQ and commented on whether the items actually measured the construct of Chinese-vocabulary-learning strategies. The expert panel comprised three instructors, who were experienced in teaching Chinese as a foreign language and had expertise in research methods, statistics, and language-strategy research and teaching. All the panel members have a doctoral degree. The panel provided information on the validity of the questionnaire using the validation rubric shown in Appendix C. The content of the questionnaire was further refined based on the feedback from the expert panel. The CVLSQ was pilot tested with six students to ensure the clarity and comprehensiveness of the questionnaire prior to the review of the expert panel. The reliability evidence of the validated CVLSQ was obtained by another pilot study with 30 students after the review of the expert panel.

The finalized CVLSQ was then used to collect data for the study, and the internal consistency of the instrument was calculated using Cronbach coefficient alpha based on the data of the 137 participants. The Cronbach coefficient alpha for the entire questionnaire and the four strategy categories are presented in Table 7. Deleting item 35

(I memorize the sound first then the meaning and shape) could improve the alpha value

of the memory category from .65 to .69. Deleting item 42 (I review the words that I

learned only before quizzes and exams) could improve the alpha value of the

metacognitive category from .56 to .68. Considering that these two strategy items may

distinguish more successful students from less successful students, they were retained.

Table 7

Reliability of the CVLSQ ($N = 137$)

Category	Items	Cronbach Coefficient Alpha
The CVLSQ	50	.85
Cognitive Strategies	23	.72
Memory Strategies	12	.65
Metacognitive Strategies	10	.56
Social Strategies	5	.73

Pearson product-moment correlations were calculated to show independence of

the four strategy categories. The four strategy categories should be related as they all

measure the same construct of vocabulary learning strategy, but they should not be

correlated highly or they would be redundant. For Likert type of scales, Pearson product-

moment correlations in the .45 to .65 range are optimal. The Pearson product-moment

correlation coefficients between the four strategy categories of the CVLSQ were mostly

in this range as shown in Table 8.

Table 8

Pearson Product-Moment Correlation Coefficients of Four Strategy Categories

	Cognitive	Memory	Metacognitive	Social
Cognitive	-	.53*	.52*	.54*
Memory		-	.35*	.47*
Metacognitive			-	.42*
Social				-

Note. $N = 137$. *Statistically significant when overall error rate is controlled at .05 level.

End-of-Semester II proficiency tests

At the end of Semester II and after taking Unit 9 achievement tests, students in the Chinese Basic Course are expected to take a proficiency test, PROFIPT, which gauges their language proficiency in listening and reading. PROFIPT is a multiple-choice instrument and consists of a listening test and a reading test. The listening test contains 60 questions with 31 passages; each passage has 1 to 2 questions with four answer choices per question. The reading test also contains 60 questions with about 26 passages, and each passage has 2 to 3 questions with four-answer choices per question.

The passages included in the tests were selected from authentic materials such as daily conversations, radio broadcasts, interviews, and newspapers. The passages covered diverse topics, ranging from social and cultural topics to scientific and military topics. In the test, a short English orientation is provided before each passage to indicate the context from which the passage is taken. The passages vary in length depending on their difficulty levels. The longest listening passage is approximately 2 minutes, and the longest reading passage has approximately 377 words. All the questions are based on the passages, and they are written in English. Each question is followed by four choices, and only one of the four choices is the correct answer for the question. Students' scores are the number of the correct answers that they choose, so the minimum possible score for a student is 0 and the maximum possible score is 60, as there is a total of 60 questions.

PROFIPT was developed by a curriculum team of experienced Chinese instructors, many of whom had extensive experience in test development prior to joining the project. The tests were pilot tested and revised by the curriculum team based on the feedback from the teachers and students. The Cronbach coefficient alpha was .78 for the

listening test and .75 for the reading test based on the available data of 56 students out of the 137 participants of the study. Because not all the participants had completed their end-of-semester II PROFIPT scores by the time this study was conducted, only scores of the students who completed PROFIPT within approximately one month of the administration of CVLSQ were collected.

Interview

For the qualitative part of the study, an interview protocol was developed to collect data from nine students among those who have taken the questionnaire. Previous studies on vocabulary-learning strategies (Schmitt, 1997; Shen, 2005; Winke & Abbuhl, 2007) were referred to in constructing the interview protocol. The interview protocol included the following questions:

1. How do you study the new vocabulary words in your textbooks?

2. How do you study the sound, shape, and meaning of new characters or words?

3. Besides the textbook, what additional materials do you use for vocabulary learning?

4. How do you review and consolidate the learned vocabulary words?

5. What activities do you use to practice using the newly learned vocabulary words?

6. How do you prepare for vocabulary quizzes?

7. Do you try to get help from others in learning vocabulary words?

8. What vocabulary strategies did you find most useful?

9. What advice would you like to give new students about how to study Chinese vocabulary words?

For interview questions 1 and 2, the students were expected to use their textbooks to show how they studied new vocabulary words and how they used strategies to assist their learning. All of the participants were asked the same questions listed in the interview protocol and follow-up questions were asked during the interviews for clarification or probing for more information.

Procedures for Data Collection

Upon receiving the approval letter from the language institute where the current research took place, an application for IRB review of the proposed study at University of San Francisco (USF) was submitted. Data collection started after the IRB application was approved at USF, and the required administrative review of the IRB approval was completed at the research site.

I collected the quantitative data through the administration of the CVLSQ and from students' self-reported GPA and PFOFIPT listening and reading scores on the questionnaire. This part of data collection went from early January to late February 2018. During the recruitment phase, I held briefings to provide interested students detailed information about the study and distributed the consent form and the questionnaire. The students were instructed to complete the questionnaire at home and return their questionnaire responses with signed consent forms within one week of receiving the questionnaire if they were interested in participating in the study. The questionnaires were filled out anonymously.

By the end of February 2018, I had administered the CVLSQ to 21 classes and received a total of 158 responses. After the questionnaire responses were returned, the following data from the questionnaire responses were entered into an Excel file: gender,

age, length of study, current GPA, and strategy use. Before entering the data, I checked with the participants' team leaders to verify the accuracy of the GPAs and PROFIPT scores self-reported by the participants. Two responses were removed from the study because they were incomplete. To eliminate confounding variables, the data of heritage speakers of Chinese or students who studied Chinese prior to coming to the Chinese Basic Course were excluded from data analysis, resulting in 137 cases for data analyses.

The qualitative data were collected through interviews. I sorted the questionnaire responses into three groups according to the participants' GPAs: a high-GPA group, a middle-GPA group, and a low-GPA group. Students with a GPA equal to or above 3.6 were in the high-GPA group, students with a GPA above 3.0 but less than 3.6 were in the middle-GPA group, and students with a GPA equal to or less than 3.0 were in the low-GPA group. The criteria for the grouping was based on the discussion with several experienced instructors in the Chinese Basic Course and the school practice that students with GPA equal to or less than 3.0 are considered to be at academic risk and need additional help, and students with GPA equal to or above 3.6 are eligible for awards such as the Dean's List Award. Altogether nine students were contacted for interview with three students from each group representing different instructional weeks. The interview took place at students' classrooms when they were not having class. All the interviews were recorded, fully transcribed, and coded for analysis.

Pilot Procedures

Two pilot tests were conducted to ensure that the instrument, the *Chinese Vocabulary Learning Strategy Questionnaire* (CVLSQ), was appropriate for the current study. The first pilot study was conducted during mid-December 2017. During the first

pilot study, six students were invited to take the CVLSQ, and these six students were at

different instructional weeks at the point of taking the questionnaire. At the end of the

questionnaire, what followed were three questions asking the participants to comment on

the length of the questionnaire, the clarity of the statements in the questionnaire, and

whether there were any other strategies that should be included in the questionnaire. I

met with the students in their classrooms, briefly explained the research project and gave

them the questionnaire with the consent form. Within a week after administering the

questionnaire, I stopped by the students' classrooms again to collect the questionnaire

responses.

All six students returned the CVLSQ responses and signed consent forms, and the

demographic data for these students are presented in Table 9.

Table 9

Demographic Data for the Participants of Pilot Study 1

Student	Gender	Age Group	GPA	First Language	Instructional Week
1	Female	26-30	3.8	English	27
2	Male	20-25	3.3	English	62
3	Male	26-30	3.3	English	26
4	Male	26-30	3.7	English	14
5	Male	20-25	3.3	English	62
6	Male	20-25	4.0	English	16

None of the six students commented on the length of the questionnaire or the

clarity of the items. One student made additional comments on the questionnaire stating

that the items were very clear to him. One student added a strategy that he preferred to

use. Due to the similarity of the strategy to an item in the questionnaire, no additional

strategies were added to the CVLSQ. An expert panel was then formed to review the

CVLSQ. As mentioned previously, all three panel members had expertise in research

methods, statistics, and language-strategy research and teaching. The panel provided

important information on the validity of the questionnaire using the validation rubric

shown in Appendix C. Based on the feedback from the panel, the wordings for item 4

and item 27 were changed slightly. In addition, one item (I use flashcards to familiarize

myself with sound, shape, and meaning of a new character or word) that was placed

originally in the cognitive category was recommended to be moved to the memory

category. The revised CVLSQ was tested for its reliability in the second pilot study,

which was conducted in early January of 2018. During the second pilot test, the

questionnaire was administered to 34 students from different instructional weeks. The

demographic data for the participants of the second pilot study are presented in Table 10.

Table 10

Demographic Data for the Participants of Pilot Study 2

Demographic	f	%
Gender		
Male	29	85
Female	5	15
Age		
Under 20	9	26
20-25	15	44
26-30	4	12
Above 30	6	18
GPA		
3.0 or under	10	29
3.0-3.6	9	27
3.6 or above	15	44
First Language		
English	33	97
Others	1	3
Week of Instruction		
Week 63	11	32
Week 30	3	9
Week 18	7	21
Week 9	13	38

The collected data were entered into the Statistical Package for the Social Sciences (SPSS) 24.0 for statistical analysis. Cronbach coefficient alpha for all 50 strategy items and for the four strategy categories (Cognitive, Memory, Metacognitive, and Social) were obtained for the reliability evidence of the questionnaire. A large value for Cronbach coefficient alpha indicates that the items are measuring the same underlying unidimensional construct. The reliability data for the entire questionnaire and the four strategy categories are presented in Table 11.

Table 11

Reliability of the CVLSQ from Pilot Study 2 ($n = 34$)

Category	Items	Cronbach Coefficient Alpha
The CVLSQ	50	.92
Cognitive Strategies	22	.86
Memory Strategies	13	.71
Metacognitive Strategies	10	.60
Social Strategies	5	.74

As can be seen in Table 11, the Cronbach coefficient alpha for the CVLSQ was .92, suggesting that items in the questionnaire all measure students' strategy use in learning Chinese. The Cronbach coefficient alpha for the three strategy categories (cognitive, memory, and social) exceeded the minimal acceptable value of .70 (Cohen, 1988). A careful examination of the data-analysis results showed that item 35 (I use flashcards to familiarize myself with sound, shape, and meaning of a new character or word) lowered the Cronbach coefficient alpha for the category of memory strategies. Deleting item 35 improved the Cronbach coefficient alpha for this category from .71 to .75. Moving item 35 back to the category of cognitive strategies, where it was placed originally, however, only slightly changed the Cronbach coefficient alpha of the category (from .86 to .85). Therefore, after the second pilot test, the CVLSQ was further revised

by moving item 35 from the memory category to the cognitive category, where it was originally placed, and it was renamed as item 23. The finalized CVLSQ is attached in Appendix A.

Data Analysis

The data analyses for this study were both quantitative and qualitative. An overview of the research questions and the data-analysis methods is provided in Table 12.

Table 12

Overview of Research Methods

Research Questions	Data-Analysis Methods	Variables
Research Question 1: What vocabulary-learning strategies are commonly used by Chinese-as-a-foreign-language students in learning Chinese vocabulary words?	Descriptive Data	Items of CVLSQ
Research Question 2: To what extent do learners of different GPAs (high, middle, and low) vary in their strategy use?	Chi-square test Interview data	Independent Variable: GPA (high, middle, low) Dependent Variable: Strategy use (high, middle, low)
Research Question 3: To what extent is there a relationship between students' strategy use and their learning outcomes as measured by their listening and reading proficiency-test scores?	Pearson product-moment correlation Kendall's tau-b	Predictor variable: Frequency of strategy use (50 strategy items and 4 strategy categories) Predictor variable: Frequency of the use of individual strategies Criterion variable: PROFIPT scores (listening and reading)

Quantitative analysis

The first research question that the current study aimed to address was: What strategies are commonly used by Chinese-as-a-foreign-language (CFL) students in learning Chinese vocabulary words? To answer this question, the descriptive data were examined at the item level. The strategy items listed on the CVLSQ were classified into three groups based on their frequency of use. Group 1 was comprised of the most-commonly used strategies. Each strategy in Group 1 had a mean equal to or above 3.5 with 65% or above of the participants choosing either 4 or 5. The strategies in Group 2 were less-commonly used with each strategy either having a mean between 3.0 and 3.5 or having a mean above 3.5 but with less than 65% of the participants choosing either 4 or 5. The strategies in Group 3 were least-commonly used with each strategy having a mean equal to or less than 3.0. The criteria used for the classification were based on the criteria used in Shen's study (2005); however, adjustments were made due to the reason that the means of the strategies in the current study in general were higher than the means in Shen's study (2015).

The second research question was: To what extent do learners of different GPAs (high, middle, and low) differ in their strategy use? To answer this question, a chi-square test was conducted to examine whether there was a relationship between students' GPA and their overall strategy use. The first variable for the chi-square test was students' GPA, which had three levels: high (equal or above 3.6), middle (between 3.0 and 3.6), and low (equal or less than 3.0). The second variable was students' strategy use, which also had three levels: high strategy, middle strategy, and low strategy. Three strategy groups (high, middle, and low) were obtained using a method similar to the approach

used in Park's study (1997). The means for total strategies were calculated for each participant, and the means were rank ordered following a descending order. Based on the rank order, the participants were then divided into three groups of roughly the same size: high-strategy group, middle-strategy group, and low-strategy group. The null hypothesis was that students' GPA and their frequency of strategy use was not related. The critical value of chi-square statistic was calculated to assess whether the null hypotheses was rejected or not rejected.

The third research question was: To what extent is there a relationship between students' strategy use and their learning outcomes as measured by their listening and reading proficiency-test scores? To answer this question, the total responses for all 50 strategies were calculated for each participant, and composite scores for the four strategy categories also were obtained for each participant by adding the responses to the strategies in each category. Pearson product-moment correlation analyses were used to examine (a) the correlation between the total scores of strategies and students' proficiency-test scores in listening and in reading and (b) the correlation between the composites of the four strategy categories and students' proficiency-test scores in listening and in reading.

Kendall's tau-b was used to examine the correlation between the frequency of use of each individual strategy and students' proficiency-test scores in listening and in reading in order to identify which individual strategies had stronger association with students' proficiency-test scores. Kendall's tau-b is a nonparametric measure of the strength and direction of association that exist between two variables, and it was chosen for the following reasons: (a) the predictor variable, individual strategy responses, was

measured on an ordinal scale (5-point Likert scale) and the criterion variable, listening

and reading performance, was measured on a continuous scale and (b) the sample size

was relatively ($n= 67$) small with many tied ranks. The listening and reading scores were

divided into five groups based on the 20th percentile, the 40th percentile, the 60th

percentile, and the 80th percentile, as the strategies were on a scale of 1 to 5. Then

Kendall's tau-b was computed to attain the correlations between the frequency of the use

of individual strategies and students' proficiency-test scores.

For all the correlation analyses, the .05 level of significance was used to

determine statistical significance. Cohen's (1988) standard was used to evaluate the

correlation coefficients to determine the strength of the relationship. Accordingly,

coefficients between .10 and .29 represent a small association, coefficients between .30

and .49 represent a medium association, and coefficients of .50 and above represent a

large association or relationship (Cohen, 1988).

Qualitative analysis

To answer the second research question, in addition to analyzing the quantitative

data with the chi-square test, indepth interviews were conducted with nine students

selected from the high-, middle-, and low-GPA groups to further examine whether and

how more-successful students and less-successful students used strategies differently.

All the interview sessions were recorded with a digital recorder and the audio files were

later uploaded to the computer. I then transcribed the audio files and made certain that

any identifying features in the transcription were excluded. After all the audio files were

transcribed, I read through the transcripts (Appendix E) to attain a general sense of the

information provided by the participants before starting the coding process. Open-coding

techniques were used to develop the codes for this research. Open coding consists of selecting parts of text of interest and coding them with a key word generated from the data itself instead of using a predetermined set of categories or codes (Creswell, 2014).

The following procedures were applied in the coding process. Before coding the data, I formatted the pages of data into three columns. The first and widest column contained the interview transcripts. The second column contained space where I could jot down any preliminary words or phrases for codes on transcripts. The third column was for listing all the final codes. For each transcript, instead of keeping the data running together as long unbroken passages, I separated the text into short meaning units with some space between them whenever the topic or subtopic appeared to change.

After the formatting process, I read through the transcript on the computer in one sitting. During this process, I highlighted relevant quotes or passages that were "codable moments" worthy of attention (Boyatzis, 1998). Then I reread the transcript and jotted down preliminary code notes. Finally, I read the transcript for a third time to develop the final codes. I also developed a codebook for the coding scheme. To develop this codebook, I randomly selected three interview transcripts from high-GPA, middle-GPA, and low-GPA groups, respectively, which constituted about 33% of the total interview data. While coding the three transcripts, I kept a record of my emergent codes in a separate file, which evolved into the preliminary codebook (Appendix D) that contained a list of codes, including a code label for each code, a definition of it, and an example (Creswell, 2014).

All the interview data were coded with the codebook as guidance. The codebook developed and changed based on the information learned during the data analysis. After

finishing coding the transcripts, I reviewed the codes constantly. Whenever necessary, the original number of first-cycle codes were collapsed into a smaller number because some larger segments of text were better suited to just one key code rather than several smaller ones. Then, codes were organized and grouped into categories. Subsequently, major categories were compared with each other and consolidated into themes that provided indepth information on how more-successful and less-successful students used strategies in learning Chinese vocabulary words.

The researcher's role

In qualitative research, the researcher also plays the role of the primary data-collection instrument, which necessitates the identification of personal values, assumptions, and biases at the outset of the study. The investigator's contribution to the research setting is not necessarily detrimental; in fact, it can be useful and positive (Miller, 1992). I learned English as a foreign language in China, and I also had experience teaching English as a foreign language in China. I have been teaching Chinese as a foreign language in the United States since 2004, and currently I am working as a faculty development specialist. I believe my language learning and teaching background enhances my awareness and knowledge on the challenges that the participants encounter in learning Chinese vocabulary words and helps me better understand why certain strategies are necessary for effectively learning Chinese characters and words. Meanwhile, due to my previous experiences in conducting workshops on strategy-based instruction and in teaching vocabulary-learning strategies to newly enrolled students during their first week of orientation classes, I bring certain biases to this study. For example, I view vocabulary learning strategies as useful tools

that can help students effectively expand their vocabulary eventually leading to higher language proficiency. Even though every effort was made to ensure objectivity, it is possible that previously mentioned biases may shape the way I viewed and interpreted the data that I coded.

Validity and reliability

Validity, also referred to as trustworthiness, authenticity, and credibility in qualitative research, is considered to be one of the strengths of qualitative research and is based on determining whether the findings are accurate from the perspectives of the researcher, the participant, or the readers of an account (Creswell & Miller, 2000). In this research, I have adopted several strategies suggested by Creswell (2014) to assess the accuracy of findings, thereby ensuring the validity of the study. First, both quantitative data and qualitative data were collected to examine evidence to provide justification for the themes that emerged. The triangulation of different data sources enhanced the validity of the study. Second, I used member checking to determine the accuracy of the findings by having the participants read the major findings and asking them whether they believed the results were accurate. I also had an external auditor review the raw data and the interpretation of the data. Finally, after identifying themes, I carefully reread the data to look for any discrepant information that ran counter to the themes.

I included the following qualitative reliability procedures to ensure that the qualitative data-analysis approaches used for the study were reliable. I had an external auditor listen to excerpts randomly selected from the audio files and check the transcripts to verify that the transcription was accurate. When coding the data, I developed a codebook and constantly compared the data with the codes to make sure that there was

not a shift in the meaning of the codes (Gibbs, 2007). To establish interrater reliability

(IRR) for my coding system, after the initial establishment of the coding scheme, I

worked with a second coder, a colleague of mine with experience in language-strategy

training, to code two sets of interviews selected at random. According to Miles and

Huberman (1994), an IRR of 80% agreement between coders on 95% of the codes is

sufficient agreement among multiple coders (Miles & Huberman, 1994). To calculate

IRR, I used the formula described in Miles and Huberman (1994):

$$\text{Reliability} = \frac{\text{number of agreements}}{\text{number of agreements} + \text{disagreements}}$$

Two IRR values were determined between each set of our codes: (a) the number

of times I agreed with Coder 2 divided by the total number of codes that I used, and (b)

the numbers of times Coder 2 agreed with me divided by the total number of codes that

she used. The reason to do so was that these numbers vary greatly due to the total

number of codes applied by each coder (McAlister et al., 2017).

I held three meetings with the second coder. During the first meeting, I used the

transcript from the high-GPA group that I had coded as an example to discuss the coding

scheme with the second coder, explaining how it was developed, what the codes were,

and what each code meant. Based on this discussion, we clarified the codes and

definitions. I then selected at random an interview transcript from the mid-GPA group,

and we each coded a copy of it. During our second meeting, we went over our coding for

the transcript and compared our results. The IRR was found to be between 77% to 81%.

We discussed coding problems where there were discrepancies and confusion and

eventually resolved our disagreements. Then, we independently coded another set of

interview transcript selected from low-GPA group at random. We compared our coding

results and the IRR was found to be between 83% to 86%. Again, we discussed and

resolved our disagreements. Finally, I independently finished coding the rest of the

interview data.

Summary

This study investigated the vocabulary-learning strategies of students learning

Chinese in an intensive-language-training setting. Specifically, it examined the strategy

use of the students and the relationship between their strategy use and learning outcomes.

Participants' overall strategy use was measured by a self-report questionnaire, the

Chinese Vocabulary Learning Strategy Questionnaire (Appendix A), which was

primarily adapted from Shen's (2005) *Character Learning Strategy Inventory*. The

learning outcomes were measured by the proficiency test of PROFIPT, which students

take at the end of Semester II, including a listening test and a reading test. To address the

three research questions, statistical analyses including descriptive statistics, Pearson

product-moment correlation, Kendall's tau-b, and chi-square tests were performed, and

interview data were coded and analyzed. Results of the data analyses are presented in

Chapter IV and findings of the study are discussed and interpreted in Chapter V.

CHAPTER IV

FINDINGS

The purpose of this study was to investigate the strategy use of Chinese-as-a-foreign-language (CFL) students in learning Chinese vocabulary words and its relationship to students' learning outcomes. The strategy use of the CFL students and the relationship to their learning outcomes were examined using a mixed-methods study. The findings of this study are organized and reported on the basis of the three research questions, and a final summary of the results concludes the chapter. For research question 2, both quantitative results and qualitative results are presented in the same section.

Research Question 1

Research Question 1: What learning strategies are commonly used by Chinese-as-a-foreign-language students in learning Chinese vocabulary words?

The *Chinese Vocabulary Learning Strategy Questionnaire* (CVLSQ) has a 5-point Likert-type scale that measured the frequency of CFL students' strategy use with 5 representing "*Always or almost always true of me*," 4 "*Generally true of me*," 3 "*Somewhat true of me*," 2 "*Generally not true of me*," and 1 "*Never or almost never true of me*." The descriptive statistics showed that the means of the 50 strategy items ranged from 2.51 to 4.74 and that the standard deviations ranged from 0.23 to 1.36. The 50 strategy items from the CVLSQ were classified into three groups based on their frequency of use. Group 1 comprised the most-commonly-used strategies. Each strategy in Group 1 had a mean equal to or above 3.5 with 65% or above participants choosing either 4 or 5 for this strategy. The strategies in Group 2 were less-commonly used with

each strategy either having a mean between 3.0 and 3.5 or having a mean above 3.5 but with less than 65% participants choosing either 4 or 5 for this strategy. The strategies in Group 3 were least-commonly used with each strategy having a mean equal to or less than 3.0. Of 50 strategies, 20 were classified as the most-commonly-used strategies. The mean, the standard deviation, and the cumulative percentage of participants choosing either 4 or 5 for the 20 most-commonly-used strategy items are provided in Table 13.

Table 13

Strategies Most-Commonly Used by Students in Learning Chinese Vocabulary Words

Cat.	Item number and the strategy represented	*M*	*SD*	Cum.%
MET	45. Use vocabulary learning apps such as Pleco to improve learning	4.74	0.69	94.9
MET	39. Preview the new words the night before class	4.45	0.76	89.1
COG	14. Look in the textbook or dictionary to check unsure meaning	4.42	0.77	92.7
COG	13. Determine whether the character in a new word has been learned	4.34	0.84	85.4
MEM	27. Pay attention to known characters when memorizing a word	4.29	0.71	86.9
COG	22. Pay attention to how a character (word) is used in context	4.28	0.76	86.1
COG	12. Recognize known radicals when learning new characters (words)	4.26	0.88	81.0
SOC	49. Ask others how they use a word in different sentences	4.23	0.87	81.8
MET	40. Preview the new words right before class	4.22	1.14	78.1
COG	1. Pay attention to the tone and associate it with Pinyin	4.15	0.83	78.0
MET	43. Notice incorrect word usage and use that information to improve	4.04	0.87	75.9
COG	23. Use flashcards to study sound, shape, and meaning of characters	3.99	1.33	72.3
COG	5. Find equivalent word from the native language	3.96	1.04	71.5
MET	36. Plan schedule to ensure enough time to study vocabulary words	3.91	0.98	65.7
SOC	47. Practice using words by interacting with others	3.89	0.97	71.5
COG	3. Find out the meaning of the radical in the character	3.88	0.98	67.9
MEM	26. Quiz oneself during memorization of characters (words)	3.86	1.11	68.6
COG	7. Say the character when writing it	3.78	1.22	67.2
COG	15. Try to use new words in sentences orally	3.76	0.90	72.3
COG	10. Try to visualize the character in one's head	3.76	1.06	66.4

Notes. *N* = 137. Cat. = the strategy category that a particular strategy belongs to. Cum.% = cumulative percentage of participants who chose either 4 or 5 for a particular strategy.

As shown in Table 13, of the 20 most-commonly used strategies, 11 were cognitive strategies (1, 3, 5, 7, 10, 12 to15, 22, 23), most of which were orthographic-knowledge-based strategies such as recognizing radicals when learning new characters (words). The 20 most-commonly used strategies also included five metacognitive strategies (36, 39, 40, 43, 45), which focus on the planning and monitoring of one's vocabulary learning such as previewing the new words before class and noticing the incorrect word usage and using that information to improve. Two social strategies (47, 49) were also in the top 20 strategies. Only two memory strategies (26, 27) were most-commonly used by the students, that is, paying attention to known characters when memorizing a word and quizzing oneself during memorization of characters (words).

The 21 strategies listed in Table 14 were less-commonly used by the students. Each strategy item in this group either had a mean between 3.0 and 3.5 or had a mean equal or above 3.5 but with less than 65% participants choosing either 4 or 5 for it. The means of these strategy items ranged from 3.02 to 3.81 and the standard deviations ranged from 0.95 to 1.30 (Table 14).

Of the 21 less-commonly-used strategies, 7 were memory strategies (24, 25, 29, 30, 31, 33, 35), 8 cognitive strategies (4, 6, 9, 11, 16, 18, 19, 20), 3 metacognitive strategies (38, 41, 44), and 3 social strategies (46, 48, 50). It is worth noticing that 60% of the social strategies and 58% of the memory strategies were in the category of less-commonly-used strategies. Among the eight cognitive strategies listed in this category, most of them focus on the phonological knowledge of characters (words), such as associating the sound of the character with its meaning and reading characters out loud and associating sound, meaning, and shape.

Table 14

Strategies Less-Commonly Used by Students in Learning Chinese Vocabulary Words

Cat.	Item number and the strategy represented	*M*	*SD*	Cum.%
SOC	48. Ask others to correct one's pronunciation when speaking	3.81	1.05	62.8
COG	4. Associate the sound of the character with its meaning	3.80	1.12	61.3
COG	20. Listen to conversations by native speakers	3.78	1.05	64.2
COG	6. Say the character and visualize it	3.77	1.06	62.0
COG	11. Check reference sources to contextualize characters (words)	3.74	1.10	61.3
MET	38. Regularly quiz oneself on the words learned	3.70	1.10	60.0
MET	44. Take notes to record important words and review them regularly	3.51	0.97	54.0
COG	9. Read characters out loud and associate sound, meaning and shape	3.50	0.99	50.4
MEM	35. Memorize the sound first and then the meaning and shape	3.49	1.12	51.1
SOC	50. Discuss with others the methods of learning characters (words)	3.42	1.28	51.1
MEM	31. Connect the new word to one's personal experiences	3.38	1.11	51.8
MET	41. Review the words learned on a regular basis	3.35	0.95	42.3
MEM	25. Compare characters to see differences and similarities in shape	3.34	1.06	48.9
SOC	46. Teach others interesting characters (words)	3.33	1.25	48.2
COG	19. Practice the words by watching Chinese movies and TV	3.33	1.23	46.0
COG	18. Listen to or sing Chinese songs	3.32	1.30	47.4
MEM	33. Connect a word to its synonym or antonym	3.31	1.14	45.3
MEM	24. Use imagination to picture the meaning of a character	3.21	1.21	40.9
MEM	30. Organize new words into theme- and topic-based categories	3.12	1.17	40.1
MEM	29. Group words with similar features (e.g., meaning and shape)	3.04	1.15	38.7
COG	16. Try to use new words in e-mail or journal writing	3.02	1.29	37.2

The least-commonly-used strategies are listed in Table 15. Each of the least-commonly-used strategy items had a mean less than 3.0. The means of these strategy items ranged from 2.51 to 2.99 and the standard deviations ranged from 0.23 to 1.36. Of the nine strategies, four were cognitive strategies (2, 8, 17, 21), two were metacognitive strategies (37, 42), and three were memory strategies (28, 32, 34). Even though writing Chinese characters by hand is commonly believed to help students better retain the vocabulary words learned, two strategies involving writing Chinese characters by hand

(writing words repeatedly to memorize them and making sentences with new words and writing out the sentences) were least-commonly used.

Table 15

Strategies Least-Commonly Used by Students in Learning Chinese Vocabulary Words

Cat.	Item number and the strategy represented	*M*	*SD*	Cum.%
COG	2. Pay attention to stroke orders	2.99	0.23	32.1
MEM	32. Write words repeatedly to memorize them	2.93	1.36	40.1
MET	37. Summarize progress in vocabulary learning periodically	2.90	1.07	27.0
COG	21. Practice the words by reading newspapers or online materials	2.90	1.03	27.0
COG	8. Listen to audio and connect meaning and shape of characters	2.77	1.16	29.2
COG	17. Make sentences with new words and write out the sentences	2.74	1.24	30.7
MEM	28. Try to make a story of the character (word)	2.72	1.19	26.3
MET	42. Review the words learned only before quizzes or exams	2.53	1.16	21.9
MEM	34. Memorize the shape of the character before the pronunciation	2.51	1.17	21.2

The tables above listed the individual strategies that were most-commonly, less-commonly, and least-commonly used by the participants. The strategy use by categories (cognitive, memory, metacognitive, and social) is summarized in Table 16, which shows that 50% of the metacognitive strategies, 48% of the cognitive strategies, and 40% of the social strategies were most-commonly used, whereas only 17% of the memory strategies were most-commonly used.

Table 16

Percentage of Four Types of Strategies by Groups

Groups	COG (%)	MEM (%)	MET (%)	SOC (%)
Group 1	48	17	50	40
Group 2	35	58	30	60
Group 3	17	25	20	0

Notes. Group 1 = most-commonly-used strategies; Group 2 = less-commonly-used strategies; Group 3 = least-commonly-used strategies; COG = cognitive; MEM = memory; MET = metacognitive; SOC = Social

Research Question 2

Research Question 2: To what extent do learners of different grade point averages (GPAs; high, middle, and low) vary in their strategy use?

Research question 2 was examined using a quantitative approach followed by indepth interview of nine students. Two chi-square tests were conducted to decide whether a statistically significant relationship existed in the strategy use of students with different GPAs (high, middle, and low). Interviews were conducted with nine students to further examine whether students with different GPAs differed in their strategy use and whether certain patterns of strategy use distinguished students with higher GPAs from students with lower GPAs. The quantitative and the qualitative findings follow.

Quantitative findings

In order to investigate to what extent learners of different GPAs (high, middle, and low) vary in their strategy use, two chi-square tests were conducted with the first one based on the data of all 137 individuals and the second on the data of 70 participants from weeks 15, 25, and 36. The second chi-square test was added due to the reason that among 67 participants from weeks 46, 56, and 60, only 8 students had a GPA equal to or less than 3.0, which is not surprising, as the students from weeks 46 to 60 are mostly in Semester III and by the end of Semester II, some students with low GPAs either have improved along the course or may have been dropped from the program for not being able to keep up with the pace of learning. Including the data from the 67 students may restrict the variance and hence affect the magnitude of the coefficient; therefore, the second chi-square without the data of the 67 students was computed.

For the first chi-square test, the GPAs of the 137 individuals were divided into three groups: low GPA ($\leq$3.0, n =37), middle GPA (3.0 to 3.6, n = 64), and high GPA ($\geq$ 3.6, n = 36). To obtain the three strategy groups, the means for strategy use for all the participants were rank ordered following a descending order. Based on the rank order, the participants were then divided into three groups of roughly the same size: low-strategy group ($\leq$3.4, n = 42), middle-strategy group (3.4 to 3.8, n = 48), and high-strategy group ($\geq$3.8, n = 47). A chi-square test was then performed using the data of 137 individuals (χ^2 = 9.33, df = 4), which was not statistically significant.

For the second chi-square test, the GPAs of the 70 individuals from weeks 15, 25, and 36 were divided into three groups: low GPA ($\leq$3.0, n =28), middle GPA (3.0 to 3.6, n = 22), and high GPA ($\geq$ 3.6, n = 20). To obtain the three strategy groups, the means for the strategy use for the 70 participants were rank ordered following a descending order. Based on the rank order, the participants were then divided into three groups of roughly the same size: low-strategy group ($\leq$3.44, n = 23), middle-strategy group (3.44 to 3.80, n = 22), and high-strategy group ($\geq$3.80, n = 25). A chi-square test was then performed (χ^2 =10.42, df = 4, Cramer's V = .27). There was a statistically significant relationship between students' GPAs and their strategy use. The Cramer's V indicated a small but close to medium measure of association (Cohen, 1988, p. 25).

Qualitative findings

The purpose of the qualitative portion of this study was to provide more indepth information on the strategy use of students with different GPAs (high, middle, and low). Nine students were interviewed for this purpose, and the demographic information for the nine participants is provided in Table 17.

Table 17

Demographic Information for Nine Interviewees

Student	Age	Gender	GPA	Week	Prior FL Experience
1	21	Male	2.33	15	Spanish
2	32	Male	2.40	25	Spanish
3	26	Male	2.92	46	Spanish
4	26	Male	3.30	15	German and Japanese
5	25	Male	3.33	36	French and German
6	20	Female	3.33	46	Latin
7	23	Male	3.82	15	Latin
8	20	Male	4.00	15	Spanish and Japanese
9	20	Male	3.93	46	French

Note. Week = instructional week.

Open-coding techniques (Creswell, 2014) were used to develop the codes and themes for this research. Six themes emerged from the analysis of the data: (a) students with higher GPAs used a wider varieties of strategies, (b) students with different GPAs varied in their perceptions regarding what strategies were useful, (c) students with higher GPAs showed a stronger trend of using orthographic-knowledge-based strategies, (d) selective attention and note taking differentiated students with higher GPAs from students with lower GPAs, (e) students with higher GPAs were more likely to learn and use vocabulary in authentic context, and (f) students with higher GPAs demonstrated a higher level of self-management.

Theme 1: Students with higher GPAs used a wider varieties of strategies

The interviews with the three groups, high GPA, middle GPA, and low GPA, showed that the participants used various strategies to assist their learning. Strategies that were mentioned by at least two members of a group were considered to be commonly used by this group. The strategies use of the three GPA groups (high, middle, and low) are presented in Table 18.

Table 18

Strategy Use of Three GPA Groups

Strategy	H	M	L
1. Connecting the sound, shape, and meaning of characters through repeated practice	3	3	3
2. Using electronic flashcards (Pleco, Skritter, or Anki) to study vocabulary words	3	3	3
3. Paying attention to how a character (word) is used in context (e.g., presentations)	3	3	3
4. Previewing new vocabulary words before class	3	3	3
5. Reviewing vocabulary words before vocabulary quizzes	3	3	3
6. Using new words in sentences orally	3	3	3
7. Creating stories to memorize a character (or word)	3	3	3
8. Practicing using words by interacting with others	3	3	3
9. Quizzing oneself or each other on the vocabulary words	3	2	2
10. Finding equivalent word from one's native language	3	3	3
11. Writing characters repeatedly to memorize them	2	2	2
12. Saying the character out loud when looking at the character or writing the character	2	2	2
13. Using self-selected online resources	3	3	1
14. Adjusting a particular strategy to focus on one's weak areas (e.g., the tone, character recognition, or character writing) based on self-evaluation of one's learning	3	2	1
15. Learning words through watching Chinese movies or shows	3	2	0
16. Determining whether the radicals in a character or the characters in a new word have been learned before	3	2	0
17. Taking notes on interesting or important words and review notes	2	3	0
18. Writing down words from non-textbook materials and connecting the words with the vocabulary from the textbooks	2	2	1
19. Categorizing words with similar features	2	1	1
20. Reading newspaper or news articles online	2	1	1
20. Paying attention to the stroke order of characters	1	1	1
21. Using hand-written flashcards	1	1	1
22. Understanding the etymology of the characters	1	0	0

A comparison of the strategies listed in Table 18 with the strategies in the *Chinese Vocabulary Learning Strategies Questionnaire* (CVLSQ) revealed that they are a subset of the strategies in the CVLSQ. Some strategies listed might have different names than

their counterparts in the CVLSQ. They, however, were considered to be the same

strategies as the use of these strategies achieves the same results. In addition, strategies 1

to 12 were used by at least two students in each GPA group and were considered to be

commonly used by the nine students interviewed. These strategies mostly overlap with

the 20 most-commonly-used strategies listed in Table 13. Two strategies that were

commonly used by the nine interviewees (writing characters repeatedly to memorize

them and creating stories to memorize a character or word), however, were identified to

be the least-commonly-used strategies in Table 15. Considering that the nine interviewed

participants constituted only a small portion of the total sample of 137 students, the

discrepancy, in this case, is not surprising.

The analysis of the interview data, as shown in Table 18, revealed that the

strategies mentioned by the low-GPA group also were mentioned by the middle-GPA and

the high-GPA groups. A few strategies identified to be used commonly by the high-GPA

group, however, were not necessarily used commonly by the middle-GPA group and the

low-GPA group. For example, all three students from the high-GPA group stated that

they tried to identify the known characters or radicals when learning the new words so

that they could relate the new words to what they had learned. Two students from the

middle-GPA group mentioned the same strategy. In addition, in their interviews, they

mentioned that they did not use the strategy as the main one in learning new vocabulary

words. None of the students from the low-GPA group mentioned this particular strategy.

Another example is the strategy of categorizing words with similar features. Two

students from the high-GPA group mentioned using this strategy, but only one student

from the middle-GPA and the low-GPA groups mentioned this particular strategy. It is

also worth mentioning that the high-GPA student used categorization in a more elaborate manner than the students from the middle-GPA and the low-GPA group.

In general, more than half of the strategies in Table 18 were used commonly by the three GPA groups. Strategies 13 to 18 in Table 18 distinguished students with higher GPAs from students with lower GPAs in that there were at least two students in the high-GPA and the middle-GPA groups using these strategies, whereas there were at most one student in the low-GPA group used the same strategies. Overall, students with higher GPAs used a wider varieties of strategies.

Theme 2: Students with different GPAs varied in their perceptions regarding what strategies were useful

The participants of the three GPA groups discussed what strategies were most useful for them. The responses from the three groups are summarized in Table 19. As shown in Table 19, the strategies perceived to be useful by the high-GPA group were mostly cognitive strategies that emphasize learning and using of vocabulary words in an authentic way, such as watching movies and practicing using words with others. The two metacognitive strategies, reviewing notes taken and identifying and focusing on aspects of words not mastered, also were mentioned by the high-GPA group. In contrast, the majority of the strategies perceived to be useful by the low-GPA group were mostly memory strategies, such as using Pleco flashcards and making a story about a character or words for better memorization. The strategies perceived to be useful by the middle-GPA group showed the features of preferences from both the high-GPA and the low-GPA groups. Only the students in the high-GPA group mentioned using radical knowledge as a useful strategy.

Table 19

Strategies Perceived to be Useful Broken Down by Three GPA Groups

High GPA	Middle GPA	Low GPA
1. Hearing words in an authentic way through TV shows	1. Using Pleco Flashcard	1. Using Pleco Flashcard
2. Watching movies	2. Learning words in presentations and listening exercises	2. Learning words in presentations and listening exercises
3. Using words in context	3. Using words in context	3. Connecting a word to one's experiences
4. Practicing using words with others	4. Taking notes of new words and reviewing	4. Making a story of the character (word)
5. Taking notes of new words and reviewing		5. Rote memorization
6. Identifying and focusing on aspects of words not mastered		6. Writing and saying the word
7. Categorizing		
8. Using radical knowledge		

Theme 3: Students with higher GPAs showed a stronger trend of using orthographic-knowledge-based strategies

Orthographic-knowledge-based strategies include the strategies that use radical knowledge to help with the learning of a new character or the strategies that use the knowledge of a known character to understand the meaning of a new word. The high-GPA group showed a strong trend of using orthographic-knowledge-based strategies in learning new vocabulary words. All three members of the high-GPA group (Students 7, 8, and 9) used the strategy of determining whether the radicals in a character or the characters in a new word have been learned when learning new vocabulary words. Student 7 described in detail his preliminary round of studying of new vocabulary words. According to him, he would look at the characters and ask himself which characters he already knew. He then highlighted the words containing the known characters with a

certain color and categorized them as the easy ones to learn. "I can read them a couple of times and hopefully since I already know them, those words will stick."

The same student gave some specific examples to demonstrate how he used this strategy to connect new words to known characters and how the strategy helped him learn the new words.

> Well, like I said, the best way for me is characters that I know. So, like we had "shi" before. "Shi," matters or things. I know that we had "shiqing" ... we had that before. So, I'm like, those are easy ones that I know how to do and for me this is basically just like a review rather than "I need to remember that." For example, "mi fan" [cooked rice]. I haven't learned "mi" [uncooked rice] yet, but I learned "fan" [food], "chi fan" [to eat food]. I know that one. So, alright, let's learn that character [the unknown one]. Like "dian cai" [to order dishes], I haven't learned "dian" [to order], but I know "cai" [dishes], so I will do that. It's kind of like Math, you can ... it just builds ... everything builds on each other so much that I know if I take the building block that I'm already aware of and [I can] try to put them together and make something.

Student 8 described a similar strategy. He commented that as he noticed more characters getting reused, learning characters was "just connecting the new ones with old ones. So it's kind of just builds on, so it's really a matter of starting early and getting foundation." The following example that he gave well illustrated how he used the orthographic-knowledge-based strategy to help him learn.

> When I am studying the characters, I look for the radicals, anything that can relate to anything learned already. So, [looked at Lesson 20 vocabulary list], like "huo qi" [flexible account], "xing qi" [week], and "xing qi ji" [what day of the week], all of them have the same character "qi." Also, "sui shen" [bring with you] and "sui shi" [any time] have the same "sui."

The same approach was used by Student 9 when studying the new vocabulary words.

> First of all, I'll look at the Pinyin. I mean not the Pinyin, the characters, because having known so many characters being this far, I'll just see if I can recognize ... well, if I can recognize of course, and then if I can distinguish the meaning on my own, maybe get some ... get a rough meaning out of it and then look at the English word. ... Like "ji feng" [monsoon], I know "ji" is in "ji jie" [season] and "feng" is wind. So I know they probably have something to do with the weather.

And then I may not be able to guess "monsoon," but you know that'll kind of put in my head what's to expect and then once I see the definition, 'oh, it's monsoon.' Then I'll try, you know, connect that together.

Out of the three members from the middle-GPA group, both Student 5 and Student 6 briefly mentioned using the orthographic-knowledge-based strategies as discussed above. For example, Student 5 said that

Uh, then for the shape of the character, there are a couple of methods that I use for that. One is more or less just associating a character that I know and I have seen before with that, so for example, I may not have seen ... I'll use "yan lei" again, uh, "lei" [tears] I haven't seen before, but I have seen "yan" [eyes] before. I have seen it in "yan jing" [eyes], a lot of different words. That builds up an understanding of the word, at least knowing half of that word. If I've never seen a word before, I'll pull up the definition and it's like 'how am I gonna understand this?'

The two students from the middle-GPA group, however, did not use orthographic-knowledge-based strategies as the main strategies in learning new vocabulary words. In addition, the way they used the strategies did not appear to be as consistent and elaborate as that of the students from the high-GPA group.

Compared with the high-GPA and the middle-GPA groups, none of the three students (Students 1, 2, and 3) from the low-GPA group specifically mentioned using the above mentioned orthographic-knowledge-based strategies, and they tended to rely more on memory strategies to study the new characters and words. Student 1 from this group commented that creating stories was one of the main ways that he was able to memorize the characters. He gave an example to show how he memorized the character "熊" (xiong, bear).

For some characters, it is just that I read or see them enough that I just ... I am able to recognize them but some of the hard ones, I will try to make up a story behind it. So, I remember one that we just did, the character for "bear." The top of it is "neng" [能, can]. It has got fire radical under it. So, a bear is very capable.

So, it will do a lot of things with fire ... like vigor. It is capable. A bear is very capable. It is how I remember it.

Students from the high-GPA group (Students 7, 8, and 9) also mentioned the strategy of creating stories to memorize characters. A salient difference, however, was that they used the strategy mainly at the beginning stage of learning when they did not know many characters. Student 7, who is at week 15, said that in the beginning, he had to come up with elaborate stories to memorize characters because characters were just strokes and they meant nothing to him. As he learned more characters, he started noticing the recurring radicals and became less dependent on creating stories to memorize characters. "Now I am finding that the more base characters I have, I can just start thinking in radicals rather than these elaborate stories. I very rarely, anymore, have to come up with elaborated stories." Student 8 also mentioned that he used to create stories frequently, but as more characters reoccurred in new word combinations, he started to focus on connecting new words to known characters and radicals.

Other memory strategies that students from the low-GPA group (Students 1, 2, and 3) preferred to use include connecting words to one's personal experiences and rote memorization. Student 2, for example, placed great emphasis on writing characters repeatedly and associating words with personal experiences to memorize characters. Student 3 preferred rote memorization in learning new characters and words. He stated that "rote memorization works really well with me. Memorization, just remembering it, is my favorite strategy."

Even though they overall prefer memory strategies, the students from the low-GPA group were well aware of the importance of orthographic-knowledge-based strategies. They admitted that they did not pay enough attention to these strategies in the

beginning. For example, Student 2, who was in the beginning of Semester II, commented

that he just started noticing the trend of how radicals were used, what they meant, and the

radicals that he had seen frequently. He explained that his overly focusing on writing

characters in the beginning diverted his attention from learning radicals:

> I will ... before in the first semester, I knew writing counted [in the vocabulary tests], I would be so obsessed with just looking at it, just trying to figure out the stroke order and just writing it. I really wasn't paying a whole lot of attention to it [radicals] because I was so concerned about, you know, that we get tested on all of them, so I needed to know them all. And I was taking them all at once. Um, so I really was just not paying attention enough. I knew some of the radicals but now that it's kind of been broken down for me in the second semester having the vocabulary test. Actually it's better for me personally 'cause I know 'ok, here is 20 words. I can spend more time on each word and look at it.' For instance, today we had a lot of words that had hand radicals like "tui" [push] and "la" [pull]. I noticed those things, and it helps me definitely like get a good grip of things.

When asked what advice he would give to new students on learning Chinese

vocabulary words, the same student again emphasized the importance of using

orthographic-knowledge-based strategies.

> Just try to analyze the character I guess as much as you can because the more you do that, and what I mean by analyzing is specifically the parts, the radicals. Um, because I always feel like if I did that more in the beginning, where I am at now would be no problem because a lot of the characters and radicals are used, you know, over and over again. So when I get words that already have the same characters even the same parts, like remembering them doesn't take long at all.

Student 3, who was at the end of Semester II, also commented on the importance

of learning radicals. When asked what advice he would like to give new students in

learning vocabulary words, he recommended learning radicals, but he said that he

personally could not do it. He then added the following explanation for what he meant:

> It's hard because I have got some friends in class... they can understand if a radical is in certain place, it means something. This is how you understand it and this is like the sound of it, the meaning behind it. I can't quite grasp it just yet. I understand some of the radicals but they know every single radical 'cause I think

they know the chart [radical chart] more than I do. There is a radical chart that we were given. In the beginning, I didn't really pay attention to it. I never thought it would like come handy much later. Now I am like starting to grasp it now, but it's a little late … it's not too late but I am just a little more behind for it.

Theme 4: Selective attention and note taking differentiated students with higher GPAs from students with lower GPAs

The comparison of the strategy use of the three GPA groups also revealed group differences in the use of two strategies: selective attention and note taking. One pattern of strategy use that notably distinguished higher-GPA students from lower-GPA students was the use of the strategy of selective attention, which refers to the practice of paying special attention to certain aspects of vocabulary learning. The students from the high-GPA group (Students 7, 8, and 9) demonstrated frequent use of this type of metacognitive strategy. Student 7 did so by categorizing new vocabulary words according to their difficulty levels and focused more on the words that were difficult for him. He said that he would highlight new words with different colors to distinguish their difficulty levels. "Yellow is the easy one. These [blue ones] got to be more moderate and the ones that aren't highlighted…these usually are the ones I am studying last that are more difficult for me."

Student 8 marked the characters in the textbook that were written differently in simplified form (the written system used in mainland China) and traditional form (the written system used in Taiwan) with asterisks to remind himself to pay more attention to these words. For Student 9, paying attention to the pronunciation of the characters was an important step in learning new characters. Therefore, when going through new vocabulary words for the first round, he would take time to make certain that he had solid grasp of the pronunciation and definition of the new characters and words. For the next

morning's vocabulary test, if he did not have the tones of a word right, he would count

that word wrong and restudy it. He also used Pleco to help him keep track of the words

for which he missed the tones. He kept testing himself using Pleco until he had mastered

the tones of these words.

One student, Student 6 from the middle-GPA group, also showed some use of the

strategy of selective attention. She described that in the early stage of learning, she

would make hand-written flashcards and organize the cards in such a way that she could

focus on the ones that did not stick well:

> So, every 3 days, I would probably spend about half an hour or 45 minutes
> making flashcards, and then, um, I'll make flashcards and then like 2 days later,
> the night before the vocab quiz, I would go through those flashcards over and
> over again and for the ones that won't stick I would take these ones and put them
> in a different pile. And once I finished with all the flashcards once, I had piled
> ones that stuck easily and ones that didn't. So I just go through the smaller one,
> the vocab that didn't stick.

Overall, the use of the strategy of selective attention was a salient feature of the

students from the high-GPA group. Students from this group paid extra attention to the

aspects of vocabulary learning that they deemed to be important or necessary based on

self-reflection of their vocabulary learning. Student 7 from this group stated that he had

difficulty in learning Chinese characters in the beginning, and he attributed this difficulty

to lack of attention in writing characters. Accordingly, he adjusted his strategy to focus

more on writing characters after realizing the importance of writing characters for

learning Chinese vocabulary words:

> At that time, I didn't recognize how important it was to write out the characters
> 'cause every other language that I have taken hasn't been such a … I guess ...a
> visual language I want to say. Like French and Latin, a lot of that you can sound
> out. They have alphabets, so I can just look at the flashcards and I can say,
> 'Alright, I can see that word over and over again in my head 'cause I know the 26
> letters and Latin alphabet, easy, that's no problem creating that word on my own.'

I was having such a problem with Chinese creating things on my own because the process is way more complicated. So, I didn't recognize that. The hardest part about learning Chinese is the creative process of learning. It's not sound, it's not the meaning, it's creating the character that is the hardest part. Once I recognize that, I said, 'Alright, I need to go buy a whiteboard and I need to write this character out 10 times, like over and over again.' Once I start recognizing this, I had notebooks just filled up with characters. When I write the character like "dou fu," as I write it, sometimes I say the story.

Similarly, after realizing that his weak area was in character recognition due to his relatively weak performance on reading tests, Student 9 from the high-GPA group changed the setting of the self-graded function of his Pleco to focus more on character recognition:

I know beforehand I was not really recognizing the characters. I would switch the setting. Originally it was on characters and audio. That way, If I don't recognize the character, I can access, uh, "li mi" [pronunciation of the characters] and I know that's centimeter in my head. So, then I'll associate the sound, the meaning with the character. That was starting out mostly during the first semester, during the first unit. But, like I said, now, I just mainly ... I just test myself on the characters and I had the pronunciation in my head.

As shown above, the students from the high-GPA group tended to be self-reflective, and they were able to identify the aspects of vocabulary learning that were difficult for them and focus their attention on these aspects. Whereas students with lower GPAs approached their vocabulary learning with much less selective attention, and the focus of their learning was often conditioned by what was tested, as Student 5 from the middle-GPA group explained:

So, you basically, at least for me, focus on what's tangible and what's tested and as much as I hate saying, what you feel is going to be vital. So, for example, writing. A lot of students around the school have mixed ability in writing Chinese characters. Why? because, like or not, our job is not based on writing. Our job is strictly based on the recipient information of hearing and reading. Yeah, things like the radicals, again, are extremely helpful for learning the language? Absolutely, it's just more of a sub thing that I do not acquire the time to take up to learn. By the time I realize 'Oh, wow, this could have really helped me,' we were way too deep in it [in learning the language].

For the students who showed selective attention in the middle-GPA group and the low-GPA group, they did so often due to their teachers' suggestions rather than as a result of self-reflection and self-evaluation of their learning. Student 4 from the middle-GPA group said that his teacher had him read the presentation, highlight the unknown words, and then write out the pinyin, tones, and definition for the characters and words. He commented that the strategy greatly helped his vocabulary learning and his scores improved from 80s to 90s. He attributed his GPA improvement from 3.1 to 3.5 to the use of this specific strategy recommended by the teacher. He also stated that he did not pay much attention to the radicals in the new characters and use the knowledge of radicals to help him learn vocabulary words until his teacher drew his attention to the learning of radicals.

> I went through two unit tests and then um, actually it was xx Laoshi [Teacher xx] asked me what my study techniques were for the characters. I was like, 'I just write them a bunch.' And so she gave me a bunch of radical resources. She e-mailed to me. Yeah, so I use those over the holiday break. .... It's night and day difference. It became a lot easier to remember stroke orders and write characters stuff.

Note-taking was another strategy that distinguished students with higher GPA from students with lower GPAs. All students from the high-GPA and the middle-GPA groups with the exception of one student reported that they kept a notebook, which they used to write down the words or expressions that were interesting or important for them. In contrast, there was no mention of the note-taking practice by the three students from the low-GPA group. The words that the students recorded included both the vocabulary words from class and the vocabulary words from outside class materials such as self-selected online resources. Student 8 from the high-GPA group stated that he had been

trying to expand his vocabulary on a daily basis. He constantly took notes of the

vocabulary from supplementary materials or movies that interested him. He also added

about 50 words every couple of days to the app that he used for learning vocabulary

words. Student 9 from the same group also kept extensive notes of new vocabulary words

and reviewed his notes on a regular basis.

> I have a notebook too that I'll write down like all the stuff that teachers write on the board, probably not all of it either. A, I might already know. B, I might think ... I don't need to know it right now, but whatever I, you know, I may deem necessary or I think is interesting, I'll write it down and then I make sure to review.

> Student 4 from middle-GPA group described how he recoded the extra

vocabulary from the video clips that he watched:

> If I hear a word and they are using a sentence I would normally understand, but they are using a different word or one that I just don't know at all. I would just stop the video, and write it down real quick, and then probably just to figure it out later. I have a little purple notebook that I keep with me and I write the words in this notebook.

> Student 6 from the same group commented that note taking was one of her

favorite learning strategies. She took extensive notes in class and then transferred some

of her notes to Pleco dictionary.

> I don't use this too much anymore and I just write it [words] in my book through first semester and most of the second semester, I had a composition notebook out at my desk all the time. And whenever we came across ... my teacher said a new word ... like, just a simple auxiliary word or, um, an important noun or something, I'll write it down in the notebook to look at it later and I'll put it into my Pleco file later or make a flashcard of it or something. Um, I've learned a lot of extra words like that or if there's something about grammar that was brought up, like it should be pronounced this way not that way, you can use the word in this context not that context, I write that down. And if it's just simple things like that, just writing it down. I'll remember it.

> Even though students from both the middle-GPA and the high-GPA groups

reported taking notes, the students from the high-GPA group kept more extensive notes,

and they took notes in a more consistent and organized manner. More importantly, they

reviewed the notes taken more consistently and frequently than the students from the

middle-GPA group.

Theme 5: Students with higher GPAs were more likely to learn and use vocabulary in

authentic contexts

The degree to which students learn and use vocabulary in authentic contexts

varied among the three GPA groups. The three students from the high-GPA group

(Students 7, 8, and 9) all stated that they learned new vocabulary through reading and

listening to authentic materials, particularly Student 8 and Student 9, who spent

considerable amounts of time reading authentic materials and watching Chinese movies

and TV shows. Student 8, who was at week 15, said that he read articles within his level

at the moment so that he knew that vocabulary, and he used an app called Skritter to learn

characters that were not in the textbook. After about 2 months of learning Chinese,

Student 8 already started to watch TV shows and movies. When asked how he watched

the shows when he did not understand a lot of language, he answered:

> There was no subtitle. So, just threw it there, I think pretty much. I just watched
> it because I like the show and it kind of helped me hear just more of the language
> as well. If I heard something interesting, like I keep hearing the same thing, it's
> like ... and I still don't know what it means, I'll look it up and find out what it
> means. I did this whenever I found something that piques my interest.

Student 9 described in detail how he learned new words through watching movies

and TV shows.

> I don't do it as much now as I should or I would but I watch like Chinese movies
> or shows but it depends on the difficulty, I'll have English subtitles on but I'll, you
> know ... see and listen what they said, like, uh, there is this one show I am
> watching now on YouTube. It's called *Nirvana in Fire* and it's based in ancient
> China. So a lot of it is ... the speed and what they are saying and ... the content
> too, I am not able to understand. So I have the English on but for some stuff like

what the English translation is, I'll look at the subtitles ... uh ... 'cause you know the ... the Chinese characters are on too. So I'll just look at, like, what the translation is and then whatever it says, you know, in the Chinese, and then I'll be like, so if he [the main character] says 'I am very depressed,' I'm like 'oh, depressed, how do you say that?'

Two students from the middle-GPA group also briefly mentioned watching Chinese movies and TV shows as a way of learning the language. The two students, however, did not use the movies and shows to learn new vocabulary words to the same degree of intensity as the students from the high-GPA group did. In fact, they may have used the strategy for different purposes as Student 6 said:

I like watching modern dramas in Chinese. I use these materials just for review. I look for words I know and try to gist as much as I can of it even though there is a lot of other vocab words I don't know. People have like accents, um, that's just reviewing and trying to be accustom to speed and accents. That's most I use it for.

Student 3 was the only student from the low-GPA group who spent time on studying self-selected authentic materials. He stated:

We have different apps and I like to read different news articles. I have Chairman's Bao [online Chinese learning resource], that's a good one. Wall Street Journal, we use that. Every once in a while, I go on to YouTube to look up things. CCTV is great. I do this every night, especially CCTV, typically about half an hour to an hour. That is usually what I try to do before I go to sleep. Just try to relax a little bit, not too worried about like the actual textbook things we learn but try to learn some new things and find a way to relax but still study Chinese.

The examples above indicated that students with higher GPAs were more likely to utilize self-selected authentic materials to provide them input on the authentic use of words. In addition to larger amounts of exposure to authentic materials, students with higher GPAs also tended to use more output strategies that focus on the use of vocabulary words in context. For the high-GPA group, Student 7 practiced using words by teaching his wife Chinese words and sentences. Student 8 practiced using the new words by

translating sentences, and he always took the initiative to do extra in addition to the sentences assigned by his teachers.   Student 9 made sentences to practice using the words learned so that the words would stick. He also paid close attention to how synonyms were used in sentences. For the middle-GPA group, Students 4 and 5 both mentioned practiced using words in speaking activities, and Student 6 mentioned speaking Chinese with his friends. Even though the students from the low-GPA group occasionally mentioned speaking Chinese with their friends, they did not use this strategy nearly as consistently and frequently as the students from the other two groups did.

Theme 6: Students with higher GPAs demonstrated a higher level of self-management

Students with higher GPAs overall demonstrated a higher level of self-management in their learning. All three students from the high-GPA group (Students 7, 8, and 9) appeared to have specific vocabulary learning objectives. They knew clearly what they needed to learn, what materials to use and how to use each material to its maximum effectiveness. They valued the learning of vocabulary words and made great effort to ensure that they had a solid foundation in the Chinese vocabulary words. Student 7 from the high-GPA group stated that he devoted every evening to thorough previewing of the vocabulary words for the next day's lesson. He used various methods including categorizing words, writing characters and saying the character out loud, and using words in sentences to make certain that he had a solid grasp of the shape, sound, and meaning of every word.

Student 8 took the initiative to stay ahead from the very beginning. He arrived at the school a month ahead of time. He finished studying the whole first unit vocabulary list before class even started. At the time of the interview, his class was in unit 4 but he

was already in the middle of studying unit 5 vocabulary words. He was hoping to keep a

unit ahead the whole time because he believed that "if you can get ahead of vocab, it

makes things a lot easier in class." In addition to staying ahead, he kept trying to expand

his vocabulary on a daily basis by adding at least 50 words every couple of days to his

vocabulary learning app. Similarly, Student 9 consistently took notes of the words or

expressions that he did not know and reviewed those words regularly. He often took

notes first by using a notebook and then transferred the words to his Pleco dictionary.

When teachers mentioned a word that he thought he might have recorded in his Pleco

dictionary, he would try to locate this word in his notebook or Pleco dictionary and

review it.

The three students from high-GPA group also were skillful at creating extra-

learning opportunities for themselves. Student 7 frequently practicing using the new

vocabulary words by teaching his wife Chinese and having conversations with his

classmates in Chinese. Students 8 and 9 spent a considerable amount of their study time

on noncurriculum materials such as Chinese movies and shows. While watching movies,

they intentionally added vocabulary learning activities as described by Student 9:

> I really like this show so, uh, on Saturdays and Sundays, besides going to the
> gym, probably it's all that I do. But, uh, so I watch like probably three shows on a
> Saturday or Sunday, and they are like hour-long each, so just whatever words
> might pop up interest me. But it's funny because actually it takes me longer
> because I often pause it ... and look up those words and then pause it again. So
> it's only an hour but it might take me an hour and a half because I keep pausing it
> to check those words and add them.

Unlike the students from the high-GPA group, the majority of the students from

the middle-GPA and low-GPA groups appeared to use less structured and methodological

approaches in their vocabulary learning. Overall, the students from these two groups

were more concerned about what would be tested. Consequently, they tended to focus on the curriculum materials only. Also the pace of learning in the program made it unlikely for students with lower GPAs to spend time working on self-selected materials. As Student 5 from middle-GPA group mentioned that

> it's really hard for me to admit that I don't watch as much Chinese media as I should. I say that knowing that's a drawback but unfortunately, we are so lacking on free time that, say, on a given weekend you finish all the required course work, the first thing that some people think … some great students will think is 'I'm going watch a Chinese movie.' My brain needs to recoup. I, unfortunately, do not watch as much as I should. I'm trying to get on Netflix to find some strictly in Chinese movies to watch and hopefully binge watch but it's really hard sometimes. It's really hard force yourself to keep going when you get that one-hour break.

Research Question 3

Research Question 3: To what extent is there a relationship between students' strategy use and their learning outcomes as measured by their listening and reading proficiency-test scores?

Pearson product-moment correlation coefficients were computed to examine the relationship between students' overall strategy use, as measured by the total strategy use scores, and their learning outcomes, as measured by their listening and reading proficiency test scores. Pearson product-moment correlation coefficients also were computed to examine the relationship between the composites of the four strategy categories and students' proficiency-test scores in listening and in reading (Table 20). As shown in Table 20, no statistically significant relationships were indicated between students' overall strategy use and their learning outcomes and between the four strategy categories and their learning outcomes.

Table 20

Pearson Product-Moment Correlations Between Strategy Use and Proficiency Tests

Strategy Use	Proficiency Tests	
	Listening	Reading
Total Strategy Use	.03	.06
Cognitive Strategy	.10	.12
Memory Strategy	-.15	-.01
Metacognitive Strategy	.10	.12
Social Strategy	.04	-.11

Kendall's tau-b was used to examine the correlation between the frequency of use of individual strategies and students' proficiency-test scores in listening and in reading in order to identify which individual strategies had stronger association with students' proficiency-test scores. The listening and reading scores were divided into five groups based on 20th percentile, 40th percentile, 60th percentile, and 80th percentile, as the strategies were on a scale of 1 to 5. The biggest difference in listening and reading scores is in the 41st-to-60th-percentile groups as all other differences are small. The percentages for listening and reading scores by percentile groups are presented in Table 21.

Table 21

Percentages for Listening and Reading Scores by Percentile Groups

Percentile Group	Listening (%)	Reading (%)
0-20th percentile	22.4	20.9
21st-40th percentile	17.9	14.9
41st-60th percentile	19.4	26.9
61st-80th percentile	23.9	22.4
81st-100th percentile	16.4	14.9

Kendall's tau-b was computed to obtain the associations between individual strategies and students' proficiency-test scores. The individual strategies that were statistically significantly related to either listening or reading scores are provided in Table

22. Cohen's (1988) standard was used to investigate the correlation coefficient to assess

the strength of the relationship. Accordingly, coefficients between .10 and .29 represent

a small association, coefficients between .30 and .49 represent a medium association, and

coefficients of .50 and above represent a large association (Cohen, 1988).

Table 22

Kendall's Tau-b Coefficients Between Individual Strategies and Proficiency Tests

	Proficiency Tests	
Individual Strategies	Listening	Reading
8. Listen to audio and think of the meaning and shape of characters	-.23	
10. Try to visualize the character	-.18	
13. Determine whether the character in a new word has been learned		.22
18. Listen to or sing Chinese songs	.21	
19. Practice the words by watching Chinese movies and TV	.23	.20
20. Listen to conversations by native speakers	.29	.23
22. Pay attention to how a character (or word) is used in context	.30	.20
24. Use imagination to picture the meaning of a character	-.20	
25. Compare characters to see differences and similarities in shape		.19
28. Try to make a story of the character (or word)	-.25	
43. Notice incorrect word usage and use that information to improve	.28	.20
46. Teach others interesting characters (or words)		-.22
48. Ask others to correct one's pronunciation when speaking	.23	
50. Discuss the methods of learning characters (or words)	-.21	

Notes. N = 137. All Kendall's tau-b are statistically significant at .05 level.

As can be seen from the table above, two cognitive strategies (8, 10), two memory

strategies (24, 28), and one social strategy (50) were negatively associated with students'

listening performance. What strategies 8, 10, 24, and 28 had in common was that they all

focus on the learning of individual characters and words without considering language

context. Four cognitive strategies that focus on learning and using words in context (18,

19, 20, 22), one metacognitive strategy (43), and one social strategy (48) were positively

associated with students' listening performance. Both strategies 43 and 48 focus on noticing errors and using that information to improve. Four cognitive strategies (13, 19, 20, 22), one memory strategy (25), and one metacognitive strategy (43) were associated positively with students' reading performance. Strategies 19, 20, and 22 focus on learning and using words in context. Strategies 13 and 25 are both orthographic-knowledge-related strategies. One social strategy (46), teaching others interesting characters or words, is associated negatively with students' reading performance. Except for strategy 22, which indicates a medium association between the strategy use and listening proficiency, all strategies listed indicate a small association between the strategy use and listening or reading performance.

Summary

Quantitative and qualitative findings were presented in this chapter regarding the three research questions addressed by the current research. The results are summarized as follows.

Descriptive analyses of the data of 137 students learning Chinese as a foreign language in an intensive program showed that 20 strategies were used most frequently by the students in learning Chinese vocabulary words. Each of these 20 strategies had a mean above 3.5 with 65% or above participants choosing either 4 or 5 for it. Among the 20 strategies, the majority of the strategies were orthographic-knowledge-based cognitive strategies and metacognitive strategies. Only two memory strategies were in the top 20 strategies, and the rest of the memory strategies had a mean less than 3.5.

A chi-square test was performed using the data of 137 individuals and the result was found to be not statistically significant ($\chi^2 = 9.33$, $df = 4$). The result was most

likely due to the small number of students with GPAs less than 3.0 among the 67 students

(n =8) from weeks 46, 56, and 60. Therefore, the second chi-square test was added

excluding the data of the 67 students, and the result was found to be statistically

significant (χ^2 = 10.42, df = 4, Cramer's V = .27), indicating students with different GPAs

(high, middle, and low) vary in their strategy use in learning Chinese vocabulary words.

The results of the analysis of the qualitative data showed that students with higher

GPAs used a wider variety of strategies. The strategies that they perceived to be useful

were mostly cognitive or metacognitive, whereas the strategies perceived to be useful by

students with lower GPAs were mostly memory strategies. Certain patterns of strategy

use distinguished students with higher GPAs from students with lower GAPs. Students

with higher GPAs tended to use the following strategies consistently and systematically:

determining the known radical and character when learning new characters or words,

selective attention, note taking, and learning and using vocabulary words in authentic

context. Students with higher GPAs also showed better self-management ability in

vocabulary learning. They were able to set clear objectives for vocabulary learning,

approach vocabulary learning in a more systematic and methodological manner, use

strategies appropriately for specific tasks, and adjust strategies based on self-reflection

and self-evaluation of learning.

Pearson product-moment correlations were calculated to investigate the

relationship between the frequency of use of total strategies, the four strategy categories

(cognitive, memory, metacognitive, and social), and students' listening and reading

performance as measured by the proficiency test, PROFIPT. The results of the statistical

analyses were not statistically significant. Kendall's tau-b was computed to examine the

relationship between the use of individual strategy and students' listening and reading performance.

Four strategies that focus on learning characters (words) out of context (two cognitive and two memory) had a statistically significant negative association with students' listening performance. The social strategy of discussing the methods of learning characters (words) with others also had a statistically significant negative association with students' listening performance. Four cognitive strategies that focus on learning and using words in authentic context and two strategies that focus on noticing one's errors (one metacognitive and one social) were statistically significantly and positively associated with students' listening performance. Six strategies had a statistically significant association with students' reading performance, including three cognitive strategies focusing on learning and using of words in authentic context, two orthographic-knowledge-based strategies (one cognitive and one memory), and one metacognitive strategy of noticing one's errors. One social strategy, teaching other interesting characters (words), was statistically significantly and negatively associated with students' reading performance

CHAPTER V

SUMMARY, LIMITATIONS, DISCUSSION, CONCLUSIONS, IMPLICATIONS,

AND RECOMMENDATIONS

The purpose of this study was to investigate the strategy use of Chinese-as-a-foreign-language (CFL) students in learning Chinese vocabulary words and its relationship to students' learning outcomes. The strategy use of the CFL students and its relationship to their learning outcomes were examined using a mixed-methods study. This chapter contains a summary of the study, its findings, its limitations, a discussion of findings, conclusions, implications for educational practice, and recommendations for future research.

Summary of Study

Vocabulary plays an important role in foreign-language learning. Studies on the relationship between vocabulary and learners' second-language proficiency have provided empirical evidence that statistically significant positive correlations exist between students' vocabulary knowledge and their reading comprehension (Qian, 1999, 2002), listening comprehension (Stæhr, 2009; Teng, 2016), and the quality of their written work (Daller & Phelan, 2017). A large vocabulary is a necessary condition for a learner to become proficient in the language that he or she is learning. Mastering a large number of lexical items, however, remains a challenge for language learners in general. It is especially so for English-speaking students who study Chinese as a foreign language.

The linguistic complexity of Chinese characters, such as the lack of sound-to-script correspondence, the large number of characters with the same pronunciation but different graphic representations, and the irregularity of strokes, poses a great challenge

for English speakers learning Chinese (Shen, 2005). The challenge of learning Chinese words by English speakers is well reflected in the study by Shen (2009), which showed that after the completion of 3rd-year Chinese classes in college, the students' average number of known words from the 8,500-word corpus was 2,229. The slow progress in vocabulary building became a hindrance for students to develop their other language skills (Shen, 2009). To help students learning Chinese as a foreign language (CFL) to expand their vocabulary repertoire, seeking and identifying effective vocabulary-learning strategies to inform vocabulary learning and instruction in a Chinese language class are important, as research has shown that a positive link exists between language-strategy use and language achievement (e.g., Bruen, 2001; Lai, 2009; Park, 1997), and that the use of vocabulary-learning strategies is associated with successful learning (Ahmed, 1989; Barcroft, 2009; Fan, 2003; Gu, 2010; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Lai, 2016; Lawson & Hogben, 1996; Sanaoui, 1995; Teng, 2015).

The majority of the studies on vocabulary-learning strategies has been conducted in the area of teaching English as a second language (ESL) or teaching English as a foreign language (EFL). Compared with the research in the vocabulary-learning strategies of ESL or EFL learners, there has been a much smaller number of studies (e.g., Ke, 1998; Shen, 2005; Shen & Ke, 2007; Sung, 2014; Wang, 1998) conducted on the vocabulary-learning strategies of CFL learners. Among the studies on Chinese vocabulary-learning strategies, the majority of them focused on Chinese character encoding strategies (e.g., Ke, 1998; Shen & Ke, 2007), some identified the character-learning strategies commonly used by CFL students (e.g., Shen, 2005; Sung, 2014), and a few investigated the relationship between character-learning strategies and students'

learning outcome as measured by a vocabulary test (e.g., Sung, 2014). The major findings of these studies include that orthographic-knowledge-based cognitive strategies (e.g., applying radical knowledge when learning new characters) are used commonly by students in learning Chinese vocabulary words (Grenfell & Harris, 2015; Ke, 1998; Shen, 2005; Zahradníková, 2016), that using orthographic-knowledge-based strategies effectively can facilitate students' vocabulary learning (Ke, 1998; Shen, 2004; Shen & Ke, 2007; Sung, 2012, 2014; Taft &Chung 1999; Xu, Chung, & Perfetti, 2014), that input and output strategies that create opportunities to learn and use vocabulary in context are perceived to be helpful by learners (Wang & Leland 2011; Winke & Abbuhl, 2007), that phonological strategies (e.g., saying a character while writing it) increase students' level of phonological comprehension of the words heard (Sung, 2014), but they are underused by learners (Hayes, 1988; Ke, 1996; Zahradníková, 2016), and that metacognitive strategies related to systematic reviewing and previewing of vocabulary words play an important role in vocabulary learning (Shen, 2005).

The endeavor of these studies provided useful information on Chinese vocabulary-learning strategies; however, it remains unclear whether there is a relationship between students' vocabulary-learning-strategy use and their learning outcomes as measured by tests other than vocabulary tests, and whether more successful and less successful students use strategies differently. In addition, the studies mentioned previously were conducted in nonintensive-language-learning environments, and there was little information available on how CFL students use vocabulary-learning strategies in an intensive-language-learning setting. Given the importance of vocabulary knowledge in CFL students' language-proficiency development and the need to

understand the role that vocabulary-learning strategies play in CFL students' learning outcomes, further studies on Chinese vocabulary-learning strategies, specifically CFL students' vocabulary-strategy use in an intensive-language-training setting and its relationship to students' learning outcomes, were merited.

To this end, the current study was conducted to answer the following research questions:

1. What learning strategies are commonly used by Chinese-as-a-foreign-language students in learning Chinese vocabulary words?

2. To what extent do learners of different grade-point-averages (GPAs; high, middle, and low) vary in their strategy use?

3. To what extent is there a relationship between students' strategy use and their learning outcomes as measured by their listening and reading proficiency-test scores?

The above research questions were examined using a mixed-methods design with a descriptive quantitative component and an interview qualitative component. Students' strategy use was measured by a 50-item questionnaire. Both demographic information and the information on students' strategy use were collected through the administration of the *Chinese Vocabulary Learning Strategy Questionnaire* (CVLSQ; Appendix A). Students' learning outcomes were measured by their end-of-semester II Proficiency Progress Test (PROFIPT). PROFIPT includes a listening test and a reading test, each of which has 60 multiple-choice items. Indepth interviews were conducted with nine participants to gain a better understanding of whether students with different GPAs (high, middle, and low) vary in their strategy use and what patterns of strategy use distinguish students with higher GPAs from students with lower GPAs.

A total of 137 students, 105 male students and 32 female students ranging from 19 to 35 years of age, participated in this study ($N = 137$). At the time when the data were collected, all the participants were enrolled in the Chinese Basic Course, and the participants comprised the students from the beginning (Semester I) to the advanced levels (Semester III). For research question 1, descriptive data were analyzed to identify the strategies commonly used by the students. For research question 2, students were divided into three groups (high, middle, and low) based on their GPAs, and chi-square tests were conducted to examine whether students with different GPAs vary in their strategy use. For the qualitative data collected through the interviews, open-coding techniques (Creswell, 2014) were used to analyze the data to develop codes and themes.

For research question 3, only the data of 67 students from weeks 46, 56, and 60 were included in the statistical analyses, as the rest of the participants had not completed PROFIPT at the time of data collection. Pearson product-moment correlation analysis was used to examine (a) the correlation between the total scores of strategies and students' proficiency-test scores in listening and in reading and (b) the correlation between the composites of the four strategy categories and students' proficiency-test scores in listening and in reading. Finally, Kendall's tau-b was used to examine the correlation between each individual strategy and students' proficiency-test scores in listening and in reading in order to identify which individual strategies had stronger association with students' proficiency-test scores.

Summary of Findings

The findings of the study include both quantitative and qualitative results. Research questions 1 and 3 were addressed by quantitative findings and research question 2 by both quantitative and qualitative findings.

For research question 1, the descriptive statistics showed that the means of the 50 strategy items from the *Chinese Vocabulary Learning Strategy Questionnaire* (CVLSQ) ranged from 2.51 to 4.74 and the standard deviations ranged from 0.23 to 1.36. The 50 strategy items were classified into three groups based on their frequency of use. Group 1 comprised 20 strategies that had a mean equal to or above 3.5 with 65% or more participants choosing either 4 or 5 for this strategy, and these strategies were considered to be the most-commonly-used strategies by the students in this study.

Of the 20 most-commonly-used strategies, 11 were cognitive strategies, most of which were orthographic-knowledge-based strategies such as recognizing known radicals when learning new characters (words) and trying to visualize the character in one's head. The 20 most-commonly-used strategies also included five metacognitive strategies, which focus on the planning and monitoring of one's vocabulary learning such as previewing the new words before class and noticing incorrect word usage and using that information to improve. Two social strategies, asking others how they use a word in different sentences and practicing using the words through interaction with others, were also in the top 20 strategies. Only two memory strategies were commonly used by the students, that is, paying attention to known characters when memorizing a word and quizzing oneself during memorization of characters (words).

A chi-square test was performed using the data of 137 individuals for research question 2, and the result was found to be not statistically significant ($\chi^2 = 9.33$, $df = 4$). The result occurred most likely due to the small number of students with GPAs less than 3.0 among the 67 students ($n = 8$) from weeks 46, 56, and 60. Therefore, the second chi-square test was added excluding the data of the 67 students, and the result was found to be statistically significant ($\chi^2 = 10.42$, $df = 4$, Cramer's V = .27), indicating students with different GPAs (high, middle, and low) vary in their strategy use in learning Chinese vocabulary words.

Six themes emerged from the qualitative analysis of the interview data. The first theme was that students with higher GPAs used a wider variety of strategies. Specifically, the strategies mentioned by the low-GPA group also were mentioned by the high-GPA and the middle-GPA groups, but some strategies were specific to the high-GPA group and the middle-GPA group in that fewer students or no students from the low-GPA group mentioned these strategies. These strategies were determining whether the radicals in a character or the characters in a new word have been learned before, adjusting a particular strategy to focus on one's weak areas based on self-evaluation of one's study, note taking, and learning new words through watching Chinese movies and shows.

The second theme concerned the perceived usefulness of strategies by students with different GPAs. The strategies that the high-GPA group perceived to be useful were mostly cognitive or metacognitive, whereas the strategies perceived to be useful by students with lower GPAs were mostly memory strategies. The middle-GPA group showed features of the preferences of both the high-GPA and the low-GPA groups. The third theme revealed that students from the high-GPA group used orthographic-

knowledge-based strategies frequently and consistently, whereas students from the low-GPA group demonstrated little use of these strategies, and they preferred to use memory strategies when learning new vocabulary words. Students from the middle-GPA group reported using orthographic-knowledge-based strategies, but their use of the strategies was less consistent and frequent than the high-GPA group.

The fourth theme was that selective attention and note taking differentiated students with higher GPAs from students with lower GPAs. Students from the high-GPA group tended to pay special attention to certain aspects of vocabulary learning (e.g., the tone) based on their self-evaluation of learning, take notes on the words that they deemed to be important, and review the words regularly. Students from the low-GPA group did not mention note-taking practices, and they paid special attention to certain aspects of vocabulary learning often as a result of teachers' suggestions. Students from the middle-GPA group all reported taking notes for vocabulary learning. Their note-taking practices, however, did not appear to be as consistent and organized as the high-GPA group's. In addition, their selective attention also tended to occur as a result of teachers' suggestions.

The fifth theme revealed that students from the high-GPA and the middle-GPA groups, especially the high-GPA group, spent more time on learning from authentic materials (e.g., Chinese movies and TV shows) not related directly to the curriculum materials, and they also intentionally used new words in context, whereas students from the low-GPA group rarely intentionally used new words in context or did so in a much less consistent manner. The sixth theme illustrated that students with higher GPAs tended to have better self-management skills in their vocabulary learning. They had clear objectives of vocabulary learning, knew what strategies to use for better effects, and were

able to adjust their strategy use based on the self-evaluation of their learning, whereas such traits were lacking for students with lower GPAs.

Pearson product-moment correlations were calculated to investigate the relationship between the overall use of strategies, the four strategy categories (cognitive, memory, metacognitive, and social) and students' listening and reading performance as measured by the proficiency test, PROFIPT, for the third research question. The results of the statistical analyses were not statistically significant. Kendall's tau-b was computed to examine the relationship between the use of individual strategy and students' listening and reading proficiency-test scores.

Five strategies were found to have a negative and statistically significant association with students' listening proficiency-test scores. These five strategies included the social strategy of discussing the methods of learning characters or words, two cognitive strategies, and two memory strategies. The two cognitive strategies were listening to audio and thinking of the meaning and shape of characters and trying to visualize the character. The two memory strategies were using imagination to picture the meaning of a character and trying to make a story of the character or word. The two cognitive and two memory strategies shared the commonality of learning characters (words) out of context. Further, based on the analysis of the qualitative data, the two memory strategies mentioned above also were the strategies that students with lower GPA preferred to use.

Four cognitive strategies that focus on learning and using words in authentic context were found to have a positive and statistically significant association with students' listening proficiency-test scores. These four cognitive strategies were listening

to or singing Chinese songs, practicing the words by watching Chinese movies and TV, paying attention to how a character (word) is used in context, and listening to conversations by native speakers. Two strategies concerning noticing one's errors also were found to have a positive and statistically significant association with students' listening proficiency-test scores. These two strategies were noticing incorrect word usage and using that information to improve and asking others to correct one's pronunciation when speaking. The strategies involving learning and using words in authentic context also were found to be the ones that differentiated students with higher GPAs from students with lower GPAs in the qualitative findings. Students with higher GPAs tended to use these strategies more frequently and more consistently.

Six strategies had positive and statistically significant associations with students' reading proficiency-test scores. Among the six strategies, three were cognitive strategies that focus on learning and using of words in authentic context, including practicing the words by watching Chinese movies and TV, listening to conversations by native speakers, and paying attention to how a character (word) is used in context. The other two strategies were orthographic-knowledge-based strategies, including the cognitive strategy of determining whether the character in a new word has been learned and the memory strategy of comparing characters to see differences and similarities in shape. The metacognitive strategy, noticing incorrect word usage and using that information to improve, also was associated positively with students' reading-proficiency test scores. One social strategy, teaching others interesting characters (words), was found to have a negative and statistically significant association with students' reading-proficiency test scores. Again, the qualitative findings also revealed that students with higher GPAs

showed a stronger trend of using the cognitive strategy of determining whether the character in a new word has been learned.

Limitations

There are several limitations that need to be addressed with regard to the internal and the external validity of the study.

First, this study used a self-reported questionnaire to collect data on students' vocabulary-learning-strategy use. One drawback of such a data-collection method is that what students report on the questionnaires might reflect what they believe they do but not necessarily what they actually do when learning. In addition, the questionnaire does not reveal exactly how students use the strategies. For example, for two students who both select "5" regarding the use of a particular strategy, the information revealed with the selection of "5" is that they always or almost always use this strategy. It remains unclear, however, whether these two students use the strategy to the same level of frequency and whether they use the strategy in a similar manner. Even though the inclusion of interview in the study, to certain degree, compensates for the drawback of using the questionnaire only, the sample size for the interview is small. A larger sample size for interviews with an addition of class observations and learning logs would better reveal students' strategy behaviors.

Second, the categorization of the strategies in this study drew on the classification systems proposed in the prior research (e.g., Oxford, 1990; Schmitt, 1997) without statistically testing whether the strategies in the same categories measure the same underlying dimension of strategy use. It is possible that a particular strategy can fit into more than one category, and the imprecision in categorization, in this case, is not desirable. Ideally, a factor analysis should be conducted to identify the underlying

factors so that the strategies measuring the same underlying dimension can be grouped together as a category. Factor analysis requires a large sample; however, it was not possible to obtain a large sample for this study, and the relatively small sample size of this study has rendered it meaningless to conduct a factor analysis.

Third, caution should be taken when interpreting the results of this study. This study is correlational in nature, and correlation does not imply causation. Any causal interpretation of the findings of the study is deemed inappropriate. In addition, this study was conducted in an intensive-language-training setting, where students are all military personnel and where the majority of the students are male. The findings, undoubtedly, will provide useful information to Chinese instructors in general in understanding CFL learners' strategy use in learning Chinese vocabulary words; however, the results of the study may not be generalizable to the Chinese programs in US colleges or universities, where students learn Chinese at a much slower pace, or the Chinese programs in China, where students have many more opportunities to experience authentic language materials and interact with native speakers.

Discussion of Findings

In order to answer the first research question, "What learning strategies are commonly used by Chinese-as-a-foreign-language students in learning Chinese vocabulary words?", the descriptive data were analyzed at the item level to identify the strategies commonly used by students in learning Chinese vocabulary words. Twenty out of 50 strategies listed in the *Chinese Vocabulary Learning Strategy Questionnaire* (CVLSQ) were identified to be the strategies most-commonly used by the students in this

study with each strategy having a mean equal to or above 3.5 with 65% or above participants choosing either 4 or 5 for this strategy.

Among the 20 strategies, 11 are cognitive strategies, of which 8 strategies are related to the use of orthographic knowledge, including determining whether the character in a new word has been learned, recognizing known radicals when learning new characters (words), and using flashcards to study the sound, shape, and meaning of characters, and so on. This finding suggests that students in this study rely heavily on orthographic-knowledge-based strategies in learning Chinese vocabulary words, which is consistent with the findings of several previous studies (Grenfell & Harris, 2015; Ke, 1998; Shen, 2005; Sung, 2014; Zahradníková, 2016). Grenfell and Harris (2015), for example, investigated the strategies that adolescent learners of Chinese as a foreign language used to learn characters. They found that among the 34 strategies commonly used by the participants in their study, 20 were considered to be Chinese specific and the majority of these 20 strategies concerned radical knowledge.

The orthographic-knowledge-based strategies commonly used by the students of this study focus mostly on the graphic knowledge of characters and words. Many phonological strategies are less commonly used, and these strategies include asking others to correct one's pronunciation when speaking; associating the sound of the character with its meaning; listening to conversations by native speakers; saying the character and visualizing it; reading characters out loud and associating sound, meaning, and shape; memorizing the sound first and then the meaning and shape; and listening to or singing Chinese songs. This finding is not surprising, as two studies (Gamage, 2003; Hayes, 1998) suggested that when processing characters, alphabetical background

learners tend to pay much more attention to the visual characteristics of the characters, neglecting the phonological strategies that could be useful for them. Similar conclusions were reached by Zahradníková (2016) and Ke (1998).

The finding of Zahradníková (2016) suggested that the students in his study used phonological strategies to a limited extent. Ke (1998), after surveying 223 first-year CFL students, concluded that the role of sound did not appear to be valuable for the participants, as the overwhelmingly majority of the participants believed that writing characters while paying attention to meaning was more effective than writing characters while paying attention to the sound. They also believed that associating new characters with known characters in terms of graphic feature was more useful than in terms of sounds. Considering that at least 50% of the participants in the current study are either beginning or low-intermediate students learning Chinese in an intensive-language program, where they have to learn on average 20 to 30 new words on a daily basis, possibly, dealing with the graphic features of a large amount of Chinese characters in the initial state of learning is so overwhelming that many of them have limited cognitive resources available for attending to the phonological features of the characters (Ke, 1998).

Students in this study did not take full advantage of some input-based strategies and output-based strategies that create meaningful and authentic context for learning Chinese vocabulary words. The following input-based and output-based strategies all rank relatively low among less-commonly-used strategies: (a) practicing the words by watching Chinese movies and TV, (b) listening to or singing Chinese songs, (c) trying to use new words in e-mail or journal writing, and (d) practicing the words by reading

newspaper or online materials, (d) making sentences with new words and writing out the sentences. Each of these strategies has a mean less than 3.5 with less than 50% of the participants choosing 4 or 5 for the strategy.

Previous studies had similar findings, Wang and Leland (2011), for example, investigated what strategies beginning learners of Chinese perceived as helpful in learning Chinese characters. They found that even though the input and output strategies of creating authentic context were perceived to be useful, they were not necessarily the strategies most frequently used by the students. Sung (2014) also found that the students in her study made little use of input and output strategies such as watching TV and using the new words in the conversation. In the current study, all the students had easy access to Chinese movies, TV shows, and Chinese songs with school-issued computers and iPads. They also had opportunities to go to evening study hall to practice speaking Chinese. They tended, however, to place less value on these activities possibly because many vocabulary words learned through these practices were not related directly to the unit tests and thus were not of high priority for them to learn.

Another important finding, which has not been addressed in the prior research on Chinese-vocabulary-learning strategies, is that students' learning context may have great influence on their strategy choice. For example, compared with the findings of Sung (2014), whose study was conducted in a nonintensive learning environment, students in this study tend to use more metacognitive strategies. Among the top 20 strategies commonly used by students, there was one metacognitive strategy in Sung's study (2014), whereas there are five metacognitive strategies in the current study. Due to the intensive nature of the program, students in this study may need more metacognitive

strategies to plan, monitor, and regulate their learning in order to keep up with the pace of learning. In addition, in this study, the wide availability of Chinese vocabulary learning apps such as Pleco and Skritter also makes the strategy of using vocabulary learning apps to improve vocabulary learning the most popular choice for the students. Before the students officially start their Chinese learning in the program, they are provided trainings on how to use vocabulary learning apps, and they can download the apps onto their school-issued computers and iPads or their cell phones for free.

Another strategy choice that reflects the influence of learning context is writing characters. Handwriting Chinese characters commonly is believed to help students better retain the vocabulary words learned. The study of Guan et al. (2011) has provided empirical evidence that handwriting Chinese characters strengthens orthographic representations and thus supports word-specific recognition process. Strategies involving handwriting Chinese characters, however, were not used commonly by the students in the current study. In Sung's study (2014), for example, the strategy of making sentences and writing out sentences was listed as one of the 20 most-commonly used strategies ($M =$ 3.52, $SD = .99$), whereas in the current study, this strategy is least commonly used by the students with a mean of 2.74, and only 30.7% of the participants responded 4 or 5 for this strategy. In the program where the current study was conducted, students are tested for listening, reading, and speaking but not writing during their final proficiency tests. The washback effect, in this case, may have led to students placing little value on handwriting Chinese characters.

In order to investigate whether differences in strategy use exist between students with different GPAs (high, middle, and low), a chi-square test was performed using the

data of 137 individuals and the result was found to be not statistically significant (χ^2 = 9.33, df = 4). The result was most likely due to the small number of students with GPAs less than 3.0 among the 67 students (n =8) from weeks 46, 56, and 60. By week 46, as previously mentioned, students with low GPAs either have improved or have been dropped from the program, so the small number of students with GPAs less than 3.0 (n =8) may have restricted the variance and hence affected the magnitude of coefficient, resulting in a nonstatistically significant finding. The result of second chi-square test, which excluded the data of the 67 students, was found to be statistically significant (χ^2 =10.42, df = 4, Cramer's V = .27), indicating students with different GPAs (high, middle, and low) vary in their strategy use in learning Chinese vocabulary words. The findings from the qualitative interviews also support the result of the second chi-square test, showing that certain strategy-use behaviors differentiate students with higher GPAs and lower GPAs.

One of the important qualitative findings regarding the second research question is that students with higher GPAs not only use more vocabulary-learning strategies on average but also used them more consistently and purposefully. This finding is consistent with many previous studies on language-learning strategies (e.g., Bruen, 2001; Lai, 2009; Philips, 1991) or studies on vocabulary-learning strategies (e.g., Ahmed, 1989; Lawson & Hogben, 1996). In addition, the current study found that the majority of the strategies perceived to be useful by the high-GPA group are cognitive strategies that emphasize learning and using of vocabulary words in authentic context, whereas the majority of strategies perceived to be useful by the low-GPA group are repetition strategies and association strategies. This finding is in accordance with the findings of Fan (2003), who

investigated the frequency of use, perceived usefulness, and actual usefulness of second-language vocabulary strategies. The study found that the high-scoring group in the vocabulary test planned their vocabulary learning and encountered new words both inside and outside class more often than the intermediate- and low-scoring groups. Students who were less proficient in second-language vocabulary depended much more on repetition strategies and association strategies in their learning than the more proficient students.

As Ahmed (1989) concluded, "good learners not only use more strategies, but they rely more heavily on different strategies than the poor learners use" (p. 9); in this study, several strategies were found to be unique for the high- and middle-GPA groups and the consistent use of these strategies differentiated students with higher GPAs from student with lower GPAs. This finding also is consistent with that of Ehrman and Oxford (1995), who reported that less-successful learners randomly use various strategies, whereas more-successful learners systematically use specific strategies for specific tasks.

The first strategy that higher-GPA students in this study consistently use is determining whether the radicals in a new character or the characters in a new word have been learned before. The effectiveness of this particular strategy can be understood from the perspective of Ausubel's theory (1968), which stated that meaningful learning occurs when the new information is integrated into the existing cognitive structure. By looking for the known radicals or known characters, students can connect effectively the new characters and new words with these known radicals and characters to make meaningful learning occur. From the perspective of cognitive-load theory, recognizing the known radicals in a new character or the known characters in a new compound word enables a

student to process the known radical or characters as chunks rather than as separate information elements, thus greatly reducing the intrinsic load in learning new characters and new words (Lee & Kalyuga, 2011).

Other salient differences between students with higher GPA and students with lower GPA in this study include that students with higher GPA use the metacognitive strategies of selective attention and reviewing notes consistently, and they demonstrate a high-level of self-management skills in vocabulary learning. The use of similar metacognitive strategies has been found to be associated with more successful vocabulary learning in many previous studies (e.g., Fan, 2003; Gan et al., 2004; Gu & Johnson, 1996; Kojic-Sabo & Lightbown,1999; Sanaoui, 1992; Teng, 2015). Sanaoui (1992), for example, found that learners with a structured approach were more successful in retaining the new vocabulary items than the learners who had an unstructured approach. The major features of a structured approach included keeping extensive records of the vocabulary items that one is learning and reviewing those records occasionally or often and engaging in more self-initiated learning activities. Gu and Johson's study (1996) indicated that self-initiation and selective attention, two metacognitive strategies, are associated with higher proficiency-test scores. Teng's study (2015) suggested that the use of indirect strategies (e.g., self-planning, self-monitoring, and self-evaluating) has a higher level of relationship with breadth and depth of vocabulary. Gan et al. (2004) found that the successful students in their study were able to set particular objectives for themselves, such as expansion of vocabulary, and that they knew clearly what learning materials that they should use and how the learning activities should be carried out.

Another pattern of strategy use that differentiates students with higher GPA from students with lower GPA in this study is the extent of conscious learning and using vocabulary words in authentic context. Ahmed (1989) concluded that the common characteristics of good learners included that they were aware of what they could learn about new words and that they made conscious efforts to use context to facilitate their learning. Sanaoui (1992) found that students who were more successful in their vocabulary learning also devoted more time and effort to practicing vocabulary items outside their language course. Fan (2003) reached the conclusion that the high-scoring group in the vocabulary test encountered new words both inside and outside class statistically significantly more often than the intermediate- and low-scoring group.

Similarly, students with higher GPAs in the current study were more likely to spend time on authentic materials (e.g., Chinese movies and TV shows) not necessarily related to the course materials. They wrote down the vocabulary words that interested them while learning these materials and connected the vocabulary learned from these materials with the textbook materials. They also made conscious efforts to use new words in context such as making sentences and speaking Chinese with their classmates. As described in Bialystok's (1978) second-language-learning model, these high-GPA students effectively manipulate the input and output information to connect their various knowledge sources (general knowledge of world, explicit knowledge of the target language, and implicit linguistic knowledge). They pay extra attention to how the Chinese words are used in authentic context, and more importantly, they make conscious effort to use the words in context to transfer their explicit knowledge of the words to implicit knowledge thus automatizing the information through using it.

In response to the third research question, Pearson product-moment correlation analyses were conducted to examine the correlation between the total scores of strategies and students' proficiency-test scores in listening and in reading and the correlation between the composites of the four strategy categories and students' proficiency-test scores in listening and in reading. The results of the analyses were not statistically significant. There are two possible explanations for this finding. First, the 67 students whose data were used for the analyses are in the later stage of their learning in the program (weeks 46, 56, and 60). Among this group of students, only 8 students have low GPAs, which is less than 3.0. Students' listening and reading scores in the proficiency test, a multiple-choice-formatted test, do not vary very much from one individual to another. The homogeneity of the group, in this case, may have led to the decrease of variance and thus affected the correlation coefficients between students' strategy use and their learning outcomes as measured by their listening and reading test scores.

Another possible reason is that this group of students are high-strategy users in general. Various vocabulary-learning strategies are introduced to the students when they first come into the program as part of the school requirements. The instructors in the program also are familiar with the Chinese vocabulary-learning strategies through participation in training or workshops on language-learning strategies. It is possible that many instructors explicitly or implicitly teach the strategies related to learning Chinese vocabulary words. In addition, a curvilinear pattern has been found commonly by L2 strategy researchers, that is, advanced learners use fewer strategies than intermediate learners and advanced learners use a subset of their former strategies (Green & Oxford, 1995; Oxford, 2011; Philips, 1991). The 67 students are either high-intermediate or

advanced students; therefore, they may not differ greatly in their strategy use, and this lack of difference may have led to the nonstatistically significant finding.

Even though no statistically significant correlations were found between students' overall strategy use, their use of the four strategy categories (cognitive, memory, metacognitive, and social), and their listening and reading proficiency-test scores, Kendall's tau-b analyses revealed that some individual strategies are associated with higher listening or reading proficiency-tests scores. The same strategies are identified to be used consistently and systematically by students with higher GPAs in research question 2. According to Kendall's tau-b results, four cognitive strategies that focus on learning and using words in authentic context (e.g., watching movies and paying attention to how a character or word is used in context) are found to have a positive and statistical significant association with students' listening performance. It is speculated that the use of these strategies helps improve students' listening proficiency through improving their depth of vocabulary knowledge. Unfortunately, three out of the four cognitive strategies discussed above were all in the group of less-commonly used strategies, indicating that effective strategies are not necessarily used commonly.

Breadth and depth of vocabulary knowledge are considered to be two distinct dimensions of vocabulary knowledge (Qian, 2002). Depth of vocabulary knowledge has been found to contribute more to students' language outcomes than breadth of vocabulary knowledge (Qian, 1999; Teng, 2016). Teng (2016), for example, found that in the multiple regression analysis model, depth of vocabulary knowledge added to the breadth of vocabulary knowledge explained an additional 28% of the variance in the listening-comprehension success, whereas breadth of vocabulary knowledge added to depth of

vocabulary knowledge contributed only an additional 9% of the variance in listening-comprehension success.

Depth of vocabulary knowledge encompasses knowledge of various aspects of vocabulary words such as the pronunciation and the morphological and syntactic properties of words. Many aspects of deep knowledge of vocabulary have to be acquired through learning words in larger contexts such as sentences and paragraphs. The four strategies, watching movies, listening to native speakers of Chinese, listening to Chinese songs, and paying attention to how characters or words are used in context, situate the learning of Chinese vocabulary words in authentic communicative situations, providing students great opportunities to develop depth of vocabulary knowledge and thus contributing to their higher listening proficiency.

Two strategies concerning noticing one's errors also show a positive and statistical significant association with students' listening performance. These two strategies are the metacognitive strategy of noticing incorrect word usage and using that information to improve and the social strategy of asking others to correct one's pronunciation when speaking. The metacognitive strategy of noticing incorrect word usage and using that information to improve also has a positive and statistically significant association with students' reading scores. This finding suggests that only when a learner notices the incorrect pronunciation or usage of a word can he or she allocate more attention to the nonmastered areas to acquire fully the various aspects of deep knowledge regarding the word. This finding also supports Oxford's (1990) language-learning theory, which states that indirect strategies do not involve directly the language being learned but nevertheless are helpful for learning the language.

It is worth noticing that four strategies, listening to audio and thinking of the meaning and shape of characters, trying to visualize the character, using imagination to picture the meaning of a character, and trying to make a story of the character or word, have a negative and statistical significant association with students' listening scores. A careful review of these four strategies shows what they all involve learning characters (words) in isolation with memorization techniques. This finding is congruent with the finding of Gu and Johnson (1996), who found that the correlations of mnemonic strategies (e.g., imagery and visual associations) with general English proficiency mostly were insignificant or even negative. As Gu (2005) argued, the knowledge of syntagmatic relations of words is critical in the development of a foreign lexicon, it is unlikely, however, that learners can acquire such knowledge solely relying on memory strategies that involve learning words in isolation. Furthermore, many researchers in the field of second-language acquisition (e.g., Lawson & Hogben,1996; Schmitt, 2000) believe that at lower proficiency levels, use of memorization techniques by learners helps them achieve better results. More advanced learners, however, will benefit more from the context found in more cognitively-demanding tasks.

A finding regarding research question 3 is that the two strategies involving audio input, practicing the words by watching Chinese movies and TV and by listening to conversations of native speakers, are found to have a positive and statistically significant association not only with students' listening scores but also with their reading scores. This finding can be explained by the ''identification-with-phonology'' hypothesis proposed by Perfetti and Zhang (1995a, 1995b). According to this hypothesis, during the processing of Chinese characters, phonological information is activated at the same

moment that a character's morphographic information is identified (Shen, 2005). This hypothesis was supported in a series of empirical experiments that investigated the role of phonological knowledge in the recognition of both single- and two-character words (Everson, 1998; Perfetti & Tan, 1998; Perfetti & Zhang, 1995a, 1995b; Tan & Perfetti, 1997). Not coincidentally, phonological strategies have been found to be an essential component in the process of character encoding for learners with character background or native speakers of Chinese (Gamage, 2003; Hayes, 1988). Therefore, it is likely that listening to words in context helps reinforce students' phonological knowledge of words and that this phonological knowledge is activated to facilitate their character recognition when encountering the same words in reading. Furthermore, learning vocabulary words in authentic context effectively helps students develop their depth knowledge of vocabulary, which is equally important for their reading skills as it is for their listening skills.

Another important finding regarding research question 3 is that two orthographic-knowledge-based strategies (determining whether the character in a new word has been learned and comparing characters to see differences and similarities in shape) have positive and statistically significant associations with students' reading scores. This finding is consistent with that of Ke (1998), who sought the relationship between students' strategy use and their performance in character recognition and production. Ke's study (1998) found that strategies associated with learning characters in the context of vocabulary items and with relating new characters to known characters in terms of graphic structure are the two strategies with the largest statistically significant effect on

character recognition after controlling for site, explaining 6.65% of the variation of the scores of Chinese character recognition.

The reason that the above two strategies are associated with higher performance in reading can be explained through the interactive-activation model. According to the interactive-activation model (Taft, 1985; Taft & Zhu, 1997), word-level processing is effected by the components of word compounds. For example, a two-character word consists of three levels of components: stroke, radical, and character. Learners can recognize a Chinese word through the active processing of the information from these three levels (Shen, 2005). The two strategies, determining whether the character in a new word has been learned and comparing characters to find differences and similarities, will necessarily draw learners' attention to known radicals and characters thus connecting the new information with the information stored in students' long-term memory to encourage meaningful learning. In addition, comparing characters to find differences and similarities itself involves meaningful rehearsal strategies that result in a deeper semantic processing of information (Craik & Lockhart, 1972). Therefore, the students using the two strategies are more likely to attain efficiency in their vocabulary learning, which further contributes to their better reading performance.

The findings discussed above, however, should be interpreted with caution. As stated earlier, correlations or associations do not imply causation. It is possible that positive or negative associations exist between certain strategies and students' listening or reading proficiency-test scores simply because these strategies are more likely to be used by students of higher or lower proficiency. For example, the social strategy of discussing with others the methods of learning characters (words) associates negatively

with students' listening scores. This negative association exists possibly because students of lower proficiency have not found the right strategies for themselves and, therefore, they are more likely to discuss with others the methods of learning.

Conclusions

This study investigated the vocabulary-learning strategies of the students learning Chinese as a foreign language in an intensive language program and the relationship between students' strategy use and their learning outcomes as measured by their listening and reading proficiency-test scores. The participants reported using orthographic-knowledge-based strategies commonly, indicating that the orthographic differences between English and Chinese has made it necessary for English-speaking learners to adjust their learning strategies and adopt Chinese-language-specific strategies to tackle the challenge of learning a large amount of Chinese characters.

The orthographic-knowledge-based strategies commonly used by the students in this study, however, tend to focus on the graphic features of characters. Important phonological strategies such as saying the character and visualizing it are less-commonly used by the students, suggesting that the cognitively-demanding task of memorizing the visual features of a large number of characters may have diverted the students from attending to the phonological aspects of characters. Considering that Chinese is an orthographic deep language and there is a lack of sound-to-script correspondence for Chinese characters, vocabulary-learning strategies that focus on the phonological aspects of Chinese characters should be given full attention by students in order for them to achieve better learning results. Accordingly, these strategies should be given emphasis in the classroom instruction or in the curriculum.

The findings of the study show that learning context plays an important role in students' strategy choice. Due to the intensive nature of the program, students in this study need to resort to more metacognitive strategies than the students in a nonintensive program to cope with the fast pace of learning. That the testing system excludes writing results in students' placing less value on handwriting characters as a useful learning strategy. The availability of vocabulary-learning apps promotes the popularity of these apps as a major tool for learning Chinese vocabulary words.

The findings of this study support the argument that more-successful learners use different strategies than less-successful learners, and they use certain strategies more consistently and purposefully. Several patterns of strategy use differentiate more-successful students from less-successful students. Students with higher GPAs show a stronger trend of using orthographic-knowledge-based strategies in learning new vocabulary words, and they have a higher level of self-management ability. In addition, the consistent and systematic use of the strategies of selective attention, note taking, and learning and using vocabulary words in authentic context also differentiate more-successful students from less-successful students. These findings have important pedagogical implications for Chinese instruction. It may be an important pathway to help less-successful students improve through explicit or implicit teaching of these strategies that successful students consistently and systematically use in their vocabulary learning.

The study also examined students' strategy use in relation to their listening and reading proficiency-test scores with the data of the 67 students form the high-intermediate and advanced level of the program. Several strategies that involve learning and using vocabulary words in authentic context (e.g., watching Chinese movies and TV

and paying attention to how a character or a word is used in context) show a positive and statistically significant association with students' listening scores and reading scores, whereas strategies focusing on memorization of vocabulary words out of context have a statistically-significant negative association with students' listening scores, indicating that pure retention of decontextualized words holds little value in developing students' language proficiency.

Therefore, memorizing individual characters or words may be useful for beginning students to accumulate a threshold level of vocabulary words; it may, however, hinder students' learning in the long term if not complemented with other contextualized strategies. Last but not least, two orthographic-knowledge-based strategies, determining whether the character in a new word has been learned and comparing characters to see differences and similarities in shape, are found to be associated positively with students' reading scores. This finding suggests that the emphasis of these orthographic-knowledge-based strategies may help students improve their character-recognition ability, which eventually leads to better reading ability.

Implications for Educational Practice

The findings of this study have many important pedagogical implications. The study found that phonological strategies, which have been found to be important for learning Chinese characters in earlier studies (Gamage, 2003; Hayes, 1988; Ke, 1996; Sung, 2014; Zahradníková 2016), are less-commonly used by the students. Therefore, it is important to draw students' attention to various phonological strategies such as saying the character while visualizing it and reading the character out loud while writing it. Chinese-vocabulary-learning apps such as Pleco and Skritter have functions that students

can use to self-assess their mastery of the tones or pronunciation of certain characters or words. Teachers can model for the students how to use these functions to develop their phonological knowledge of characters or words that they are learning.

As previously stated, the Chinese written system lacks an obvious sound to script correspondence. Many Chinese characters, however, do contain phonetic components that indicate the pronunciation of the characters. Even though only 36% of the phonetic components still reliably represent the pronunciation of the characters in modern Chinese (Yin & Butterworth, 1992), introducing the concept of phonetic components and drawing students' attention to the common phonetic components is useful. The phonetic components can provide useful cues for learners to better memorize and retain the characters. In addition to using phonological strategies for learning individual characters and words, even more important for students is to hear the character and the words in larger contexts such as sentences and paragraphs, as the tones and intonations of the characters and the words may change slightly due to the adjacent characters and words.

The importance of orthographic-knowledge-based strategies is confirmed in the findings of this study. Two such strategies, determining whether the character in a new word has been learned before and comparing characters to find similarities and differences in shape are found to be associated with higher reading scores. In the interviews, students with higher GPAs also consistently used the strategy of learning new words by relating the new information to the known characters or radicals. For beginning students, when they do not have much knowledge about common radicals and characters that reoccur in many new characters and words, it is natural for them to rely on memory strategies such as creating stories for the characters or words that they are learning.

These types of memory strategies, however, should not be overused, as they may be effective for memorizing individual characters, but they lose effectiveness when students need to master a large number of characters and words. The reason is that these types of memory strategies fail to establish connections between characters and words, whereas orthographic-knowledge-based strategies help students improve their efficiency in vocabulary learning by revealing the internal connection between characters and words.

Therefore, the vocabulary learning and instruction in the beginning stage in a Chinese program should help students attain a solid mastery of common radicals and base characters that frequently reoccur in different word combinations. To achieve this goal, it is necessary to align the assessment with the instructional objectives. As several students mentioned in their interviews, they focus their learning on what is tested. In the program where the study was conducted, students in general have vocabulary quizzes on a daily basis. The vocabulary quizzes typically test whether students can recognize a word when seeing it or hearing it. The words are given sometimes in sentences and sometimes without any context.

The disadvantage of using such vocabulary quizzes is that students tend to memorize the meaning of the words without paying enough attention to the known radicals and characters in the words that they are memorizing. To draw students' attention to the common radicals and base characters, teachers can include in the vocabulary quizzes some activities that require the use of orthographic-knowledge-based strategies. For example, teachers can give students a new character that contains a radical that they have learned and have them choose the correct English meaning of the character based on their knowledge of the radical. Teachers also can give students a new word that

contains characters that the students have learned and ask them to guess the meaning of the new word.

The findings of the study also highlight the importance of learning and using vocabulary words in authentic context. It is important to create various language input and output opportunities to encourage learning and using vocabulary words in authentic communicative situations. For example, the topics covered in the beginning stage of learning often involve daily-life situations such as ordering meals or reserving airplane tickets. Teachers can select carefully some excerpts from movie or TV shows that have the same scenes as those the students are learning, supplementing the nonauthentic textbook materials with authentic materials on similar topics. Students may not be able to understand fully the excerpts, but hearing the known words in a boarder context can help them develop depth of knowledge of these words. Teachers also should create sufficient output opportunities for students to use the newly learned words for authentic communicative purposes, for example, using the authentic task of reserving airplane tickets online.

Finally, helping students develop important metacognitive strategies such as selective attention, reviewing notes taken, and self-managing one's vocabulary learning activities is of great importance. Good learners may be able to apply automatically these strategies, and they are able to monitor their strategy use, evaluate the effectiveness of the strategies, and adjust their strategies as needed. For less-successful students, they would need more scaffolding to achieve learner autonomy; therefore, initially, it is necessary for teachers to provide them specific guidance regarding what aspects of vocabulary learning they should focus on, how to take notes, and how to organize and review the notes

effectively. They should work closely with these students, helping them set vocabulary-learning objectives, modelling effective Chinese vocabulary-learning strategies, and guiding them to evaluate periodically the effectiveness of their strategy use so that they can make necessary adjustments. They also can pair up less-successful students with more-successful students to encourage peer learning. As shown in Oxford's (1990) language-learning-theory model, through interaction with teachers and more-able peers, less-successful students gradually can develop the essential metacognitive strategies to internalize the effective Chinese vocabulary-learning strategies that they have learned from teachers or more-able peers, eventually becoming successful and autonomous learners.

Recommendations for Future Research

This study was conducted in an intensive-language-training setting. The findings of the study may not be generalized to other different settings such as nonintensive language programs. It is recommended that future studies replicate or complement the current study in different learning settings to compare findings. As with any similar studies that use self-reported behavior data, the accuracy of the results of this study may have been influenced by participants' honesty and willingness to respond to the questionnaire and their accuracy in recalling how they apply strategies in learning Chinese vocabulary words (Lai, 2016). To limit the influence of the biases inherent in the self-reported behavior data, it is recommended that future studies use class observations, learning logs, and recall protocol to collect data on learners' strategy use.

Additionally, although the interviews used in this study have generated rich and meaningful data, the number of participants for the interviews is small ($n = 9$). Future

studies could include more participants for interviews to investigate whether the strategy patterns identified through the interviews in this study hold true with a larger sample. Further, when examining the relationship between students' strategy use and their learning outcomes, this study only included students' listening and reading proficiency-test scores in the study, which both assess students' receptive skills. Future studies also should include tests that assess students' productive skills of speaking and writing, as different vocabulary-learning strategies might be needed for these skills. Additionally, students' learning outcomes were measured by proficiency-test scores only in the current study. Future studies also could include vocabulary tests as a measure of students' learning outcomes to compare which strategies have higher associations with students' vocabulary test scores and which strategies are associated with higher-general-language proficiency.

This study found that students with higher GPAs are more likely to use orthographic-knowledge-based strategies, whereas students with lower GPAs are more likely to use memory strategies such as making story of a character or a word when learning new vocabulary words. Students with higher GPAs, however, admit that they also used similar memory strategies frequently in the beginning stage of learning. This finding suggests that the effectiveness of certain strategies may be conditioned by learning stages and some strategies may be more suitable for beginning learners than for intermediate and advanced learners, and vice versa. Therefore, it is recommended that longitudinal studies be conducted to test this hypothesis and identify Chinese vocabulary-learning strategies effective for different learning stages.

Researchers argued that interaction of learner difference factors and contextual factors contribute to different levels of success as language learners (Clément & Gardner, 2001; Sinclair, McGrath, & Lamb, 2000). For example, it is not surprising that motivation plays a strong role in strategy use, whereas the presence of anxiety would have the opposite effect (Macaro, 2006). Therefore, future studies should take into consideration learner difference factors and contextual factors when examining the strategy use of students in learning Chinese vocabulary words. Specifically, future studies could examine how learners' gender, motivation, language aptitude, language learning background, and cultural background interact with their strategy use. Future studies also could investigate what role instructors and instructional methods play in shaping students' strategy use.

Also recommended is that future research on vocabulary-learning strategies focus on the learner's conscious and proactive contribution to the improvement of his or her own learning process, that is, how the learner self-regulates his or her own learning (Dörnyei & Skehan, 2003). As can be seen from the findings of this study, among the patterns of strategy use that differentiate more successful learners from less successful learners, many are related to learner self-regulation. For example, students with higher GPAs are more likely to be selective in focusing their attention on the aspects of vocabulary learning that they considered to be difficult. They take notes on the words and expression that interest them and review the notes, and they demonstrate higher levels of self-management in their learning. Further research on the relationships between self-regulation and strategy use is needed to gain a more comprehensive

understanding of the role that vocabulary-learning strategies have in students' vocabulary learning and proficiency development.

Afterword

My experience with this research has helped me gain a better understanding of the strategy use by students learning Chinese as a foreign language (CFL) in an intensive-language setting. The findings of this study highlight the importance of the Chinese-specific vocabulary-learning strategies for CFL students, particularly CFL students whose first languages use an alphabetic system such as English. The textbooks of the students in this study, like many other Chinese-teaching textbooks available on the market, focus on developing students' target language communicative competence. Accordingly, the lessons in these textbooks are theme-based, and the vocabulary words in the glossary are listed following the order that they appear in the presentations.

Presenting vocabulary words with such an approach is disadvantageous for beginning students in developing their orthographic awareness, as characters with the same radicals and words sharing common characters are not presented necessarily together to draw students' attention to the recurring radicals or characters. In this case, students essentially need to build connections between characters and words to improve their learning efficiency through the use of orthographic-knowledge-based strategies such as grouping characters with the same radicals together or inferring the meaning of a new word based on the known characters in the word.

English-speaking beginning CFL learners, however, are not likely to develop automatically these useful Chinese-specific vocabulary-learning strategies due to the orthographic differences between English and Chinese. In the beginning stage of

learning, most likely many students will reply upon their first-language vocabulary-learning strategies to learn Chinese vocabulary words. In this case, Chinese-specific vocabulary-learning-strategy training will be of great necessity to help them develop quickly effective learning strategies. The training can focus on the strategies that are found to be associated with better learning outcomes in this study to maximize the effectiveness of the training.

As the findings of the study suggest, metacognitive strategies such as selective attention, reviewing notes taken, and self-management are equally, if not more, important for students to be successful in their vocabulary learning, which leads to their higher language proficiency. Therefore, the strategies trainings provided for the CFL students should not be limited only to the Chinese-specific vocabulary-learning strategies, especially for the students who are struggling in learning Chinese. Effective vocabulary-strategy training for CFL students also should include the previously mentioned metacognitive strategies to help the students develop better self-management skills through learning with teachers or more-able students. The development of metacognitive strategies through social learning will help the students internalize the important cognitive strategies needed for learning the Chinese vocabulary words. Finally, it is my hope that the findings of this study provide useful information for Chinese-language teachers or Chinese programs in developing effective strategy-training programs or curriculum.

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APPENDIXES

APPENDIX A

Chinese Vocabulary Learning Strategies Questionnaire

(CVLSQ)

Chinese Vocabulary Learning Strategies Questionnaire

Part A: Demographic Information

1. Gender: Male (   )   Female (   )

    Age: Below 20 (   )   20-25 (   )   26-30 (   )   Above 30 (   )

2. Current GPA (on a 4-point scale) _____

    End-of-Semester II Proficiency Test Scores (if available):

Listening _____   Reading _____

3. Please indicate the semester and the instructional week that you are currently in:

    Semester _____   Week _____

 4. Is English your Native Language?

A. Yes _____   B. No _____, please specify the language _____

5. Do your parents speak Mandarin Chinese or any kind of Chinese dialects such as Cantonese?

A. Yes _____, please specify the dialect _____   B. No _____

6. Have you studied Chinese before?

A. Yes _____, for how long? _____   B. No _____

7. What foreign languages have you previously studied?

Foreign Languages   When?   How many years?

_____   _____   _____

8. In order to understand more about how students learn Chinese vocabulary words and what strategies they use, I am conducting an interview for about 30 minutes as the follow-up of this questionnaire. Would you be interested in participating in this interview?

Yes _____   No _____

Chinese Vocabulary Learning Strategies Questionnaire

Part B: Please indicate your opinion after each statement. Circle the number which best shows your level of agreement with the statement. For example:

	Never or almost never true of me	**Generally not true of me**	**Somewhat true of me**	**Generally true of me**	**Always or almost always true of me**
I like learning Chinese.	1	2	3	4	5

Please circle only **ONE** number for each statement.

	Never → Always
1. I pay attention to the tone and try to associate the sound with Pinyin when learning the new character (or word).	1　2　3　4　5
2. I observe the new character (or word) carefully and pay attention to its stroke order.	1　2　3　4　5
3. I see what radicals are in a new character and try to make sense of why they are there.	1　2　3　4　5
4. I try to associate the sound of the character with its meaning.	1　2　3　4　5
5. I convert the word to my own native language and find an equivalent in meaning.	1　2　3　4　5
6. I say the character to myself and try to picture what the character looks like in my mind.	1　2　3　4　5
7. I say the character (or word) aloud or silently to myself as I write.	1　2　3　4　5
8. I listen to audiotapes and think of the meaning and shape of the character (or word).	1　2　3　4　5
9. I read the character (or word) out aloud until I know how to say it, and associate the sound with meaning and shape.	1　2　3　4　5
10. I try to visualize the character in my head.	1　2　3　4　5
11. I check the character (or word) in the textbook or dictionary to see related meanings and how the character (or word) is used in different contexts.	1　2　3　4　5

	Never			Always	
12. I try to recognize the radicals that I have already learned when learning a new character (or word).	1	2	3	4	5
13. I see if the character in a new word has been used in previously learned words or phrases.	1	2	3	4	5
14. I look in the textbook or dictionary to check the character's (or word's) meaning that I am not sure of.	1	2	3	4	5
15. I try to use new words in sentences orally.	1	2	3	4	5
16. I try to use new words in e-mail or journal writing.	1	2	3	4	5
17. I make sentences with new words and write out the sentences.	1	2	3	4	5
18. I listen to or sing Chinese songs.	1	2	3	4	5
19. I practice the words by watching Chinese cartoons, movies, or TV programs.	1	2	3	4	5
20. I practice the words by listening to native speakers or fluent speakers of Chinese.	1	2	3	4	5
21. I practice the words by reading newspaper, magazines, or other online reading materials.	1	2	3	4	5
22. I pay attention to how the character (or word) is used in context.	1	2	3	4	5
23. I use flashcards to familiarize myself with sound, shape, and meaning of a new character (or word).	1	2	3	4	5
24. I use my imagination to picture the meaning that the character represents, as if each character is a picture.	1	2	3	4	5
25. I compare among the characters to see the differences and similarities in shape.	1	2	3	4	5
26. I quiz myself during memorization; for example, given the sound, I try to think of the character's shape and meaning.	1	2	3	4	5
27. I pay attention to the character that has been used in previously learned words or phrases when memorizing a word.	1	2	3	4	5
28. I try to make a story of the character (or word).	1	2	3	4	5

	Never			Always	
29. I group the words with similar features such as similarity in meaning, sound, or shape.	1	2	3	4	5
30. I organize new words into theme-based and topic-related categories.	1	2	3	4	5
31. I connect the new word to my personal experience.	1	2	3	4	5
32. I write words repeatedly to memorize them.	1	2	3	4	5
33. I connect a word to its synonym or antonym.	1	2	3	4	5
34. I memorize the shape of the character first, then the pronunciation.	1	2	3	4	5
35. I memorize the sound first then the meaning and shape.	1	2	3	4	5
36. I plan my schedule so that I will have enough time to study vocabulary words.	1	2	3	4	5
37. I summarize my progress in vocabulary learning periodically.	1	2	3	4	5
38. I regularly quiz myself on the words that I have recently learned.	1	2	3	4	5
39. I preview the new words the night before class.	1	2	3	4	5
40. I preview the new words right before class.	1	2	3	4	5
41. I review the words that I learned on a regular basis.	1	2	3	4	5
42. I review the words that I learned only before quizzes and exams.	1	2	3	4	5
43. I notice my mistakes when I use words incorrectly and use that information to help me improve.	1	2	3	4	5
44. I take notes to record important words and review these words regularly.	1	2	3	4	5

	Never			Always	
45. I use vocabulary learning software or other apps such as Pleco to improve my vocabulary.	1	2	3	4	5
46. I teach others the characters (or words) that I think they would find interesting.	1	2	3	4	5
47. I practice using words by interacting with others such as my teachers, classmates, or friends.	1	2	3	4	5
48. I ask my Chinese teacher or other fluent speakers of Chinese to correct my pronunciation when I speak Chinese.	1	2	3	4	5
49. I ask how words could be used in different sentences if I don't understand them (e.g., asking a teacher, classmates, language partner, or friend).	1	2	3	4	5
50. I discuss with other students the methods of learning characters (or words).	1	2	3	4	5

APPENDIX B

The Taxonomy of Chinese Vocabulary Learning Strategies

A Taxonomy of Chinese Vocabulary Learning Strategies

Category	Strategies
COG	1. I pay attention to the tone and try to associate the sound with Pinyin when learning the new character (or word).
COG	2. I observe the new character (or word) carefully and pay attention to its stroke order.
COG	3. I see what radicals are in a new character and try to make sense of why they are there.
COG	4. I try to associate the sound of the character with its meaning.
COG	5. I convert the word to my own native language and find an equivalent in meaning.
COG	6. I say the character to myself and try to picture what the character looks like in my mind.
COG	7. I say the character (or word) aloud or silently to myself as I write.
COG	8. I listen to audiotapes and think of the meaning and shape of the character (or word).
COG	9. I read the character (or word) out aloud until I know how to say it, and associate the sound with meaning and shape.
COG	10. I try to visualize the character in my head.
COG	11. I check the character (or word) in the textbook or dictionary to see related meanings and how the character (or word) is used in different contexts.
COG	12. I try to recognize the radicals that I have already learned when learning a new character (or word).
COG	13. I see if the character in a new word has been used in previously learned words or phrases.
COG	14. I look in the textbook or dictionary to check the character's (or word's) meaning that I am not sure of.
COG	15. I try to use new words in sentences orally.
COG	16. I try to use new words in e-mail or journal writing.
COG	17. I make sentences with new words and write out the sentences.
COG	18. I listen to or sing Chinese songs.
COG	19. I practice the words by watching Chinese cartoons, movies, or TV programs.
COG	20. I practice the words by listening to native speakers or fluent speakers of Chinese.
COG	21. I practice the words by reading newspaper, magazines, or other online reading materials.
COG	22. I pay attention to how the character (or word) is used in context.
COG	23. I use flashcards to familiarize myself with sound, shape, and meaning of a new character (or word).
MEM	24. I use my imagination to picture the meaning that the character represents, as if each character is a picture.
MEM	25. I compare among the characters to see the differences and similarities in shape.

Category	Strategies
MEM	26. I quiz myself during memorization; for example, given the sound, I try to think of the character's shape and meaning.
MEM	27. I pay attention to the character that has been used in previously learned words or phrases when memorizing a word.
MEM	28. I try to make a story of the character (or word).
MEM	29. I group the words with similar features such as similarity in meaning, sound, or shape.
MEM	30. I organize new words into theme-based and topic-related categories.
MEM	31. I connect the new word to my personal experience
MEM	32. I write words repeatedly to memorize them.
MEM	33. I connect a word to its synonym or antonym.
MEM	34. I memorize the shape of the character first, then the pronunciation.
MEM	35. I memorize the sound first then the meaning and shape.
MET	36. I plan my schedule so that I will have enough time to study vocabulary words.
MET	37. I summarize my progress in vocabulary learning periodically.
MET	38. I regularly quiz myself on the words that I have recently learned.
MET	39. I preview the new words the night before class.
MET	40. I preview the new words right before class.
MET	41. I review the words that I learned on a regular basis.
MET	42. I review the words that I learned only before quizzes and exams.
MET	43. I notice my mistakes when I use words incorrectly and use that information to help me improve.
MET	44. I take notes to record important words and review these words regularly.
MET	45. I use vocabulary learning software or other apps such as Pleco to improve my vocabulary.
SOC	46. I teach others the characters (or words) that I think they would find interesting.
SOC	47. I practice using words by interacting with others such as my teachers, classmates, or friends.
SOC	48. I ask my Chinese teacher or other fluent speakers of Chinese to correct my pronunciation when I speak Chinese.
SOC	49. I ask how words could be used in different sentences if I don't understand them (e.g., asking a teacher, classmates, language partner, or friend).
SOC	50. I discuss with other students the methods of learning characters (or words).

APPENDIX C

Questionnaire Validation Rubric for Expert Panel—VREP

Questionnaire Validation Rubric for Expert Panel

Modeled after the Survey/Interview Validation Rubric for Expert Panel - VREP

By Jacquelyn White and Marilyn K. Simon (White & Simon, n.d.)

Criteria	Operational Definitions	Score **1=Not Acceptable** (major modifications needed) **2=Below Expectations** (some modifications needed) **3=Meets Expectations** (no modifications needed but could be improved with minor changes) **4=Exceeds Expectations** (no modifications needed)				**Items NOT meeting standard (List page and item number) and need to be revised.** *Please attach a separate page to recommend revisions.*
		1	2	3	4	
Clarity	• The statements in the items are direct and specific. • The participants can understand what is being asked.					
Wordiness	• The statements in the items are concise and understandable. • There are no unnecessary words					
Negative Wording	• The statements in the items are given using the affirmative (e.g., Using "I listen to or sing in Chinese" instead of "I do not listen to or sing in Chinese").					
Use of Jargon	• The terms used in the items are understandable by the target population.					

Use of Technical Language	• The use of technical language is minimal and appropriate.					

Please put the number of the items from the *Chinese Vocabulary Learning Strategies Questionnaire* in the table below to show which strategy categories they belong to.

Strategy Categories	Item numbers
Cognitive Strategies [Strategies that enable learners to manipulate the reception and production of language]	
Memory Strategies [Strategies that involve remembering and retrieving information and relating new material to existing knowledge or organizing mental information and transforming it in a way that makes it memorable]	
Metacognitive Strategies [Strategies that involve a conscious overview of the learning process through planning, monitoring, and evaluating one's learning]	
Social Strategies [Strategies that improve language learning through interacting with other people and managing discourse]	

APPENDIX D

Codebook

Code name	Definition	Example
Recognize known radicals or characters	Determine whether a radical or character in the new character or the new word has been learned before and relate new information with old information to help with learning	If you don't know what the word is, you might be able to put together some kind of meaning from it, from the two characters that you see.
Connect shape with meaning and sound through repeated practice	Make connection between a character (word), its meaning, and its pronunciation by repeatedly looking at the character, thinking about its meaning, and saying the character out loud	I go to the list of the words. I look through them, and first I look at the Pinyin and then I look at the character and the Pinyin, try to find the English meaning, so it would be check-look and then try to look at them again, say the Pinyin aloud and then go to the next word.
Electronic Flashcard for characters (words)	Use the Flashcard function in Pleco, Skritter, Anki or other apps to familiarize oneself with the shape, the pronunciation, and the definition of characters	So when I am feeling like rusty on some of the presentations, I can pull up a test and test me on it just with flashcards. It has all these new words on it so that I can just flip through them. I see "yao," then I can think that is "to want" or think of how it sounds. Flip it over, it will show me the Pinyin. It also has the recording. You flip through it, it has the Pinyin and it can play the sound for it as well. I mainly looked at the Pinyin. I usually skip the recordings.
Get the pronunciation and definition right first round	Focus on the pronunciation and definition when first studying the new words	And usually going through the first round, I'll just make sure that I have the pronunciation and definition right.

Code name	Definition	Example
Selective attention: Focus on non-mastered areas	Focus on the aspects that one finds that he or she has not mastered during the vocabulary learning process	The next morning for the vocab test, if I don't have the tones right, I'll count it wrong and redo it.
Selective attention: Focus on difficult areas	Focus on the aspects of vocabulary learning that one considers to be difficult based on the evaluation of one's learning	I do traditional and simplified and then I just marked it because there was a traditional form of the character. This is before, right before the vocab test. I just want to make sure I have it.
Pleco Flashcard: self-assessment	Use Pleco Flashcard to self-assess character meaning or pronunciation	There are other types of tests, like one of them is multiple choice so... I've used self-graded [one function of Pleco] and then for "show," I chose just characters. ...All I've used is self-graded and then just the character only.
Get sound to stick through repetition	Say a word to oneself a few times to get the sound stuck in one's head	If I get it [pronunciation]wrong, I'll say it to myself a few times to get the sound stuck in my head until I know I am used to saying it.
Get characters to stick through repetition	Repeatedly look at a character until it is stuck in one's head	I get the characters to stick by repetition until I am totally familiar with the characters. Actually, that's my initial way of doing it.
Say the character (word) aloud	Say the character aloud when reading or writing the characters	I'll just kind of like, say them [the words] out aloud and then I'll be like, "hey, um, 'he shi yan' (nuclear test) or something." I don't know. Um, she is ... basically ignores me, but it's just like say words out aloud or like we all will be sitting here and we'll all just say the words aloud ... just to say them ... just to hear them.

Code name	Definition	Example
Find equivalent word in English	Connect a Chinese character (word) with its English equivalent	I will kind of look at the character and then look at the Pinyin and then look at the English meaning maybe one or two times until I am kind of familiar with them.
Adjust strategy to focus on weak areas	Self-evaluate one's learning and adjust one's strategies to target one's weak areas (e.g., aspects that one has not mastered or aspects that one perceives to be difficult to learn)	The hardest part about learning Chinese is the creative process of learning. It's not sound, it's not the meaning, it's creating the character that is the hardest part. Once I recognize that, I said, "alright I need to go buy a whiteboard and I need to write this character out ten times, like over and over again." Once I start recognizing this, I had notebooks just filled up with characters.
Strategy adjustment with help from others	Adjust strategies to focus on one's weak areas as a result of the suggestions from others (e.g., teachers)	One of my teachers also gave me some different activities to do. Um, she now gives me … we have a big test ... at the end of the schooling, she has given me different topics to practice my speaking so I can prepare how to give directions, talk about the environment.
Use self-selected online resources	Use various online reading or listening materials for learning vocabulary words	I watch TV shows, use what they call *Chairman's Bao* [online Chinese learning materials] to read articles within my level at the moment so that I knew that vocabulary and an app called Skritter to learn characters not in the textbook.
Selective attention to extra vocab in class	Pay special attention to the words mentioned by the teachers or in the supplementary materials in class	I had a composition notebook out at my desk all the time. And whenever we came across ... my teacher said a new word, like, just a simple auxiliary word or, um, an important noun or something, I'll write it down in the notebook to look at it later.

Code name	Definition	Example
Notice known words when watching Chinese movies/videos	Focus one's attention on the words that have been learned when watching Chinese movies/videos	I like watching modern dramas in Chinese. I use these materials just for review. I look for words I know and try to gist as much as I can of it even though there is a lot of other vocab words I don't know. People have like accents, um, that's just reviewing and trying to be accustom to speed and accents. That's most I use it for.
Learn new words by watching Chinese movies/shows/videos	Pay special attention to the interesting words in Chinese movies/shows and take the initiative to intentionally learn these new words	So I watch like probably three shows on a Saturday or Sunday, and they are like hour-long each, so just whatever words might pop up interest me. But it's funny because actually it takes me longer because I often pause it ... and look up those words and then pause it again. So it's only an hour but it might take me an hour and a half because I keep pausing it to check those words and add them.
Extra efforts for self-initiated activities	The extra efforts that students make to work on vocabulary learning activities that are self-initiated and that are not part of the class requirement	Before, actually before the class started I was here a month ahead of time. It gave me a chance to study the vocabulary. So I finished studying the whole first unit vocab before class even started, so I already knew the vocab. And now I am trying to keep that up, so I am in Unit 4 now. I am trying ... right now, I am in the middle of studying unit 5 vocab so I already know all the vocab.
Maintain vocab mentioned	Keep reviewing the learned words (e.g., review before quizzes)	Usually Pleco, reviewing the grammar book and homework. It's just the same thing I do normally. It's just all about when you come across something that you should already know and you don't remember it, you just have to, you know, re-solidify.

Code name	Definition	Example
Initial interest in Chinese movies /shows	The starting point that a learner starts to take interest in watching Chinese movies/shows	In class, we had our head teacher xx told us about, or we were just watching because we had some spare time, the "xiao meihao," *love so beautiful*. I really like those kind of dramas, so I was interested in watching it.
Selective note taking in class	Learner selectively writes down the words that teachers mention in class	And whenever we came across ... my teacher said a new word ... like, just a simple auxiliary word or, um, an important noun or something, I'll write it down in the notebook to look at it later.
Transfer notes from notebook to Pleco	Learner transfers the vocabulary that he or she initially wrote down in a notebook into Pleco dictionary	I'll put it [the words from the notebook] into my Pleco file later or make a flashcard of it or something.
Connect new words to the notebook	When encountering a new word, try to remember whether this word has been recorded in the notebook before and locate this word in the notebook	If I don't, maybe in class, they might say something, like, I don't know, what is this? [looking at a word from his Pleco], "xiao mai", wheat, and then I am like " ' xiao mai', I heard that before." I think I wrote it down. I might go through and check it and like "oh yeah, wheat."
Sound grasp of newly learned words	Learn new words in such deep manner that the learner has a solid grasp of the words just learned	But, uh, for me, mostly after I have learned them, most of the time I do have a ... a solid grasp of them. So, I don't know, say like Lesson 52, more than likely, I'll have ... you know, I'll remember 90% of them when they come up later.
Focus on supplementary vocab	Spend sufficient time intentionally studying the vocabulary words outside textbooks	I try to focus more on supplementary vocab, on stuff that I might hear on my own or learn on my own.

Code name	Definition	Example
Connect textbook vocab with supplementary vocab	When learning a new word in the textbook, try to remember in what supplementary materials the word already appeared before	And then sometimes I'll go to YouTube or something just, like, search for, I don't know, say "nuclear test" in Chinese and then just look for news reports or something about it. And that's not really to learn new vocab. It's just to try the gist and then hear that word and hear things related to it and try to get the big picture.
Focus on the curriculum vocab	Mostly pay attention and study the vocabulary words from the textbook	For the tests I am given, my unit tests and my vocab tests, these [curriculum vocabulary] have to be kind of like my wheelhouse where I focus. That's all. Extra stuff hopefully will come later, but I know it is not the most important, so I don't focus there, I focus on this 'cause I want to do it well in this curriculum.
Learn by using	Learn a new word by using the word in context through speaking	Like right now, we are just talking about mountains and stuff. Being in Monterey with all the different types of land masses around, I am like, "hey, let's talk about these mountains," like try to use the vocab … talk about "shan feng" [mountain peak].
Time spent on vocab study	The amount of study time spent on learning vocabulary every evening	So, vocab, I would say, probably 2 hours for vocab. I don't get to sleep much. About 2 hours every day for vocab and then homework usually takes me about an hour or 2 as well.
Space out learning	Study vocabulary words at different times rather than in one sitting	Maybe in-between breaks, during class or, like, really... a lot on the bus, on the way to lunch and on the bus on the way back from lunch, and then after ... also If I go to the gym, if I have a work-out that I can have my phone on my hand, like on the bike.

Code name	Definition	Example
Efficient use of time	Take advantage of whatever time is available to study vocabulary	Maybe in-between breaks, during class or, like, really... a lot on the bus, on the way to lunch and on the bus on the way back from lunch, and then after ... also If I go to the gym, if I have a work-out that I can have my phone on my hand, like on the bike.
Pay attention to context	Pay close attention to how a character (word) is used in context (e.g., presentations)	A lot of words, as you know, in Chinese might have the same meaning but you would use them in/ different situations. Like "qu bie", "shi bie" , "fen bie" [all synonyms for "to distinguish" in Chinese]. I am still not too certain on all those on when to use which one but I know I used.
Learn with others	Practice using words by interacting with others such as family members, classmates, or friends	I have a different bunch of friends in class I am very close with, so with them ... I will talk with them and my roommate is also in one of my sister classes, so me and him will talk about things so I can try to make those [words] more memorable because I was told if you talk about it more you will remember it more.
Take notes of new words and review notes	Take notes on the words that interest one and keep coming back to review these words	I have a notebook too that I'll write down like all the stuff that teachers write on the board, probably not all of it either. A, I might already know. B, I might think ... I don't need to know it right now, but whatever I, you know, I may deem necessary or I think is interesting, I'll write it down and then I make sure to review.
Quiz oneself or each other	Quiz oneself or each other on the vocabulary words	We will draw characters and write character, then we ask each other "what is that?" and then someone will say it.

Code name	Definition	Example
Writing characters	Memorize characters by repeatedly writing the characters	You know what, Pleco, everyone talks about how great it is. It is great like looking things up or drawing characters, but most of what I do, I do it on a whiteboard. It is just in my house. I have a white board and I have to write it out and that is how it sticks in my mind is that I write it over and over again.
Be flexible and open	Keep a flexible and open attitude when learning vocabulary words	You kind of need to be flexible, like, and follow whatever helps you learn best. If your strategies change over the course, you need to... follow that.
Understand the etymology of radicals	Dig deep when learning a radical by relating the radical to its original meaning	As for using radicals, the ones I know I definitely use ... definitely trying to attach more meaning to it 'cause that's the thing too, like, I'll try dig deeper with it but not just knowing like what it is. Like, "qian" [money], like money, like it has a metal radical on the side, so I would not just know it is money but saying "oh, the metal radical, and then you know, back in the day, money was coin," stuff like that, or however you might attach meaning to it.
Create stories to memorize characters	Create idiosyncratic stories to memorize characters	Like for the ones that don't have the radicals that I am familiar with, like "dou fu" [bean curd]]. I had to do a story for it. It is kind of silly but I image there's a little piece of Tofu. That is ... I guess you can say the "kou" [mouth], I don't know if it's a "kou," but that's a little piece of Tofu. The top is like the top of a pot, and then this is like the water and this is like the bubbles like fire, boiling or something.

Code name	Definition	Example
Look at example sentences	Look at example sentences to see how a word is used in sentences	If it's not super self-explanatory, like, "cha kan" [to inspect], that one looks like it's easier to remember but this one is harder to remember, so I look at the example sentences.
Categorize words with similar features	Put words into different categories bases on similarities (e.g., semantic similarities or orthographic similarities) to better retain the words in memory	The night before, I went through and I highlighted it in categories. Um, the blues are the name of the country, the pink is the important phrases like nuclear test.
Rote memorization	Memorize characters or words through rote memorization	I learn more by like memory and stuff. So, I am like drill my head with this [the word] so many times then I will understand it.
Make hand-written flashcards	Make flashcards by writing down characters/words	I go back and forth and I also make flash cards every night as well. First, I write everything done. I have a flashcard there at my room right now, I can't show you those, but every night I make flash card for each and every word and then I sometimes preview them when I have time.
Preview vocabulary words	Study the new vocabulary words before class	A lot of the times I will do is that I will go to the presentations in our textbook, and I will take like new words and highlight these with one color, and then I will highlight our new grammar points in another color.
Read newspaper and news articles	Read newspaper and news articles that are authentic	We have different apps and I like to read different news articles. I have Chairman's Bao [online Chinese learning resource], that's a good one. Wall Street Journal, we use that.

Code name	Definition	Example
Connect words to personal experiences	Connect words to one's personal experiences	Like one of the words we have was "summer camp", and I was like, ok, I was once in a summer camp, I can remember, I try to remember these different ... um, this summer camp just base off my own experience, make my own stories with the summer camp, trying to use the vocab as much as I can.
Learn stroke orders	Pay attention to stroke orders when learning characters	Learn the stroke orders 'cause stroke orders really help a lot. I don't understand the science about it, but every time I like follow the stroke order that my Pleco shows me, it actually does help me very much 'cause Pleco can quiz you for the stroke order and it just helps to get the stroke order down and helps you memorize the character more.
Review vocabulary before vocabulary quizzes	Spent time and use various activities to prepare for the vocabulary quizzes or tests.	So the best way to review is just give myself my own listening test. Um, I don't really do a lot of review I guess. Looking at it besides maybe just doing what I am doing now, like going through the list. I feel like if I can listen to it and write it, then I have it. That is normally what I will do during my lunch times, give myself like a test.
Useful strategies	Strategies that students perceive to be useful for vocabulary learning	Honestly, the categorizing is helpful, just finding some way to attack it [vocab learning]. Memorizing the radicals for sure that's helpful. And having someone to help me like my wife is helpful.

APPENDIX E

Transcripts of Interviews

Transcripts of Interviews

Interview for Student 1

W: How do you study the new vocabulary words in your textbooks? Can you show me with examples?

S: A lot of the times I will do is that I will go to the presentations in our textbook, and I will take like new words and highlight these with one color, and then I will highlight our new grammar points in another color so that I can kind of differentiate them while I am reading them. Those [Yellow ones] are the major grammar points we are learning during the unit. Also like English is ... kind of remind myself what they are, so when I am learning it, I can look at that and I can connect that with the English meaning. I will try to get to how to say it in Chinese too. So I will also kind of create a list of the new words before reading it. So I will look through these first [vocabulary list] and that is how I know these are new words here, so then I will go through reading these, and if I see something that is new, I will highlight it. And then I will try to review going back and forth between these until I can try to read it somewhat fluently.

W: How do you know the pronunciation?

S: I will just look at Pinyin. I will look at the words and kind of get the general topic what is going on. So, this is like what things you can buy, so it is like going to the store, so I kind of get that idea down, and then I'll look through them, trying to preview them. I will kind of look at the character and then look at the Pinyin and then look at the English meaning maybe one or two times until I am kind of familiar with them. And then I will go back to do the presentations. I will go through the presentations and I try to read them ... somewhat fluent with them. So like when I am reading them, at first I am not fluent, so I'll have words that I don't know. so that is when I highlight them. If I am looking at this, I get to it, I see the character, I know the English meaning, I can't quite remember how to say it, I will just turn back to the Pinyin, look at the Pinyin.

W: Why do you always use presentations with vocabulary list?

S: My thinking behind going to the presentation is that it is easier for me to learn the words when they are in context. I can then see the grammar points and start learning those as well before the class.

W: How do you study the sound, shape, and meaning of the new characters or words?

S: Um, for some characters, it is just that I read or see them enough that I just ... I am able to recognize them but some of the hard ones, I will try to make up a story behind it. So, I remember one that we just did, the character for "bear," the top of it is "neng" [can]. It has got fire radical under it. So, a bear is very capable. So, it will do a lot of things with fire ... like vigor. It is capable. A bear is very capable. It is how I remember it.

W: What about the dots on the bottom?

S: Yes, that is the fire radical, right? Yes, it's like you are able to do with a lot of passion, I think fire is like passion or vigor.

W: Do you use this strategy a lot? At this point, do you use this strategy a lot?

S: Yeah, I think that is one of the main ways that I am able to memorize the characters.

W: What about radicals, components? Do you use them to help you with the memorization of characters?

S: Yes, sometimes. There are some radicals that I can recognize and others I don't recognize yet.

W: You mention Pinyin. Do you listen to the recordings?

S: Yes, we don't have recordings for all of them. Sometimes, like when I am cleaning my rooms or something, I will put on headphones and just listen to a list of pronunciations. We can also listen to the presentations as well. So I can hear the whole presentation and then speak out what I am hearing. I try to be able to read them [words] first, then I will listen for them later on ... be able to say them the same way.

W: In addition to your textbook, what additional materials do you use to help you study vocabulary learning?

S: Sometimes a lot of homework are writing, so writing these characters also helps. Just studying on my own, just studying the presentations. About once a week before we have a vocab test, we have a homework that is for writing. A few of the characters, not a lot. Mainly writing the characters when I am writing my homework or essay.

W: How do you review the words you have learned?

S: I have an app called Pleco that I use. We have those vocab list in Pleco. We kind of go through that like Flashcards.

W: Can you be more specific and take me through the process how you use Pleco to study vocab?

S: So when I am feeling like rusty on some of the presentations, I can pull up a test and test me on it just with flashcards. It has all these new words on it so that I can just flip through them. I see "yao," then I can think that is "to want" or think of how it sounds. Flip it over, it will show me the Pinyin. It also has the recording. You flip through it, it has the Pinyin and it can play the sound for it as well. I mainly looked at the Pinyin. I usually skip the recordings.

W: Do you read the sentences with the words?

S: Not very often.

W: In Pleco, you can find words with certain character and characters with certain radical. Do you often use this function?

S: I actually just found about that function this week. I haven't really used it at all.

W: When you look at a character, do you analyze it?

S: If I can recognize a radical, I will try to make a story around it. It is like a cow has a fire radical in front of it.

W: When you see a new character, do you take the character apart and analyze it?

S: [laugh] not really.

W: Do you often try to use new words in daily activities? What activities do you use to practice using the newly learned vocabulary words?

S: Not outside the class. Not a lot. Sometime I had dinner with some other Chinese students. Sometimes we will start using words. We are learning about food now, so we will put the food we have on the tray and just say it. It is small things like that if anything.

W: How do you prepare for vocab quizzes?

S: It is mostly just what I do to learn the presentations. Just try to memorize the characters the same way. Usually a few days before the test, I try start working on it. Like three or four days before the test, it is when I start it. For the new vocab. I will start

looking at these and try to memorize them. On the weekend, I try to go back read some of the old presentations. About every weekend, not on a daily basis.

W: Do you try to get help from other people in learning vocabulary words?

S: Sometimes when I go to the study hall, there will be other students there who want to work on vocab, so I will work on vocab with them. We are kind of learning it together, sometimes. I try to go to the study hall at least twice a week, but doing vocab at the study hall is kind of rare.

W: How much time do you spend on vocab learning on a daily basis?

S: Maybe an hour to an hour and half. A lot of it was during learning in class. I study around three hours, including doing the homework. For the one hour, I pretty much do what I have been saying, previewing vocab or even reviewing vocab.

W: Do you use other technique to memorize characters other than creating stories?

S: Um, I don't think so. I mostly just try to make up stories for them.

W: Do you often periodically review your vocabulary learning strategies?

S: I don't think I do that because the pace is so quick. I sometimes think "do these strategies work? maybe I should try something else." I just feel that I don't have time to explore other ways. I have kind of got used to this way. It seems most of us have been doing the same thing, which is how I kind developed what I am doing.

W: What strategies did you find most useful?

S: I think just reading the new vocab in context. It is the most helpful for me. Like in a sentence. In Pleco you can see the words in the sentence. I will try to read it and I will try to make sense of it. If I can't get it through trying to read it, I'll use the story telling one.

W: What suggestions would you give to new students on how to study Chinese vocabulary words?

S: I would say the most important thing is reading the presentations in the textbook 'cause those will cover all the vocab in each lesson as well as talking about the grammar we are going to be learning. If you can get some understanding of the presentations, then you should be able to understand the lessons very well.

W: Do you have a system keeping your vocab?

S: Sometimes, like I hear the word a lot I will write it down. Most of the time, I follow the order of the list, sometimes, like toothbrush or toothpaste, I would group them together. Toothbrush and toothpaste are things you use in the morning, soap and other things. Even colors. You can put a bunch of words together and try to memorize them together. I do it normally when I go over [the words] the first time. I'll try to put them into categories. I mentally categorize them.

Interview for Student 2

W: How do you study the new vocabulary words in your textbook? Can you take me through the process?

S: Sure. The first thing I try to do, now we are in the second semester, they [vocabulary words] were broken down by presentations, so it's a little more manageable. The first thing I do is I kind of look at it for maybe 15-30 seconds, just kind of say it in my head and then what I try to do is I'll say it out loud like "zong suan" [finally]. After I try saying

to myself, I normally listen to it. Just see how they say it and see how those compare and then I'll repeat it, and English is kind of the last thing I focus on because I have noticed that it has been the easiest thing for me to pick up. So pronunciation and writing are the two biggest things I focus on initially, especially the night before because that's when I try to get ahead and I try to study the night before right after class, so I focus solely on Pinyin and writing. And then just looking at the long form. So first I go down the list, and I will go in order. Um, I probably spend on average the first time going through ... like 2 to 3 minutes a word. It takes me ... it takes me anywhere from about 30 minutes to an hour depending on how many words to kind of get through the first pass. So I will do that and then read the presentation to kind of see if I can recognize [the words] once I read the presentation.

W: When you read the presentation, do you read it silently or do you read it out aloud?

S: I like to read it out loud, but sometimes I do read it silently` like if I am... if my roommate is home doing something or he is like ... um, if I feel like I don't want to disturb anybody, I'll read it silently. But normally if I do that, then I'll wake up in the morning kind of read it out loud to myself. If he is, like, sleep, I am not gonna wake him or anything, yeah, I know that reading out loud has produced the best results for me. Um, the presentations I have the best grip on are the ones that I read out loud the most. So that's what I try to do.

W: How do you study the sound, shape, and meaning of the new characters or words?

S: I kind of just started noticing the trend of, like, how radicals were, what they mean, like the ones we have frequently seen. And then noticing the left and right side of the character. The right side normally is how it is going to be pronounced and then the radical in the left side at least from what I have noticed and what I have heard kind of tell you what kind of category or what it could be.

W: Is it something that happened recently?

S: Probably. Yeah, I would say. I think once I knew that writing is not going to count as much, I kind of settled down and just looked at it. I will ... before in the first semester, I knew writing counted, [so] I would be so obsessed with just looking at it, just trying to figure out the stroke order and just writing it. I really wasn't paying a whole lot of attention to it because I was so concerned about, you know, that we get tested on all of them, so I needed to know them all. And I was taking them all at once. Um, so I really was just not paying attention enough. I knew some of the radicals but now that it's kind of been broken down for me in the second semester having the vocabulary test. Actually it's better for me personally 'cause I know "ok, here is 20 words. I can spend more time on each word and look at it." For instance, today we had a lot of words that had hand radicals like "tui" [push] and "la" [pull]. I noticed those things and it helps me definitely like get a good grip of things.

W: Did you do a lot of this kind activities in the beginning?

S: No, it was mentioned but we didn't really do. What we focused on, our class focused a lot, was like knowing the strokes, like "heng" [horizontal stroke], "dian" [dot], "pie" [slant downward]. So we did a lot work on that. It was definitely mentioned and I knew that radicals are at the back of the writing book, um, but I just, I never really like got into those 'cause I was so obsessed with trying to get every single word down in writing. Writing them down, just trying to do it, manage it with listening and writing or reading, so I was kind of like just going through the motions, I guess, would be the best way to

play. I probably do more writing now than I did during the first semester just because I feel like it is manageable now and I realized probably since Unit 3 or 4 like how much it helps. And yes, I do a lot of writing. I will do it in between classes, um, I try to get back early from lunch and write.

W: What do you do to help you remember the words?

S: I like stroke order. Um, when I use Pleco, it shows me the stroke order and I try to follow the stroke order. Um, especially it is something I don't know. And then I count, I count, so like, I know that "Li" [a common surname] has five strokes. This one [pointed to a character in the textbook] has, I want to say, 8 strokes. So I try to assign number to them 'cause I like numbers. That helps me, especially when I get stuck. Um, but yeah, originally what I tried was write 10 times, just look at the one that I have done before if I get stuck and then what I'll try to do is like, in random places like, I will cover this one [the character already written] and I'll try to write it right there without looking at it.

W: On average every night how much time do you spend on vocabulary?

S: I would say at least 30 minutes every night. Normally the more time I spent the night before the better I feel, the less time I have to spend the during the day 'cause we take the vocabulary quizzes right after the lunch. I normally wake up at least an hour and half, two hours earlier to spend another hour, mostly on listening just so I kind of get my ear ready. And there is only something specific that I am listening for, then I'll write too. I'll also try to, you know, recall or write if I hear something in the presentation or a word, I'll try to pause it and try to write that word once I recognize it in the presentation. For me, I'd like to try to get a whole understanding of things. So anyway that connects the writing, the listening, the speaking, and um seeing it, those all help me. Once I feel like "ok, if I hear I can write it, if I see it I can read it, I can tell in English the tone marks, then I am like, ok, I have this word, I have it." Then normally, more often than not, once I feel confident with the word then I don't really have any problems with it.

W: Do you think that radicals are important?

S: I do. I think what they [course developers] are doing now is ...what I am seeing is it's making it a lot easier to remember. I think I was making things a little bit harder for myself. Um, so seeing the meaning, knowing the meaning of the word, like, even if I didn't remember it, you know, like "tui," which is "push," right, um, I know what I am saying. I know 'cause I got to use my hand to push so I know that the left side more than likely is going to be the hand radical. Um, and then the sound helps it too. The sound, I am still kind of trying to figure it out because I know that it doesn't necessarily mean it is the exact sound, but it does narrow it down.

W: Besides your textbook, what additional materials do you use to study vocabulary words?

S: Pleco. Pleco is what I normally use probably the day of. So I am still kind of learning how to use this app very well. I started probably Unit ...by Unit 2 for sure. I think somewhere in the middle of Unit 1, I started but I learn a little bit more. What I normally do is "test." I click here on "new test," and it'll give these categories, so for instance, we just did presentation 2 lesson 33 today. So the next thing I would do is go to Presentation 3, so this is if I have some down times when I am waiting for the bus, and I only have maybe 5 or 6 minutes. This is my go-to because normally when I open up the textbook, I want to spend at least like15 to 20 minutes looking at it, writing characters, reminding myself. Don't always have that time. So, the first thing I will do is go to "review only,"

and then I will just begin "test session" and it gives you all the information. It tells you it is a noun, verb, adverb and it gives you a lot more information than, say, the unit book will do it so. I used to rely on this only, but the problem was that it may mean something different in that lesson I was studying.

W: How do you review and consolidate the words you have learned?

S: Whew, I probably have not come up with a good strategy with that yet, which is why I think this presentation ... the style we do now, we do a vocabulary test every day helps me because it has kind of been consolidating for me. Um, I would like to, I guess, probably what would make sense to me would probably maybe try to first consolidate by what type of word it is. Um, probably maybe visual because I am pretty visual.

W: Do you have review tests?

S: We don't have review tests, not yet. At least not in class. I have heard that it may come soon.

W: Do you have time to review the old vocabulary?

S: Normally it is the weekend. What I'll try to do is on Friday when I get out, I do a little review. And normally when I review, it was always through Pleco. I don't think I have looked at the book through review yet.

W: On average, how many hours do you spend on review?

S: Just vocabulary, I probably say a couple of hours. I would say 1 or 2 hours.

W: What about those newly learned vocab? What activities do you use to practice using those words?

Um, a lot times the sample sentences help. So I will say and try to read and try to understand the sentence, and then I will try to personalize it. So I will try to find a way, and normally the words that mean a lot to me ... I guess in my life, for example, I am a pretty tall guy, so like we did a lesson about hobbies and stuff. Those words were very easy for me to remember because I was just thinking in my head and speaking in myself like how I would use it. If it is something that I am not very interested in, that can be tougher.

W: Can you give me one example?

S: Um, if I am learning a word like "Lan qiu" [basketball], I probably learn that word like right away. Um, and just I would say "wo chang change da lan qiu" [I often play basketball], and yeah, then if it is something I probably wasn't interested in, grammar patterns and sometimes vocab words can be tough for things that maybe don't directly translate into English. I just have to memorize it. Like just memorize, like I guess just memorize, hey, this is the way it is in Chinese, like "kan qi lai" [look like] was one of that. I was like, "ok, I just have to memorize this one."

W: How do you prepare for vocabulary quizzes?

S: Um, ideally I try to do as much preparation the night before as possible because for me vocabulary quiz is just being confident. Um, how I feel is going to affect how I do it but often I'll spend 20 minutes during lunch, 20-30 minutes just looking over again. What I try to do is listen, so I turn on my computer and I will listen and hear it, and then if I can write it and write the Pinyin, then I know I have it. So the best way to review is just give myself my own listening test. Um, I don't really do a lot of review I guess. Looking at it besides maybe just doing what I am doing now, like going through the list. I feel like if I can listen to it and write it, then I have it. That is normally what I will do during my lunch times, give myself like a test.

W: Do you try to get help from other people in learning vocabulary words?

S: Um, I haven't. As of lately, I have been trying a lot of things just because I feel like maybe I've spent a lot of time on it or maybe I don't want to say "a lot of time." I want to say I don't use my time efficiently. I think I could be more efficient in using it. The one thing that I don't mind reaching out 'cause it is not often, but when I do have others help me is like trying to put a story to a character and trying to memorize it more than just strokes. If my classmates think "ke le" [coke] ...this character looks like a smiley face, and then it kind of helps me remembering it. But I felt that the radicals are better, like I feel like if I could do that for the radicals, I would be in a much better case.

W: Creating stories, did you just started to do it or have you been doing it from the very beginning?

S: It was told to us from the beginning, but when I heard it, I was like, "um, that kind of sounds complicated." We have 60 vocabulary words and I have to create stories for every single character, so I was like, Uh, I don't know, that's gonna be kind of tough, so I was a bit reluctant to do it, but if there was one that I just couldn't remember, I'll try. I'll try to do something to help me to associate better in my mind.

W: Did it work?

S: Uh, sometimes. I don't think it works as good as some of the other methods that I have tried. Like looking at it and saying it. And one thing is that when I write it, I will say it. That really helps it too, but as I write it I say it, but yeah, this one [creating stories], I can see it helping, but I am not like 100% convinced yet.

W: What strategies did you find most useful when it comes to learning vocab?

S: Writing. If I can write it. I mean the best one is if I can write it then I feel like I have it. Uh, I feel like I am most likely a kinesthetic and visual learner, so if I'm writing it, I'm doing it, and as I'm writing it, I'm seeing it. Whether seeing the character itself, or like, seeing the action of the character, seeing the picture of the character, um, that's the best way.

W: When you can write it, it doesn't mean you also know the pronunciation.

S: The pronunciation, I think, it doesn't. I mean tones has been an issue for me, so it probably is not the best thing for pronunciation. I think saying it, I guess, not just saying it, I would say using it in a sentence, in common language, probably is the best way to really have it.

W: Do you do that? Use it?

S: I try. Like for the words I like, yeah. I am like, if this is a word that I am gonna to use when I talk about things, then definitely I will use it. Those are the words that I probably have the best handle on.

W: Do you do it on a regular basis?

S: Um, I would say it depends on whether I like it or not. Like if I speak, if I am speaking, if I feel like it is something that is gonna be part of my daily language, then I am always using it. If I don't like it or if it is confusing to me, um, yeah, I kind of shy away from it at times.

W: Do you have any other favorite strategies or methods?

S: Um, I don't know. I think my favorite is just listening to it and being able to write it. Um, and then I like it a lot in the presentation, like just... that helps me a lot. Like when I learn it, look at it, and read the presentation, I see it in the presentation. Um, that really

helps me get a grip on it. Just because I think it is using the context and that helps me a lot.

W: Do you have any advice for the new students on how to study Chinese vocabulary words?

S: I would say my biggest advice for the new students is to try a little bit of everything but spend time on it, spend the time that you need to spend on it initially it because what I am starting to realize and care and look at it and, yeah, ...just try to analyze the character I guess as much as you can because the more you do that, and what I mean by analyzing is specifically the parts, the radicals. Um, because I always feel like if I did that more in the beginning, where I am at now would be no problem because a lot of the characters and radicals are used, you know, over and over again. So when I get words that already have the same characters even the same parts like remembering them doesn't take long at all. So yes, spend that time and really look at it and depending on what type of learner you are, you know, whether it is writing it, saying it, or just looking at it, you will probably figure that out but definitely do it all. Do as much as you can because you know that's gonna show you understand it. And use it ... use it in speaking cause that is obviously what it's for, speaking and writing.

W: You mentioned every night, you spend half an hour on the vocab. Is that enough time for you?

S: It's enough for me. Half an hour is enough for me to know how it sounds and what it looks like and what it means in English. Um, if I want to know how to write it, I'll spend more time. I'll spend more time, but if I know, like, again if I spend an hour, I spend more time trying to write it out, especially some of these characters that are a little longer. Um, I definitely feel like I have more of the grasp of it.

Interview for Student 3

W: How do you study the new vocabulary words in your textbook? Can you show me with examples?

S: For each presentation, we get a new list. We also have this presentation, and every night I translate that entire thing completely so I can have a context for each of the words to help me out and, um, also we have Pleco. I use that a lot, so I can understand the tones better 'cause my tones are very horrible. So, once I get the context and the tones, I can usually do well in my test.

W: Do you use the vocabulary list?

S: Oh, yes, Ma'am. I go back and forth, and I also make flashcards every night as well. First, I write everything down. I have flashcards there at my room right now. I can't show you those, but every night I make flashcard for each and every word, and then I sometimes preview them when I have time, but I mainly ... I just do it ...just to make sure I am writing down everything we are going to study, and then I start working on the presentation, translating that, going through the whole thing and making sure I understand it sentence by sentence, so [doing this] just help with the context 'cause I know some things would ... we came through some words I was just like "this doesn't really make sense" but once I put it into context, it is like "ok, now I understand what they are trying to say it here."

W: So, you said you wrote down the words, did you write them down one by one in this order?

S: Yes, one by one in this order [the order that the words appear in the list]. I write short form and long form for each word and then on the back [of the flashcard], I write Pinyin and the definition of it. I try to use the words every once in a while, but the main thing I use is mainly Pleco. I just use that to help like preview and Pleco helps me really understand it [the word] and know what it means. We have a bunch of different ... different functions here that we can use. We have just basic review and the multiple choice by picking which one is which. They show you the characters and you have to pick the definition and Pinyin for it and because my tones are very horrible, my teacher taught me to use tone practice to get the tones right. I can put the words up, but first they [Pleco] give you the Pinyin of these [words] but I have to plug in the actual tones for it, so "jue da duo shu"[most of], the tones are "2, 4, 1, 4" , so then I just keep doing that until I can get all the tones down.

W: How do you the sound, shape and meaning of new characters?

S: It's kind of easier now, but before we had word ...vocabulary preview. The preview sheet would give us one word, we would like understand every part of it, understand the radicals that were to go with it, understand like the meaning, what part of the word can go... how one character can go with other characters. Those were very interesting. We still have it but we don't get that homework anymore.

W: How do you make connection between these three aspects?

S: I am still working on the whole thing. I learn more by like memory and stuff. So, I am like drill my head with this [the word] so many times then I will understand it. So, my usual tests sometimes are not the greatest because I know everything based off a certain pattern so if somebody changes the pattern it is hard. Eventually I am getting a little bit better. It's always been what I have done ever since I was little If I ever was like given something new. Chinese is a lot of stuff though 'cause it is completely new transition from what I am used to, but, yeah, it is really just one of those that has always been. I know my brain. I can understand it. If somebody were saying something, I can usually remember a good majority of things.

W: Do you use any strategies or techniques?

S: The Pleco just makes sure I understand the new words. It is by going through the textbook and the listening book that I try to understand different patterns that they use it in, and also sometimes when I watch different movies and TV shows that I understand their patterns and how they use [the words] the same.

W: What additional materials do you use to learn vocabulary words other than the textbook?

S: Textbook, movies, TV. We have different apps and I like to read different news articles. I have Chairman's Bao [online Chinese learning resource], that's a good one. Wall Street Journal, we use that. Every once in a while, I go on to YouTube to look up things. CCTV is great. I do this every night, especially CCTV, typically about half an hour to an hour, that is usually what I try to do before I go to sleep. Just try to relax a little bit, not too worried about like the actual textbook things we learn but try to learn some new things and find a way to relax but still study Chinese.

W: How much time do you spend on studying the vocab?

S: Studying the actual vocab, that's a long process 'cause I am … I feel like the vocab is the most important thing to learn that everything else can come natural once you get the patterns in vocab 'cause Chinese uses a lot of basic grammar patterns so once you get the grammar patterns down the vocab just kind of throws itself in there. So, vocab, I would say, probably 2 hours for vocab. I don't get to sleep much. About 2 hours every day for vocab and then homework usually takes me about an hour or 2 as well. Then I have an hour or so for additional materials just to help me sleep.

W: How do you review and consolidate the vocabulary words you have learned?

S: For those, I mainly go with different friends. I have a different bunch of friends in class I am very close with, so with them ... I will talk with them and my roommate is also in one of my sister classes, so me and him will talk about things so I can try to make those [words] more memorable because I was told if you talk about it more you will remember it more. So, it's tough 'cause some things … like we are doing geography, it is difficult to put that into everyday terms but they help me out a lot.

S: Do you set aside certain amount of time to review the vocabulary words periodically?

W: Yes, Ma'am. Usually every weekend I just make sure I can go through the whole thing from the very beginning. I try to ... I am now starting to actually schedule it out so it is not just everything but we also often have review test from old vocabulary so it definitely helps us out. Our teaching team leader is a great guy. He helps us and he makes sure we remember as much as we can.

W: Do you try to use the newly learned vocabulary words in your daily activities?

S: I try to. Some of them was way harder than others, but then most of the older vocabulary was more basic. Now it is more advanced words, and speaking of geography is really hard to use in everyday language. Most of time I try to.

W: What activities do you use to practice using the newly learned vocabulary words?

S: Like right now, we are just talking about mountains and stuff. Being in Monterey with all the different types of land masses around, I am like, "hey, let's talk about these mountains," like try to use the vocab … talk about "shan feng" [mountain peak]. It is difficult just because it is something that is really hard to use in everyday life. My roommate is really good at just making up crazy stories, making me have to adjust to it. I think he was once in drama or something so he knows how to make up stories. He would say "hey, let's have fun with this." We would try to use it [the word] in conversation. We also have a bunch of supplemental readings that our teaching team gave to us, the listening book. we have homework book and I try to finish that almost every night.

W: Do you review these words by watching movies?

S: Yes, Ma'am. Like I can remember if I watch a movie and they bring up the word and I am like "ok, this is how they are going to use it." And it sometimes helps like in different context too 'cause the presentation is kind of basic and movies give you a broader way to use something.

W: How often do you review the old vocab?

S: That's probably once a weekend. About an hour. Just sit there, relax and see if I can remember without having to look at the phone 'cause the phone can talk to you saying this is the word and if I can remember it. I know my reading is way better than my listening so I try to close my eyes and try not to look at the characters.

W: How do you prepare for vocabulary quizzes?

S: I usually just ... now with the new system I just put all the words in Pleco myself. First I translate our presentations so I have a better understanding how they are going to use the new vocabulary and then I find out what are the actual vocab they want us to remember. So I try to get a big picture first. I learn how they use it, what kind of sentence structure it is, and then I just focus on the word itself.

W: Do you try to get help from other people in learning vocabulary words?

S: Yes, Ma'am, very much. Um, my tutor is also one of my classmates, so that is really helpful and one of my best friends is also in my class as well. They like, they help me talk about things more. I get help form my tutor, my roommate and my friends. They know I am not the strongest at Chinese so they are all eager to help me. They help me with vocab and listening. I remember during dinner they would have conversation in Chinese completely and then turn to me and say " what did we just say?" They had me translate the entire thing. Sometimes, it is everyday conversation. Sometimes they try to use the new stuff. One of my teachers also gave me some different activities to do. Um, she now gives me … we have a big test ... at the end of the schooling, she has given me different topics to practice my speaking so I can prepare how to give directions, talk about the environment.

W: What vocabulary strategies did you find most useful?

S: Putting it in your own context. Presentation will give you a certain way to use it and a certain sentence, but you can find a way to make it you own, relate to your own life, that's what I like the most. Like, "ok, I can remember this 'cause I can remember this point in my life."

W: Can you be more specific?

S: Um, like one of the words we have was "summer camp," and I was like, ok, I was once in a summer camp, I can remember, I try to remember these different ... um, this summer camp just base off my own experience, make my own stories with the summer camp, trying to use the vocab as much as I can.

W: What other strategies do you really like and you think really work?

S: I think Pleco really works 'cause Pleco gives you options of seeing, reading and everything for it [the character/word], even teaches you how to write the strokes of the characters. So that really helps 'cause it has everything you need, and it already has our vocab in place so you don't have to add anything. It's already just there ready for you, and Pleco is the perfect source if you are out at a restaurant. When you are waiting, you can just get out your phone to self-study.

W: You have so many words to study, how can you memorize them?

S: Me, it's really always been there. Every day, every morning I also write down every single vocab word and that also helps me practice them as well. But it's just really like ...just I am the type ... I have to do something over and over. Once I do something over and over, it helps with my memory. Rote memorization works really well with me. That's why I love Math when I was in school 'cause I was like, ok, once you get it, memorization is really easy. Memorization, just remembering it, is my favorite strategy. So that's why I try to make it my own, so I was like, ok let me not use what the presentation gives, but make up my own story to help me memorize.

W: Then do you spend time evaluating your strategies?

S: Yes, Ma'am. All the time. We have unit test so often and then I know based off my scores I am like, this works and this definitely did not work and maybe I should focus

more 'cause with my last one [last test], my multiple choice answers were all correct but I was still missing details with my translation, so I know I may need to work more on certain patterns now and then, on certain specific words 'cause I usually do very well on my vocab tests, but when it comes to big actual test of everything involved with actual monologues and dialogues, that's where I start to fall apart. So, I know I need to focus more on sentences and structures. I have no problems with individual words, but when they are in bigger context, something I've never heard, I get really confused 'cause I put the words in my own way, like, "ok, this is the way it should go." So, when that changes, it really messes up like I know what these words mean but I am not used to the new pattern.

W: What advice would you like to give new students about how to study Chinese vocabulary words?

S: Don't come here with the wrong mindset. I thought coming in here it's going to be easy to do this, but it's very hard. They are gonna to know that you are gonna have to change what you do to study all the time. There is no real one method that works. So really focus on the basics cause if you had a tough time at the beginning so now I am really struggling. Now I am getting it together more but the basics were the hardest for me 'cause I didn't focus on that as much. So definitely focus on the basics. Learn the radicals and I have heard learning the radicals really helps a lot. Well, I can't personally do it, but I have been told learning radicals is great. It's hard because I have got some friends in class... they can understand like if a radical is in certain place it means something. This is how you understand it and this is like the sound of it, the meaning behind it. I can't quite grasp it just yet. I understand some of the radicals but they know every single radical 'cause I think they know the chart [radical chart] more than I do. There is a radical chart that we were given. In the beginning, I didn't really pay attention to it. I never thought it would like come handy much later. Now I am like starting to grasp it now, but it's a little late … it's not too late but I am just a little more behind for it.

W: Do you have any other strategies that you would like to recommend to them?

S: Just get the basics down. That's the main thing cause the radicals in the ... you are going to see some words all the times so those are the main ones. When you learn a new character, know that character very well 'cause Chinese uses that one character in many different aspects and it can really help you out. Sometimes they shorten it down to just one character and it is really helpful if you know like all the characters and have a good understanding of the foundation of the characters, you should be alright. Practice writing characters over and over again. Learn the stroke orders 'cause stroke orders really help a lot. I don't understand the science about it, but every time I like follow the stroke order that my Pleco shows me. It actually does help me very much 'cause Pleco can quiz you for the stroke order and it just helps to get the stroke order down and helps you memorize the character more.

W: How often do you write the characters?

S: Not so much as we used to before 'cause in the first semester we had more homework that was more … we had to write out different sentences. It was more grammar based. Now in second semester, we are mostly just writing English, answering questions. But I still try once in a while like during studying the new vocab, I definitely will write down every single character every time. For each character, I would write at least ten times if not more.

Interview for Student 4

W: How do you study the new vocabulary words in your textbook? Can you show me with examples?

S: So, my teachers are having me doing this thing now. Whenever we read, so anything I don't already know, and I usually try to use long form. I accidentally use short form for this one. But basically, like we go through and highlight the ones we don't know and then we write them out, the pinyin, tones, and the definition. And this is actually being the most helpful. My vocabulary scores improved dramatically just from doing this. Before this, I had like a 3.1 GPA. I was doing like high 80s on unit test and stuff. Um, my vocab. quizzes were usually like high 80s, mid 90s. And then I started doing this and I have 3.5 GPA now. Pretty dramatic increase.

W: Can you take me through the process how you study the vocabulary for the lesson that you are going to study, say, tomorrow?

S: Yeah, absolutely. I want to show you one of the newer ones. So, let's say with this one. So obviously, you start by reading these, and then you listen to them, and you read them and listen to them again. That's what I would do. If I'm reading, "xiao jie, wo xiang ba mei yuan huan cheng ..." [Miss, I want to exchange American dollars into ...], I didn't know what this was then "huan cheng" [exchange into], so obviously you highlight that, and then you just keep going. And then once you get to the end of the presentation, and you know what you have to do. I bring up Pleco, and Pleco has like a stroke order test. So, I use Pleco to teach me the stroke order on it. And then, yeah.

W: You don't use the vocabulary list to study?

S: Not really. Well, I have the big grey book they gave us. That has each lesson broken down and has like practice sentences and stuff. I'll use that before I use the back of this book. But Pleco has all the units broken down by presentation as well, yeah.

W: How do you use Pleco? Can you show me?

S: Yeah, absolutely. So, this is actually pretty neat. So with Pleco, um, I can go to, actually … just added some new features so, ok, card categories. So I have the first five units, and then it's just like free to go download the rest of the units by semester. So once I finish semester I, obviously, I put Semester II there. Yeah, so once you like ... so I am in Unit 4. So I hold the arrow down, and then it has all the different lessons for me. So, um, next lesson is 21, At the Post Office, so if I ... I can even break it down into proper nouns, and by presentation if I want. Usually I just do the whole thing.

W: Can you show me how you study the vocabulary using this?

S: So typically, after I do the lesson, after I do these, the presentations. Then I have a pretty good understanding what they are. So I would go in once and you know like … this is "dan zi" [list] and then you've got "jiang ke" [teach]. So I just look at the characters, and then definition, and then I read the practice sentences. This gives you some idea what it looks like in context. If I struggle with one, like just now, I would read the sentences because I couldn't figure out the "jiang ke" [to teach]. But, um, then after that ... after I do that, I actually have another thing that I recently added where you can do fill in the blanks. I think that's the one and then begin test, and then that's "chu" [get out]. I can check the Pinyin by filling in the blanks. These are the two functions that I often use. I have some other functions there but I haven't really played around with them yet.

W: When did you start using Pleco to study vocab?

S: Um, I have been using this since the beginning, but only just this week that I upgraded to this new version. On the old one, I could do the flashcards like I was showing you but on this one I am able to like ... it gives you a more involved test. Instead of just flipping flashcards, right, you have to actually type in information. Does it make sense?

W: Yeah. It does. Then how do you study the sound, shape, and meaning of the new characters?

S: Usually by writing my sentences. Yeah, I have like a notebook that I keep in my desk in my room, so if I have an especially hard time remembering the pronunciation or something, or how to write it or anything, I'll try to write it out … like the character out for remembering. But more often than not, I have to look it up a few times before I am able to really remember it.

W: Do you have any special techniques that help you memorize the characters?

S: Um, I did ... there was a website they gave us, like, they gave us like a hundred radicals and so yeah, I went through that in, yeah, over the holiday break we had. I just focused on learning radicals and then yeah, but then unfortunately with that, I started only want to write in long form because, yeah, it's told that it had more of the radicals in it.

W: So when did you start to focus on the radicals? From the very beginning?

S: No, I went through two unit tests and then um, actually it was xx Laoshi (Teacher xx) asked me like what my study techniques were for the characters. I was like "I just write them a bunch." And so she gave me a bunch of radical resources. She e-mailed to me. Yeah, so I use those over the holiday break.

W: How did it help you?

S: It's night and day difference. It became a lot easier to remember stroke orders and how to write characters stuff.

W: Before that, did you pay attention to these radicals?

S: No. I mean, every now and then the teachers would write it on the board, like break a character down for me. But even before that, I went to study hall once and I was ... I couldn't remember how to write "da pai qiu" [play volleyball]. And then the teacher wrote it on the board, and then I was like "what's the J radical in it? " [the character for "play" has a hand radical that looks like the letter J] 'cause I used to hit-and-run a J ball, and I was like "They have names? The little parts have names? " I also use stories to memorize characters. Like "zhi" [to sense] in "zhi dao" [to know]. It looks kind like a guy trying to remember something. I try to do this as often as I can, but sometimes it's like with "huan" [exchange], I just couldn't come up with anything for that.

W: Do you use radical knowledge more or this kind of technique [creating stories] more?

S: Oh, I use radical knowledge more recently. Before, I tried to memorize them by individual radicals, um, I definitely tried harder to make stories out of them, but even then, like there were some ... the story like this one, like I will probably never forget how to write that for as long as I live. But yeah, some of, like, they just didn't click for me.

W: You mentioned that you write sentences to help you memorize characters, so how often do you do that?

S: Usually it's with the grammar pattern, the grammar words. Or words that I'm just having a particularly hard time with remembering, like, "ti kuan" [to withdraw money] was the one that I had to practice with a lot 'cause every time I wanted to translate something we had to use "kuan" [money] in this lesson, but I always wanted to use

"qian" [a less formal way of saying "money"]. I have a notebook with words and sentences and it's about half full now.

W: Besides your textbook, what additional materials do you use for vocab learning?

S: Um, I just recently found this Fluent U thing [Chinese-learning website]. Um, it's just like these little videos ... there is one video where they were trying to give directions and the whole video is this guy asking for directions to get around town. So, they are using "dui main" [opposite], "hou bian" [behind], and all that stuff, so listening to it, kind of like seeing it acted out helps me a little bit. Sometimes, I just come in and just start talking at my classmates, try to get them, like, buy into my nonsense. And so I feel like that helps me with my speaking. But yeah, like seeing little videos well, like, ... it's like in actual playing out the events and I can like see what they are doing. That can help a lot.

W: How often do you do that?

S: Not too often 'cause I have a hard time finding videos that are exactly what I need.

W: What about TV shows?

S: I was watching this show called *Love is Beautiful*, but lovey-dovey romantic shows aren't really my thing. So I had to stop. But I do watch "mei hou zi wang" [Monkey King]. I have only watched two movies they have on Netflix, which was, I think ... was *2013*. It's kind of like retelling from the beginning and then they had a sequel to it. It was like *Conquering the Demon*. That was pretty good.

W: Does that kind of materials help you with your vocab learning?

S: Um, it doesn't really help me with like old vocab, but it teaches me some new words.

W: When you see some new words, what do you do?

S: Well, so I pause it and obviously, I want to keep watching the movies, so I usually ... if I hear a word and they are using a sentence I would normally understand but they are using a different word or one that I just don't know at all. I would just stop the video, and write it down real quick and then probably just to figure it out later. I have a little purple notebook that I keep with me and I write the words in this notebook.

W: How do you review and consolidate the vocabulary words that you have learned?

S: Usually Pleco, reviewing the grammar book and homework. It's just the same thing I do normally. It's just all about when you come across something that you should already know and you don't remember it, you just have to, you know, re-solidify.

W: How do you prepare for vocabulary quizzes?

S: A lot of writing, yeah. On some tests, I write every single word. I tried to get my roommate to read off but he is not in Chinese, so I can't really understand his pronunciations.

W: Do you try to get help from other people in learning vocabulary words?

S: Um, yeah, I had three classmates ahead of me in class, so usually I have a question, I would ask them first. And then they will write the character down for me or like just describe it to me so I remember it. Usually we do this before classes or between classes whenever we have time.

W: How often do you do that?

Um, there is usually something I don't understand about once every class, so probably six times a day.

W: How much time do you spend on studying vocabulary every evening?

S: When I get out of class, um, I just kind of stay in my room until sun leaves, so probably like two hours or so I just don't touch school stuff for my sanity. And then I get

out of the chaw hall like 18:00, so from 6'oclock to 10, so four hours usually. Four hours, like an hour and half for vocab, like an hour to do the homework. I study all the words at one time. Someone told me that I should try and do it by presentation because then there is kind of like a theme to the vocab, but I am kind of impatient, so I want to know all right now.

W: So, then what activities do you use to practice using the new words you have just learned?

The teachers gave us these PEP-speaking forms [a set of activities for speaking practices], and they have all the different talking points that make us use all the vocab. So, I just, I read it, I ask myself questions and then I answer my own questions. That's usually part of my vocab practice. I specially do it, ... like I started doing it a lot probably within a week of like mid-unit or something. Like if I know that unit test or something is coming, I add the speaking portion to it. Yeah, I definitely do that.

W: What vocab strategies did you find most useful?

S: Um, honestly, just review for the most part, just using the flashcard technique and filing-in-the-blank test. Uh, I found listening helps a lot, like using the ... I guess the presentation, but usually the listening book 'cause it'll give you a breakdown of what vocab is in that, like, I guess, section of the listening book and then I should have known this at first, but as it goes through sentences it gives you the vocab that is going to be used in the sentences, so you just listen for it.

W: So, then do you have any advice for new students and, you know, in terms of vocab learning?

S: Yeah, everyone is different. So, um, it's possible that there is really nothing I've said here would be helpful to another person but I do know that as long as you have even some minor interest in the Chinese culture, there is something that you can use, so I had to look pretty hard to find mine, but I mean I would just do what your teachers say. So if you at least do the school assignments, that's like a starting point. And then you can, from there, like... like find what works for you the best. I had no idea that I was this kind of learner with the highlighting words in the presentations. I had no idea that would work for me. I've never done that. And then my teachers made me do it, and it worked really well for me. Highlighting the ones that I didn't know, write them, define them, all that. I had no idea.

W: Any other suggestions?

S: Yeah, don't play, don't play around Monday through Friday. Be all about school or Sunday through Thursday, I should say. It should all be about school. At the beginning of course, they are gonna hear about all these apps they can download that will help them out. Pleco, Skritter and VOA, get all of them, and get all of them if you can. And especially considering the school supplies Skritter to you, which is invaluable, it's like an app that teaches you stroke orders and like tones and everything. It's pretty great.

Interview for Student 5

W: How do you study the vocabulary words in your textbook? Can you show me how you do it?

S: How I started studying vocab versus how I study now has altered significantly because the pace has picked so rapidly. So, for example, every day we are more or less responsible for learning somewhere between 20 and 30 words, um, so the primary tool I use is Pleco. I am sure you are familiar with Pleco. Uh, so, for example, if tomorrow we have class, we have a new lesson of vocab that morning for a test. How I usually go about learning …we have presentation that covers each lesson's vocab, like I said that those 20, 30 words. We have a corresponding listening exercise as homework as well and then it's just studying by yourself stuff. Me … primarily I will just usually read the presentation first with some minor glancing of vocab, so for example, I'm reading it and I don't recognize this word, I'll scan it, check and make sure to pull out that vocab, mark it and come back to it later. So, after reading that presentation and understand how each one of those words are used in the presentation with the nouns, the verbs, and what significance they play, etc. Uh, usually I do that listening exercise. The listening exercise borrows heavily from the presentation. It has not so much copy-and-paste sentences but very similar sentence structures using very similar subjects and actions, uh, which helps me because using these vocab helps me get an earful. So, after this point, I have homework down. Usually I save studying the new vocab last of the day, usually by about late evening. Uh, I actually go through Pleco and test myself. At the point, I've already seen the vocab and I more or less have associated a lot these words with sound because I did the listening exercise. So, in addition to being able to ... not all of them are first-time go, say we have 25 words, after this method, I can usually get about, I don't know, 15 of them and the other I am still a little bit shaky on because I only saw that one time or listen to that one time. But I found that subsequent times, you know, you have to go through it five, six times. So it helps cement it a little bit faster. I use the vocab list to cross check because Pleco as handy a device as it is and time saving as it is … flipping back and forth is not really as effective as just pressing a button, plus as much as I hate saying it, if you look at the words in order ... I've learned this back in college, you'll sometimes associate the word with like where it is in that list with meaning, so for example, you look at this right now and you say "yan lei" [tears], I can cover up right not, I can recognize ... I can see that character and not know what that character means but I recognize that somewhere around here there was "yan lei," so that doesn't really help me. So, if I could randomize this list, that would be more helpful but because it is obviously set in stone in this [in the textbook], you can't do that. Now what I do use the book for is to make sure to know the books' definition because Pleco... because I feel like it was created possibly by an alumnus from here and they are not always 100% accurate. So, I do use this for accuracy measures.

W: How do you study the sound, shape and meaning of the new characters?

S: The sound, again, ... I go through them first and foremost. That's what I hear first. Secondly, because Pleco and the book, for that matter, they offer the tone marks, the Pinyin, so for example, if it's third tone "yan" [eye] and fourth tone "lei" [lei], so it's "yan lei"[tears]. And then each time I pull up this flashcard in Pleco, I say to myself a couple of times. For one, build up that listening and character association, so when I see that character I can kind of mentally think that sound but also because I can practice saying it. Um, usually I'll say three or four times, if I really can't, I try using it in a couple of sentence examples to kind of solidify its meaning to me. Uh, then for the shape of the character, there are a couple of methods that I use for that. One is more or less just

associating a character that I know I have seen before with that, so for example, I may not have seen ... I'll use "yan lei" again, uh, "lei" [tears] I haven't seen before, but I have seen "yan" [eyes]before. I have seen it in "yan jing" [eyes], a lot of different words. That builds up an understanding of the word, at least knowing half of that word. If I've never seen a word before, I'll pull up the definition and it's like "how am I gonna understand this?" I try using a picture more for this. I try to more or less create a story based on what I can see. This is kind of problematic though because obviously traditional and simplified do not have the same picture, so if I am looking at the traditional character, I come up with a story for it based off of the character for it, I ... then switch over to simplified, obviously switching from traditional to simplified is easier than the other way but if they [the switching] cut out whatever I used in that picture now I'm in hot water. Uh, so usually I try to look at both the simplified and the traditional to see what they have in common, uh, trying build off that, but as much as I hate saying this, it is not hundred percent foolproof.

W: What about radicals? Do you use radical knowledge to help you with your learning?

S: Some people can. I ... do not pick that up well, but I do know some simple ones, for example, the rice radical and the hand radical, the speech radical. Um, great example, we have a classmate who previously studied Japanese. He is really good at writing Hanzi [Chinese characters], all that stuff. He is very adept at picking up each one of those radicals and their meaning. Me, having coming from studying romantic and Germanic languages, not so much. And it's one of those things like I could start over and start xx[the program] over and done it differently knowing what I know now, yeah, I probably would give it a lot of more time to studying that way. But because we are way too deep in and the homework load and study load each night, you just don't have time to go back. Obviously if I went back and did the homework they assigned us, then now I can probably knock out that homework like 20 minutes because you know, it's like " ni hao ma" [how are you]. But back then, it's like I don't know what they are saying, so obviously that very simple stuff takes an hour, two hours and you got to study for those, I've mentioned, vocab tests. So, you basically, at least for me, focus on what's tangible and what's tested and as much as I hate saying, what you feel is going to be vital. So, for example, writing. A lot of students around the school have mixed ability in writing Chinese characters. Why? because, like or not, our job is not based on writing. Our job is strictly based on the recipient information of hearing and reading. Yeah, things like the radicals, again, are extremely helpful for learning the language? Absolutely, it's just more of a sub thing that I do not acquire the time to take up to learn. By the time I realize "oh, wow, this could have really helped me," we were way too deep in it [in learning the language].

W: Besides the textbook, what additional materials do you use to help you with the vocabulary learning?

S: Besides the textbook, I obviously use Pleco too. Are we strictly talking about the course vocab or supplementary?

W: Supplementary too.

S: So, what I try to do is ... we often go over authentic materials. These authentic materials often have course subjects like science, politics, etc. usually I'll try to write a lot of the words down, just real quick notes, usually just in Pinyin so I can go back later. I have a device called Anki [flashcard app]. It is a little spaced repetition system recreating

your cards based on how well you know. It'll show you it in two days or ten days. I'll use the system based on these supplementary words that aren't in the book or at least not in the book yet. I'll try add to that Anki system so in addition to the course materials I am still picking up something supplementary material. There is a drawback. The more words you add, the more quizzes per day. When you are in a very time-constraint environment like xx, it's really ... you need to be finishing homework and finishing studying at 9, 10 pm at night and look at your Anki deck saying "oh, you got a hundred words to study", I'll pass.

W: Any other additional materials do you use?

S: Well, I'll start with news because its' probably what I get the most exposure to. Uh, the news primarily come from in-class assignments and homework assignments, primarily ...Uh, you are familiar with GLOSS [extra materials for learning Chinese], I am sure. GLOSS, FLO material, the random YouTube assignments such as CCTV or Voice of America Chinese. Uh, because this far the course material is workable but it's also a good way to learn, and I do try and soak up as much information as possible. Now as far as going out of my way in my own free time, it's really hard for me to admit that I don't watch as much Chinese media as I should. I say that knowing that's a drawback but unfortunately, we are so lacking on free time that, say, on a given weekend you finish all the required course work, the first thing that some people think … some great students will think is "I'm going watch a Chinese movie." My brain needs to recoup. I, unfortunately, do not watch as much as I should. I'm trying to get on Netflix to find some strictly in Chinese movies to watch and hopefully binge watch but it's really hard sometimes. It's really hard to force yourself to keep going when you get that one-hour break.

W: I understand. Then how do you review and consolidate the words you have learned?

S: So first of all, we have talked about the Anki thing. The Anki thing, um, uses spaced repetition thing, so if I say "dian nao" [computer], which is used as an example, if I first put it in, I say it's good and it'll show four days later. If I say it's good after that, it'll show ten days later and then twenty, a few weeks and ten months. But it'll keep coming back. So, basically, it tests how far it's cemented in your memory. So, if after 50 weeks, I see it again and no clue, I hit it again, guess what, it can quiz me on it tomorrow. So basically, it's based on how strong your memory is on that word until it gets bashed into your head and you will not forget. Uh, so that'll keep bring up old vocab that I previously supplemented. I constantly ... I started to use Anki before the New Year … I still see the same words I first input. In addition to that, I already mentioned that we have a vocabulary test every day. We also have a review vocab test every afternoon. This is kind of love-hate relationship, but on the one hand, it's good because it forces you to review that vocab. The problem with this is depending on how much vocab that is, it puts a lot of strain on you. Sometimes it's just one-presentation worth, so you're talking about 30 words, 50 words. Sometimes, it's a fourth of the whole unit, 80 words, not the worst in the world. Sometimes it's the whole unit worth, then you are talking about quite nearly 400 words. That's a little bit heavy, especially in one night. In addition to that new vocab, you have to learn because that's going to be basis that the entire next day's lesson is built on. Um, basically, these two ways I've tried to stay sharp on vocab. Well, that being said, above anything else that cements vocab into your memory, at least I feel, is usage.

W: Speaking of usage, what activities do you use to practice using the new words you have just learned?

S: Mostly just classmates. We're each other's greatest strength, honestly, I'm not even trying to be fluff them up or anything, but me, for example, me and some classmates would go to beach or ... a few weeks ago, we went to a shooting range out in the Watsonville and we were trying speaking Chinese as often as we could. Oh, great! Our levels of Chinese vary dramatically, so sometimes I would say something and one guy with us would be not picking it up quite fast, and then the wiz kid of the class would say something, I would be that guy who is not picking up quite fast. Um, basically, speaking with each other both in and out of class in Chinese as much as we can of course. English obviously would break in every now and then but as much as we can. Um, one, it does cement that vocab. Two, it helps learn new vocab because like that wiz kid … he is using new vocab and he'll tell me a word that I don't know, I'll look it up on Pleco and I was like "um, it's interesting. I should know that." And it also builds up the flow a lot better. A lot of people are really hesitant to speak because they're stumbling over their own words. It's a lot easier, I feel, when you're speaking to a colleague than, say, a teacher.

W: How often do you do that? how long each time?

S: Every day. It varies. For example, I saw that wiz kid …I just call him wiz kid. I saw him at the library last night, you know. Well we were doing homework side by side, we were just occasionally asking how we were doing or if we were having any problems, and again, only use Chinese. When the library closed, we left, and one the way to our barracks we were still chatting. Some of them were in English but we were still trying to use Chinese.

W: How do you prepare for vocabulary quizzes?

S: So obviously studying the night before is crucial. Some people can study in the morning. I feel like that's a really bad idea. Um, I feel if you can get a grasp of all the words that you are studying the next day beforehand, when you sleep … I don't know how to very well word this … I guess it kind of rests in your brain. I found that if I study something over and over and over, over time, I fatigue my brain. But by sleep, the next morning I wake up and I review those words. I am remarkably efficient in remembering them.

W: So how much time do you spend on studying the vocab every night on average?

S: Uh, for presentation, I would say, takes about … I don't know… 20 minutes, 30 minutes tops. The listening book, they are usually about 8 sentences but usually because some... a lot of alien words you have to listen to three, four, five times, which actually helps. You're hearing that word more and more. Uh, so we'll say that's about another 30 minutes. That's an hour right there. By that time, later on, you're going to have to be studying the words on your own in Pleco or vocab book if you are more for tactile learning. And that you can spend anywhere from, I'd say, for me, it'll be average about another extra 20 or 30 minutes that night. Then later I go to bed, I try not to think about it. So yeah, wake up that morning and I'll hit studying again.

W: Do you try to get help from other people in learning vocab?

S: Yes and no. I ask what people do, more out of interest rather than help. I especially like people who are doing really well or really poorly. For the ones doing poorly, I can go "ok, well, why do you feel like you are doing that way?" It's more like kind of to help them. The really good people … I ask "how do you remember all the stuff?" Like one

guy, that wiz kid, he can remember some arbitrary word that we've never used but once, he still remembers it bright as the day several months later. I have no idea how he does it. I asked him and he just says "I do this with that" so I was like "I would do that if I had that time." It's just one of those things ... maybe he is faster at doing homework but between homework and studying... I ... there is just literally no time for me to try it. I am sure it's effective tool, again, it goes back to that thing, if I could do it all over again, I would have changed my strategies remarkably.

W: Interesting. Can you elaborate on that a little bit more? What would you like to change if you could start over?

S: Well, let's put this way. We had a kid not too far long ago, who unfortunately got med-cycled [to be held back to a lower-level class due to medical reasons]. He had an accident so he started in Unit 2. Before he got med-cycled he was in Unit 6. So, to give you an idea, each unit has about between three to four hundred vocab, so for him to go from Unit 6 to Unit 2, starting over again and knowing what he got to learn, he had significant advantage compared to the rest, so, say, if I broke my hand tomorrow and get recycled, one, I'll focus a lot more on writing because I do believe that writing does help cement the memory of characters a lot better. Um, unfortunately my writing skills are very poor because I never grew up learning an Asian language. I'm not being fictitious, but just learning how to write is an incredibly slow and painful process. Um, I'll definitely dedicate a lot more time to that. The second thing is I'll start off learning traditional because when we all started that one guy he foresaw it coming. We all for the most part focused on the simplified, why, because it's easier to remember. Um, so basically, I had to go back and relearn what I already learned in traditional, which is very time-consuming. So if I could go back over and do it all over again, one, I would change my study strategies. Two, I definitely write and study traditional more. Three, because you got to do that Unit 2 homework, when you got accustom to doing Unit 8 homework, you can knock out relatively quick. I'll dedicate that free time that I am used to spending on homework and I'll probably invest more into, say, watching VOAC or reviewing GLOSS material or watching *Chairman's Bao* [online Chinese learning resources] … something like that.

W: So far what vocabulary strategies did you find most useful?

S: Um, probably usage. If you can learn how to use and subsequently use it …our teacher actually said … our teacher is very phenomenon when it comes giving you ways of storing information. He said, "if you can find a way to use a single word in three sentence examples to yourself, your chance of memorizing it goes up significantly." Um, I found, not a hundred percent, but a great amount of the time, it generally really is the case.

W: Did you do it?

S: It goes back to that time thing. When you have to create three sentences for 30 words a day, you'll cut corners. Um, if there is a word that I just can't remember no matter how many times I look at it, yes, I usually try to. If there is a word that I feel I usually get a grasp on pretty quick, I usually don't.

W: Any other favorite strategies?

S: Other than the previous kind of routines I mentioned, not really. At this point, it's, I hate using this term because ... but it's very much sustainment strategy. I have been able to add more incoming vocab because unfortunately it's a "sink or swim" situation at xx, so at this point, you just got to sustain what you've already learned to the best of your

ability, of course. You do lose stuff along the way as much as I hate saying it. While simultaneously being capable of adding more vocab, you can't focus solely on reviewing it and solely focus on new. You have to find a way to do both to the best of your ability.

W: What advice would you like to give new students about how to study Chinese vocabulary words?

Are we say new xx [name of the school] students or just new students in general? The reason I say it because I feel like the typical students tend to go on their own pace or regular college pace versus here. Night and day. But like I tell people back at home, like my four years in college was way easier than the 8 months I have been here or 10 months, way easier. For the new students here, one I'll tell them to focus on traditional because first and foremost, the xx [end of course proficiency test], our capstone test, tests how much we learn basically, will focus heavily, if I remember correctly, about 60 or so percent on traditional characters during the reading portion. So, it would behoove any newcomers to study that. Two, I'll tell them to try their hardest to practice writing, at very least, simplified. Obviously traditional will be a deal but that whole time-crunch thing comes back and bite us. Um, what else I would tell them. Also I'll just try tell them try maintain interest in the language. It's really hard and I hate saying this. Some days I feel this way it's really hard to see this language learning as just a job. The people who do the best, almost 100 percent of the time, are people whoever have genuine interest in the language, the culture, the history. And also, I would advocate to new students to … there is a little sheet, I am sure they can find the thing that has like all 200 or some radicals and basically their meaning or at least association. Tell them not to memorize the sheet because that's going to ask a whole lot from someone just starting out. But whenever they learn a character or get a new character… I think when they start they'll be getting about, I don't know, maybe, 50 words a week at most. Whenever they get a new word, I would advocate to them to have that radical sheet nearby, trying to associate the radical in that word with that. So that way, they are seeing how it comes into play, if that makes sense.

Interview for Student 6

W: My first question for you would be how do you study the new vocabulary words in your textbook? Can you show me with examples?

S: Honestly, I don't look at the textbook anymore for vocab. I use Pleco, um, but first, I go to the list of the words. I look through them, and first I look at the Pinyin and then I look at the character and the Pinyin, try to find the English meaning, so it would be check-look and then try to look at them again, say the Pinyin aloud and then go to the next word.

W: So you mean you look at the list from the textbook or from Pleco?

S: From Pleco [vocabulary learning app]. This is actually for reviewing presentations, but [it] shows you the vocab list. It organizes it by presentation, by lesson, by unit. Here is Unit 9 we just did. This is what I just did. [I] start with the top [selected a word] and I will go into to see how it's used in examples and try to relate it to English the best I can. That's how I do it.

W: Do you always read the example sentences?

S: If it's not super self-explanatory, like, "cha kan" [to inspect], that one looks like it's easier to remember but this one is harder to remember, so I look at the example sentences. I read these example sentences aloud and then I go down to "ji lie" [fierce]. Actually I don't remember this one, so I look at example sentences. Um, sometimes, as I'm going through these, well, ok, I'll go through these and I'll start flashcard rotation and go through all flash cards once. Um, and then when I go through them second time, I put, if I still can't remember the word, I put them in another folder for words that don't really stick ... so, see I probably got that ... and these are words that still won't really stick. Um, and I do like that. That's how I do, like, for the list.

W: Then what do you do with the "trouble vocab?"

S: I just keep them in the list here, and then I am reviewing. I honestly don't review as much as I should, but I go back and look at the vocab and I'll look through like this and then I'll go through and start off flashcard test. And, um, if I remember it very easily by now, I'll take it off the list.

W: How do you study the sound, shape, and meaning of a new character or word?

S: A lot of it is association with English for the meaning and then I associate the meaning with the radicals or pictures, um, and then, I have to associate the sound with the character. Let's see, like, "xiang" from hometown [the character "xiang" is part of the word "jia xiang," meaning hometown], if I'm trying to remember the traditional, then I see the "xiang" in the left side and I know that from the simplified. That's how I'll connect the sound to the meaning. That's easier to do with the traditional. Um, like this one "lian xu bu duan" [continuously], I see "xu" like "ji xu" and that carries meaning for me for "continuous."

W: How often do you do this?

S: Um, every day we have vocabulary quiz, so about half an hour before ... the night before, I'll do it. And in the morning when I get 3 minutes or 5 minutes, I'll keep going through the vocab ... up until the vocab quiz. And as part of our homework, we have to read the presentation ahead of time.

W: I saw that you highlighted a lot of words [the presentation shown on Pleco had many words highlighted]. Can you explain that to me?

S: This one was a really difficult presentation but I, um, before ... the night before, I went through and I highlighted it in categories. Um, the blues are the name of the country, the pink is the important phrases like nuclear test. You'll hear that a lot [from the presentation]. Um, the orange is "cheng yu" [Chinese idioms] and there're a couple of them next page. And then the yellow is I forgot these words or I can't remember these words. Um, and then these are just what I wrote down in class, like extra vocab that teacher mentioned. And the homework part is we have to, like, bracket and write little summaries in the margins of what each part of presentation is about, so I did that and this [pointed to an acronym] ... 'cause I have trouble with acronym sometimes, like, political acronyms like "ASEAN" (Association of Southeast Asian Nations), so I wrote up the full name underneath it.

W: Earlier you mentioned using radical knowledge, did you use radical knowledge a lot?

S: I didn't study radicals very much, but I kind of ... I do have good memory, so I picked them up as I went along. Um, most of the time, it's actual, like, the actual word that radicals are and what they mean, sometimes, it's just like, oh, that [pointed to a character with a radical that looks like a fish] kind of looks like a fish, I don't know, oh, it kind

of ... it looks a little like a fish. So just kind of use your imagination for it. I guess it's kind of supposed to look like a fish. Um, a lot of it is just straight memorization 'cause I remember facts very easily. So I don't write characters very much. that's just kind of ... It's slower for me to do that but I know one of my classmates ... he writes a lot. Yeah, one of my classmates, like, in class, he'll just write down characters over and over again to prepare for the next day's vocab quiz.

W: Does radical knowledge help you?

S: It does. Sometimes, it's a bit of a stretch. Like, if I see something like the roof radical with "dian" [dot] on top, and then I think it means valuable, right? So I have to use my imagination, oh, I guess some people would see this is valuable, so ok then it works.

W: Besides your textbook, what additional materials do you use to study vocabulary?

S: Um, just Pleco. Pleco is life saver for Chinese students. I honest don't know how other languages do without something [like this]. But when I was studying Latin, I would just look at the list over and over again, and I write the vocab list a couple of times. I would use colored pens a lot just because colored pens are more interesting to me. It catches my attention more than pencil. Um, Pleco helps mostly because it's already all there versus memorize or, um, I don't even remember what other ones [other apps] are, but you have to add flashcards. You spend that time adding 53 cards per presentation every single night. That's going to be half of the time we spend on the homework. So, in the beginning, I tried making flashcards. I made flashcards for probably like six or seven months, yeah, I made hand-written flashcards and I write traditional on the front and then simplified and Pinyin and English on the back, but it got to a point when it ... it got it a point where it was every three days I was doing about 60 vocab cards and that was getting to be too much to do on a regular basis so I just solely relied on Pleco. It's already there and you can so easily make vocab lists and move cards around.

W: In additional to Pleco, what other materials do you use?

S: I like watching modern dramas in Chinese. I use these materials just for review. I look for words I know and try to gist as much as I can of it even though there is a lot of other vocab words I don't know. People have like accents, um, that's just reviewing and trying to be accustom to speed and accents. That's most I use it for. Um, sometimes, if I can tell that there are a couple words in the sentence that are very important to the meaning, then I'll look those up and put those in a new Pleco folder so that I can go back and look at them later. It's a [the folder for supplementary vocab] little disorganized now but I've got several folders that are supplementary. This is for GLOSS [Chinese learning materials], um, here several supplementary ones, here are some random stuff. I started the system but it's not that organized. Like the words I'll be applying in my life, um, like, I don't know, I probably gonna just have to describe someone for xx [the speaking test that students take at the end of the course], so I can describe by saying "she has this many tattoos" or something. So, I may try to put that [the word "tattoo"] in there.

W: How do you review and consolidate the words you have learned?

For a lot of the course, I'll just review three days before the test and I'll just go ... and start at the very beginning of what'll be tested. Like, if we are tested on the first half of the unit, I just start the beginning of the unit, and just go through lessons presentation by presentation of vocab in Pleco and any words that don't stick I put them in the Pleco "trouble vocab" folder that I have and I'll just review that vocab over and over. I don't review the old vocab on a daily basis. I'm trying to start reviewing more 'cause we all get

to the point where there're even vocab words from Unit 2 that we are forgetting, like, I forgot "ming sheng gu ji" [historical sites] the other day, which was in Unit 2, but I'm trying to get that as more of a habit into my daily routine.

W: What activities do you use to practice using the newly learned vocab?

S: Um, classwork helps. Um, after you take the vocab quiz in the morning, you go through the same words over and over all day in class. And then sometimes I'll go to YouTube or something just, like, search for, I don't know, say "nuclear test" in Chinese and then just look for news reports or something about it. And that's not really to learn new vocab. It's just to try the gist and then hear that word and hear things related to it and try to get the big picture. I don't talk about stuff much. When I do talk in Chinese outside Chinese, it's casual small talk. So, I don't talk ... there is a lot of vocab I don't use outside of class in speaking. Um, when I get time I want to start using it more.

W: How do you prepare for vocabulary quizzes?

S: I just, I study like 30 minutes the night before and sleep on it. I just ... I look at the vocab list and I skim the presentation. And then I look at the vocab list in it right before I go to bed and then I sleep on it, and when I wake up in the morning, I review the words again. It's like ten minutes I can go through Pleco on the bus down here, and we'll be there for 5 to 10 minutes before class starts, and we can keep looking at Pleco until vocab quiz.

W: Do you try to get help from other people in learning vocabulary words?

S: Uh, I am a little obnoxious about it. I just ... basically just, like, [say the words]to my roommate. She is really tolerant of it. I'll just kind of like, say them [the words] out aloud and then I'll be like, "hey, um, 'he shi yan' (nuclear test) or something." I don't know. Um, she is ... basically ignores me, but it's just like say words out aloud or like we all will be sitting here and we'll all just say the words aloud ... just to say them ... just to hear them. My roommate is going to graduate beginning of April.

W: How often do you do this kind of activity?

S: Maybe out of like ... maybe like 20% of the words I do that way. She [her roommate] just goes on with what she's doing, like, cleaning or whatever.

W: What vocabulary strategies did you find most useful?

S: Um, flashcards, Pleco flashcards. I am good at memorizing facts, so I memorize a lot. I don't play with words much like writing them or trying to have conversation with them. I don't write them when I use Pleco flashcards. That's the one I use now. I stopped writing flashcards probably when we started Semester II or before that. Before that, I've got a box probably like this big [showed the size of the box with gestures] full of flashcards. It was helpful at the time but it just got to the point that it's just too much you can't ... all the supplementary stuff you are learning everyday ... you can't write it all.

W: Any other strategies that you like?

S: Um, I don't use this too much anymore and I just write it [words] in my book through first semester and most of the second semester, I had a composition notebook out at my desk all the time. And whenever we came across ... my teacher said a new word ... like, just a simple auxiliary word or, um, an important noun or something, I'll write it down in the notebook to look at it later and I'll put it into my Pleco file later or make a flashcard of it or something. Um, I've learned a lot of extra words like that or if there's something about grammar that was brought up, like it should be pronounced this way not that way, you can use the word in this context not that context, I write that down. And if it's just

simple things like that, just writing it down I'll remember it. I don't have to go back and look at it. So it has a lot of random notes, like TV show recommendations, strategy recommendations and stuff. It's kind of like a dump box for what I hear in the classroom. The one I used in first semester is almost full and I got a new one when I start the second semester just because the old one looks old. I don't take a lot of notes any more. Um, I've gotten used to the language, and a lot of things about grammar or context I'll remember it now. Like, today, I learned that ... I tried to use "zhu yi" [pay attention] as "to be considerate of" but it's not exactly the right way to use that word, so I just remember that now. I don't need to write it down. A lot of it was to just to help get used to context and little things about culture.

W: So ... you mentioned that you spend half an hour on vocab learning every day, before in semester I, was it the same?

S: Um, in semester 1, we would have a vocab quiz every three days instead of every day. So every three days, I would probably spend about half an hour or 45 minutes making flashcards and then, um, I'll make flashcards and then like two days later, the night before the vocab quiz, I would go through those flashcards over and over again and for the ones that won't stick I would take these ones and put them in a different pile. And once I finished with all the flashcards once, I had piled ones that stuck easily and ones that didn't. So I just go through the smaller one, the vocab that didn't stick.

W: So, do you have any advice for the new students about how to study vocab words?

S: Um, Pleco is a life saver. Um, also I would say that if you have a system ... if you find a system, establish it in the beginning and stick to it because when you are having so much thrown at you, so many vocab words ... everything thrown at you, it's nice to have a way to organize it. Um, and also I have a lot friends who either like dead set on it, like, "I need to study every minute of the day or I need to follow this rigid system or something." You kind of need to be flexible, like, and follow whatever helps you learn best. If your strategies change over the course, you need to... follow that.

Interview for Student 7

W: Can you tell me how you study the new vocabulary words listed in your textbooks?

S: Well, what I usually do is … I go through, I want to show you here, Uh, I highlight the ones instead of putting them necessarily just in straight categories, like I could just do all of the food dishes and all the beverages. I just look at the characters and I say which characters do I already know and I just highlight all the ones that would be really easy for me to remember or it's like a combination of characters so that way I can look over once. I can read them a couple of times, and hopefully since I already know them, those words will stick. So that is like my preliminary round of studying. So, then the next time I come through I can start highlighting words that are a little bit tougher. And then actually I save the hardest ones for ...later, for when I have more time like on the weekend to go over and actually study. During the week, I am usually studying some of the easy ones that I already know so hopefully they will stick in my mind and then I get to these harder ones. Uh, yeah, sometimes, I'll review categorically. I'll go back and look at all the finished one when I go over initially.

W: When you say categorically, how do you do that?

S: So categorically would be just like all of the drinks I would put together, like juice, cola, beer, and then all of the tastes, like sugar, or tian [sweet] and la [spicy], things like that, I will put them into category.

W: How do you do that? Do you use Pleco or do you just put them on the paper?

S: You know what, Pleco, everyone talks about how great it is. It is great like looking things up or drawing characters, but most of what I do, I do it on a whiteboard. It is just in my house. I have a white board, and I have to write it out, and that is how it sticks in my mind is that I write it over and over again. My wife, she will help me. She'll sit there and she will give me the English and then first I will just write the Pinyin, and afterwards I will start writing characters over and over again. I try to get to as many characters as I can. Obviously, it is a crunch because in a week maybe we will have two vocab tests, so I don't have time for all of them but I do as many as I can. That is also why I do the easier ones first, so I can probably … I can write them out if we have a test later.

W: How do you study the sound, shape, and meaning of the new characters or words?

S: When it comes to the sound, most of the … since they [teachers] did a pretty good job during like the Pinyin week, I don't have trouble. I can just see it says "gen wo lai" [follow me]. I can see that. So I will say that aloud a lot and make sure I hear it in my brain. If I am not sure on the pronunciation, like it has a <u>"u ma",</u> (umlaut) or something tricky, then I will use Pleco and I will get the sound. But shape, you know, originally, I had to come up with these elaborate stories of like how each character...how I get to each character. Now I am finding that the more base characters I have, I can just start thinking in radicals rather than these elaborate stories. I very rarely any more have to come up with elaborated stories. I can just be like "ok, here is the mouth radical and here is the sun radical. There is a little person in there … looks like". So that's what I would think of now instead of thinking of elaborate stories.

W: You mean in the beginning you always created some sort of story?

S: Yes, 'cause they [the characters] meant nothing to me. They were just strokes. Now they mean something. Now I see that's a mouth and that's a sun. So it is like you need to know something in order to be able to know other things in Chinese. You can't go in blind obviously.

W: How did you develop the knowledge? Did you just figure out?

S: Um, that combined with like listening to teachers during English week when they talked about learning strategies.

W: Besides textbooks, what other additional materials do you use for vocabulary learning?

Um, Like I said, sometimes Pleco. Uh, and then besides the textbook, we have a glossary of all the vocab. That is kind of nice 'cause it breaks down [words] categorically by presentation. So, for the curriculum I am given, it works very well. But, yeah, that's about it, honestly. Just this and Pleco. I read the words over again and again, and I read and say them out aloud. I sometimes watch TV and movies. I just watched Red Cliff with my wife. It's a good movie. It is really long though. Vocab like that [vocab from the movie], I try to do that minimally even though I really want to branch out. For the sake of DLPT at the end of this and for the tests I am given, my unit tests and my vocab tests,

these have to be kind of like my wheelhouse where I focus. That's all. Extra stuff hopefully will come later, but I know it is not the most important, so I don't focus there, I focus on this 'cause I want to do it well in this curriculum.

W: How do you review and consolidate the vocabulary words you have learned?

S: Honestly there is not a ton of time at xx[name of the school] but they [curriculum developers] do a good job putting them into the presentations here. So I see them a lot again and I think that's...that's helpful enough. There'll be the occasional word that is … it is not frequent words that come up in conversation. It is very topical then I'll forget but the fact that we use them so many times in the presentations that I can constantly read it, see the character, say it out loud 'cause we read it out loud. That's very helpful.

W: So you basically review them with the new words. Do you put aside some time just to review old vocabulary?

S: Before unit tests. I usually ... I go through all the vocab we have gone through so far in the unit and I try to review. I will do more. I will go back. Sometimes in the beginning I was very idealistic, and I tried to go back to Unit 1 to review but I recognized that if you do that you're going to fall behind with the new vocabulary. So it is a very tough balance here. If I had the pace I will do it all the time. I think it'll be really good for me but I don't have the time.

W: What activities do you use to practice using the newly learned vocabulary words?

So usually it's at the dinner table with my wife. Like this lesson was great because it's all about foods. I will point at things and then I just ask her in Chinese "what do you call this?" She doesn't know. It is kind of unfair question, but then I tell her "this is wan" [bowls], "dao ca" [knife and fork], things like that. I just go over [the words] with her. So I teach my wife. Teaching is one of the best ways to learn.

W: How often do you do that?

S: Almost every day [laugh]. Dinner … dinner is only 30 minutes so it is not a lot of time to get to Chinese. I do that for maybe 10 minutes with her and then that's enough Chinese for a while and then maybe I will do it the same day for another 10 minutes. But that's probably about it. We don't do more than … maybe half hour max a day. Yeah... Yeah, and you know it happens, it is not like we sit down. It happens here and there. As we are driving, I'll see something, like "oh, that's this in Chinese."

W: Any other activities?

S: Uh, no other specific activities besides just prepping for tests. You know ... I know that every week I am going to be ... graded and I am going to be reviewed on the vocab, so I am ... every night I make sure that I set aside at least thirty minutes to an hour of just writing on the whiteboard over and over again. I purposely get … I do my homework in between periods so I have time during the night to do vocab. I know we are not really required here to do writing, eventually it kind of phases out with just speaking and listening. But I think my speaking and listening and obviously my reading will be so much better if I continue to focus on being able to write every character. In college I took Latin, and French, and one of my professors said like it is all about vocabulary. You can't do anything with the language, you can't do any of the grammar if you don't know the vocabulary. So ever since then, every language I studied I have always been like "alright,

I am going to know every word. I may not know how to put them together yet, but that'll come later." Every mind has grammar but every mind does not have the vocab. Exactly, that is what researchers say.

W: How do you prepare for your vocab quizzes?

S: Um. My wife usually helps me. I feel like it is better when I have another person there helping me. She would read the English, sometimes the Pinyin, and I'll just sit there, on the whiteboard I will write out ... if she gives me the English I will write out Pinyin and I'll write the character. I was like, "now give me the next one." I usually try to chunk them into groups of about 20 maximum. And those groups vary. The first group is usually the characters that are the easiest, the second group then might be, ok, more categorical, or I just might be what I deemed the second easiest. So if I see a word repeat, I try to group them all in the same category.

W: Did this strategy come from your prior learning experience?

S: No, I have never done this before with French and Latin. I never had this much vocab to master in this little of the time. This is just I needed a way to manage it all. It was like sixty something words and I was like "how I'm gonna do this?" So I was like "alright, I need to start grouping in some meaningful way." Sometimes I really wonder how meaningful it is if it is just psychologically like "this is my trick" for just being able to do it.

W: Can you give me one example like how you put them into category and how you make them memorable?

S: Well, like I said, the best way for me is characters that I know. So, like we had "shi" before, "shi," matters or things, I know that we had ... "shiqing" ... we had that before. So, I'm like, those are easy ones that I know how to do and for me this is basically just like a review rather than "I need to remember that". For example, "mi fan" [cooked rice]. I haven't learned "mi" [uncooked rice] yet, but I learned "fan" [food], "chi fan" [to eat food], I know that one. So, alright, let's learn that character [the unknown one]. Like "dian cai" [to order dishes]. I haven't learned "dian" [to order], but I know cai [dishes], so I will do that. It's kind of like Math, you can ... it just builds ... everything builds on each other so much that I know if I take the building block that I'm already aware of and [I can] try to put them together and make something. Next, it is either ... it depends on the day. This day, it was more categorical. So I was like "alright, these are flavors," and I'll put all the flavors together. I did like "bitter, vinegar, sugar, spicy" and then I said "alright, here are ... over here ...these were the easy characters but here is some that I missed like tableware. I saw over here I was like "oh man, "kuai zi" [chopsticks], "shao zi" [spoon], "dao cha" [knife and fork]. I was like, "those are all tableware." I didn't even realize at the time. I was just looking at the difficulty of the characters.

W: I see. You break the words into several groups. How come you have different colors here [pointed to the vocabulary list in his book]? What do they mean?

S: Yellow is the easy one. These [blue ones] got to be more moderate and the ones that aren't highlighted…these usually are the ones I am studying last that are more difficult for me.

W: Then how do you memorize characters?

S: When I want to learn it, I look at the characters to see how easy they are. Then when I go to actual trying to get them in my brain, yeah, I need to know the Pinyin so that I can know how to say it out loud. I have to say it out loud, "gen wo lai" [follow me], I need to say it out loud and then after I have it down, usually my wife will say "it is 'follow me'." I will give the Pinyin and then I say "alright, give me another hour, I need to study the characters." And after we do the Pinyin part, we move on to the character part. I do both Pinyin and characters.

W: Do you have any techniques that help you memorize the characters?

S: Besides the story telling in the beginning and now just knowing the meaning of radicals. That helps me with meaning. Now I only do stories for the really hard ones. Like for the ones that don't have the radicals that I am familiar with, like "dou fu" [bean curd]]. I had to do a story for it. It is kind of silly but I image there's a little piece of Tofu. That is ... I guess you can say the "kou" [mouth], I don't know if it's a "kou," but that's a little piece of Tofu. The top is like the top of a pot, and then this is like the water and this is like the bubbles like fire, boiling or something. And over here, I have seen that top radical before, but then it was like a standing man. I call ...this is wrong... I call it a "t" radical, the standing man. And then I was like "Mr. T," I don't know whether you know who Mr. T is. He is a big guy from the 80's. Mr. T and then Mr. T likes to eat meat, because "rou" is there. I say that to myself every time I read it. "Alright, Mr. T likes to eat meat." I did use stories a lot in the beginning until the end of last unit ... the end of Unit 2. In Unit 3, I felt the significant difference. I don't need to do that as much. I started using more radicals and components to help me memorize characters rather than my random stories. For the difficult words, I still do the story things.

W: Do you get help from others in learning vocabulary?

S: During the beaks in the class periods, sometimes, we'll ... especially in the mornings, when we get here early, my whole class, we have a white board. We test each other. We will draw characters and write character, then we ask each other "what is that?" and then someone will say it. And then sometimes we give someone the Pinyin and then the person has to go to draw... write the character. So, yeah, that is actually pretty helpful when you collaboratively work on that. We definitely do that every day before we have like an exam or a vocab test. We always are there doing that. But some other days we do that as well. I would say ... probably two times a week, at least.

W: What strategies did you find most useful?

S: Honestly, the categorizing is helpful, just finding some way to attack it [vocab learning]. Memorizing the radicals for sure that's helpful. And having someone to help me like my wife is helpful. Also, it just comes down to time and motivation. That's like the most important parts. You just ... have to spend time on vocabulary. If you don't, it is not going to stick and with Chinese it is especially true because it doesn't use an alphabet. You really have to be motivated to come back do it again.

W: Do you often spend time evaluating your strategies?

S: Um. With this whole categorization thing, I have been thinking a lot lately. How should I categorize? should I categorize more topically or should I categorize by difficulty, kind of what I am doing now. Honestly, right now, it is just try and error 'cause I am not that far in my Chinese yet, so I am gonna keep trying this by difficulty thing

then later I may try, if I have the boldness, the topical. I have also tried to group the characters with the same radicals together. I remember like this one. These like all had "can" [food] in it. I, at one point, I had them highlighted when I was going through all of those. Also, I need to write. Just purely Flashcards, like Pleco, just Plecoing, that doesn't stick it for me. If I don't physically write the character down, it is really not going to stick in my head ever.

W: If we have new students coming into the program, what advice would you give new students about learning vocabulary?

S: Listen to everything you teacher is telling you because they obviously are professionals. They have been doing this for really a long time. Most of them do it but not all at once, like drop these hints, like group words in categories or think about radicals. I think sometimes because they say it so much, it is just we don't realize the importance. So really recognizing the importance what you are being told by the teachers, honestly, just implementing it is effective. I think having background experience in college and knowing that you just need to dedicate a lot of time to work if you want to be a quality product is also important. So my advice to them would be do what you teachers say and give it time because at first I remember being up until 9 or 10 each night, that is late for me [laugh], 'cause I get back at 6, start studying for up to 4 hours, just studying and it wasn't sticking and it was really frustrating. Definitely it was very difficult. My first vocab test wasn't nearly good as it is now. At that time, I didn't recognize how important it was to write out the characters 'cause every other language that I have taken hasn't been such a … I guess ...a visual language I want to say. Like French and Latin, a lot of that you can sound out. They have alphabets, so I can just look at the flashcards and I can say "alright, I can see that word over and over again in my head 'cause I know the 26 letters and Latin alphabet, easy, that's no problem creating that word on my own. I was having such a problem with Chinese creating things on my own because the process is way more complicated. So, I didn't recognize that. The hardest part about learning Chinese is the creative process of learning. It's not sound, it's not the meaning, it's creating the character that is the hardest part. Once I recognize that, I said, "alright I need to go buy a whiteboard and I need to write this character out ten times, like over and over again." Once I start recognizing this, I had notebooks just filled up with characters. When I write the character like "dou fu," as I wrote it, sometimes I say the story. Stoke order, at first, I was like, "stoke orders, stupid." [laugh] It is really helpful now. I get why it is the thing. Eventually after being corrected so many times by my teachers, I was like "well, I am getting tired of this" and I need to do it, and then I did recognize that you just started to feel this flow when you know strokes. That helps you memorize somehow. I don't know whether I can really articulate it. Yeah. I know the general principle, left to right, top to bottom but when I have a new character, I do find it hard for me to remember 'cause I don't have a flow, I don't have a pattern like every time. But the ones that I know the stroke order they come easier.

Interview for Student 8

W: My first question for you is how do you study the new vocabulary words in your textbook? Can you show me with examples?

S: Before, actually before the class started I was here a month ahead of time. It gave me a chance to study the vocabulary. So I finished studying the whole first unit vocab before class even started. So I already knew the vocab. And now I am trying to keep that up. So I am in Unit 4 now. I am trying ... right now, I am in the middle of studying unit 5 vocab so I already know all the vocab. So it helps during the class 'cause I know all the vocab they are taking about and then any supplementary stuff they might bring up. That's just me, I mean, not a lot of people, actually no one else wants to go a unit ahead.

S: Can you take this lesson as an example and show me how you study vocabulary words?

W: I usually just use an app called Skritter to help me with character writing. And I probably usually learn the Pinyin first and then characters and then meaning, like relate back to the English meaning. When I am studying the characters, I look for the radicals, anything that can relate to anything learned already. So, [looked at Lesson 20 vocabulary list], like "huo qi" [flexible account], "xing qi" [week], and "xing qi ji" [what day of the week], all of them have the same character "qi." Also, "sui shen" [bring with you] and "sui shi" [any time] have the same "sui."

W: Why did you mark these words [the words marked with asterisks in his textbook]?

S: I do traditional and simplified and then I just marked it because there was a traditional form of the character. This is before, right before the vocab test. I just want to make sure I have it.

W: How do you study the sound, shape and meaning of the new characters or words?

S: At this point, we've been studying for ... I think long enough to be aware of a lot of the radicals and characters. I've made connection through certain stories in my head. Some of them, for example, um, let me find a good example. Ok, like "shen," it's body, so it kind of looks like a pregnant lady. That's a bad example, but at this point, I don't really think about the connection too much and just it's kind of intuitive at this point. I used to create stories a lot but now more and more characters getting reused, I think, it's just a matter of like connecting the ones I already know to what Pinyin ... whatever new Pinyin if there is new Pinyin. So it's just connecting the new ones with old ones, so kind of just builds on, so it's really a matter of starting early and getting foundation. Staying ahead really helps. It's still helping.

W: Besides textbooks, what additional materials do you use for vocabulary learning?

S: I watch TV shows, use what they call *Chairman's Bao* [online Chinese learning materials] to read articles within my level at the moment so that I knew that vocabulary and an app called Skritter to learn characters not in the textbook.

W: So when did you start to watch TV shows and movies?

S: In class, we had our head teacher xx told us about, or we were just watching because we had some spare time, the "xiao meihao," *love so beautiful*. I really like those kind of dramas, so I was interested in watching it. Then I finished that pretty quickly. That was around Unit 2. I think we just finished Unit 2.

W: At Unit 2, you couldn't understand a lot of language, so how did you watch the show?

S: There was no subtitle. So, just threw it there, I think pretty much. I just watched it because I like the show and it kind of helped me hear just more of the language as well. If I heard something interesting, like I keep hearing the same thing, it's like ... and I still

don't know what it means, I'll look it up and find out what it means. I did this whenever I found something that piques my interest.

W: So on average, how many hours do you spend on watching the show?

S: Recently I have been trying to watch the new one but I put it on pause a little bit because I've just been doing other studying, but before I watched like 2 or 3 episodes a night. One night, I watched, ... it was the weekend, so I watched like 10.

W: Then how much time do you spend on learning the vocabulary from the textbook?

S: That's probably the majority of my time is in. I know that later on, more of the materials will be less focus on the textbook but for now I want to do well in the class, so I use Skritter to do a lot of the vocab. That's probably at least an hour or two a day.

W: Two hours devoted to vocabulary learning?

S: No, throughout the day because two hours sitting down just doing vocab is a little crazy. So whenever I am on the bus, waiting for the bus, in the chow hall, in class during 10-minute breaks, I'm just studying vocab.

W: How do you review and consolidate the words you have learned?

S: The app that I use, Skritter. It has the way the system is set up. Old words ... things you know pretty well, they don't show up for weeks, and it comes up two, three weeks later and then it's just the way reviewing it, so you don't forget about it. And then newer words pop up more frequently like several times a day, just to help it ... really get it stuck in your head.

W: How do you make the system recognize the words you know or you don't know well?

S: So there is a little "x," um, a little yellow check mark, green check mark, and blue check mark. And then if you get the "x," obviously that's wrong and then it will pop up more often. Um, blue is ... it's ... that's the most ... like you know it is solid and then you click that so it doesn't show off very often. The lists were made by ... I found someone has made lists of the vocab. And then I just downloaded them into my phone. So I didn't make the list myself.

W: What about those additional words you have learned? do you put them in the app?

S: That would be a good idea. I should start doing that. No, I don't. I should because the words I get from articles or something, I just write down and I have no way of memorizing them again. I just write them down because I thought they were interesting, so I should do that [putting the words into the app]. It's a good idea.

W: What activities do you use to practice using the newly learned vocabulary words? Um, so we were obviously assigned the grammar book [the translation exercises in the grammar book], but only certain numbers. But I like doing all the problems, all the sentences, just for practice. Sometimes we are given a grammar booklet with sentences in it, and before our mid-unit or test or something, I will look through it and practice, translating or making my own sentences. Every week, we have a journal. We have to write. I usually like spending a good amount of time doing that. And doing like not the basic sentences, doing sentences that we haven't really done in class yet, but then so I can see if it's right or not and Laoshi [teachers] can tell me if that's the right way to use it or not. After class, if I see something just walking alone during the day, I'll try to think of how I would say that in Chinese.

W: How do you prepare for your vocab quizzes?

Pretty much the same way I learned them and how I said earlier.

W: Do you try to get from other people in learning vocab words?

S: Other than the teachers that bring up the words, not really. I have to have a pretty good vocabulary. I am trying expanding my vocabulary like on a daily basis ... I add at least 50 words every couple of days to the app. I won't know how to use them or know ... really know them solid but they are like there.

W: What vocabulary strategies did you find most useful?

S: Um, let's see. Repetition. I've always like ... I don't think I have been naturally good at stuff but I put in the practice for it, so just practicing.

W: Can you be a little bit more specific?

S: Writing and speaking while I am writing, using words in context and hearing it in somewhat an authentic way through TV shows, I think that's pretty useful.

W: So you can often hear the words used in context when you are watching TV shows?

S: A little bit. Like now, a lot more than before, obviously. So it's pretty cool.

W: So when you hear it in context, what do you do?

S: I might pause it, remind it just to hear it again. But sometimes, they speak really fast.

W: Do you have any advice for new students about how to study Chinese vocabulary words?

Uh, for the new students I would say get ahead of it, like I said earlier, I am trying to keep a unit ahead, hopefully the whole time. Um, I know it's not easy especially with grammar but if you can get ahead of vocab, it makes things a lot easier in class. So, really one thing.

W: Anything else you would tell them?

S: Just Jiayou [keep it up].

Interview for Student 9

W: My first question for you is how do you study the new vocabulary words in your textbook? Can you show me how you do it?

S: Well, I study ... I just mainly... just look at ... well, first of all, I'll look at the Pinyin, I mean not the Pinyin, the characters, because having known so many characters being this far, I'll just see if I can recognize ... well, if I can recognize of course, and then if I can distinguish the meaning on my own, maybe get some ... get a rough meaning out of it and then look at the English word. And then for those I can't, I'll just look at the English meaning and how it's pronounced. And then when I'm comfortable with the pronunciation and meaning, then I move to my phone using Pleco Flashcard for the characters. It'll just be the characters only that pop up on my phone. So that way, you know, I have to guess the tones and the definition on my own. And usually going through the first round, I'll just make sure that I have the pronunciation and definition right but the next morning for the vocab test. If I don't have the tones right, I'll count it wrong and redo it. Just like now, I will just do... we just do the vocab test by presentations, so like the presentation I'm preparing for ... "start the test," and it just has the characters on there and I have to guess the meaning on my own. So, usually I'll have it on my own, like this is "wei kun," just besiege. Usually it's in my head. I'll say the pronunciation to myself but everything else is just in my head. Like I have it right, so I'll mark it right. Or like "gong tong" [together], it was wrong, fourth tone and second tone, so I'll mark it wrong and then after I go through all of these, I have a set of words that I missed and it'll retest me on them.

W: How do you know the pronunciation is wrong? You spoke to someone?

S: No, just to myself. 'Cause you know originally it's just the character, so in my head, like "jin fei" [expenses], first and fourth tone [checking his answer using the app], and I was right, so that would be correct. Like "xing zou" [to walk], second and third, say, like I thought it was third and third. If I thought it was third and third and it shows me second and third, I know I was wrong. I usually use the book first for the English definition and the Pinyin mainly because sometimes what Pleco has and then what the book has, the definition might be slightly different. So that's ...that's another big reason why I look at the book first. And then, like I said, after I have the definition and pronunciation down, then I'll switch to the, um ... I'll switch to the book and work on familiarizing myself with the characters.

W: So, how do you study the sound, shape and the meaning of a new character or word?

S: I'll say, if I get it [pronunciation]wrong, I'll say it to myself a few times to get the sound stuck in my head until I know I am used to saying it. And then, uh, I get the characters stick by repetition until I am totally familiar with the characters. Actually, that's my initial way of doing it. You know, like I said, later on as more characters are introduced, I'll have more of a foundation. Like "ji feng" [monsoon], I know "ji" is in "ji jie" [season] and "feng" is wind. So I know they probably have something to do with the weather. And then I may not can guess "monsoon," but you know that'll kind of put in my head what's to expect and then once I see the definition "oh, it's monsoon" then I'll try, you know, connect that together.

W: So you actually try to figure out the meaning on your own first before you look at the English. Do you do that often?

S: Yes, most of the time. I started to do this ... I want to say probably about ... I want to say beginning of second semester, maybe beginning through halfway because the first semester, you know, not knowing any characters, I just was based on the Pinyin and English really. I was not focused on the characters. But after, you know, reading test, I don't know what the characters looked like, I started paying more attention to them. And then like I said probably about second semester, after I have a kind of basic foundation for the characters, I'll start trying to put the meaning together my own. That way, like my teachers always say, later on in DLPT or maybe in the middle of the test, if you don't know what the word is, you might be able to put together some kind of meaning from it, from the two characters that you see.

W: Besides your textbook, what additional materials do you use to help you with vocab learning?

S: Uh, nothing official. I read the *Chairman's Bao* [Chinese learning resource online] sometimes or maybe even *Slow Chinese* [Chinese learning resource online]. Other than that, a lot of it is like stuff that'll pop up in class that one of the teachers might use, write down on the board, or maybe like during GLOSS [Chinese learning materials] or during the actual vocab [versus the vocab from the textbook] learning. Then a lot of it actually ... I don't do it as much now as I should or I would but I watch like Chinese movies or shows but it depends on the difficulty, I'll have English subtitles on but I'll, you know ... see and listen what they said, like, uh, there is this one show I am watching now on YouTube. It's called *Nirvana in Fire* and it's based in ancient China. So a lot of it is ... the speed and what they are saying and ... what is the content too, I am not able to understand, so I have the English on but for some stuff like what the English translation

is, I'll look at the subtitles ... uh ... 'cause you know the ... the Chinese characters are on too. So I'll just look at, like, what the translation is and then whatever it says, you know, in the Chinese, and then I'll be like, so if he [the main character] says "I am very depressed," I'm like "oh, depressed, how do you say that?" And then I'll see the characters and listen and search on Pleco and add it ... add it to my dictionary in Pleco.

W: How often do you do it?

S: Now I'll do it at least probably about two or three times a week but like on Saturdays ... like, I really like this show so, uh, on Saturdays and Sundays, besides going to the gym, probably it's all that I do. But, uh, so I watch like probably three shows on a Saturday or Sunday, and they are like hour-long each, so just whatever words might pop up interest me. But it's funny because actually it takes me longer because I often pause it ... and look up those words and then pause it again. So it's only an hour but it might take me an hour and a half because I keep pausing it to check those words and add them.

W: So now you have a lot vocabulary words that are not from your textbook?

S: I do. The only thing is just practicing it, maintaining it 'cause it's a lot of words. It's just like the more you know, and the more you seem to know, the more there is to learn. So, it's just, you know, never ending process.

W: When did you start to do that?

S: I actually started to do it in the first semester because there was a Chinese ... a Chinese show called "shen ye shi tang," *Midnight Diner*, on YouTube that I started to watch and I started back then, you know, it still was not as often. Actually, I'm going to say beginning of the second semester was when I started taking it more seriously.

W: Do you always write down the words you are interested in?

S: I have a ... I forgot to bring it here ... I have a notebook too that I'll write down like all the stuff that teachers write on the board, probably not all of it either. A, I might already know. B, I might think ... I don't need to know it right now, but whatever I, you know, I may deem necessary or I think is interesting, I'll write it down and then I make sure to review. I try to do it regularly to then transfer those notes ... those words ... to Pleco. Or if anything ... if I don't, maybe in class, they might say something, like, I don't know, what is this? [looking at a word from his Pleco], "xiao mai," wheat, and then I am like " ' xiao mai,' I heard that before." I think I wrote it down. I might go through and check it and like "oh yeah, wheat." And then you know, in case it's not in Pleco or I haven't, you know, learned yet. My notebook is probably about this big [showing with gestures] and probably 20 pages.

W: Another thing I want to know is how you review and consolidate the words you have learned?

S: Uh, a lot of them, most of the time, I want to say, it's just ... really, for a test or quiz, like, I have recognized lately that I do need to start going over more words that we've learned. But, uh, for me, mostly after I have learned them, most of the time I do have a ... a solid grasp of them. So, I don't know, say like Lesson 52, more than likely, I'll have ... you know, I'll remember 90% of them when they come up later. Just I know personally I have a good grasp on them, so I just ... I focus ... I try to focus more on supplementary vocab, on stuff that I might hear on my own or learn on my own or that might come up ... you know, teachers might write them on the board or like I said, I might learn from a show. I try to focus on that more because ... just because I know this [vocabulary words in the textbook] is all going to be re-iterated one way or another whether it is vocab quiz

or it comes up in a test later or in an article reading, but I know that actual vocab ... I focus on the actual vocab [referring to the vocab from the movies and shows etc.], that way, I can kind of expand it and then you know, bring them together 'cause I mean later on, I actually ran into a lot of them in the books, whether it's a unit later or the next lesson. I do run into a lot of them eventually. But, you know, I try to ... and even so that just helps me 'cause like, "Oh, I already know 'ying xiang' [influence] 'cause I studied in that show or, you know, however it might be, but I do try to mainly focus on the actual curriculum vocab.

S: On average, how much time do you usually spend just on vocab learning every evening?

Um, it's not that much time to spend on vocab learning. Uh, just really from using it. For the presentation, the vocab from the presentation, I'll say, I probably spend about 10 or 20 minutes mainly because it's one presentation so I might spend 10 to 20 minutes on it, memorizing it. And then on the actual vocab, I want to say, altogether probably about 20 to 30 minutes a day because it's not all at one-time period. It's mostly spaced out during the day. Maybe in-between breaks, during class or, like, really... a lot on the bus, on the way to lunch and on the bus on the way back from lunch, and then after ... also If I go to the gym, if I have a work-out that I can have my phone on my hand, like on the bike, I'll use it there or if we get class ... time during class to study on our own. Just little different times like that, just like that.

W: Can you tell me what activities you use to practice using the newly learned vocabulary words?

S: To practice using them, I really just ... I'll make sentences with them in my head when I am learning it to get it to stick and then also to get it to ... to the proper usage 'cause like, a lot of words, as you know, in Chinese might have the same meaning but you would use them in different situations. Like "qu bie," "shi bie," "fen bie" [all synonyms for "to distinguish" in Chinese]. I am still not too certain on all those on when to use which one but I know I used ... I think I used "shi bie" one time. I told my teacher that there's two twins in my class in high school. I said "wo ke yi shi bie tamen" [shi bie is incorrectly used here]. She said, "you won't say shi bie, you say qu bie. That sounds better." So, really I just try to make sentences with them or you know, use things that I can relate them to, and also kind of group them all together because that way when I am... maybe reaching for a word, it'll all be right there and then what I used ... sometimes it might be the wrong word or wrong usage but you know it's the same meaning and then it can be corrected later on.

W: How do you prepare for vocabulary quizzes?

S: Um, just the same way I learned them and how I said earlier. Just with Pleco or I'll use just characters, and then I'll, I usually say the word to myself, and then ... get the pronunciation and the meaning right 'cause usually the day before I've got the meaning down but maybe the tones are wrong. So I'll just say it to myself, like this one "huai," which is damage or in repair. Just like that, and then "cheng tu" (to certain degree). Even if I have the English right, if the tones are wrong, I'll mark it (on Pleco) wrong anyway. That way, uh, ... I'll just mark a few more wrong, then it says "you are now being retested on all the cards which you answered incorrectly. "And then like there's five wrong 'cause I only marked five wrong. It'll then retest me and then, say, I still can't get these last three, then it'll retest me on these last three and then even if like this last one, it'll retest

until you mark it correct. There are other types of tests, like one of them is multiple choice so... I 've used self-graded [one function of Pleco] and then for "show," I chose just characters. For example, you can have just pronunciation or just the Pinyin or like you can do just the audio. "Dao ta" [playing the audio], which is "collapse." Then everything will pop up after that. All I've used is self-graded and then just the character only. That's how I test myself on it.

W: Thank you for showing me that. Do you try to get help from other people in learning vocabulary words?

S: No, not really. I know ... vocab quizzes ... right before them, we'll quiz each other so we'll kind of help each other out. Or like, I'll guess the word myself or I will get it myself and then I'll ask them. So, I'll be like "oh, qiang xian" [to rescue] and they will be like "oh, rescue." And then I'll look at it myself, you know, like that way. That way, I'm learning and then they are learning at the same time.

S: How often do you do this?

W: Probably every day before the vocab quiz. It's mainly ... it'll be me and these two other classmates. They like to do it too, but usually like everybody will get involved. If they are not saying it out aloud, they are thinking to themselves. We usually do this for probably 10 minutes in between breaks.

W: What vocabulary strategies did you find most useful?

S: Probably just what I am doing now. I know beforehand I was not really recognizing the characters, I would switch the setting. Originally it was on characters and audio. That way, If I don't recognize the character, I can access, uh, "li mi" [pronunciation of the characters] and I know that's centimeter in my head. So, then I'll associate the sound, the meaning with the character. That was starting out mostly during the first semester, during the first unit. But, like I said, now, I just mainly ... I just test myself on the characters and I had the pronunciation in my head. And then afterwards, like I said, if the pronunciation or the meaning is wrong, then I will mark it wrong so it'll pop up again at the end. That's what works best for me. I want to say taking notes and watching movies works too, but I want to say I use Pleco, that's really all I use to test me on. The notebook for the movies, I'm just really having it [referring to the vocab from the movies, class, etc.] stored somewhere 'cause I can't pull out my phone in class to add it, so I just have it written down so later on I can add it on my own. Just writing it down in general, you know, trying to think about it ... it'll help, but not only that, once you switch later on, once you move it to Pleco later on, as long as you continue to quiz yourself on it, it will stick with you.

W: Do you do a lot of writing?

S: Not too much. I've been trying to start back on it, but now I don't. I don't really write characters at all.

W: What advice would you like to give new students on how to study Chinese vocabulary words?

S: Um, well, I'll just tell them that everybody has their own different ways of learning because I know like the student sitting next to me, he is kind of very particular about how he learns things. So for one thing, I'll just say, try to find an English translation, of course, English meaning to it, but then again be flexible with meaning because a lot of it, how you used to use it in English, or the definition in English, doesn't exactly match all the time in Chinese. And then some people are very particular about it. They are like

"why or why is it, why can't they do this, do that," so I guess if anything, be more open and be more accepting to it because if you get too caught up on why it's this way, why it means that, you know, or you say this in English, you hinder yourself from learning. So I guess that'll be the biggest thing just to be ... just to be open to the definition and how you use them. Um, the way to learn characters is just by learning them. There's not an alphabet, so you know these characters you have to memorize them. The more you see it, unless you know you have a photographic memory or something. The more you see it, the more it sticks. So just keep doing it. As for using radicals, the ones I know I definitely use ... definitely trying to attach more meaning to it 'cause that's the thing too, like, I'll try dig deeper with it but not just knowing like what it is. Like, "qian" [money], like money, like it has a metal radical on the side, so I would not just know it is money but saying "oh, the metal radical, and then you know, back in the day, money was coin," stuff like that, or however you might attach meaning to it. Um, I am trying to learn more radicals, that way, I can break it down more, that way, also with writing it, it will be easier 'cause you know, I might have a mouth radical on this side and speech radical here, whatever there. But I would advise you learn radicals, don't be like me slacking off.

W: Did you try creating stories to memorize characters in the beginning?

S: No, not too often. I mean, I guess you can say that. I would do whatever it would make sense in my mind of how it's written. But, uh, not too much.