探究透過翻譯練習使用字典學習字彙之成效

The Efficacy of Various Types of Dictionaries on Vocabulary Learning through Translation Tasks

by

李貞儀　Chen-I Lee

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CHINESE ABSTRACT

探究透過翻譯練習使用字典學習字彙之成效

研究生：李貞儀
指導教授：尤菊芳博士

摘要

查字典一直以來就是被視為協助學生查詢字彙意思的主要工具。根據認知層次運作理論/運作深度和投入量假設，學生在查字典學字彙時會細讀內容，學生的投入狀況增進了認知負荷，而學習的品質即取決於認知負荷的多寡。然而，在字典查詢的研究中，並沒有足夠的實驗研究來進一步證實投入量假設。

本研究旨在探討三種不同字典，包括英英字典、英英/英漢雙解字典、英漢字典，在字彙學習上的效益。除了考量到字典種類為自變數，學生的語言程度亦為另一個自變數。兩個自變數，包括三種不同的字典與兩種學生的語言程度，因此產生了六個研究組別的設計。在施行教學設計前，學生們需接受前測以檢驗是否他們已認識此研究測試中的主要 12 個單字。在教學實驗中，受試者需要使用其中一種字典完成翻譯任務。翻譯任務的設計主要是因為要檢視當學生在查字典時，學生認知負荷的增加是否促進字彙的學習。

後測的使用目的則在於衡量學生在字彙學習量的增加，而在後測施行後的兩個禮拜，實施延遲後測。延遲後測的使用，目地在於衡量學生在字彙習得的效益。

研究結果顯示當學生在查字典時，翻譯任務可以促進字彙習得。除此之外，字

典的種類對於不同程度的學生也造成不同的影響程度。整體而言，英英字典比起其他兩種字典可以促進字彙較長期的記憶。英英字典和英英/英漢雙解字典所帶給高程度學生的學習效益明顯較英漢字典高；另一方面，由於低程度學習者在使用三種字典後的學習效果相當，低程度學習者又對於英英字典內文理解力有限，故建議低程度學習者可以使用英英/英漢雙解字典或是英漢字典。

本研究與其他相關研究主要差異在於後測與延遲後測題目的設計。在審視過去研究的測驗工具後發現，在實驗中的題目情境常易同樣的出現在後測與延遲後測的題目當中。如果和在測驗當中使用完全不同的題目情境比較起來，使用同樣的題目情境在測驗中，測驗結果會比較優異。因此，在本研究中，測驗的題目設計包括實驗中使用題目情境相同的句子和新題目情境的句子。研究結果顯示在後測中，學習者在舊句子的題目表現明顯優於新句子的題目，但是，這種情況在延遲後測中並沒有發生。這樣的研究結果可以幫助我們推測出，測驗工具中題目的困難程度，在短期內，將會影響實驗成果的解釋；然而，長時間來看，由於人在記憶遺忘的現象，因新舊題目情境造成的研究工具的難易度差異，對測驗結果無顯著影響。所以，在測量一個方法的學習成效時，在測驗工具的設計上，應考量其難易度與題句內容，以利可以實際測量其效益，做出具有效度的測量結果。

針對字典的種類對於字彙學習的成效，本研究提供了實驗性的證明。除此之外，本研究除了討論到含有認知負荷的學習活動對於學習的重要性，更關切到測驗工具的題目困難度將會影響實驗結果在學習效益上的詮釋。

關鍵字：查字典、字彙學習、認知層次加工理論/加工深度、投入量假設、翻譯練習

The Efficacy of Various Types of Dictionaries on Vocabulary Learning

Chen-I Lee
Supervisor: Dr. Jyu-Fang Yu

ABSTRACT

Dictionary consultation has been regarded primarily as a learning strategy to assist learners in locating the meanings of words. However, according to *the Depth of Processing Hypothesis* (Craik & Lockhart, 1972) and *the Involvement Load Hypothesis* (Laufer & Hulstijn, 2001), learners' elaboration and engagement with the words when they consult dictionaries enhances the amount of cognitive load and determines the quality of their learning. There is a lack of experimental studies on dictionary consultation which examines *the Involvement Load Hypothesis.*

The present study probed the vocabulary learning efficacy of three types of dictionaries: monolingual dictionaries, bilingualized dictionaries, and bilingual dictionaries. The participants are 127 university freshmen. In addition to the independent variable of dictionary type, learners' language level, high or low, was also treated as an independent variable. The two variables generated 6 experimental groups. Before the treatment, a pretest was given to determine whether the participants already knew the 12 target words. They were asked to complete a translation task with the consultation of one type of dictionary. The translation task was used to examine the relationship between an increase in learners' cognitive load and dictionary consultation. A posttest was then administered to examine learners' vocabulary gain; a delayed posttest was conducted two weeks after the posttest to investigate vocabulary retention.

The results indicate that the translation task facilitated vocabulary learning when the participants consulted dictionaries. Furthermore, the dictionary type makes a difference in vocabulary acquisition regardless of participant level. By and large, monolingual dictionaries enhance longer vocabulary retention than other two types of dictionaries. Those participants in the high-level group performed better on tests with monolingual and bilingualized dictionaries than with bilingual dictionaries. Dictionary type did not make significant differences in low-level participant performance. It is suggested that low level learners use bilingual or bilingualized dictionaries rather than monolingual dictionaries because low-level learners lack the language proficiency needed to benefit from monolingual dictionary use.

One feature that distinguishes the present study from other similar studies is the design of test items in the posttest and delayed posttest. A survey of the instruments used in similar studies indicated that results from previous studies may have been compromised due to the nature of the items used in posttests and delayed tests. In many of those studies, instrument test items appearing in the study material were reused on the posttest or test items used in the posttest were adopted again in the subsequent tests.

The present study designed the posttest and delayed posttest test items that were retrieved from the treatment material and those new to the participants. It was found that while the participants performed differently on those posttest items using old contexts and those using new contexts, their performances on the delayed posttest items using old or new contexts were similar. It appeared that the participant's familiarity with the test items had a significant impact on their posttest performance. The influence faded off with the time. They scored similarly on the familiar and unfamiliar test items.

In conclusion, the present study provides empirical evidence for the efficacy of

different types of dictionaries on second language vocabulary learning. The importance of a task embedded with cognitive load, as proposed by Laufer and Hulstijn (2001), to learning efficacy was further evidenced. Moreover, the results bring forth the concern that the participant familiarity of test items makes the results significantly different

Key words: dictionary consultation, vocabulary learning, the depth of processing hypothesis, the Involvement Load Hypothesis, a translation task

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CHAPTER ONE

INTRODUCTION

The background of the present study will be introduced in this chapter. This chapter begins with a concise description of the development of the Involvement Load Hypothesis and second language vocabulary acquisition with the inclusion of dictionary consultation. Following a brief background of the present study is the statement of the problem which intends to bridge the gap requiring investigation. Then, the purposes of the study and research questions will be elaborated on. This chapter ends with the clarification of the significance of the present study.

1.1 Background of the Study

The powerful effect of second language vocabulary learning on second language learning has been widely investigated (Gass & Selinker, 2001; Hedge, 2000; Nation, 2001). Researchers (Hulstijn, 2001; Nation, 2001; Schmitt, 2000) have found that learners acquire vocabulary mainly by means of incidental and intentional vocabulary learning and further suggest that teachers prepare learners with vocabulary learning strategies in order to create learner autonomy and to improve their vocabulary learning process. In order to facilitate vocabulary learning, deep elaboration of the meaning of unknown words is believed to enhance learners' awareness of the word and also improve the efficacy of incidental learning (Huckin & Coady, 1999; Hulstijn, 2001; Rosa & O'Neill, 1999), a concept that is similar to the idea of *the Depth of Processing* proposed by Craik and Lockhart (1972).

The quality of learning is determined by the amount of cognitive load, also termed *the*

Depth of Processing. This construct was not operationally defined until the *Involvement Load Hypothesis* was proposed byLaufer and Hulstijn(2001). According to the experimental findings of Laufer and Hulstijn (2001), the involvement of dictionary consultation induces an increase in the involvement load which in turn enhances the tasks designed to direct learners' attention to target words and provides learners with opportunities to engage in words (Hill & Laufer, 2003). It is thus acknowledged that dictionaries are influential in L2 language learning.

In order to properly exploit the capabilities of dictionaries, studies have been conducted to expand the literature in this field and the knowledge of researchers and instructors of L2 vocabulary acquisition. The main purpose of dictionary consultation for learners is to locate the meanings of an unknown word (Bogaards, 2003; Diab & Hamdan, 1999; Kent, 2001). However, it has also been found that learners and researchers have varied preferences for types of dictionaries; bilingual dictionaries are favored owing to quick and direct L1 equivalents; on the other hand, international students and some researchers have a preference for monolingual dictionaries because they provide learners with greater genuine context and language input (Bogaards, 2003; Chi, 2003a; Kent, 2001; Nesi & Haill, 2002). Fan (2000) found that not all L2 learners attain the same learning effect due to their language ability, claiming that learners with better vocabulary competence are more capable of making use of the information in the dictionaries. This indicates that language ability is an important factor that has an influence on the learning effect of dictionary consultation. Additionally, all learners are likely faced with difficulties when using dictionaries, such as failure to determine word class and choosing the relevant meaning of a word in dictionary entries (Bogaards, 2003; Nesi & Haill, 2002; Nesi & Meara, 1994). Therefore, structured teaching procedures for dictionary use to

facilitate second language learning are necessary for educators and researchers (Chi, 2003a; Fan, 2000).

The previous studies not only investigate the importance of dictionary consultation and factors affecting the learning of dictionary uses but further examine the learning efficacy of dictionary consultation. They attempted to explore significant elements which were embedded in tasks and to verify the *Involvement Load Hypothesis* (Fraser, 1999; Hill & Laufer, 2003; Hulstijn, Hollander, & Greidanus, 1996; Knight, 1994; Luppescu & Day, 1993). Laufer and Hill (2000) investigated vocabulary learning efficacy with bilingualized dictionaries which contain monolingual information about a word and its translation into the learner's mother tongue. They also examined the relationship between lookup patterns and recall of looked up words. They stated that greater attention during lookup rather than the number of lookups is the key factor which has an influence on vocabulary retention. That is, careful attention, noticing, elaboration, and deeper processing enhance retention of newly acquired words.

In order to explore the significant elements included in tasks, researchers conducted experimental studies to examine learners' recognition of receptive vocabulary (Nation, 2001) and compared the learning efficacy of monolingual, bilingual, and bilingualized dictionaries. Laufer and Harder (1997) demonstrated that the type of dictionary that L2 learners use does exert various levels of influence on vocabulary learning, and that the task requirements appear to determine the way learners exploit dictionaries. Tasks designed to elicit learners' production seem to assist learners in processing the words elaboratively and therefore enhance their retention of target words. In addition to the examination of tasks, researchers (Laufer & Melamed, as cited in Laufer & Kimmel, 1997) attempted to ascertain which dictionaries were more effective in comprehension and

production tasks. Those researchers demonstrated that bilingualized dictionaries proved to be the most useful for good, average, and unskilled dictionary users. However, in an exploration of how learners use bilingualized dictionaries, Laufer and Kimmel (1997) found that not all learners read all of the lexical information which is provided under dictionary entries in both languages. It is believed that this finding may weaken the learning efficacy of bilingualized dictionaries. Hulstijn and Trompetter (1998) investigated Laufer and Harder's finding and concluded that writing tasks that included dictionary use did not yield better significant increases in vocabulary retention over reading tasks with dictionary use. It is dictionaries that play the effective role in vocabulary learning, not solely the act of writing. At present, little conclusive evidence evaluating the efficacy of various types of dictionaries has been presented by scholars.

The current study made use of the theoretical framework of *Involvement Load Hypothesis* to increase the learners' devotion to the task in hand and therefore to facilitate learners' vocabulary learning. The involvement load of a task is determined by three factors: *need, search, and evaluation*. If the *need* of learning is driven by an external agent, the resultant need is moderate compared to its strength when need is induced by learners' intrinsic motivation. *Search* means the act of searching for the meaning of unknown L2 words by consultation of an authority such as a dictionary. *Evaluation* refers to a comparison between words, between meanings under the same lexical item in order to determine the context of words.

This study aims to provide empirical results about the learning efficacy among types of dictionaries by means of exploiting *Involvement Load Hypothesis*. For the purpose of motivating learners to read the information provided in the entry, a translation task was created for the present study. The use of translation tasks is advocated by researchers

(Laufer & Girsai, 2005; Nation, 2001; Peters & Leuven, 2007; Ramachandran & Rahim, 2004) because they are believed to help learners clarify their understanding and enhance their engagement in target words.

1.2 Statement of the Problem, and Purpose of the Study

Literature related to second language vocabulary learning and *the Depth of Processing* has examined several aspects of vocabulary learning. Findings in previous literature also advocate the role of elaboration induced in a task, and they signify that dictionaries are able to play a role in facilitating vocabulary elaboration and learning. However, the efficacy of vocabulary retention with the inclusion of dictionary consultation is not clearly evident. Whether or not the usage of a particular type may generate different vocabulary retention rates in L2 learners has yet to be decided on. Hence, the present study investigates the efficacy of vocabulary retention with relation to the effect of various types of dictionaries used on L2 vocabulary learning through a translation task, which was created based on the theoretical framework of the *Involvement Load Hypothesis*. Translation tasks have rarely been used in previous studies in which researchers tried to help instructors and learners make better use of dictionaries to facilitate vocabulary learning.

The purpose of the present experiment is to examine the efficacy of dictionary consultation on incidental vocabulary learning through a translation task, and to investigate the effects of different types of dictionaries on L2 vocabulary acquisition. Moreover, the factor of language ability is taken into consideration in the present study, to enable clarification of whether or not certain types of dictionary consultation effectively assist language learners. Through investigation of the above factors, it is hoped that the

present study can provide insightful and practical guidelines to equip instructors with teaching skills and enhance learners' L2 vocabulary learning.

1.3 Research Questions

This study aims to answer the following research questions：

1. Does the translation task help learners acquire and retain new L2 vocabulary?
2. Do learners perform differently when learning new L2 vocabulary by consulting different types of dictionaries, monolingual, bilingual, and bilingualized dictionaries?
3. Would the translation task be equally helpful to L2 learners of different language levels when learning new vocabulary?
4. Do learners of different language levels perform differently on the posttest when learning new L2 vocabulary by consulting different types of dictionaries?
5. Do the new or old test items significantly affect the results of different tests, the *Posttest* and *Delayed posttest* in this study?

1.4 Significance of the Study

This study aims to provide insightful perspectives on dictionary consultation and translation tasks for researchers and instructors for the purpose of making effective use of dictionaries. In the literature, more empirical evidence is required to further examine tasks involving dictionary consultation and their learning efficacy in order to verify the *Involvement Load Hypothesis* and to identify the beneficial elements of the learning task, such as the translation task in the present study. Given the lack of consensus among scholars and empirical evidence on dictionary efficacy in second language learning, the

present study is expected to make significant contributions to the field of dictionary consultation and second language vocabulary acquisition.

CHAPTER TWO

REVIEW OF THE LITERATURE

Vocabulary development is recognized as an important aspect of foreign language learning for language learners because problems with vocabulary comprehension are potentially more misleading and more likely to interfere with communication than problems with grammar (Gass & Selinker, 2001; Hedge, 2000). In order to facilitate second language vocabulary learning (SLVL), it is necessary to understand how the learning process can be accelerated and how learners learn vocabulary.

2.1 Second Language Vocabulary Learning

Fundamentally, language learning involves knowing and remembering new words. The way in which learners acquire the meaning of second language vocabulary must first be understood, and then strategies for enhancing the vocabulary learning process may be described.

2.1.1 Incidental and intentional vocabulary learning

Researchers have explored the processes of SLVL by investigating the vocabulary learning processes of first language speakers. They concluded that vocabulary acquisition includes two main processes. Some researchers (Nation, 2001; Schmitt, 2000) define them as explicit learning and incidental learning, while others (Laufer & Hulstijn, 2001) term them incidental and intentional vocabulary learning. These concepts and their definitions are basically identical. Incidental vocabulary learning is defined as the learning of vocabulary as the by-product of activities that are not explicitly focused on

vocabulary learning, while intentional vocabulary learning occurs when learners are directed to the focused study of words (Hulstijn, 2001; Schmitt, 2000). Operationally, intentional and incidental learning are discriminated from each other solely by either the act of forewarning or not forewarning participants of the consequent retention test (Chin, 2001). However, it must be noted that incidental learning may be either explicit or implicit—explicit learning, a distinction that refers to input processing with conscious intention to work out the concepts or rules within the linguistic regularities, whereas implicit learning means processing of vocabulary input without conscious intent to do so (Hulstijn, 2005; Laufer & Hulstijn, 2001). In this study, the terminology of incidental and intentional vocabulary learning is used.

Some scholars advocate the implementation of incidental vocabulary learning through extensive reading or guessing from context (Huckin & Coady, 1999; Nation, 2001; Paribakht & Wesche, 1999). From their perspectives, incidental learning offers the merits of both the provision of context and the intention to make vocabulary learning meaningful, which accord with communicative teaching. However, Hill and Laufer (2003) summarized research on vocabulary acquisition through reading (without any enhancement tasks) and observed that such research demonstrates that the rates of acquisition of unfamiliar words is 1-5 words in a text of over 1,000 words. An L2 learner thus may have to read 420 simplified readers with 20,000 running words to acquire 2,000 words and s/he will have to read 4,200 novels to learn 20,000 words, which native speaking educated adults are equipped with before university. Moreover, inferring word meaning in context is vulnerable to mistaken definition, especially for learners with low levels of proficiency (Schmitt & McCarthy, 1997; Sökmen, 1997; Knight, 1994). Most importantly, guessing from context does not necessarily contribute to long-term retention

even if words are embedded with rich clues (Hulstijn, 1993; Hulstijn, Hollander, & Greidanus, 1996; Parry, 1993).

Incidental and intentional learning should play complementary roles. One should not dominate the other. This is due to the fact that, vocabulary learning is incremental in nature (Schmitt, 2000; Henricksen, 1999). Therefore, L2 learners learn vocabulary not only from extensive reading or inferring from context but also through intentional vocabulary learning and from tasks intended to enhance the quality of incidental learning (Schmitt, 2000).

Researchers suggest that learners should take the responsibility to broaden their vocabulary levels (Nation, 2001; Schmitt, 2000; Schmitt, 1997; Sanaoui, 1995). Accordingly, learners need to be taught / instructed about to vocabulary learning strategies to achieve learned autonomy and to facilitate their learning.

2.1.2 Vocabulary learning strategies

Results from research on learning strategies imply a trend of moving away from the teacher-oriented approach. Instead current focus is focusing on learner ability. A learner's ability plays a significant role in their language development, indicating learner investment of time and energy are the essential basis of vocabulary learning (Schmitt, 1997). Hence, teachers are encouraged to equip learners with vocabulary learning strategies, in order to create learner autonomy and to facilitate independent vocabulary learning (Nation, 2001; Schmitt, 2000). Learners are urged to use multiple vocabulary learning strategies concurrently. Scholars have started to pay greater attention to the importance of learning and argue that learners should take steps to gain control of their learning process, an behavior lacking in poor learners (Sanaoui, 1995).

A taxonomy of vocabulary learning strategies has been robustly developed by Schmitt (1997; 2000). Vocabulary learning strategies are primarily divided into two categories, discovery strategies and consolidation strategies. The former refers to strategies useful for the initial discovery of a word's meaning, while the latter consists of strategies which are beneficial for recalling words once they have been introduced. This taxonomy describes distinct processes which are considered to be vital for determining a new word's meaning and usage, and for committing it to memory for future use. Discovery strategies include a) determination strategies, such as the use of dictionaries, employed when learners have a need to discover the meaning of a word without the ability to ask someone else for help; and b) social strategies, such as strategies of interaction with others to obtain the meaning of a word, such as asking a teacher for an L1 translation. Unlike discovery strategies which are normally used before the meaning is discovered, consolidation strategies are used after the meaning is known to the learner. These strategies comprise a) social strategies, such as studying and practicing meaningful usage in a group context; b) memory strategies, generally involving elaborative mental processing which facilitates long-term retention; c) cognitive strategies, such as verbal or written repetition; and d) metacognitive strategies, such as continuing to study word over time (Schmitt, 1997).

In sum, when encountering an unfamiliar word, learners frequently need to work out the meaning of the word first and then they may make use of consolidation strategies to retain the word for later usage. Learners should be gradually introduced and encouraged to employ strategies autonomously during the course of vocabulary acquisition.

2.1.3 Aspects of knowing a word and remembering a word

Researchers have contributed knowledge to the various aspects of knowing a word and remembering it. It is argued that the provision of meaning of an unknown word plays a significant role in retaining that word (Nation, 2001). Meanwhile, noticing is seen to be a starting point and key factor in the quality of vocabulary acquisition that takes place (Nation, 2001).

Henriksen (1999) advanced a three-dimensional model for vocabulary acquisition. The Three-dimensional model refers to the partial-precise vocabulary knowledge dimension, the depth of knowledge dimension, and the receptive-productive dimension, a continuum that illustrates language learners' vocabulary development. Henriksen explains that L2 learners are expected to be unclear about the meaning of the word at first and may gradually develop a clearer sense of the word over time. Henriksen's model elaborates on the incremental nature of vocabulary acquisition. In the process of understanding a word, learners must link a lexical item with a labeling referent, and select intentional relations between that item in the lexical set (Chi, 2001). The procedure of form-meaning association of a word provides learners with the chance to construct connections between words and develop their lexical schema network in L2. Receptive words may be transformed into productive words. Ellis (as cited in Nation, 2001), on the other hand, defines several kinds of vocabulary knowledge and proposed structurally effective learning techniques, including distinguishing the form learning aspects from the meaning aspects of vocabulary Ellis suggests that form recognition and form production depend on implicit learning, while meaning and constraints on use are learned by explicit, conscious processes. He defines implicit learning as attention to the stimulus rather than attention to other conscious operations, and argues that repetition exerts great influence on implicit

learning. On the other hand, explicit learning, such as searching for rules, is more conscious and is influenced by the quality of the mental processing. A broad overview of the foregoing discussion is provided in Table 2.1 (Nation, 2001).

Table 2.1

Types of vocabulary knowledge and related learning activities

Kinds of knowledge	Kinds of learning	Activities
Form	implicit learning involve noticing	repeated meetings as in repeated reading
Meaning	strong explicit learning	depth of processing through the use of images, elaboration, deliberate inferencing
Use: grammar collocation	implicit learning	repetition
Use: constraints	explicit learning	explicit guidance and feedback

Another crucial issue in vocabulary acquisition is the process of remembering a word. Nation (2001) advanced three common processes leading to a word being remembered: noticing, retrieval, and generative use. Noticing refers to attention paid to a word; learners have to notice the word and be aware of the word and take it as a meaningful language item through the use of dictionary consultation, deliberate word study, guessing from context, or the provision of its definition (Schmidt, 1990; Sharwood, 1993). Second, subsequently spaced retrieval strengthens the link between the form and meaning and leads to better retention (Baddeley, 1997). Third, making actual use of the word by making an original sentence enhances retention of the word.

Among these three processes, noticing exerts the greatest influence on incidental vocabulary learning because it is crucial at the beginning of the process. It is

recommended that instructors effectively facilitate the noticing processes of learners (Schmidt, 2001). Given that different task demands result in various degrees of engagement in learning on the part of learners, the extent of the explicitness of task/engagement is influential to the intake, and the degree of resulting awareness is highly correlated with the effect of intake (Rosa & O'Neill, 1999). This conclusion was also reached by Nagy (1997), Huckin and Coady (1999), and Hulstijn (2001). Hulstijn, Hollander, and Greidanus (1996) and Prince (1996) further concluded that deep elaboration of the meaning of an unknown word enhances incidental learning.

With regard to tasks involving deep elaboration, Prince (1996) argued that the efficacy of translation tasks and the role of context should be taken into consideration. It is suggested that learners maybe better able to retrieve the word from the mental lexicon when L1 and L2 lexical items receive sufficient attention during the study phase. That is, tasks which incorporate the use of bilingualized dictionaries may facilitate better learner autonomy. Presentation of L1 translation equivalents achieves efficiency and learner autonomy; on the other hand, learners can acquire how the words are used from the information in appropriate contexts. So he suggested that the learning strategies/tasks, combining the two techniques, should be explored.

With its close relationship to language learning, the field of cognitive psychology offers an array of findings that bear on learning and information retention. The Depth of Processing Hypothesis states that an individual may experience better retention of information if they have more manipulation, thinking, and engagement with the information (Craik & Lockhart, 1972). In a nutshell, the amount of cognitive load, which refers to the depth of processing, determines, at least in part, the quality of learning which takes place. Moreover, according to Hulstijn et. al. (1996), the efficacy of engagement in

words with little exposure achieves significantly better retention than that of much exposure to a word without engagement. In the following section, a variety of views based on findings from cognitive psychology on vocabulary learning will be discussed, in order to develop a more robust concept of L2 vocabulary learning.

2.2 Views On Vocabulary Learning And The Relevance Of Cognitive Psychology

Second language vocabulary learning is highly correlated with learners' learning mode, cognitive and metacognitive skills. All three of these are widely discussed in the field of cognitive psychology. Exploiting knowledge from the field of cognitive psychology can broaden the horizons of both instructors and learners. The application of the empirical findings can make learning more effective.

2.2.1 Depth of processing for vocabulary

Craik and Lockhart (1972) introduced the concept of *depth of processing* which has exerted a substantial influence on scholarly attention to the quality of the learning process. It is suggested by Craik and Tulving (1975) that retention depends on the richness of the material rather than simply the presentation of word meanings. Their belief that more elaboration in the processing of new lexical items may lead to enhanced retention is supported by researchers of knowledge representation, information encoding and retrieval, attention, and memory. Additionally the concept of D*epth Of Processing* can be applied to both incidental and intentional vocabulary learning (Anderson, 1995; Baddeley, 1997; Craik & Lockhart, 1972; Ellis, 1994; Hulstijn, 2001; Laufer & Hill, 2000; Schmitt, 2000; Watanabe, 1997).

Although incidental learning has been deemed an inefficient way to acquire

vocabulary, the use of Depth Of Processing or elaboration can compensate for its flaws and facilitate the incidental vocabulary learning process. However, the Depth of Processing hypothesis proposed by Craik and Lockhart fails to adequately define its operational definitions. More recently, with the rise of cognitive psychology, Laufer & Hulstijn (2001) have advanced the Involvement Load Hypothesis, which attempts to provide an operational framework for the Depth Of Processing hypothesis.

2.2.2 Involvement load hypothesis and task-induced involvement load

Laufer and Hulstijn (2001) developed the Involvement Load Hypothesis for L2 vocabulary learning, which includes three factors, *need, search, and evaluation*. In this hypothesis, when the *need* of learning is imposed by an external agent, the resultant need is considered to be moderate. However, when need is induced by learners' intrinsic motivation, it is considered to be strong. *Search* refers to the act of looking for the meaning of unknown L2 words by consultation of an authority such as a dictionary. *Evaluation* involves a comparison between related words, between meanings under the same lexical item, or between words in order to determine the meaning embedded in the context that words occur in. When a learner processes a word in a natural or artificially designed task, each of the above three elements maybe present or absent. The involvement load is determined by the combination of these three factors and the degree to which they are incorporated into the task. In other words, according to Involvement Load Hypothesis, the involvement load of rote memorizing is considered to be light while that of elaboration is considered heavy.

In order to verify the Involvement Hypothesis, Laufer and Hulstijn (2001) analyzed the degree to which the aforementioned three elements were employed in tasks in prior

experimental studies which investigated and compared the efficacy of vocabulary learning tasks. Their findings indicated that the results of their analysis with Involvement Hypothesis were consistent with the results generated in the previous experiments. Based on the application of Involvement Load Hypothesis, it was concluded that once dictionary consultation is involved in the learning process, the involvement load tends to be greater than that without dictionary consultation, i.e. task-induced involvement load varied with the design of the task. Therefore, effective instruction should include tasks directing learner attention to the words and requiring elaboration of the words to enhance the retention of target vocabulary (Hill & Laufer, 2003).

2.2.3 The importance of dictionary use in increasing involvement load

Based on the Involvement Load Hypothesis, and on the empirical evidence provided by researchers (Hill & Laufer, 2003; Laufer & Hill, 2000; Laufer & Hulstijn, 2001), dictionaries appear to play a critical role in the vocabulary learning process of language learners (Gonzalez, 1999; McKeown, 1993). Miller and Gildea (as cited in McCreary & Dolezal, 1999) demonstrated that selecting the definition of an unknown word most appropriate for the meaning in the text is considered to be a high level cognitive task. Both Coady (as cited in Chi, 2003a) and Wright (2003) suggested that in the course of vocabulary acquisition learners should be supplied with both definitional and contextual information about new words. The implication of this is that the role of dictionaries is significant because with the help of dictionaries, learners with vocabulary and language limitations have access to the fast and reliable resource (Gonzalez, 1999). However, the importance of dictionaries is often underestimated by students and teachers of English as a second language (Miller, 2006). Researchers Beattie, (2003); Gonzalez, (1999); Miller,

(2006) advised learners be encouraged to use dictionaries on a regular basis to help them explore and make greater use of this valuable resource. That persistent use of dictionaries should enable learners to compensate for their deficient vocabulary knowledge.

Consulting a dictionary is one of the most common strategies used by learners when they encounter an unfamiliar word (Peters, 2007). From the perspective of promoting autonomous learning, several researchers (Beattie, 2003; Chi, 2003b; Cubillo, 2002; Gairns & Redman, 1986; McKenna, 2002; Wright, 2003) have argued that the key characteristic of dictionaries is that they help learners achieve independence and empower language learners to take independent charge of their learning. Cubillo (2002) documented students' self reports on learning gains and reported that they affirmed that dictionary consultation assists them in increasing vocabulary, finding more ways to express themselves with the use of the most appropriate word, and paraphrasing. It is thus evident that dictionaries improve the language production (skills) of learners.

2.3 Studies On Dictionary

It is acknowledged that dictionaries are influential in language learning. The following sections present summaries of how learners use dictionaries, how they learn dictionary skills, and provides empirical studies on the efficacy of dictionary use.

2.3.1 Learners' Dictionary use

Generally speaking, dictionaries, as stocks of words with glosses, are mainly used for decoding language and are considered advantageous learning tools for language learners who use them (Béjoint, 1981; Chi, 2003a). Several studies have explored learners' use of dictionaries with questionnaires, interviews, and experiments (Bogaards,

2003). The literature sheds light on such aspects of dictionary use as the consultation process, the purpose of dictionary consultation, dictionary preference, different uses among different learner proficiency levels, and problems that learners might face when consulting dictionaries.

In order to further understand how learners employ dictionaries, researchers have investigated elements involved in the consultation process. Atkins and Varantola (1997) described in detail what participants did when they consulted their dictionaries for help with a translation; the researchers kept records of their use, and analyzed the data collected. 103 learners made 1000 dictionary look-ups while attempting to understand 574 new words. This study described some cases in which participants could not find unknown words in the dictionary, and learners' comments on dictionaries. The researchers found that learners with lessL2 knowledge made more use of the direct-translation facility the dictionary offers while those with more L2 knowledge were more likely to exploit other information provided by the dictionary. Likewise, Hulstijn (1993) conducted an empirical investigation and found that the frequency of look-up behavior of a word depended on the reading goals and individual differences of learners, specifically pointing out the factors governing look-up behavior during the dictionary consultation process. Diab and Hamdan (1999) examined dictionary use records and structured interviews finding that the type of words being looked up, such as words which are repeated in the text or words which impede reading fluency also affects look-up behavior. These findings correspond with Hulstijn's conclusion that reading goals affect look-up behavior.

The primary purpose of learner dictionary use is to locate the meaning and pronunciation of words. Diab and Hamdan (1999) studied the dictionary use of 50 Jordanian university students of English while studying a special text about linguistics.

The results showed that EFL learners look up adequate meaning and pronunciation from dictionaries. A large-scale survey was conducted in 2000. A total of 1076 freshmen in a Hong Kong university completed a questionnaire on dictionary strategies, a vocabulary learning strategy questionnaire, and the World Levels Test designed by Nation in 1990 (Fan, 2000). The researcher found that learners often use dictionaries for context-dependent meanings of words, sometimes for L1equivalents, and occasionally for collocations and pronunciation. Kent (2001) found that 76% of the participants in another study looked for an L1 translation; 69% consulted dictionaries for reading, and 18% for writing. In Bogaards' (2003) study, dictionaries were used mostly for reading to find the meanings of unknown words, less for writing tasks, and least for oral tasks such as listening or speaking. Bogaards also observed that learners rarely look up grammatical, etymological, or phonetic information. However, according to Chi (2003a), most Chinese students (72.3%) consult dictionaries often, especially when reading or writing for schoolwork. There is a high percentage of reported ownership of dictionaries among Chinese students. The findings of research studies are consistent with the assertion that semantic information is the predominant reason learners consult the dictionary. Despite extensive research, dictionary preferences of EFL L1 Mandarin speaking college students in Taiwan remain an area which awaits investigation and conclusive results. Chinese college students in Chi's (2001; 2003a) study appeared to have a preference for bilingual or bilingualized dictionaries over monolingual dictionaries most likely because of their inability to comprehend English definitions. Bilingual dictionaries were preferred because learners felt that they were able to provide fast and direct L1 equivalents. It is therefore not surprising that Bogaards (2003) and Kent (2001) found that, bilingual dictionaries are used more frequently than monolingual ones for L2 speakers of a language. On the other

hand, participants in studies by Béjoint(1981) and Nesi and Haill (2002) indicated more satisfaction with monolingual than bilingual dictionaries. Diab and Hamdan's (1999) study shows that monolingual dictionaries are consulted more often than bilingual ones and found more useful and satisfactory by international EFL students. Moreover, owing to advances in technology, electronic dictionaries have become popular withL2) language learners. Researchers have explored this new type of dictionary in research on dictionary use. Kent (2001) investigated the features of dictionaries which make them appealing to language learners. He found that 56% of the participants in his study indicated the speaking functions of electronic dictionaries were an important factor in dictionary choice. The weight or thickness of traditional dictionaries was found to be less appealing whereas illustration with examples, portability, and a large number of examples are desirable attributes of electronic dictionaries. Fan's (2000) research on the differences in the dictionary use of high and low achievers indicated that students with greater vocabulary knowledge are able to take advantage of more information in the dictionary than low achievers. Moreover, learners who ranked high in the L2 vocabulary knowledge test made more use of information in the dictionary, including context, definitions, pronunciation, appropriateness, and frequency. These aspects are regarded to be useful references by them but often neglected by less proficient language learners.

In addition to the description of the actual use and preferences of language learners in their interactions with dictionaries, related literature further points out problems and difficulties faced by students and language instructors with regard to dictionary usage. The most common difficulty that L2 learners encounter is the lack of enough vocabulary knowledge which leads to failure to determine word class and the failure to choose the best meaning of the word in dictionary entries. Two studies depict the problems that

learners have as they consult dictionaries. Nesi and Meara (1994) examined how 52 EFL undergraduate learners interpreted definitions in the dictionary. The participants were asked to make a meaningful sentence with assigned words. This study reported that 56.5% of all sentences written by the participants were deemed unacceptable due to incorrect use of the given words and a set of errors made can was generalized into a broad pattern, the Kidrule strategy" as termed by Miller and Gildea (as cited in Nesi & Meara, 1994).

The Kidrule strategy includes four steps: a) reading the definition; b) selecting a short familiar segment; c) composing a sentence containing that segment; d) substituting the target word for the selected segment. The use of The Kidrule strategy resulted in the inappropriate use of assigned words. In addition to The Kidrule Strategy, four other behavior patterns were identified among L2 learners during dictionary consultation (Nesi & Meara, 1994). Learners sometimes failed to make use of grammatical information in dictionary entries, chose inappropriate lexical collocations, confusing words that looked or sounded similar to one another, or rejected useful dictionary entry information which did not match their preconceived notions of what the target word meant. In short, these findings imply that L2 learners when using monolingual dictionaries perceived a part of the definition without understanding the usage of the entry they looked up. In other words, many of the errors collected by Nesi & Meara are attributable to the participants' partial understanding of the entry. They in turn explain such problems as the result of a lack of beneficial L2 vocabulary comprehension strategy implementation:. Poor dictionary users did not thoroughly investigate the context of unknown words to determine the word meaning in the entry (Cubillo, 2002). Nesi and Haill (2002) conducted a longitudinal study on international students at a British university and reported that students tended to

fail to select appropriate entries and sub-entries in monolingual dictionaries when they tried to find the meanings of unknown words in texts. They analyzed assignments of seventy-seven subjects. According to the data, dictionary consultation failure could be also attributed to the poor strategies of dictionary users. Moreover, the language itself in the explanations is difficult to interpret for learners, which is the other attribute to dictionary consultation failure and which could be depend on dictionary type, learner level and familiarity of context. And they found that 43 out of 77 subjects were unsuccessful with one or more of their dictionary consultation. 23 words out of 65 failed to be used with the correct word class. Though the dictionary entries of 11 out of 65 words were correctly determined, the subjects still misinterpret the information in the entry. The problems these researchers found imply the significance of dictionary use instruction.

Bogaards (2003) asserts that such problems are most likely caused by insufficient instruction in dictionary use, rendering users unable to take advantage of the rich information in the dictionary, an argument supported by Sökmen (1997), Beattie (2003) and Fan (2000). Fan agrees that there is a need for L2learners to consciously explore several aspects of the target language, such as collocations, pronunciation, appropriateness of word usage, and frequency, and asserts that the dictionary can serve as a learning tool with language information and as the input for learning the aspects of the language. In order to solve some of the problems that learners have when they consult dictionaries, some studies on EFL learners have been conducted to examine the efficacy of the teaching on dictionary use skills.

Table 2.2
Dictionary use of learners

Studies	Participants	Dictionary-use related purposes	Dictionary-use related findings
Hulstijn (1993)	82 Dutch high school students receiving 4 to 5 years of instruction in EFL	To investigate the relationship between reading activities and the second language vocabulary acquisition.	The factors governing look-up behavior during the dictionary consultation process were the reading goals and language competence of learners.
Atkins & Varantola (1997)	71 participants from 15 different language communities	To describe what strategies participants used when they consulted their bilingual dictionaries.	1. Learners with less L2 knowledge made most use of the direct-translation facility the dictionary offers. 2. Learners with advanced L2 skills were more likely to exploit other information provided by the dictionary.
Diab & Hamdan (1999)	50 Jordanian university students of English	To find out the primary purpose of dictionary consultation for learners.	EFL learners expected adequate meaning and pronunciation from dictionaries.
Fan (2000)	A total of 1076 freshmen in a Hong Kong university	To find out the primary purpose of dictionary consultation for learners.	Learners often used dictionaries for context-dependent meanings of words, sometimes for Chinese equivalents, but seldom for collocations and pronunciation.
Kent (2001)	244 freshmen at a Korean University	To find out the primary purpose of learner dictionary use.	76% of the participants looked for an L1 translation; 69% consulted dictionaries for reading comprehension, and 18% for writing.
Chi (2003a)	over 200 university freshmen in HK	1. Discuss students' habits and choices when they use dictionaries. 2. Investigate what content and methodology are effective in teaching or learning how to consult a dictionary. 3. To evaluate the effectiveness of explicit teaching of dictionary skills.	Most Chinese students (72.3%) consulted dictionaries often, especially when reading or writing for schoolwork. There was a high percentage of reported ownership of dictionaries among Chinese students.

Table 2.2 (continued)
Dictionary use of learners

Studies	Participants	Major purposes	Major findings
Bogaards (2003)	No participants; to review studies on dictionary uses and comment on the methods used in the past studies.		Dictionaries were used mostly for reading tasks to find the meanings of unknown words, less for writing tasks, and least for oral tasks such as listening or speaking. Learners rarely looked up grammatical, etymological, or phonetic information.

2.3.2 Dictionary use skills teaching

Although studies show that EFL/ESL students strongly believe dictionaries play a beneficial role in their learning of English, and that dictionary consultation has been promoted by educators, learners appear to possess limited dictionary consulting skills (Chi, 2003a; McKenna, 2002; McCreary & Dolezal, 1999). There is thus a need for educators and researchers to come up with structured teaching procedures for dictionary use to facilitate second language learning (Chi, 2003a; Fan, 2000). Studies on dictionary use skills instruction have generally examined the issue from two perspectives: teacher development and teaching materials.

Studies on teacher development in dictionary use skills examine/describe the advantages that dictionaries can pose for teachers and the knowledge which teachers should be equipped with, with regard to dictionary skills instruction. Fan (2000) suggested that teachers encourage learners to consult dictionaries as often as it is appropriate, and contended that such encouragement is positively correlated with vocabulary proficiency. According to Marckwardt (1973), dictionaries, which typically supply information about the use of the language, are reliable resources for word

meanings, pronunciation help, and correct spelling. Dictionaries are useful weapons in a teachers' armory but teachers need to learn how to teach skills for dictionary consultation before they can really help learners make thorough use of those dictionaries. Marckwardt then argues that teachers must be prepared to differentiate among dictionaries and interpret linguistic sophistication in the entry. In the context of consulting dictionaries, four variables must be considered: the teacher, the learner, the work, and the dictionary (Beattie, 2003). She suggests that teachers avoid presenting materials of a level inappropriate to learners and that they attempt to equip students with the ability to discern when to look up or guess the meanings of words and what to look for in an entry. Before dictionaries can serve as a learning aid, learners need to be provided with particular groundwork of lexical and syntactical knowledge. Beattie (2003) recommends monolingual dictionaries with explanations simple enough for the learners to comprehend. This may facilitate learning partly owing to reinforcement of the context used in the definition.

Several studies provide teaching materials for dictionary consultation by detailing the correct steps of beneficial dictionary use in order to help learners use dictionaries wisely (Fan, 2000; Nesi, 2003; Scholfield, 1982). Nesi comprehensively summaries all the skills needed for university-level language students to use dictionaries effectively. They were listed in 6 chronological stages：with the first to fifth stages representing the process of dictionary consultation, while stage 6 is independent of the consultation process (Table 2.3).

Table 2.3
Skills needed to use dictionaries effectively

Stages	Descriptions of the stage
Stage 1	before study
Stage 2	before dictionary consultation
Stage 3	locating entry information
Stage 4	interpreting entry information
Stage 5	recording entry information
Stage 6	understanding lexicographical issues

Scholfield (1982) proposed seven main steps in dictionary consultation and constructed guidelines for L2 learners, arguing that looking up target vocabulary in monolingual dictionaries demands that certain skills be applied systematically, and strategically.

1. Locate the unknown word(s) or phrase.
2. If the unknown is inflected, remove the inflections to uncover the base form to look up.
3. Search for the unknown in the alphabetical list.
4. If more than one main entry for the unknown is found, try the following procedures:
   a) If the unknown seems to be a set phrase, idiom, or compound word, try looking up each main element.
   b) If the unknown seems to have a suffix, try the entry for the stem.
   c) If the unknown appears to be an irregularly inflected form or a spelling variant, scan nearby entries.
   d) If there is an addendum, search there.

Both procedures a) and b) require inferring the internal structure of the unknown

word and some familiarity with common dictionary practice. The user needs the ability to distinguish lexical from non lexical (function) words so as to judge the relative probability of a particular word appearing as the main entry. Moreover, a dictionary user needs knowledge about word formation when looking up derived words for part (b).

5. If there are multiple senses or homographic entries, reduce them by elimination. In order to do this, it may be necessary to work out from the relevant entry/entries any or all of the following kinds of information: *pronunciation, part of speech,* more detailed *grammatical subclass, style, collocation/selection,* and *meaning.*

To find the right sense, the learner has to judge which of the above properties to pursue in any given case and the optimum order for doing so. Normally a much more important discriminatory guide is *part of speech*, but the learner has to do more than identify particular words from the source text that match the words stated as collocation, one has to weigh the probability that the words encountered could be in an appropriate relation to the stated collocational words, either in the language or in the text. Understanding the definition and incorporating it into the context where the unknown was met. This may involve:

a) looking up unknown words in the definition itself

b) adjusting for complementation and collocation

c) adjusting for part of speech

d) adjusting for breadth of meaning

Even when the alternatives have been reduced to one possible definition, the central definitional information about the unknown target word has to be combined with the context where it was met and sense made of the whole.

7. If none of the senses seem to fit, learners should attempt to infer one that fits from.

If more than one fits, seek further contextual clues in the source text to disambiguate. Both of these last-ditch situations require sophisticated skills of inference.

Based on empirical evidence, it is recommended that language instructors explicitly instruct learners in the use of dictionaries. Chi (2003a) devised training materials based on aspects of dictionaries which learners expressed interest in, and then conducted explicit dictionary-use instruction in classes via learning tasks. The results demonstrated that explicit teaching of dictionary consultation was effective on learners' knowledge and skills of dictionary consultation. Before the treatment of Collocation and Style Labeling, 48.6% of participants had correct answers, and 80% were correct after the treatment. Chi advocates that explicit rather than implicit teaching of dictionary consultation skills triggers and improves learners' awareness and knowledge of dictionary consultation and language knowledge itself.

2.3.3 The efficacy of dictionary use

As the foregoing discussion shows, dictionary consultation and the instruction of dictionary use skills are widely regarded as important for L2 learners. The following sections will review empirical studies on the effect of dictionary use on reading comprehension and vocabulary learning.

2.3.3.1. The efficacy of using dictionary on reading comprehension

Dictionary consultation is a kind of vocabulary learning strategy as well as a language tool which may be used to assist language learners in reading activities. Therefore, dictionary use is also deemed to be a reading strategy. Research on foreign

language reading strategies provided much understanding of the reading process, but few studies have been conducted on how learners make use of dictionaries to aid in the understanding of texts (Liou, 2000). Moreover, the results are still inconclusive. In pioneering research in this area Bensoussan, Sim, and Weiss (1984) found that when reading, the use of bilingual dictionaries had no influence on comprehension test scores for EFL learners. Jacobs and Dufon (as cited in Luppescu & Day, 1993) investigated the effectiveness of including glosses in texts to facilitate vocabulary learning, finding that the learning effect in a delayed test was not as significant as in the immediate posttest. More recent studies conducted on dictionary consultation and reading comprehension have identified a variety of variables that have to do with the interaction between dictionary consultation and reading comprehension. The results of the above studies yielded different findings. Hulstijn (1993) conducted an experiment to examine the effect of different tasks on L2 readers' look-up behavior. The two independent variables in the study were readers' L2 vocabulary knowledge and their ability to infer the meaning of unfamiliar words from context. The participants consisted of 82 Dutch EFL learners who were divided into a high proficiency group and a low proficiency group according to their L2 vocabulary knowledge. Three tasks were completed: an FL reading comprehension task (consisting of 772 words, with the use of dictionary consultation, an FL ability inferencing task (with some words replaced by pseudo-words) and an FL vocabulary task (developed by Nation, 1983). Hulstijn found that the participants did not use their dictionaries to look up all of the unfamiliar words. However, participants frequently looked up words which they deemed to be relevant in terms of reaching the goal of reading. Learners with higher inferring ability not only performed significantly better in vocabulary (comprehension tasks but also acquired words and their meanings more easily

and extended their existing vocabulary with less difficulty than those with lower inferring abilities. It is noteworthy that high inferring ability did not guarantee less dictionary consultation when reading because such individuals preferred to verify meanings. This study presented learners' look-up behavior during a reading task, demonstrating how (learner variables) affect learners' performance on reading comprehension (Liou, 2000).

Whether or not dictionary use interferes or facilitates reading comprehension is still widely debated by researchers. . The results of experiments conducted thus far still seem inconclusive. Knight (1994) confirmed that L2 college students with higher achievers were better at correctly guessing and learning the meaning of unknown words when reading, while low achieving readers were often unable to do so. However, with the use of dictionary consultation lower-level achievers achieved significantly better reading comprehension scores than the participants in the non-dictionary group. Knight's findings contradicted the argument that looking up words in dictionaries while reading may interfere with reading comprehension. In Knight's study, the recall scores and the number of words looked up by low achievers were highly correlated (.68, $p<.001$) which indicated that dictionary use did not disturb the short-term memory, but instead, enhanced comprehension. Although with the assistance of dictionary use these low achievers performed significantly better on reading comprehension tasks and vocabulary learning tasks than those participants who completed tasks without help from dictionaries. Rhoder and Huerster (2002) suggest that L2 learners read without dictionaries in order to avoid disturbance of the reading comprehension process, however other studies (Knight, 1994; McCreary & Dolezal, 1999) suggest the opposite. McCreary and Dolezal (1999) divided 74 advanced ESL learners into three experimental groups to investigate how they grasped the meanings of words under three conditions: 1) from dictionary definitions alone; 2)

from reading words in context alone; 3) from both dictionary definitions and context. Participants later completed a multiple-choice test. Results demonstrated that there was no statistical significance between the results for Group 1 and the results for Group 2, signifying dictionary use alone did not exert greater learning efficacy than context alone. However, the combination of dictionary use and the provision of the context appeared to be beneficial for the participants. The findings of Fraser (1999) and Liou (2000) also support the efficacy of dictionary consultation on reading comprehension. In both studies, learners consulted bilingual dictionaries for reference while reading. Their findings also imply that the ignoring strategy might either cause misinterpretation of unfamiliar words or facilitate reading fluency at the cost of accuracy.

Generally speaking, the empirical evidence appears to support the argument that dictionary consultation assists learners in reading comprehension as well as vocabulary gain. In the next section, more on the interaction between dictionary use and vocabulary acquisition are examined

2.3.3.2. The efficacy of using a dictionary on vocabulary acquisition

In addition to the effect of dictionary use on reading comprehension, frequency of vocabulary occurrence has been found to be one of the factors enhancing incidental vocabulary learning in the context of dictionary use (Hulstijn, Hollander & Greidanus, 1996). During the 1990s, researchers began paying increasing attention to the interaction between dictionary consultation and vocabulary acquisition. Results of studies in this field have demonstrate that when advanced second language learners are provided with the meanings of unknown words through marginal glosses or when they consult dictionaries, they are exposed to the unknown words a few more times than when there is

no information regarding them and thus are more likely to remember these words. The positive influence of deep elaboration of the meaning of an unknown word has informed pedagogies that dictionary use exert beneficial effects on incidental vocabulary learning (Chi, 2001).

Luppescu and Day (1993) focused on the role of bilingual dictionaries in the learning of vocabulary while reading. The participants, 293 Japanese university students, read a short story containing 17 target words and then received a multiple choice vocabulary test. Dictionary use by EFL Japanese learners while reading was found to be more significantly beneficial to the vocabulary learning compared to those learners who read the short story without consulting bilingual dictionaries. It could be argued that dictionary consultation takes learners more time, which contributes to more learning of vocabulary, but there was almost zero correlation between the time taken to read the passage and performance on the test (Hill & Laufer, 2003; Luppescu & Day, 1993). Knight (1994) found that American adult students of Spanish who had read two Spanish texts while using a dictionary were able to remembered more word meanings (3.38 words for immediate post-testing and 2.86 for delayed post-testing out of 24 target words) than those who had had no dictionary at their disposal (0.15 words), a finding consistent with that of Luppescu and Day (1993). Based on the results of this study, dictionary use is believed to promote the possibility of vocabulary learning for both high and low verbal ability learners (stratified based on The American College Test verbal scores, especially for low ones. Knight argued that dictionary use compensated for insufficient vocabulary knowledge, especially among low achievers. For example, researchers point out that on the immediate-select-definition test, dictionary use makes low verbal ability learners capable of (learning) almost as many words as learners with high verbal ability (51% and

55%, respectively). Another experiment exploring different reading conditions and vocabulary learning rates was conducted by Hulstijn, et. al. (1996). The researchers compared three text reading conditions; texts accompanied by marginal glosses (L1 translations of unknown words), texts accompanied with the use of dictionaries (use of a bilingual dictionary), and a control group (neither marginal glosses nor dictionaries). The participants, Dutch advanced students of French, were instructed to read a French short story and take an immediate posttest, in which the learners were assessed on their ability to recall 16 words that had been shown once or three times in the text. Results once again supported the efficacy of dictionary use when reading an L2. The researchers concluded that frequency of occurrence is a key factor that fosters incidental vocabulary learning. The provision of the meanings of previously unknown words through marginal glosses or dictionary consultation assisted advanced L2 readers more than no access to the meanings of unknown words. It is important to note that there was no delayed posttest to investigate learner retention of target words.

Another L2 vocabulary acquisition researcher, Fraser (1999), investigated the relationship between reading comprehension and dictionary consultation from the perspective of learning strategies. Fraser explored the effectiveness of lexical processing strategies (LPS), consulting dictionaries, inferencing, and ignoring, when reading. His participants were required to take a test after the treatment and a delayed test one month after the end of the treatment to assess their word learning. 841 learners inferred more frequently (44%) than they ignored (24%) or consulted a dictionary (29%). The participants recalled word meanings which they had determined half of the time when they supplemented the inferrencing of target word meanings with dictionary consultation. When they consulted dictionaries or inferred alone, only 30% of the meanings of target

words were recalled on the immediate post test. The results imply that enhanced retention was brought about by inferring and then consulting dictionaries for verification of inference because of the depth of involvement, processing, and elaboration involved in the process.

With the advent of computers, dictionaries are now presented and operated in a digital interface. Dictionaries used in Computer Assisted Language Learning (CALL) produce log files recording participants' lookup history, which Laufer & Hill (2000) used in an experiment. They investigated L2 vocabulary acquisition with the use of "bilingualized" dictionaries, which are dictionaries which contain monolingual information about a word and its translation into the learner's mother tongue. They examined the relationship between lookup patterns and recall of looked up words. Participants were asked to read a text on a screen using the CALL dictionary to look up words and to take an immediate posttest recall tests after reading. The researchers proposed that provision of a variety of lexical information is associated with better vocabulary learning, whereas the number of times words were looked up does not guarantee acquisition of target vocabulary which suggests that paying greater attention during lookup rather than the number of lookups is the key factor in L2 vocabulary acquisition. Their results showed that if subjects consulted the dictionary in L1 and L2, bilingualized dictionaries, the meanings of unknown words are better retained, consistent with the claim that, whether learning is intentional or incidental, careful attention, notice, elaboration, and deeper processing enhance retention (Ellis, 1994).

In addition to the above studies, more recent studies (Bogaards, 2003; Chin, 2001; Rhoder & Huerster, 2002) provide empirical evidence supporting the efficacy of dictionary consultation in L2 vocabulary acquisition. Dictionary use appears to play a

constructive role in long term vocabulary acquisition. However, since learners can choose from many different types of dictionaries, a comparison of the effectiveness of different types of dictionaries is presented in the following section.

Table 2.4
The efficacy of dictionary use on vocabulary acquisition

Studies	Participants	Major purposes	Major findings
Luppescu and Day (1993)	293 Japanese university students	To focus on the role of bilingual dictionaries in the learning of vocabulary while reading.	Dictionary use by EFL learners while reading was found significantly beneficial to vocabulary learning than those without. It could be argued that dictionary consultation takes learners more time, which contributes to more learning of vocabulary, but there was almost zero correlation between the time taken to read the passage and performance on the test.
Knight (1994)	105 Spanish sophomore	To examine the relationship between reading comprehension and dictionary consultation and the significant difference of between vocabulary performance with dictionary consultation and without dictionaries.	1. American students of Spanish who had read two Spanish texts while using a dictionary later significantly remembered more word meanings (3.38 words for immediate testing and 2.86 for delayed testing out of 24 target words) than those who had had no dictionary at their disposal (0.15 words), a finding consistent with that of Luppescu and Day (1993). 2. Dictionary use promotes the possibility of vocabulary learning for both high and low verbal ability learners, especially for low ones.
Hulstijn, J.H., Hollander, M., & Greidanus, T. (1996)	78 Dutch advanced freshmen of French	To explore different reading conditions and vocabulary learning.	1. It is the frequency of occurrence that fosters incidental vocabulary learning. 2. The provision of the meanings of unknown words through marginal glosses or dictionary consultation assisted advanced L2 readers more than no access to the meanings of unknown words. 3. It is important to note that there was no delayed posttest to investigate learner retention of target words.
Fraser (1999)	The 841 university learners	To explore the effectiveness of lexical processing strategies (LPS), consulting dictionaries, inferencing, and ignoring, when reading.	1. The 841 learners inferred more frequently (44%) than they ignored (24%) or consulted a dictionary (29%) when encountering unknown words. 2. The results imply that enhanced retention was brought about by inferring and then consulting dictionaries for verification because of the depth of involvement, processing, and elaboration.

Table 2.4 (continued)
The efficacy of dictionary use on vocabulary acquisition

Studies	Participants	Major purposes	Major findings
Laufer & Hill (2000)	Of the 72 subjects, 32 were EFL students from the University of Haifa, Israel, and 40 were first year ESL students from the University of Hong Kong.	To investigate vocabulary acquisition with "bilingualized" dictionaries and the relationship between lookup patterns and recall of looked up words.	1. Provision of a variety of lexical information is associated with better vocabulary learning, whereas the number of times words were looked up does not guarantee the vocabulary learning of the words. 2. The finding suggests that greater attention during lookup rather than the number of lookups is the key factor. 3. Their results showed that if subjects consulted the dictionary in L1 and L2, the meanings of unknown words are better retained.
Chin (2001)	44 university students in HK(from where?) enrolled in intermediate Spanish class	To investigate the effects of dictionary use on the vocabulary learning strategies used by intermediate learners to understand new vocabulary in a reading test without a dictionary, with a bilingual dictionary , or with a monolingual dictionary.	Results indicated that when a dictionary was available, students tended to consult it rather than guessing the meaning from the context. Learners in the bilingual dictionary group tended to consult their dictionaries more often than those using a monolingual dictionary.
Rhoder& Huerster (2002)	No participants; they propose their standpoints and voices about the use of dictionaries for language learners.		The researchers advocate the use of (dictionaries and word elaboration activities to facilitate learners' vocabulary learning.
Bogaards (2003)	No participants; to review studies on dictionary uses and comment on the methods used in the studies.		After reviewing some experimental research, he found that as to the long-term benefit of dictionary use in the form of vocabulary acquisition, the role of dictionary seems to be more constructive.

2.3.4 Comparison of monolingual, bilingual, and bilingualized dictionaries

Dictionaries are generally divided into three major types according to their use of language: monolingual, bilingual, and bilingualized dictionaries (Landau, 2001). They are usually contrasted based on their features, and have seldom been investigated from the standpoint of their efficacy on vocabulary retention. With the development of digital technology, electronic dictionaries have appeared. Scholars have begun to explore the differences between paper and electronic dictionaries. The features of different types of dictionaries are outlined below, and a comparison of efficacy of these dictionaries is offered.

2.3.4.1 Features of monolingual, bilingual, and bilingualized dictionaries

Some lexicographers (Bogaards, 1996; Dalgish, 1995; Hartmann, 1981) have made systematic comparisons of the underlying principles of dictionary construction, employing such criteria as learner needs, the ability to solve look-up problems, entry selection, pronunciation, and definition writing.

Generally speaking, most researchers have argued for the beneficial nature of monolingual dictionaries in their studies. Baxter (1980) suggested that if L2 learners regularly use monolingual dictionaries, the accumulative experience can help them learn the use of a particular lexical item, alternative ways to express an item, the means to actually engage a definition, and the cultivation of conversational fluency. These benefits cannot be achieved with bilingual dictionaries (Kent, 2001; Louw, 1995). Atkins and Knowles (1990, as cited in Laufer & Hadar, 1997) conducted a comprehensive study of over 1,000 ESL learners in seven European countries. Their results demonstrated that most students (75%) preferred to use bilingual dictionaries; however, this does not mean

that bilingual dictionaries are more helpful. According to Atkins, Knowles and Fan (2000), monolingual dictionaries give learners access to more relevant, detailed, and precise information about a word than bilingual dictionaries which provide one-word translations, which can be equivocal, especially when there are no semantic correspondences between two language items. On the other hand, Fan (2000) and Thompson (1987) cautioned that when using monolingual dictionaries, learners of lower proficiency in L2 may neither able to read the definitions nor benefit much from them.

As for bilingual dictionaries, researchers (Fan, 2000; Kent, 2001; Thompson, 1987) have acknowledged the strengths of bilingual dictionary consultation, arguing that they are more efficient and better motivate language learners. Bilingual dictionaries provide less motivated learners with access to L1 equivalents of L2 words. However, several researchers have pointed out the disadvantages of bilingual dictionaries. Baxter (1980) states that learners are more engaged in the target language when using monolingual dictionaries. Translation equivalence in bilingual dictionary consultation deprives learners of opportunities to examine how the new word is used in the L2 context. Learners may ignore the semantic differences and the syntactic uses of words. Moreover, they may be misled because there are no perfect equivalents across the two languages (Fan, 2000; Louw, 1995; Thompson, 1987). Louw (1995) found that Korean university students were often encouraged to consult monolingual dictionaries to obtain greater familiarity with L2input, but they felt more confident because bilingual dictionaries provide L1 equivalents and that is why they prefer bilingual dictionaries to monolingual ones.

In order to combine the advantages of monolingual and bilingual dictionaries, bilingualized dictionaries offer an L2 entry with an L1 equivalent and L2 definition (Laufer & Hadar, 1997). Laufer and Kimmel (1997) conducted an experiment to find out

which part of the entry L2 high school and university English learners read when they looked up words in bilingualized dictionaries, and to examine the extent to which learners benefit from them. Results demonstrated that only 13% of the participants read the whole entry for most words. Most participants were inclined to read definitions in either one of the two languages instead of the entries in both languages. Clearly, the efficacy of the three types of dictionaries requires further empirical investigation.

Table 2.5
Features of monolingual, bilingual, and bilingualized dictionaries

Dictionaries	Pros	Cons
Monolingual	1. If learners regularly use monolingual dictionaries, the accumulative experience can equip them with the use of a particular lexical item, alternative ways to express the item, the means to actually engage definition, and the cultivation of conversational fluency as well (Baxter, 1980). 2. Monolingual dictionaries give learners access to more relevant, detailed, and precise information about the word than bilingual dictionaries providing one-word translations, which can be equivocal, especially when there are no semantic correspondences between two languages (Atkins, Knowles & Fan, 2000).	It was cautioned that when using monolingual dictionaries, learners with lower L2 proficiency in may neither able to read the definitions nor benefit much from them (Fan, 2000 & Thompson ,1987).
Bilingual	1. They are more efficient and better motivate language learners. 2. Bilingual dictionaries provide lazy learners with access to L1 equivalents of L2 words (Kent, 2001; Fan, 2000; Thompson; 1987).	1. It is stated that learners are more engaged with the target language when using monolingual dictionaries. Translation equivalence in bilingual dictionary consultation deprives learners of opportunities to examine how the new word is used in the L2 context (Baxter, 1980). 2. Learners may ignore the semantic differences and the syntactic use of words. 3. Definitions may be misleading because there are some items are language specific and do not have exact translations in L2 (Fan, 2000; Louw, 1995; Thompson, 1987).
Bilingualized	In order to combine the advantages of monolingual and bilingual dictionaries, bilingualized dictionaries offer an L2 entry with an L1 equivalent and L2 definition (Laufer & Hadar, 1997).	Results demonstrated that only 13% of the participants, L2 high school and university English learners, read the whole entry for most words. Most participants were inclined to read definition in either one language instead of the entries in both languages. (The study indicates the existence of look-up preference.)

2.3.4.2 Comparison of paper and electronic dictionaries

With the popularity of digital electronic dictionaries, a new field for research has emerged. Several scholars have attempted to make comparisons between paper and electronic dictionaries (Carr, 1997; Kent, 2001). According to Leffa (1992), electronic dictionaries facilitate reading comprehension for learners who understand about 38% of a passage, using 50% less time, compared to learners who use a paper dictionary. Several studies support this content, concluding that participants with access to electronic references consult dictionaries twice as often as those with paper dictionaries, but reading comprehension between the two groups does not differ significantly (Aust, Kelley, & Roby, 1993; Chun & Plass, 1996; Laufer & Hill, 2000; Peters, 2007).

Laufer and Hill (2000) devised a computer program with an interactive dictionary, which was quick and easy to use and, therefore, decreased reading flow interruption. This computer program helped direct subjects' attention to unfamiliar words during reading in the hope to achieve incidental vocabulary learning. The log files of the participants who employed the program recorded the look-up processes of learners, and assisted researchers in generating statistics on learners' look-up behaviors. Results demonstrate that each target word was looked up on average more than once, between 1 and 3.2 times (in total and that a larger number of lookups did not guarantee the retention of target words. On the other hand, the results support the claim that dictionary consultation exerts positive effect on incidental vocabulary learning (Peters, 2007).

Researchers (Laufer & Hill, 2000; Peters, 2007) further stated their opinions about whether electronic dictionaries are less effective in vocabulary retention because electronic dictionaries might elicit only shallow processing and because learners may click on many words in a short amount of time, and as a result less attention may be paid

to the definition and lexical information in an entry.. Peters (2007) disagreed that online dictionaries produce shallow processing, assuming that the level of word processing is not determined by the type of dictionary, but the type of task. However, conclusive studies are still needed

2.3.4.3 Comparison of efficacy of three types of dictionaries

Though researchers have engaged in qualitative evaluation of the strengths and weaknesses of different kinds of dictionaries, few quantitative studies have investigated the efficacy of monolingual, bilingualized, and bilingual dictionaries. Laufer and Harder (1997) empirically compared the efficacy of the three types of dictionaries across, comprehension and production tasks. The participants, 123 Hebrew students, received 15 low-frequency words with dictionary entries, 5 words of which were presented in a monolingual context; another 5, which were presented in a bilingual context; and the remaining 5 words, which were presented in a bilingualized context. Each participant was exposed to each dictionary type and the researchers had the 15 words tested. The participants completed a multiple choice comprehension test and a production test which involved sentence making. The study's results suggest that the three different kinds of dictionaries exert different levels of influence on vocabulary learning. The task's requirements appear to determine the way learners exploit dictionaries. According to Laufer and Harder (1997), production tasks seem to assist learners in processing the words elaborately and therefore enhance their retention of the words.

Furthermore, Laufer and Melamed as cited in Laufer & Kimmel, 1997) attempted to ascertain which dictionaries were more effective in two types of tasks, comprehension and production tasks. They demonstrated that bilingualized dictionaries proved to be the

most useful for good, average, and unskilled dictionary users. They proposed that learners who exhibit limited dictionary use may depend chiefly on bilingual information, but that monolingual dictionaries play a significant role in learner progress in competence and dictionary skills. Teachers encourage L2learners to employ bilingualized dictionaries because the provision of L1 translations can be used to help reassure, reinforce, and clarify learners' decisions about the meaning and use of words after learners read the monolingual entries. The process of reading an L2 entry and confirming what has been read in the L1 facilitates and enhances learners' vocabulary development. Laufer and Kimmel (1997) conducted research on how learners employ bilingualized dictionaries and found that not every learner reads lexical information in both languages. Bilingualized dictionaries, as an effective tool for language learning, can accommodate the different look-up patterns of L2 learners with different language learning styles.

Hulstijn and Trompetter (1998) examined Laufer and Harder's (1997) findings and concluded that production tasks facilitate vocabulary learning better than comprehension tasks. However, Hulstijn and Trompetter demonstrated that writing tasks with dictionary use did not yield significant increases in vocabulary retention over reading tasks with dictionary use. According to these two studies, it is the dictionary that plays the effective role in vocabulary learning, not solely the act of writing.

Table 2.6
Comparison of efficacy of the three types of dictionaries

Studies	Participants	Major purposes	Major findings
Laufer & Harder (1997)	123 Hebrew students	To empirically compare the effectiveness of the three types of dictionaries across different tasks, comprehension and production.	1. Various kinds of dictionaries exert different effectiveness when learners use dictionaries. 2. The task requirements appear to determine the way learners exploit dictionaries. 3. Bilingualized dictionaries were better than the other two dictionaries for comprehension and better than monolingual dictionaries for production.
Laufer and Melamed (1994, as cited in Laufer & Kimmel, 1997)	NA	To ascertain which dictionaries were more effective in two types of tasks, comprehension and production tasks.	1. They demonstrated that bilingualized dictionaries proved the most useful for good, average, and unskilled dictionary users. 2. They proposed that learners who exhibit limited dictionary use may depend chiefly on bilingual information, but that monolingual dictionaries play a significant role in learner progress in competence and dictionary skills.
Laufer & Kimmel (1997)	70 EFL Hebrew learners	To investigate what part of the entry will be read by learners in the bilingualized dictionaries.	They conducted research on how learners employ bilingualized dictionaries and found that not every learner read lexical information in both languages.
Hulstijn & Trompetter (1998)	110 Dutch high school students learning French	They wanted to find out whether dictionary use for writing purposes leads to higher incidental vocabulary learning than dictionary use for purposes of reading comprehension.	Writing tasks with dictionary use did not yield significant increases in vocabulary retention over reading tasks with dictionary use.

2.4 Summary

Generally speaking, dictionary consultation assists learners in second language acquisition; nevertheless, study results are indefinite with regard to the effect that dictionary use has on vocabulary acquisition and on the use of different types of dictionaries. At present, no conclusive evidence evaluating the efficacy of various types of dictionaries has been presented by scholars. The Involvement Load Hypothesis proposed by Laufer and Hulstijn (2001) further examined the significant elements of L2 vocabulary retention. This hypothesis attempts to explain the phenomenon that not all dictionary consultation in past experiments has enhanced learners' learning efficacy because the depth of processing may be varied. The concept of Involvement Load Hypothesis provides instructors and researchers with guidelines to reflect on the efficacy of the learning process and learning tasks. The treatment of the current study utilizes three factors of the Involvement Load Hypothesis (need, search, and evaluation) to enhance the involvement of participants and investigates the learning efficacy of dictionary consultation. Since few previous studies have discussed the difference in learning efficacy among various types of dictionaries and the effect that dictionaries of different types have on learners of various levels, this study intends to fill the gap by exploring the impact of different types of dictionaries on L2 vocabulary learning among participants of dissimilar L2 proficiency levels.

CHAPTER THREE

METHOD

The purpose of the current experiment is to examine the efficacy of dictionary consultation on incidental L2 vocabulary learning, and to investigate the effects of different types of dictionaries on EFL vocabulary acquisition. This section describes how the experiment has been conducted, including a description of the participants, research design, data collection and data analysis procedures.

3.1 Participants

The participants of the current study were non-English-major freshmen from a university in Central Taiwan. In order to help the students achieve better learning efficacy, the Freshmen General English Program uses a placement test to divide new students into four English proficiency levels: low, low mid, high mid, and high. Grouping standards were devised and validated by the teaching faculty of the Freshmen English program (Sims, 2004).

A total of 127 participants were invited to participate, including 3 classes of low mid proficiency freshmen and 3 classes of high mid proficiency freshmen. The 6 experimental groups across the two language proficiency levels received three treatments; namely, monolingual dictionary exposure, bilingualized dictionary exposure, and bilingual dictionary exposure (see Table 3.1). In other words, there were two groups, a high and a low level group, in each type of treatment.

Table 3.1
Grouping of the participants

Class	The number of students	Level	Dictionary	
1	24	High	Monolingual	(HM)
2	21	Low	Monolingual	(LM)
3	24	High	Bilingualized	(HZ)
4	17	Low	Bilingualized	(LZ)
5	17	High	Bilingual	(HB)
6	24	Low	Bilingual	(LB)

3.2 Research Design

In order to examine the effect of dictionaries on vocabulary acquisition, participants were asked to read material and subsequently, to complete a translation exercise. In the translation exercise, participants translated English sentences containing target words with multiple meanings into Mandarin. It is important to note that the participants had to choose the most suitable meaning from each dictionary entry in order to complete the translation task. After the treatment, a posttest was given to participants and a delayed posttest was also given two weeks after the posttest in order to examine vocabulary learning retention.

The next section of the research design presents how the experiment was devised and conducted. First, the development of the materials is described and the rationale is explained. How the instruction was given is explained next. The discussion of the data collection follows, in which the process of the whole experiment is documented chronologically. This section ends with a description of the data analysis procedures which are presented in order to clarify how the data were analyzed.

3.2.1 Material for the Treatment

Because of the need to examine the learning efficacy of dictionary consultation, the materials for the current study were devised as booklets with the intention that it would simulate the use of dictionaries. Booklets contain twelve target words. What follows in this section further depicts how words are selected, the similarities and differences among types of booklets, and how each part of the booklet is compiled and used in the experiment.

Before the material was devised, target words had to be selected. At the beginning, possible candidate words for the prescreening instrument were selected based on a number of criteria as a pretest (Appendix A). The first criterion was that, the words could not be found in the first 2,000 high-frequency word list (Cobb, 2006). Second, the meanings of the words needed to be semantically available and explicit in Chinese because the participants had to be able to translate them into Chinese easily in a sentence context. The third criteria was that only homographs could be selected; i.e. all the words had to have at least two distinct meanings. Only homographs were selected due to the fact that the researcher didn't include pseudo words or pseudo meanings for learners to learn which would be exclusive to the current experiment. Therefore, the selection of homographs was the third priority in target word inclusion for the current study. Moreover, distinguishing between the different definitions of the homographs and evaluating the dictionary entries for the translation task enhanced the participants' processing during dictionary consultation

The researcher selected words from the Oxford Advanced Learner's Dictionary. At first, a word list of 33 words was created and each word received further scrutiny of their definitions. The researcher evaluated the dissimilarities among the definitions by looking

up each word in three other dictionaries, namely *Cambridge Advanced Learner's Dictionary, Macmillan English Dictionary: For Advanced Learners of American English*, and *The Oxford Advanced Learner's Dictionary of Current English*. Finally, 21 candidate words were left on the word list.

After careful screening, 21 words were selected to compose the prescreening instrument (see Figure 3.1). Before this actual pilot study was conducted, the prescreening assessment devices were tested on a high-level proficiency class from the Freshmen English Program. These participants were asked to examine the list of words and decide whether they had seen/heard the words before. If they had not, they checked the first box. If they thought that they had seen the word before but did not remember the meaning, they checked the second box. If they believed they knew the word, they were asked to provide a Mandarin Chinese translation of the word. The main purpose of the preliminary screening test in the current study was to determine which words were least known to the participants. The assumption was that if the words were unknown to those students whose English level was higher, the actual participants of this study would be less likely to know them. In the end, only the 12 least known words were chosen for the present study.

Figure 3.1
Prescreening instrument

請依你對每一個字認識的情況，在每一個字對應的格子裡勾選你認識該字的情形。

Please check the box which describes the extent to which you know the words.

編號 Item Number	單字 Vocabulary	1 不認識，從未看過 I don't know the word; I haven't seen it before.	2 看過，但不確定其字義 I have seen the word before, but I am not sure the meaning of it.	3 我認識，並知道其字義 I know the word and meaning of it.
1	accessible	☐	☐	☐ _____
2	accommodation	☐	☐	☐ _____
3	mint	☐	☐	☐ _____
4	seal	☐	☐	☐ _____
5	blast	☐	☐	☐ _____
6	bond	☐	☐	☐ _____
7	gut	☐	☐	☐ _____
8	capacity	☐	☐	☐ _____
9	scramble	☐	☐	☐ _____
10	stock	☐	☐	☐ _____
11	mellow	☐	☐	☐ _____
12	mechanical	☐	☐	☐ _____
13	mount	☐	☐	☐ _____
14	pit	☐	☐	☐ _____
15	possession	☐	☐	☐ _____
16	render	☐	☐	☐ _____
17	dim	☐	☐	☐ _____
18	foul	☐	☐	☐ _____
19	edge	☐	☐	☐ _____
20	discharge	☐	☐	☐ _____
21	neutral	☐	☐	☐ _____

Table 3.2 presents the 21 words selected for the screening test. Those marked in bold were the final 12 target words used in the present study. They were selected not only because they were least known but also because they have diverse meanings and are semantically available in Chinese, as stated in 3.2.1 earlier. Among the 12 words, 3 were chosen for the treatment instruction, 3 for practice, and 6 for self study. The reason why some of the words unknown to all the participants were not chosen as target words was that they were thought to have less diverse meanings than the other words. For example, *dim* means a) emitting or having a limited or insufficient amount of light；b) dull,

lusterless；c) lacking pronounced, clear-cut, or vigorous quality or character. There is little diversity among three definitions.

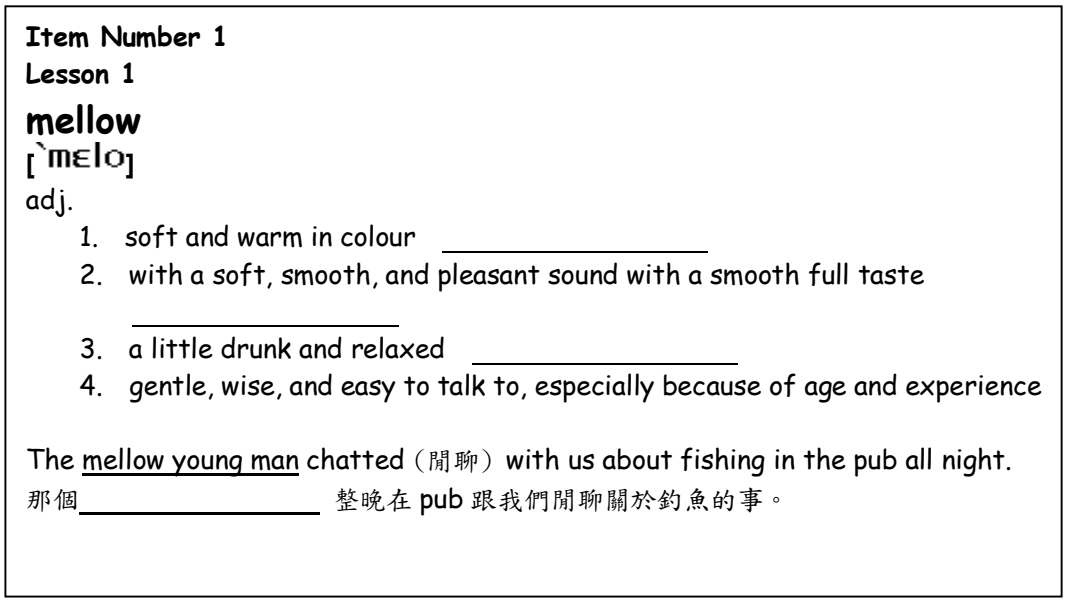
Table 3.2
Words for the screening test and the pretest

Item number	Target words	Functions in the treatment	Percentage of the correct answers
1	**mint**	**instruction**	0%
2	**mellow**	**instruction**	0%
3	**neutral**	**instruction**	0%
4	**accessible**	**practice**	0%
5	**seal**	**practice**	0%
6	**blast**	**practice**	0%
7	**bond**	**self study**	0%
8	**gut**	**self study**	0%
9	**scramble**	**self study**	0%
10	**stock**	**self study**	0%
11	**foul**	**self study**	0%
12	**discharge**	**self study**	0%
13	edge	not used	42%
14	mechanical	not used	11%
15	accommodation	not used	5%
16	capacity	not used	5%
17	mount	not used	0%
18	pit	not used	0%
19	possession	not used	0%
20	render	not used	0%
21	dim	not used	0%

Three kinds of booklets were devised and used in the experiment. The three types of booklets simulated the use of three kinds of dictionaries, monolingual (Appendix B), bilingual (Appendix C) and bilingualized (Appendix D). Every page of the three types of booklets had similar presentation: the word and its pronunciation layout, a list of definitions with varied meanings, and a translation task in a sentence context. Figures 3.2 to 3.4 are the sample pages for the target word from the booklets. The only difference among the three types of booklets was the language employed in the definition sections:

only English was used in monolingual dictionary booklet (Figure 3.2), only Mandarin Chinese was used in the bilingual dictionary booklet (Figure 3.3), and both English and Mandarin Chinese were used in the bilingualized dictionary booklet (Figure 3.4).

Figure 3.2
Sample page for the target word from monolingual dictionaries

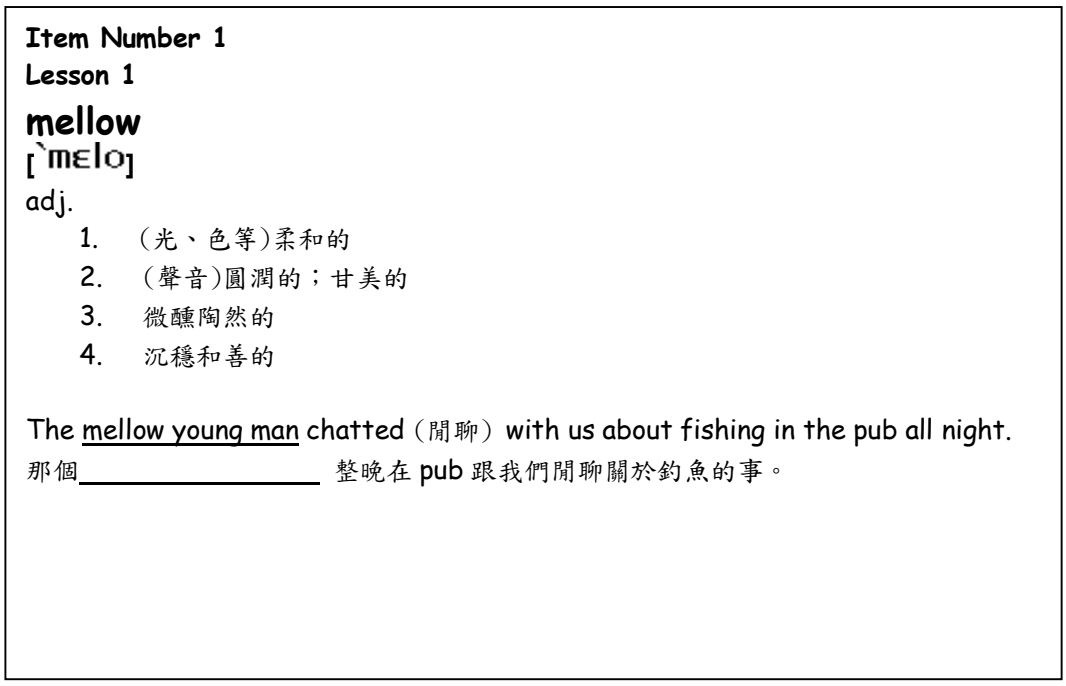

Item Number 1
Lesson 1

mellow
[ˋmɛlo]
adj.

1. soft and warm in colour _____
2. with a soft, smooth, and pleasant sound with a smooth full taste _____
3. a little drunk and relaxed _____
4. gentle, wise, and easy to talk to, especially because of age and experience

The mellow young man chatted（閒聊）with us about fishing in the pub all night.
那個_____ 整晚在 pub 跟我們閒聊關於釣魚的事。

Figure 3.3
Sample page for the target word from bilingual dictionaries


Item Number 1
Lesson 1

mellow
[ˋmɛlo]
adj.

1. （光、色等）柔和的
2. （聲音）圓潤的；甘美的
3. 微醺陶然的
4. 沉穩和善的

The mellow young man chatted（閒聊）with us about fishing in the pub all night.
那個_____ 整晚在 pub 跟我們閒聊關於釣魚的事。

Figure 3.4
Sample page for the target word from bilingualized dictionaries

Item Number 1
Lesson 1

mellow
[ˋmɛlo]
adj.

1. soft and warm in colour （光、色等)柔和的
2. with a soft, smooth, and pleasant sound
   with a smooth full taste （聲音)圓潤的；甘美的
3. a little drunk and relaxed 微醺陶然的
4. gentle, wise, and easy to talk to, especially because of
   age and experience 沉穩和善的

The mellow young man chatted（閒聊）with us about fishing in the pub all night.
那個_____ 整晚在 pub 跟我們閒聊關於釣魚的事。

In each booklet, there were twelve lessons, each of which contained learning materials for a target word. Three of the words in the materials were for instructional use and were included in order to demonstrate how to use the booklet in three different ways and the learners were expected to use the booklet accordingly to learn the remaining 9 words.

When editing the definitions of the words, the researcher focused on several issues. The entry of each homograph displays only one word class, which makes the entry a manageable size for the low-level learners (Béjoint, 1981). All language uses in the definition were compiled from *Oxford Advanced Learner's Dictionary*, *Macmillan English Dictionary for Advanced Learners*, and *Cambridge Advanced Learner's Dictionary*, and then proofread by a native speaking English teacher. The definitions of the target words were sequenced according to the frequency of the usage, in the same way that the definitions are sequenced in a real dictionary. Most importantly, the vocabulary

used in the definitions was analyzed by VocabProfilers (Cobb, 2006) in order to ensure that learners would be able to comprehend the words used in the definitions and to avoid the negative effect of language threshold. The VocabProfilers program (see Tom Cobb's website http://www.lextutor.ca/vp/) has the capability to analyze vocabulary in a text by categorizing the vocabulary into four types of words: the 1,000 most frequently used word families (WFs), the 2,000 most frequently used WFs, the academic word list, and off-list words, which are words which do not belong to the first three groups.

Two separate sentences provided two contexts to support one word were devised (Appendix E) in order to provide learners with a translation task and tests about learning efficacy based on dictionary use. In other words, one sentence was used for the translation task in the booklet, and the other was used as the test items in the posttest and delayed posttest. The two sentence contexts for all the target words were adapted from dictionaries and edited by a native speaker to coordinate the difficulty level of the translation tasks at the end of each worksheet and in the tests. Please note that the definition used in the test was the same as that used in the translation task. Take *mellow* as an example. In both sentences below, the definition of mellow was 微醺陶然的.

(1) The mellow young man chatted with us about fishing in the pub all night.

(for the translation task and the old context for the test)

(2) He'd had a few glasses of champagne and was fairly mellow.

(the new context for the test)

The task of the present study asked participants to translate English as an L2 into the L1, Mandarin in order to examine the effect of the translation approach on the retention of the vocabulary meaning. The translation task also ensured that learners read the definitions because participants had to choose one definition of the target word in order to successfully complete the translation task. Most importantly, the translation task provided

learners with opportunities to undergo examining, searching and evaluating all the definitions provided in the booklet. These processes enhance learners' attention and engagement, as advocated by researchers (Peters and Leuven, 2007; Laufer and Girsai, 2005; Ramachandran and Rahim, 2004; Nation, 2001).

3.2.2 Instruction of the target words

The design of the current study consisted of a three-stage treatment: 1) demonstration of how to use dictionary entries (3 words), 2) practice of the newly learned skill, and 3) independent study of the material and completing the learning tasks (translation). In addition to the differences of the treatment materials, the instructions for the three types of booklets were dissimilar. For the participants using monolingual booklets, the participants were guided to examine the spelling of the words and read the correlated phonetic symbols aloud. Then, they heard the pronunciation of the target words by the instructor/researcher and were guided to read the definitions in English. The instructor would then ask the participants what the Mandarin equivalents could be and give them the answer. That is, students were guided to read the English definitions first and then were informed of the suitable Chinese equivalents. After filling in the Chinese equivalents of each definition, learners were asked to read the sentence at the end of the page, and select the most appropriate definition for the target word used in the sentence context. Before finishing the instruction, the instructor would check if they chose the right definition.

Next, the participants with bilingual booklets were directed to examine each target word individually, read aloud phonetic symbols and Chinese definitions. After a few seconds, the learners were also told to choose the most appropriate definition for the

sentence context at the end of the page. Before studying the next word, the instructor would also give them the correct answer.

Participants grouped in the bilingualized group were instructed in a different way. Besides examining the word and reading aloud the phonetic symbols. Unlike the monolingual group who had to fill in the blanks with the Chinese equivalents, this group just needed to read both the English and Chinese definitions. When subjects finished reading the definitions, the instructor led them to select the most appropriate definition for the target word used in the sentence context and checked if their answer was correct.

Because the languages provided in the booklets were varied, the instructor, i.e. the researcher, used different ways to teach each group of participants to exploit the information in the booklets and finish the translation tasks. Table 3.3 summarizes the differences among the three approaches.

Table 3.3
Differences of instructions among three types of dictionaries

Dictionaries / Instruction	Monolingual	Bilingual	Bilingualized
Spelling	✓	✓	✓
Pronunciation	✓	✓	✓
Chinese definitions	✓	✓	✓
English definitions	✓		✓
Filling in Chinese Equivalents	✓		
Translation tasks	✓	✓	✓

After the instruction, the participants started to practice and finished the next 3 translation tasks as directed. During this time the researcher walked around and helped learners check their answers. By doing so, the researcher could make sure learners understood how to finish the last 6 translation tasks on their own.

After the researcher was sure that the students knew how to use the learning material, students finished the other translation tasks. To ensure that those learners consulted the provided dictionaries, the researcher emphasized again that they had to read the definitions carefully and choose the definition which was the most meaningful and appropriate for the sentence context.

Unlike the participants in the bilingual and bilingualized groups, those using the monolingual booklet needed to perform an additional step. Before doing the translation task, they had to finish reading the definition and fill in the Chinese equivalents in order to check their comprehension of the definition and their elaboration on the reading of definitions.

3.2.3 Measurement Instruments

To examine the efficacy of the vocabulary learning process with three types of dictionaries, a total of five instruments were used in this study. The first two tests were the 1000- and 2000-word-level Vocabulary Levels Tests (appendices F and G). They were used to assess learners' vocabulary proficiency and to make sure their vocabulary competence were enough to understand the words used in the material.

Then a pretest was given to verify that learners knew little about the words selected for the experiment. After the three-stage treatment, instruction, practice and self-study, the participants took a posttest (Appendix H) to examine the learning efficacy of each

dictionary type. After the posttest, a delayed posttest (Appendix I) was administered without telling the participants beforehand to measure the vocabulary retention of the task. In the following paragraphs, the measurements will be described in detail.

The first two tests used in the current study were 1000 Vocabulary Levels Test (K1 VLT) and 2000 Vocabulary Levels Test (K2 VLT). They were used to examine the learner's vocabulary knowledge and explore the differences between speakers of high and low EFL proficiency in the present study. The K1 VLT was developed and validated by Huang (1999), while Beglar and Hunt (1999) and Schmitt, et al. (2001) designed the K2 VLT. According to Nation (2001), Vocabulary Level Tests are valid and reliable instruments, which are also practical to be taken quickly, and marked and interpreted easily. They may help instructors determine what type of vocabulary tasks learners possess.

After taking VLTs, the participants took the pretest which took the same format as the prescreening test (Figure 3.1). They had to check one of the three options that best described their understanding the target word: *1) I don't know the word; I haven't seen it before; 2) I have seen the word before, but I am not sure the meaning of it; 3) I know the word and meaning of it*, which also asked them to write the translation in Chinese. These participants were not expected to know these target words because they were low frequency words. The students were expected to learn the meanings of them in the treatment stage. It is important to note that these words were homographs, with at least two significantly distinct meanings. This devise gave the participants the opportunity to evaluate entries in the dictionaries and respond to the construct of task-induced involvement. Further, since translation tasks examine learner comprehension of the words and enhance learner retention of words (Nation, 2003; Laufer & Girsai, 2005), the

researcher had to confirm whether the participants comprehend the dictionary entries. Therefore, only target words that could be easily translated into Chinese were chosen in the posttests.

Immediately after the treatment was administered to the participants, they took the posttest. They did not know there would be a posttest which aimed to examine learners' recognition rather than their production of the words While it has rarely been mentioned in other studies whether the posttest used similar contexts or even the same sentence as the pretest, the researcher of the current study made an effort to take a "combined" approach to investigate the genuine learning effect and to examine whether learners are able to transfer what they had learned during the treatment. *Old sentence contexts* refers to the contexts that the target words were provided in during the treatment while *new sentence contexts* refers to the contexts which those same six target words were used in during the posttests and delayed posttests. It is important to note that *new sentence contexts* were not provided during the treatment phase of the study. Therefore, half of the test items the participants had encountered and the other half were new to them. Six of all the sentence contexts were as the same as those on the translation tasks in the booklet and the other half are new sentence contexts that learners never read in the booklet. The highest possible score on the posttest was 12. Two weeks after the posttest, a delayed posttest was implemented. This time again was done without notification. The delayed posttest consisted of twenty-four matching questions. Half of the sentence contexts in the material were studied by participants, while the other half consisted of matching questions with new sentence contexts. The posttest was designed to examine the vocabulary retention with respect to the different treatments which were used among the three dictionary groups and whether there was a significant difference between learner

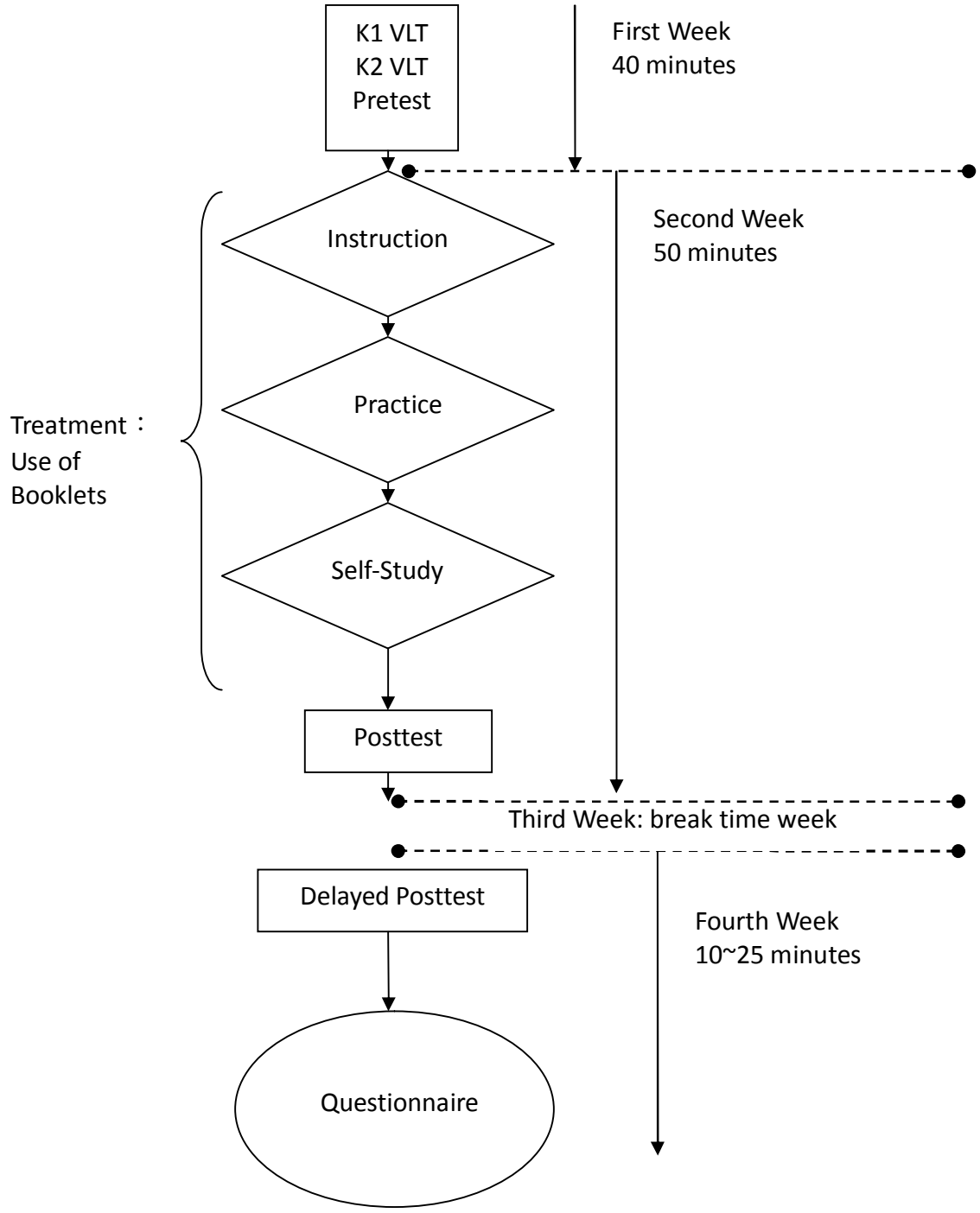
performance in the new and old sentence contexts. The highest possible score on the posttest was 24.

The main reason why there were only 12 questions, instead of 24, in the posttest was that the researcher had to take the participants' learning load and the time span into consideration. It took about 45 minutes to complete each of the three treatments the treatment. By the time the participants had finished studying the material and completing the tasks, there was insufficient time left for a 24-item posttest. The whole treatment plus a 24-item matching posttest would have overworked the participants.

3.3 Data Collection Procedures

The experiment took one month to conduct, which included the implementation of the treatment and five measurements. The data collection procedure is presented in Figure 3.5.

Figure 3.5
Data collection procedure



In the first week, two Vocabulary Level Tests and a pretest were given to examine the vocabulary knowledge of the participants. It took about 40 minutes for each group. A week after the pretest, the participants received the material and were instructed how to use the booklet. The researcher gave instructions with the first three lessons by guiding learners to read the definitions and complete the translation tasks together. The learners were led to practice what they had been instructed to do with another three lessons and check their answers to ensure that they were able to evaluate the entries and complete the translation tasks. Afterward, the participants were asked to follow the way that they had been guided and finished the rest tasks by themselves. The participants spent 50 minutes both learning the other six lessons and studying all the material (or booklet). After that, they took a posttest. It took them fifteen minutes to finish. A delayed posttest was given two weeks later to investigate the vocabulary retention of learners.

A questionnaire (Appendix J) adapted from those designed by some previous researchers who studied the use of bilingualized dictionaries was given to the group using the Bilingualized learning material to further explore learners' look-up behaviors (Béjoint, 1981; Chin, 2001; Kent, 2001; Laufer & Kimmel, 1997). The posttest and delayed posttest were administered without notifications beforehand.

3.4 Data Analysis Procedures

For all the measurement instruments, one point was given for one correct answer and zero points were given for a wrong response. Hence, the maximum score of the pretest is 21, 1,000-word and 2,000-word levels tests 18 and 30 respectively; the posttest and the delayed posttest 12 and 24. Table 3.4 displays all the possible scores of the measurements.

Table 3.4
Maximum scores of the measurements

	Measurement instruments				
	Pretest	1,000-word levels tests	2,000-word levels tests	Posttest	Delayed posttest
Maximum score	12	18	30	12	24

To analyze the performance of the different groups of the participants, several statistical procedures were undertaken. To analyze the initial vocabulary knowledge of the participants and to reveal the breadth of the participants' vocabulary knowledge, descriptive data of the two VLTs and pretest were obtained. The data of the posttest and delayed posttest were then calculated to examine participants' performance and the learning effect after the treatment with the employment of Paired samples T Test. In addition, the effect of old or new sentence contexts on learners' performance on the tests will be inspected with Paired-samples T Test.

Moreover, the performances of the high and low groups and among the groups with the three types of dictionaries were examined to discover the differences between high and low achievers and among groups in order to explore how the use of the different material affected the different groups by exploiting Independent-samples T Test and One-way ANOVA. All the above statistical procedures were conducted with SPSS 13.0 using Windows software.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents the results of the experiment. It consists of seven subsections. First, the reliability of all the research instruments will be examined and documented. The reliability of results is followed by the statistical results of the research questions. The participants' performance on the translation task will be reported in order to examine their learning efficacy on the translation task. In addition, their learning efficacy with the three types of dictionaries will be investigated. After the inspection of the translation task and the efficacy of dictionary consultation, several comparisons will be conducted, which include comparisons between the high and low groups on their translation tasks and on the consultation of the different kinds of dictionaries s. The test results yielded from new and old sentence contexts are examined. Finally, this chapter will be ended with a discussion of the analytical results, the answers to the research questions and comparisons with previous studies.

4.1 Reliability of the Research Instruments

The reliability of all instruments was examined. The reliability and descriptive statistics of the K1 and K2 tests were investigated first to ensure the vocabulary competence of the participants and the grouping of their language levels. The reliability of the *Pretest*, *Posttest*, and *Delayed posttest* were then investigated.

4.1.1 Reliability and descriptive statistics of K1 and K2 tests

Two Vocabulary Levels Tests were used to ensure the vocabulary competence of the

participants. The reliability coefficient of the K1 test of 18 test items was .689, while that of the K2 (30 test items) was .829. A total of 127 participants took the K1 and K2 tests. The mean score on the K1 was 14.68; standard deviation (SD), 2.13. The mean score on the K2 was 21.6 with an SD of 5.12. The descriptive statistics of the K1 and K2 tests were displayed in Tables 4.1 and 4.2. The learners' performances in the high and low groups were documented in the tables as well.

Table 4.1
Descriptive Statistics of K1 test

Group	N	Minimum	Maximum	Range	M	SD
H	065	10	18	08	15.25	1.95
L	062	07	17	10	14.08	2.17
All	127	07	18	11	14.68	2.13

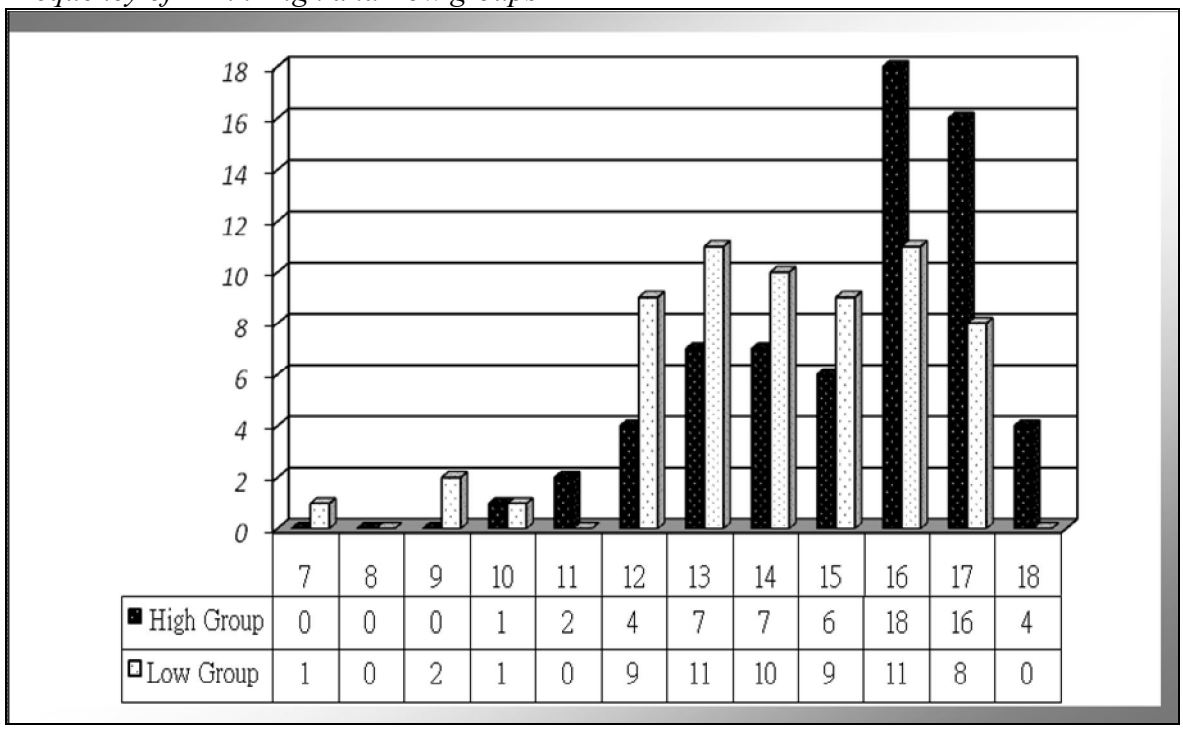
Table 4.2
Descriptive Statistics of K2 test

Group	N	Minimum	Maximum	Range	M	SD
H	065	10	30	20	23.11	4.75
L	062	10	29	19	20.02	5.06
All	127	10	30	20	21.60	5.12

There were 65 participants in the high group, and 62 in the low. Figures 4.1 and 4.2 display the frequency of the K1 and K2 test scores of the two groups. While it was surprising to find that 27 participants in the high group scored lower than 16 on the K1 test, it was equally surprising to find that some participants from the low group scored higher than 80% on the K2 test. This phenomenon is believed to indicate a problem with the method employed in the original grouping process as it may have failed to correctly identify some learners' actual English proficiency levels.

Figure 4.1

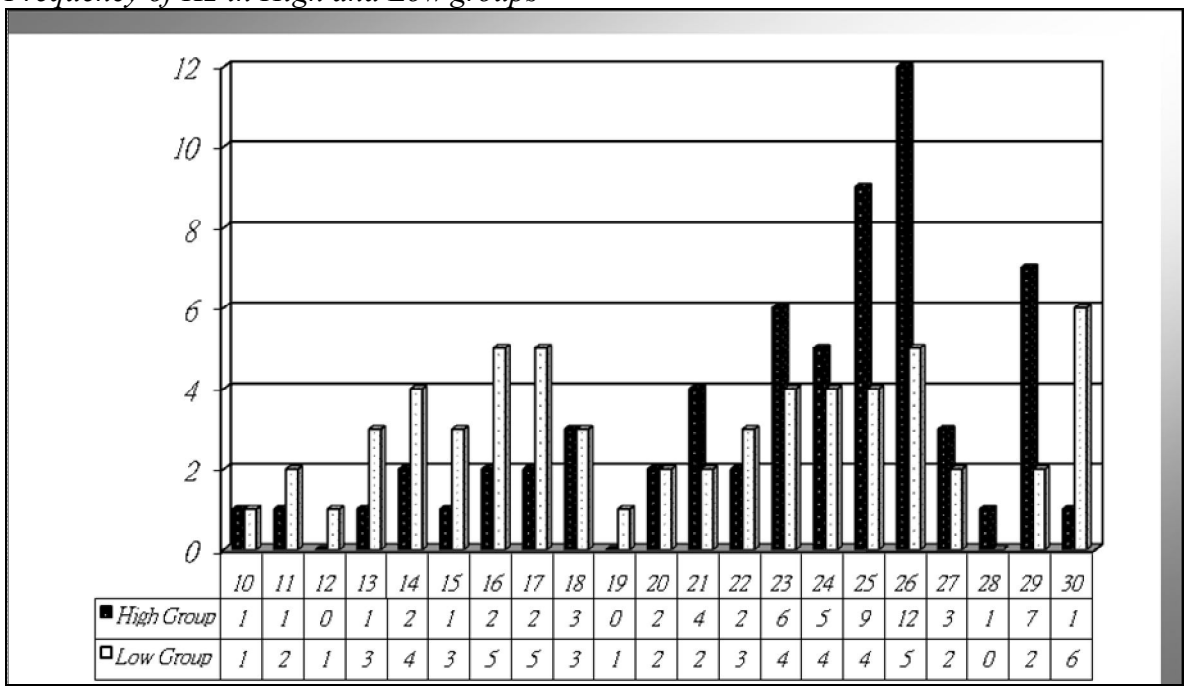
Frequency of K1 in High and Low groups



	7	8	9	10	11	12	13	14	15	16	17	18
High Group	0	0	0	1	2	4	7	7	6	18	16	4
Low Group	1	0	2	1	0	9	11	10	9	11	8	0

Figure 4.2

Frequency of K2 in High and Low groups



	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
High Group	1	1	0	1	2	1	2	2	3	0	2	4	2	6	5	9	12	3	1	7	1
Low Group	1	2	1	3	4	3	5	5	3	1	2	2	3	4	4	4	5	2	0	2	6

Therefore, the performance of the participants was further examined and adjustments were made with regard to grouping in order to ensure the the participants were placed in the right language level group to meet the needs of the currernt study. Learners in the low group who scored more than 80% (15 out of 18) on the K1 test and more than 60% (18 out of 30) on the K2 test were relabled as high achievers. Likewise, participants in the high group who scored less than 15 on the K1 test and 18 on the K2 test were moved to the low group and relabled as low achievers. Table 4.3 shows the adjusted groupings of all the participants.

Table 4.3
Participants adjusted to the other level group

No.	Student No.	Group	K1 (18 items)	K2 (30 items)	Original group	Adjusted group
1	027	Bz	14	16	H	L
2	028	Bz	13	18	H	L
3	035	Bz	11	15	H	L
4	050	Bi	14	16	H	L
5	052	Bi	12	17	H	L
6	054	Bi	10	11	H	L
7	055	Bi	13	13	H	L
8	059	Bi	13	14	H	L
9	061	Bi	12	17	H	L
10	067	Bz	16	22	L	H
11	070	Bz	17	18	L	H
12	077	Bz	16	23	L	H
13	080	Bz	16	27	L	H
14	081	Bz	15	22	L	H
15	082	Bz	17	23	L	H
16	085	Mono	15	21	L	H
17	090	Mono	17	26	L	H
18	091	Mono	17	26	L	H
19	092	Mono	16	27	L	H
20	093	Mono	17	25	L	H
21	094	Mono	16	26	L	H
22	096	Mono	17	24	L	H
23	097	Mono	15	26	L	H
24	098	Mono	15	20	L	H
25	101	Mono	17	29	L	H
26	107	Bi	16	23	L	H
27	109	Bi	16	25	L	H
28	111	Bi	15	18	L	H
29	115	Bi	16	25	L	H
30	122	Bi	15	23	L	H
31	123	Bi	16	23	L	H
32	125	Bi	16	24	L	H

The rest of the participants stayed in their original groups. The total number of the participants after the adjustment was 32 (Table 4.4). This adjustment of the language levels did not affect the grouping of the dictionary type (Table 4.5).

Table 4.4
The number of participants after the adjustment

Group	H→L	L→H
Mono	0	10
Bz	3	06
Bi	6	07
All	9	23

Table 4.5
Adjusted grouping based on vocabulary level tests

	Original Grouping			Adjusted Grouping		
	H	L	All	H	L	All
Mono	24	21	045	34	11	045
Bz	24	17	041	27	14	041
Bi	17	24	041	18	23	041
All	65	62	127	79	48	127

The descriptive statistics of K1 and K2 tests were reexamined after the adjustment. The mean score of the K1 test in the high group increased from 15.25 to 15.80 with the decrease in SD from 1.95 to 1.44. The mean score of the K1 test in the low group decreases) from 14.08 to 12.83 with the decrease in SD from 2.17 to 1.78. Similarly, the mean score of the high achievers on the K2 test increases) from 23.11 to 24.19 with the decrease in SD from 4.75 to 3.45; the mean score of low achievers on the K2 test decreases) from 20.02 to 17.33 with the decrease in SD from 5.06 to 4.55 (Table 4.6 & 4.7).

Table 4.6
Descriptive Statistics of K1 test before and after the adjustment

Original Grouping						
Group	N	Minimum	Maximum	Range	M	SD
H	065	10	18	08	15.25	1.95
L	062	07	17	10	14.08	2.17
All	127	07	18	11	14.68	2.13
Adjusted Grouping						
Group	N	Minimum	Maximum	Range	M	SD
H	079	11	18	07	15.80	1.44
L	048	07	17	10	12.83	1.78
All	127	07	18	11	14.68	2.13

Table 4.7
Descriptive Statistics of K2 test before and after the adjustment

Original Grouping						
Group	N	Minimum	Maximum	Range	M	SD
H	065	10	30	20	23.11	4.75
L	062	10	29	19	20.02	5.06
All	127	10	30	20	21.60	5.12
Adjusted Grouping						
Group	N	Minimum	Maximum	Range	M	SD
H	079	10	30	20	24.19	3.45
L	048	10	29	19	17.33	4.55
All	127	10	30	20	21.60	5.12

Table 4.6 shows the minimum score on the K1 test in the high group is 11, in the low group, 7; the maximum score in the high group is 18, in the low group 17. The reason why there are still low points in the high group and high points in the low group after adjustment is that those participants who scored either above 80% (15 out of 18) on the K1 test or 60% (18 out of 30) on the K2 test remained in their original groups. Take student No. 15 of the high-monolingual group for example; he/she only scored 13 out of

18 on the K1 test but scored 23 out of 30on the K2 test would be placed in the original high group. Likewise, a student, who was originally grouped in the low group and scored 14 on the K1 test but scored 29on the K2 test, remained in the low group (Appendix K).

4.1.2 Reliability and descriptive statistics of the Pretest, Posttest, and Delayed posttest

The Spearman-Brown split-half coefficient analysis was applied to examine the reliability of all the instruments, including K1, K2, the *Pretest, Immediate Posttest,* and *Delayed Posttest.* The scores of all of the participants who took part in the experiments were included for the calculations of the overall test reliability. The reliability coefficients of the *Pretest* were .694, .826 and .876 were respectively extended to be the reliability of *Immediate Posttest,* and *Delayed Posttest. (*Given that the purpose of the *Pretest* was to evaluate whether the learners knew the target words and to ensure that the items tested for the (thesis were unknown to them, the low reliability is anticipated. Most learners scored zero on the *Pretest*, which also explains the low level of reliability. Table 4.8 displays descriptive statistics of the three instruments used in the experiment.

Table 4.8
Descriptive statistics and reliability of the three instruments (n=12 target words)

Test N=127	No. of Items	Mean	M%	SD	Range	Maximum	Spearman-Brown Coefficient
Pretest	21	0.56	00.03%	0.86	04	04	0.69
Posttest	12	8.29	69.08%	3.05	12	12	0.83
Delayed Posttest	24	6.16	25.67%	4.37	20	20	0.88

Even though 12 target words were selected for the experiment, only 6 target words were used to examine learners' learning efficacy with different types of dictionaries. Data

from only 6 words was analyzed due to the fact that all of the experimental groups received correct Mandarin Chinese equivalents for the 3 words used in the instruction phase and the 3 words used in the practice phase of the translation tasks. Mandarin Chinese equivalents were given to the participants so that they could check their answers and to ensure that they were properly engaged in the learning process and the translation tasks. Although the learning materials of the 3 groups were different, the similarity across groups in the last stage of the treatment process might have yielded undesirable mixed results because all the three groups of participants received the Mandarin Chinese translation of the first 6 target words. In order to prevent the treatment in instruction and practice phases from interfering with the results of learning efficacy among three types of dictionaries, the first 6 words were removed from the final analysis. The remaining 6 target words were finally used to authentically reflect the learning efficacy of the tasks and the efficacy of using different kinds of dictionaries for learners of different levels.

The reliability of all the instruments was reexamined with regard to the 6 target words. The reliability coefficients declined because the number of the test items decreased from 12 to 6. Nevertheless, the reliability coefficients of the *Posttest* and *Delayed posttest* were respectively .77 and .79. Once again, the reliability of the *Pretest* was .17 because a large majority of the participants did not know the target words. (Table 4.9).

Table 4.9
Descriptive statistics and reliability of the three instruments (n=6 target words)

Test N=127	No. of Items	Mean	M%	SD	Range	Maximum	Spearman-Brown Coefficient
Pretest	06	0.32	05.33%	0.58	02	02	0.17
Posttest	06	4.04	67.33%	1.78	06	06	0.77
Delayed Posttest	12	2.73	22.75%	2.42	11	11	0.79

On average, participants could recognize .32 words (5.33% of the target words) before the treatment, acquired 4.04 words (67.33% of them) after the treatment, and retained 2.73 words (22.75%) two weeks after the treatment. The SD of the *Pretest* is .58; that of the *Posttest*, 1.78 and *Delayed posttest*, 2.42.

Table 4.10 displays the results of the paired samples *t* test. The first comparison, Post－Pre, demonstrates a significant difference between *Posttest* scores and *Pretest* scores (t=24.45, p<.05), as does the second comparison, the Delayed Posttest (DeP) －Pre (t=11.77, p<.05). The difference between *Pretest* and *Posttest* scores (62.00%) indicates the vocabulary gain after the treatment; likewise, the difference between the *Pretest* and *Delayed Posttest* (17.42%) refers to the amount of vocabulary which was retained two weeks after the treatment. As for the difference between *Posttest* and *Delayed Posttest*, -44.58% (t=-6.43, p<.05) indicates that the retention of the vocabulary declined significantly.

Table 4.10
Paired samples T Test results of participant performances as a whole throughout the experiment

Test pairs **N=127**	Paired Differences				*t*	Sig (2-tailed)
	M% difference	SD	95% CI			
			Lower	Upper		
Post－Pre	-62.00%	1.71	-3.42	-4.02	24.45	.000*
DeP－Pre	-17.45%	2.31	-2.00	-2.82	11.77	.000*
DeP－Post	-44.55%	2.29	-1.71	-0.91	-6.43	.000*

Note. $p<.05$

4.2 The Effect of Different Dictionaries on Vocabulary Acquisition

One of the purposes of the present study was to examine vocabulary learning efficacy with the use three types of dictionaries, monolingual, bilingualized, and bilingual. To this end, one-way ANOVA was conducted. The analysis shows there were significant differences among the vocabulary gains of the three groups (p=.005) on the *Posttest*, which means the vocabulary learning efficacy of certain groups was better than that of others. Similar results also occurred with participants' vocabulary retention. As shown in Table 4.11, learners' performance on the *Delayed Posttest* varied significantly among the three groups (p=.001).

Table 4.11
One-way ANOVA analysis among different types of dictionaries in Posttest, and Delayed posttest

Source	For *Posttest*				
	SS	*df*	*MS*	*F*	*p*
Group	032.67	002	16.33	5.532	.005
Error	366.14	124	02.95		
Source	For *Delayed Posttest*				
	SS	*df*	*MS*	*F*	*p*
Group	079.71	002	39.85	7.497	.001
Error	659.19	124	05.32		

Note. $p<.05$

After comparing (the efficacy of different types of dictionaries, the test results of each group of participants is investigated in detail to inspect the vocabulary learning efficacy with special regard to dictionary type. Table 4.12 displays the descriptive statistics and Table 4.13 demonstrates the paired samples *t* test results of the Monolingual group. On average the participants of this group acquired 76% of new words on the posttest and retained31.5% of them two weeks later. According to the *t* test results, the significant vocabulary gains on the *Posttest* and *Delayed posttest* were 69% and 24.5%, respectively. The difference between the *Posttest* and *Delayed posttest*, the decline of the vocabulary retention, was not significant in the Monolingual group.

Table 4.12
Descriptive statistics of Monolingual group

Test N=45	No. of items	Mean	M%	SD	SE	Range	Max score
Pretest	06	0.42	07.00%	0.62	.09	02	02
Posttest	06	4.56	76.00%	1.49	.22	04	06
Delayed	12	3.78	31.50%	2.92	.44	11	11

Table 4.13
Paired samples T Test results of participants performances in the Monolingual dictionary group throughout the experiment

Test pairs N=45	Paired Differences				*t*	Sig (2-tailed)
	M% difference	SD	95% CI			
			Lower	Upper		
Post－Pre	-69.00%	1.44	-3.70	4.57	-19.26	.000*
DeP－Pre	-24.50%	2.77	-2.53	4.19	-08.14	.000*
DeP－Post	-44.50%	2.74	-1.60	.05	-01.91	.063*

Note. $p<.05$

Table 4.14 provides descriptive statistics of the results of the 3 tests in the Bilingualized group. The differences in mean scores across the three tests were significant

(Table 4.15). The results of the *Posttest* and the *Delayed posttest*, when compared with that of the *Pretest*, indicate significant gains. However, the difference in scores between the *Posttest* and *Delayed posttest* was also significant, implying significant loss of the vocabulary gain in 2 weeks.

Table 4.14
Descriptive statistics of Bilingualized group

Test N=41	No. of items	Mean	M%	SD	SE	Range	Max score
Pretest	06	0.22	03.70%	0.52	.08	2	2
Posttest	06	4.17	69.50%	1.86	.29	6	6
Delayed	12	2.37	19.75%	1.87	.29	8	8

Table 4.15
Paired samples T Test results of participants performances in the Bilingualized dictionary group throughout the experiment

Test pairs N=41	Paired Differences				*t*	Sig (2-tailed)
	M% difference	SD	95% CI			
			Lower	Upper		
Post－Pre	-65.80%	1.77	-3.39	-4.51	-14.26	.000*
DeP－Pre	-16.05%	1.74	-1.60	-2.70	-07.90	.000*
DeP－Post	-49.75%	1.82	-2.38	-1.23	-06.35	.000*

Note. $p<.05$

Table 4.16 illustrates the descriptive statistics of the Bilingual group, and Table 4.17 demonstrates paired samples *t* test results. On average the participants in the Bilingual group acquired 55.67% of new words on the *Posttest* and retained 16.25% of them on the delayed posttest.. According to the *t* test results, the significant vocabulary gains on the *Posttest* and *Delayed posttest* were 50.37% and 10.95%, respectively. The decline of the vocabulary retention indicated by the difference between the *Posttest* and *Delayed posttest*, was significant in both the Bilingual and Bilingualized groups but not in

Monolingual group.

Table 4.16
Descriptive statistics of Bilingual group

Test N=41	No. of items	Mean	M%	SD	SE	Range	Max score
Pretest	06	0.32	05.30%	0.57	.09	2	2
Posttest	06	3.34	55.67%	1.81	.28	6	6
Delayed	12	1.95	16.25%	1.90	.30	9	9

Table 4.17
Paired samples T Test results of participants performances in the Bilingual dictionary group throughout the experiment

Test pairs N=41	Paired Differences				*t*	Sig (2-tailed)
	M% difference	SD	95% CI			
			Lower	Upper		
Post－Pre	-50.37%	1.75	-2.47	-3.58	-11.05	.000*
DeP－Pre	-10.95%	1.91	-1.03	-2.24	-05.49	.000*
DeP－Post	-39.42%	2.10	-2.05	-0.73	-04.25	.000*

Note. $p<.05$

After the test results of each experimental groups were calculated, the comparison of the performances of the three treatment groups on each of the *Pretest*, *Posttest*, and *Delayed Posttest*, were conducted. Table 4.18, 4.19, and 4.20 display the descritive data of the three experiment groups. The participants in Monolingual group scored 4.56 words out of six on the *Posttest*, which is higher than the 4.17 in the Bilingualized group and 3.34 in the Bilingual group (Table 4.19). Learners' performance on the *Delayed posttest* in the Monolingual group was also better than the other groups (see Table 4.20).

Table 4.18
Descriptive statistics of different types of dictionaries in Pretest (6 test items)

Groups	N	Mean	M%	SD	SE	Range	Max score
Mono	45	.42	7.00%	.62	.09	2	2
Bz	41	.22	3.70%	.52	.08	2	2
Bi	41	.32	5.30%	.57	.09	2	2

Table 4.19
Descriptive statistics of different types of dictionaries in Posttest (6 test items)

Groups	N	Mean	M%	SD	SE	Range	Max score
Mono	45	4.56	76.00%	1.49	.22	4	6
Bz	41	4.17	69.50%	1.86	.29	6	6
Bi	41	3.34	55.67%	1.81	.28	6	6

Table 4.20
Descriptive statistics of different types of dictionaries in Delayed posttest (12 test items)

Groups	N	Mean	M%	SD	SE	Range	Max score
Mono	45	3.78	32.00%	2.92	.44	11	11
Bz	41	2.37	19.75%	1.87	.29	8	8
Bi	41	1.95	16.25%	1.90	.30	9	9

The HSD did not indicate significant differences among the three experimental groups on the *Pretest* as expected. Contrastively, the statistical procedurerevealed significant differences among the three groups on the *Posttest* and *Delayed Posttest.* The mean score in the Monolingual groups was significantly higher than the Bilingual groups on the *Posttest.* As for the efficacy of the vocabulary retention, participants in the Monolingual groups scored significantly higher than the Bilingualized and Bilingual groups (Table 4.21).

Table 4.21
Significant mean difference among different types of dictionaries in Pretest, Posttest, and Delayed posttest

		Mean Difference	M% difference	Std. Error	Sig.	95% CI	
						Lower	Upper
Pretest (6 test items)	Mono-Bz	-.20	-03.33%	.12	.235*	-.09	0.50
	Mono-Bi	-.10	-01.67%	.12	.674*	-.19	0.40
	Bz-Bi	-.09	-01.50%	.12	.722*	-.40	0.20
Posttest (6 test items)	Mono-Bz	1.38	-06.33%	.37	.555*	-.50	1.26
	Mono-Bi	1.21	-20.17%	.37	.004*	-.33	2.09
	Bz-Bi	1.83	-13.83%	.38	.078*	-.07	1.73
Delayed posttest (12 test items)	Mono-Bz	1.41	-11.75%	.50	.015*	-.23	2.59
	Mono-Bi	1.83	-15.25%	.50	.001*	-.65	3.01
	Bz-Bi	1.41	-03.42%	.51	.695*	-.79	1.62

Note. $p<.05$

4.3 Comparison of Participants' Performance on the Translation Task Between the High and Low Groups

In addition to the factor/variable of the dictionary type, the vocabulary competence of participants was the other factor investigated in this study. Participants' performance on the *Posttest* and *Delayed posttest* was also analyzed in terms of high-low grouping as well. As expected, high achievers performed significantly better than low achievers on both the *Posttest* and *Delayed posttest* while both groups scored less than 1% on the pretest (Table 4.22).

Table 4.22
Comparison of the performance on the vocabulary acquisition between high and low achievers

Tests	Level	N	Mean	M%	SD	*F*	*t*	*df*	Sig. (2-tailed)
Pre	H	79	0.42	07.00%	0.61	17.86	2.580	117.4	.011
	L	48	0.17	03.00%	0.48				
Post	H	79	4.73	79.00%	1.49	00.27	6.507	125.0	.000
	L	48	2.90	48.00%	1.63				
Delayed Posttest	H	79	3.58	30.00%	2.59	20.31	6.690	116.6	.000
	L	48	1.33	11.00%	1.15				

4.4 Comparison of the Learners' Performance between High and Low Groups Across Different Types of Dictionaries

Further comparison of high and low achievers among the three groups on the *Posttest* and *Delayed posttest* was conducted. High achievers in the monolingual and bilingualized groups performed significantly better than low achievers on the *Posttest*, but high-level students using the bilingual material did not learn more words than low-level learners using the same material. On the *Delayed posttest*, high achievers in all three groups scored better than low achievers (Table 4.23 & 4.24).

Table 4.23
Comparison of the performance on the Posttest between high and low achievers among the three groups with different dictionaries

Group	High			Low			F	t	df	Sig. (2-tailed)
	M	M%	SD	M	M%	SD				
Mono	5.03	83.80%	1.24	3.09	51.50%	1.22	.463	4.52	43	.000*
Bz	4.88	81.30%	1.56	2.93	48.80%	1.71	.790	3.73	39	.001*
Bi	3.82	63.70%	1.63	3.00	50.00%	1.89	.574	1.45	39	.154*

Note. $p<.05$

Table 4.24
Comparison of the performance on the Delayed Posttest between high and low achievers among the three groups with different dictionaries

Group	High			Low			F	t	df	Sig. (2-tailed)
	M	M%	SD	M	M%	SD				
Mono	4.38	36.50%	3.10	1.91	15.92%	0.83	10.21	4.20	42.38	.000*
Bz	3.08	25.67%	1.79	1.13	09.42%	1.30	01.70	3.68	39.00	.001*
Bi	2.82	23.50%	2.24	1.33	11.08%	1.34	03.97	2.66	39.00	.011*

Note. $p<.05$

4.5 Comparison of Test Results between the New and Old Sentence Contexts

One of the purposes of the present study was to examine whether the new and old sentence contexts in the test items affected participants' performance. Table 4.25 displays the descriptive statistics of all participants' performances on the old and new sentence contexts in the posttest and delayed posttest. The percentages of the words learned using the old sentence contexts were higher than those on the tests using the new sentence contexts. In the posttest, learners correctly identified 73.3% of the target words from the old sentence context. This score was, higher than the 61% identified from the new context. As for the delayed posttest, such differences were not found. The paired samples *t* test results signified that the difference in the posttest scores was significant but not in the delayed posttest (Table 4.26). That is, the text employed in the test items effects performance.

Table 4.25
Descriptive statistics of participants' performances with different sentence contexts

Tests N=127	No. of items	Mean	M%	SD	SE	Range	Max score	No. of items
Posttest								
Old	3	2.20	73.30%	0.99	.90	3	3	3
New	3	1.83	61.00%	1.12	.10	3	3	3
Delayed Posttest								
Old	6	1.44	24.00%	1.35	.12	6	6	6
New	6	1.29	21.50%	1.38	.12	6	6	6

Table 4.26
Paired samples T Test results of participants performances with different sentence contexts

Test pairs	Paired Differences						*t*	Sig (2-tailed)
	Mean	SD	M% difference	SE	95% CI			
					Lower	Upper		
Posttest Old－New	.37	1.15	12.30%	.10	-.17	.57	3.638	.000*
Delayed Posttest Old－New	.15	1.27	02.50%	.11	-.07	.37	1.325	.188*

Note. $p<.05$

4.6 Discussion

The statistical results have been presented, and what follows are the interpretations of the statistics and the answers to the research questions. Moreover, comparison with previous studies will be conducted at the end of each subsection. The research questions of this study are as follows:

1. Does the translation task help learners acquire and retain new vocabulary?
2. Do learners perform differently when learning new vocabulary by consulting different types of dictionaries, monolingual, bilingual, and bilingualized dictionaries?
3. Is the translation task equally helpful to learners of different language levels when learning new vocabulary?

4. Do learners of different language levels perform differently on the posttest when learning new vocabulary by consulting different types of dictionaries?
5. Do the new or old test items significantly affect the results of different tests, the *Posttest* and *Delayed posttest*?

4.6.1 Overall performance of participants on the translation task

The results of the paired samples t test indicate a significant difference between both the *Pretest* scores and *Posttest* scores and between the *Pretest* scores and the *Delayed posttest* scores as well. The translation task facilitated vocabulary learning no matter which type of dictionary the participants employed. On average, the immediate vocabulary gain from the 20-minute translation practice was 62.00% (＝67.30%－5.30%, 3.72 out of 5.78 words, Table 4.10). The translation task, which comprises the three factors of the involvement load, *need, search,* and *evaluation*, appears to play an effective role in facilitating vocabulary learning.

The present experiment used a translation task as the treatment rather than a reading task, which has often been used in similar studies (Hill & Laufer, 2003; Hulstijn, Hollander, & Greidanus, 1996; Hulstijn & Trompetter, 1998; Knight, 1994; Laufer & Hill, 2000; Luppescu & Day, 1993). While the purpose of these previous studies was to examine the efficacy of the dictionary consultation for vocabulary acquisition under a reading condition, the design of the present study was based on the Involvement Load Hypothesis (Laufer and Hulstijn, 2001) by incorporating a translation task to facilitate vocabulary acquisition .

The comparisons between the present study and previous related studies are summarized in Table 4.27. Six related studies were found and they were summarized in

Table 4.27. Firstly, the purposes of dictionary consultation in previous studies are mainly to finish reading comprehension, and only one study attempted to compare three types of tasks with dictionary consultation. Secondly, the amount of time participants spent on tasks during treatments in past studies ranges from 5 to 50 minutes. Hill and Laufer (2003) inspected whether the amount of time spent on the task had significant influence on learning efficacy by comparing three types of tasks. They concluded that time exerts insignificant effect on vocabulary learning, finding that the type of task yields different vocabulary results. It is their conclusions that the reason for better effectiveness induced by the form-oriented task rather than message-oriented task lies in the increase in dictionary activity that is required to complete the task. They further contend that "the time which *contributes towards* learning is not time spent on the *task*, but time spent on the *target item*" (p.103).

Table 4.27
Comparisons between the present study and other studies

Studies	No. of target words	The use of a delayed posttest	Purpose of dictionary consultation (Posttest formats)	Language of dictionaries	Time of the treatment (minutes)	Results	
						vocabulary gain on the posttest	vocabulary retention from the delayed posttest
The present study	6 words	Yes	To complete a translation task (Recognition test: matching in a sentence context)	Monolingual Bilingualized Bilingual	20	69.00% 65.80% 50.37% M=62.00%	(2 weeks later) 25.00% 16.05% 10.95% 17.45% (not as the same as the posttest)
Luppescu and Day (1993)	17 words	No	reading comprehension (Recognition test: matching of the definition)	Computerized Bilingual dictionaries	21	dictionary group: 8.94% no dictionary group: 5.29%	NA
Knight (1994)	24 words	Yes	reading comprehension (Recognition test: matching of the definition)	No information	24	dictionary group: 53.00% no dictionary group: 29.00%	(2 weeks later) dictionary group: 43.50% no dictionary group: 26.50% (as the same as the posttest)
Hulstijn, J.H., Hollander, M., & Greidanus, T. (1996)	16 words	No	reading comprehension (Recognition test: providing a definition in L1/L2)	Bilingual	25	25.00%	NA
Hulstijn & Trompetter (1998)	10 words	No	reading comprehension (Recognition test: providing a definition in L1)	Bilingual	50	reading: 38.00% (a day after)	NA
Laufer & Hill (2000)	12 words	No	reading comprehension (Recognition test: providing a definition in L1/L2)	Computerized Bilingualized dictionaries	10	52.98%	NA
Hill & Laufer (2003)	12 words	Yes	reading comprehension 3 task types 1) a form-oriented production task[a] 2) a form-oriented comprehension task[b] 3) a meaning-oriented task[c]	Computerized Bilingualized dictionaries	5.23 5.62 5.62	42.00% 62.20% 71.90%	(1 week later) (the same as the posttest) 29.40% 37.90% 45.30%

Note.[a] A meaning-oriented task required learners to answer *yes/no* comprehension questions, each question on a different portion of the text including one target word. [b] A form-oriented comprehension task means the target word shown on the screen of the computer and the learners had to use the reading context to select its meaning from four choices. [c] In a form-oriented production task, a synonym or paraphrase of the practiced word was provided and the participants had to select its corresponding word form from four options. It is also called a productive recognition task in that learners are not asked to write something.

Before the vocabulary gains of these experiments are compared, the test formats of the posttests must be mentioned. It is summarized in Table 4.27 that recognition tests, either matching or providing a definition, were widely used in related previous experiments. Only one experiment out of the seven studies reviewed used other format of posttest. The results showed that the higher posttest scores were 71.90% (Hill & Laufer, 2003), 62.00% (the present study), 53.00% (Knight, 1994), and 52.98% (Laufer & Hill, 2000) while those of 38.00% (Hulstijn & Trompetter, 1998), 25.00% (Hulstijn, Hollander, & Greidanus, 1996), and 8.94% (Luppescu and Day, 1993) were lower.

In order to further examine vocabulary retention, the results from the delayed posttests were compared. Only two of the previous studies included delayed posttests. Participants in Hill and Laufer's study (2003) were given a delayed posttest 1 week after the posttest, whereas learners in Knight's (1994) took the delayed posttest 2 weeks after the posttest. The present study also scheduled the delayed posttest 2 weeks after the posttest.

In addition to the difference of the time span between the posttest and delayed posttest which makes comparisons of the delayed posttest unequal, the delayed posttest format is another factor which should be taken into consideration. The materials used in the delayed posttests in both Knight's study and Hill and Laufer's were the same materials used as the posttests. That is, learners took the same test twice at different time

intervals. The performance might have been attributed to the practice effect. The retrieval would become easier. In the present study, the delayed posttest was not the same as the posttest. To investigate whether learners knew the words, it comprised half of the old and half of new sentence contexts of each target word.

Overall, the incorporation of the translation task with dictionary consultation facilitated learners' vocabulary learning. Nevertheless, there may be still more empirical studies needed to validate the Involvement Load Hypothesis and to devise more effective tasks beneficial to vocabulary learning.

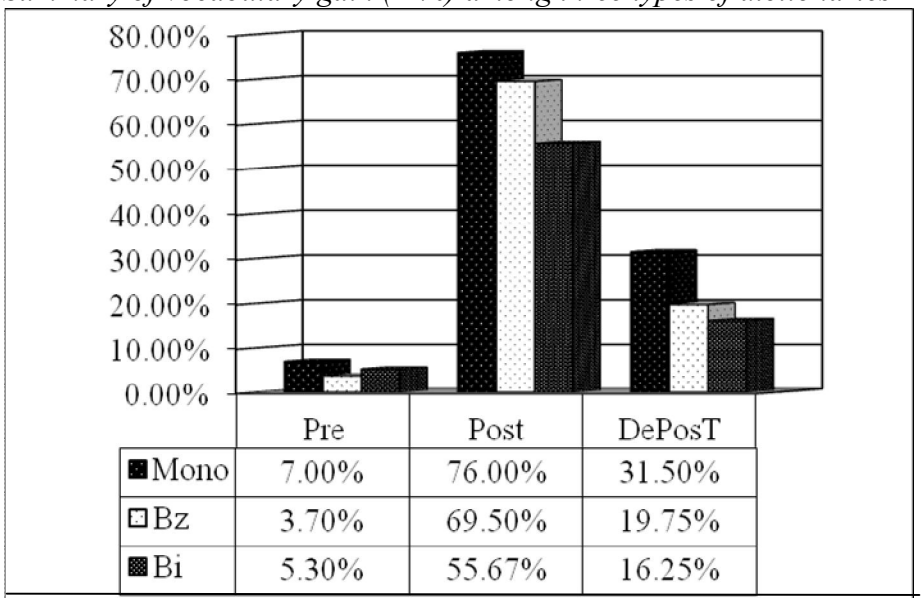
4.6.2 The effect of different dictionaries on vocabulary acquisition

Though the translation task itself appears to help learners' vocabulary learning, it is also necessary to look into the efficacy of different types of dictionaries on vocabulary acquisition to investigate whether dictionary types have different impacts on vocabulary acquisition.

Figure 4.3 presents the results of the posttest and delayed posttest. The three experiment groups performed differently. The monolingual group scored higher (76.00%) than the bilingualized group (69.50%) and the bilingual group (55.67%) on *Posttest*. Moreover, the participants in the monolingual group retained more vocabulary (31.50%) than the other two groups (19.75% and 16.25%) on the *Delayed posttest*.

Figure 4.3

Summary of vocabulary gain (M%) among three types of dictionaries



	Pre	Post	DePosT
Mono	7.00%	76.00%	31.50%
Bz	3.70%	69.50%	19.75%
Bi	5.30%	55.67%	16.25%

In addition to simple contrast of the participants' performances on *Pretest*, *Posttest*, and *Delayed posttest*, vocabulary gains on *Posttest* and *Delayed posttest* and even vocabulary loss (between the posttest and the delayed posttest) were compared to precisely examine the efficacy of using each type of dictionary (Table 4.28). Both the vocabulary gains on *Posttest* and the vocabulary retention rates on the *Delayed posttest* in three dictionary groups achieved statistical significance. This signifies that dictionary consultation incorporating the translation task facilitates vocabulary acquisition and retention. However, the bilingualized and bilingual groups displayed significant vocabulary loss over time while the monolingual group exhibited insignificant vocabulary loss.

Table 4.28
Summary of paired samples t tests results of three groups

Test pairs	Monolingual		Bilingualized		Bilingual	
	M%	Sig.	M%	Sig.	M%	Sig.
Post－Pre (gain)	69.00%	.000*	65.80%	.000*	50.37%	.000*
Dep－Pre (retention)	24.50%	.000*	16.05%	.000*	10.95%	.000*
Dep－Post (loss)	-44.50%	.063	-49.75%	.000*	-39.42%	.000*

Note. $p<.05$

Vocabulary gains, vocabulary retention rates, and vocabulary losses among the three groups were further investigated. The results of one-way ANOVA indicate significant differences in vocabulary gains and vocabulary retention rates among the three groups and insignificant difference in overall vocabulary losses (see Table 4.29). That is, two weeks after the treatment, the vocabulary loss among all three groups was similar, which could be attributed to the shared characteristics of human memory faculty.

Table 4.29
One-way ANOVA analysis of paired samples t tests results among the three groups

Source	For Pre-Post (vocabulary gain)				
	SS	*df*	*MS*	*F*	*p*
Group	29.72	2	14.86	5.42	.006*
Error	340.08	124	2.74		
Source	For Pre-De (vocabulary retention)				
	SS	*df*	*MS*	*F*	*p*
Group	14.40	2	7.20	5.68	.004*
Error	157.12	124	1.27		
Source	For Post-De (vocabulary loss)				
	SS	*df*	*MS*	*F*	*p*
Group	7.93	2	3.97	1.46	.237
Error	337.26	124	2.72		

Note. $p<.05$

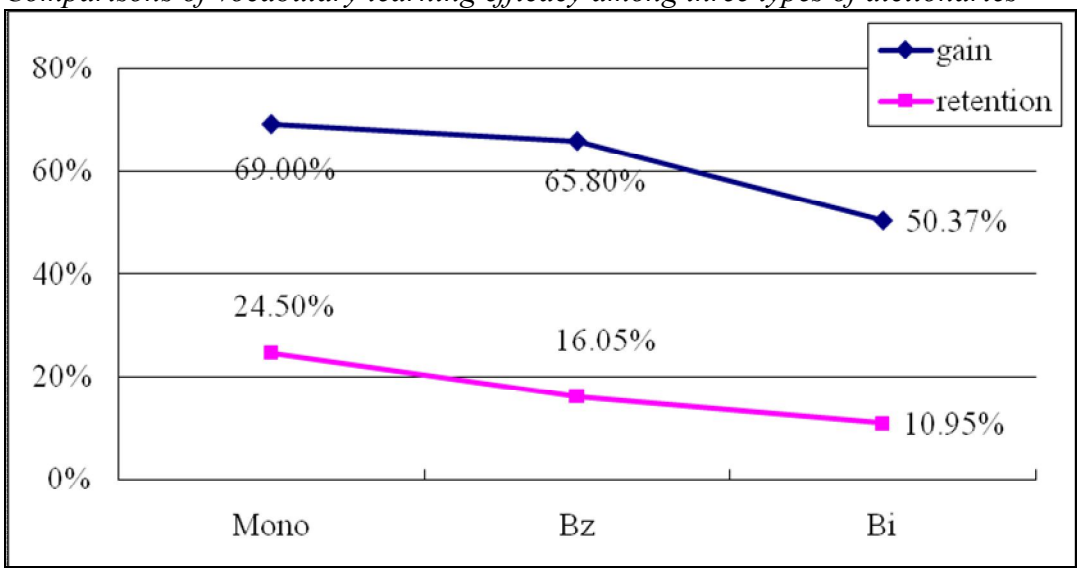
Post Hoc Tests were taken to further examine the differences between the two groups (Table 4.30). Given that the *p* values of the *Delayed Posttest* and *Posttest* were more than .05, it can be inferred that all the three groups had lost access to similar percentages of the words which they had learned during the treatment phase of the current study. For the vocabulary gain, the monolingual group performed significantly (18.48%, p=.007) better than the bilingual group, while the bilingualized group outperformed the bilingual group (15.45%, p=.033). Two weeks after the treatment, the monolingual group also retained more vocabulary (13.47%) than the bilingual group, but when the bilingualized group was compared with the monolingual and bilingual groups, the differences were insignificant. Results from the vocabulary gain scores signifies that participants using monolingual and bilingualized dictionaries had better vocabulary achievement than participants using bilingual dictionaries; however, the strengths of these two types of dictionaries did result in vocabulary retention. This could be attributed to human memory loss and may be treated by scheduled repetitive review activities (Cheng, 2009). In short, the vocabulary learning efficacy of monolingual dictionary consultation appears to be the highest (Figure 4.4), which provides empirical evidence for the advocation of using monolingual dictionaries. More importantly, bilingualized dictionaries seemed to be as useful as monolingual dictionaries. Bilingualized dictionaries are less intimidating to learners because the provision of both the target language and mother tongue lessens the tension of interpreting the entries which is present when L2 learners use monolingual dictionaries. The statistics of the retained vocabulary provide evidence that the vocabulary learned by the bilingualized group can be remembered as well as those target words learned by the monolingual group. Therefore, learners are suggested to take advantage of bilingualized dictionaries and monolingual dictionaries.

Table 4.30
Post Hoc Tests among different types of dictionaries in vocabulary gain, vocabulary retention, and vocabulary loss

		Mean Difference	Mean % Difference	Std. Error	Sig.	95% CI	
						Lower	Upper
Post－Pre (gain)	Mono－Bi	.11	18.48%	.36	.007*	.26	1.96
	Mono－Bz	.18	3.04%	.36	.867	- .67	1.03
	Bz－Bi	.93	15.45%	.37	.033*	.06	1.79
Dep－Pre (retention)	Mono－Bi	.81	13.47%	.24	.033*	.23	1.38
	Mono－Bz	.50	8.39%	.24	.100	- .07	1.08
	Bz－Bi	.30	5.08%	.25	.440	- .28	.89
Dep－Post (loss)	Mono－Bi	.30	5.01%	.36	.676	- .54	1.15
	Mono－Bz	- .32	-5.35%	.36	.640	-1.17	.52
	Bz－Bi	.62	10.37%	.36	.206	- .24	1.49

Note. $p<.05$

Figure 4.4
Comparisons of vocabulary learning efficacy among three types of dictionaries



The translation tasks appeared to have significantly helped the learners retain some of the vocabulary learned. Regardless of the dictionary types, learners were able to acquire vocabulary through the translation task itself, which further supports the Involvement Load Hypothesis. It was already shown that there were significant

differences in the vocabulary gains and in the vocabulary retention among the three dictionary groups, implying that incorporating the translation task with dictionary consultation facilitates vocabulary acquisition and retention. Therefore, the learning efficacy of the task itself is more important than the effect of the dictionary type. For L2 learners with monolingual dictionaries, vocabulary retention in the long run is better than that of the other groups.

Only a single study by Laufer & Harder (1997), has discussed the effectiveness of the 3 types of dictionaries examined here. They concluded that bilingualized dictionaries were suitable for learners. However, the purpose and methods of Laufer & Harder and the current study were different. Laufer & Harder gave the participants 15 low-frequency words with dictionary entries, 5 from the monolingual dictionaries, 5 from the bilingualized ones, and 5 from the bilingual dictionaries. The effectiveness of the three types of dictionaries on vocabulary learning was examined by both a multiple-choice recognition test and a production test, requiring learners to write original sentences with each target word. The present study investigates the vocabulary learning efficacy of the three types of dictionaries by providing a translation task to facilitate the learning process and using a matching posttest, an alternative format of multiple choice, to measure the vocabulary acquisition. Laufer & Harder (1997) found that bilingualized dictionaries were effective for learners of 3 different language levels, unskilled, average, and good language learners, grouped by a placement test. In the results of the present study, participants who used bilingualized dictionaries showed significantly better performance than participants who used bilingual dictionaries and exerted as similar learning efficacy as monolingual dictionaries.

4.6.3 Comparison of participants' performance on the translation task between high and low groups

In order to find out whether the translation task would influence learners of different L2 proficiency levels production in different ways, the performances of the high and low groups on the translation task were compared. Although the target words were equally unknown to both groups, high achievers scored significantly higher than low achievers on both the *Posttest* and *Delayed posttest* (see Table 4.23&4.24). It is not surprising to find that the high achiever's vocabulary gain was also higher than that of the low achievers. The Matthew Effect was found in Hulstijn's (1993) study on vocabulary learning and was found in the present study, which means that high achievers score better than low achievers on tests after learning activities

Table 4.31
Results of Independent samples t test between high and low groups in vocabulary gain and loss

Test pairs	Level	N	Mean	M%	SD	*F*	*t*	*df*	Sig. (2-tailed)
Post－Pre (gain)	H	79	4.32	71.94%	1.52	.02	5.65	125	.000*
	L	48	2.73	45.49%	1.57				
Dep－Pre (retention)	H	79	1.37	22.89%	1.25	10.59	4.90	125	.000*
	L	48	.50	8.33%	.76				

Note. $p<.05$

Hulstijn pointed out that learner L2 language proficiency affected the dictionary consultation process. This was confirmed by Knight with empirical evidence stating that higher achievers performed better at learning the meaning of unknown words when reading. According to Hulstijn, the correlation between inferrencing ability and vocabulary knowledge was .50 ($p<.001$). Independent *t* tests demonstrated that subjects

with higher inferrencing ability scored significantly better on English vocabulary acquisition tasks; however, no significant differences were found in inferring ability between participants with English scores above and below the mean. Therefore, the results provided a plausible idea that learners who can infer word meanings well pick up words and their meanings easily with the help dictionary use. Based on the above results shown in Table 4.31, the high achievers performed significantly better on the vocabulary learning task than the low achievers in the present study, in which the Matthew effect also appeared to take place.

4.6.4 The comparison between high and low groups performance with the use of different types of dictionaries

In addition to examining the performance of the high and low groups on the translation task, the differences of test scores between the high and low achievers on the three types of dictionaries were also investigated. The difference between the *Posttest* and *Pretest*, was calculated as vocabulary gain, , while the difference between the *Delayed posttest* and *Pretest* and the difference between *Delayed Posttest* and *Posttest* were considered to be vocabulary retention. The details of these comparisons are presented in Tables 4.32, and 4.33, and Figure 4.5.

Table 4.32
Comparison of the performance in the vocabulary gain between high and low achievers among the three groups with different dictionaries

Group	Vocabulary gain (Posttest－Pretest)									
	High			Low			*F*	*t*	*df*	Sig. (2-tailed)
	M	M%	SD	M	M%	SD				
Mono	4.56	75.98%	1.31	2.82	46.97%	.98	2.21	4.05	43	.000*
Bz	4.59	76.54%	1.55	2.71	45.24%	1.54	.12	3.69	39	.001*
Bi	3.44	57.41%	1.58	2.70	44.93%	1.84	.37	1.37	39	.178
All	4.32	71.94%	1.52	2.73	45.49%	1.57	.02	5.65	125	.000*

Note. $p<.05$

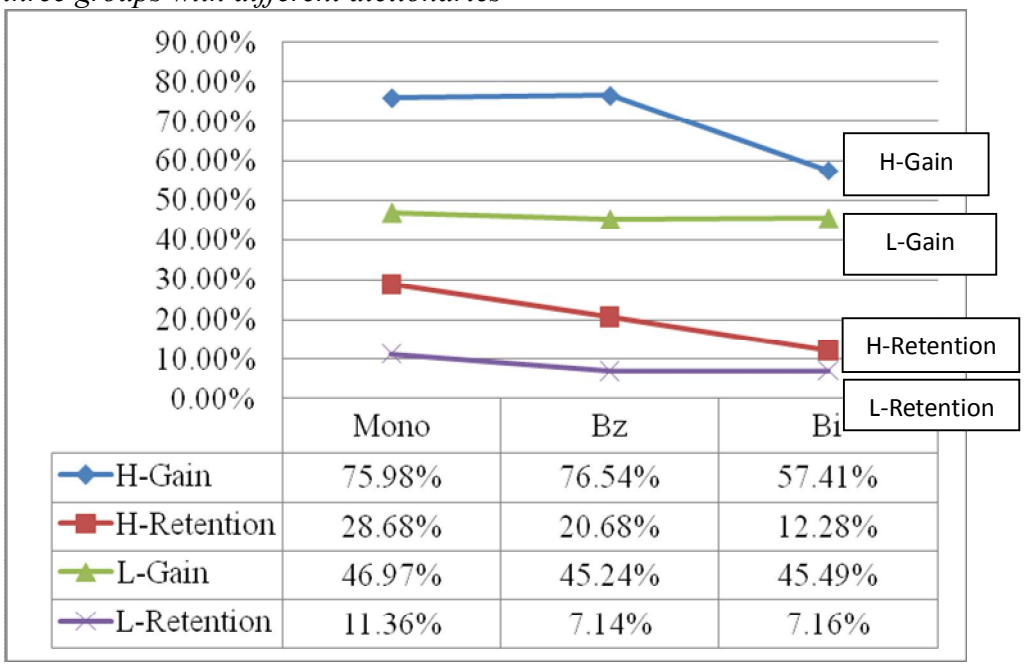
Table 4.33
Comparison of the performance in vocabulary retention between high and low achievers among the three groups with different dictionaries

Group	Vocabulary retention (Delayed posttest－Pretest)									
	High			Low			*F*	*t*	*df*	Sig. (2-tailed)
	M	M%	SD	M	M%	SD				
Mono	1.72	28.68%	1.40	.68	11.36%	.93	1.85	2.29	43	.027*
Bz	1.24	20.68%	.94	.43	7.14%	.39	8.15	3.89	38	.000*
Bi	.92	15.28%	1.22	.46	7.61%	.85	1.70	1.43	39	.162
All	1.37	22.89%	1.25	.50	8.33%	.76	10.59	4.90	125	.000*

Note. $p<.05$

Figure 4.5

Comparisons of vocabulary gain and retention between high and low achievers among three groups with different dictionaries



	Mono	Bz	Bi
H-Gain	75.98%	76.54%	57.41%
H-Retention	28.68%	20.68%	12.28%
L-Gain	46.97%	45.24%	45.49%
L-Retention	11.36%	7.14%	7.16%

Overall, the comparisons made among groups provided evidence for the presence of The Matthew effect. High achievers scored significantly higher vocabulary gains and vocabulary retention than low achievers (Table 4.34), signifying dictionary consultation with translation task facilitates high achievers' learning process better than low achievers'. Closer examination of the performance of the three groups sheds light on how the three types of dictionaries influenced high and low achievers differently. High achievers in monolingual and bilingualized groups performed better (on vocabulary gain and vocabulary retention than low achievers. Bilingual dictionaries, on the contrary, were found to diminish the learning effect of high achievers as high achievers scored least with bilingual dictionaries. According to Figure 4.5, it is observed that bilingual dictionaries bring the least learning efficacy to high achievers, but not to low achievers. Besides, monolingual dictionaries help high achievers retain more vocabulary than bilingualized

ones. Dictionary type exerts little influence on the vocabulary learning efficacy for low achievers because they scored quite similarly among three types of dictionaries

In conclusion, high achievers experience a significantly greater benefit from the monolingual and bilingualized dictionaries than the bilingual dictionaries. On the other hand, bilingual dictionaries are more beneficial to low achievers than high achievers.

Table 4.34
Comparisons of test pairs between high and low groups among the three groups

Test Pairs	All H－L	Groups		
		Mono H－L	Bz H－L	Bi H－L
Vocabulary gain (Posttest－Pretest)	＊ 26.45%	＊ 29.01%	＊ 31.30%	= 12.48%
Vocabulary retention (Delayed posttest－Pretest)	＊ 14.56%	＊ 17.32%	＊ 13.54%	= 7.67%

Note. "＊"stands for significant difference. "=" stands for no significance.

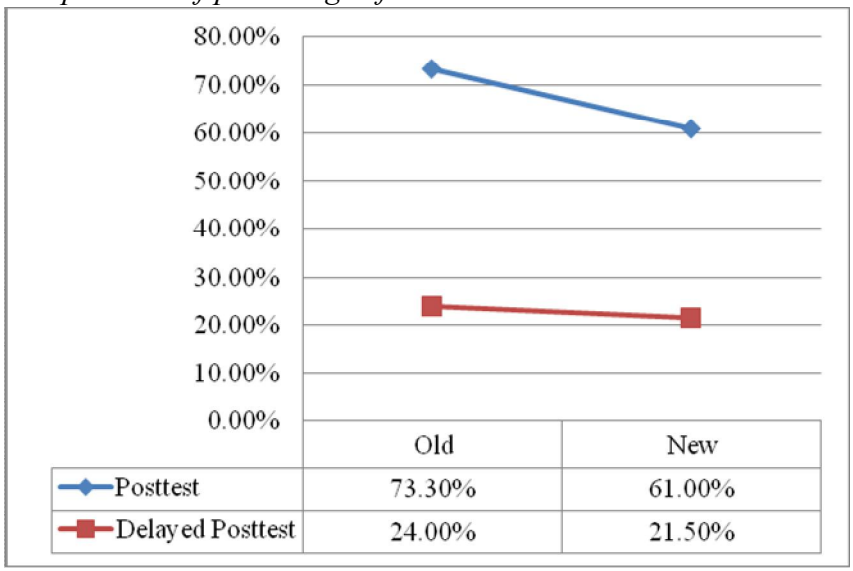
In another similar study, Laufer & Harder (1997) concluded that bilingualized dictionaries compared to monolingual and bilingual dictionaries, were helpful for all three levels of English proficiency (unskilled, average, good) in their study,(redundant) . This finding was also supported by Laufer and Melamed (1994), as cited in Laufer & Kimmel, 1997). Laufer and Melamed claimed that the process of reading L2 entries and the procedure of confirming what has been read in L1 facilitate and enhance learners' L2 vocabulary development. It is important to notice that the researchers found that some (participants in their experiment (9.5%) did not read lexical information in both L1 and L2 definitions. In the present study, bilingualized dictionaries did contribute to more influence on learners' vocabulary learning. Conversely, the results of this study do not suggest that monolingual dictionaries bring greater benefits to low achievers than high

achievers. Further, this study also suggests that low achievers should not be pressed to use monolingual dictionaries. Instead, it appears that bilingual dictionaries which have traditionally been regarded as less valuable by some researchers and teachers actually play a constructive role in the learning process, especially for low achievers.

4.6.5 The comparisons of the test results between new and old sentence contexts

Based on the results of the present study, both old and new test contexts appear to carry some weight in the analysis of the research results (Tables 4.25 and 4.26), especially for the immediate posttest. In other words, convenient test content that either uses the instruction material or repeats the pretest items turned out to be easier for the test-taker and are likely to lead researchers to exaggerate the effect of the treatment in the short run. In the long run, due to memory loss over time, the difficulty of test contexts may have little influence on the research results (Figure 4.6).

Figure 4.6
Comparisons of percentage of old and new contexts in Posttest and Delayed Posttest



Most previous studies reviewed did not clearly specify the instruments devised for their experiments and only minimally discuss (Knight, 1994; Prince, 1996) the test items used to investigate learning efficacy. Knight gave the participants two types of tests to measure different levels of word learning. One was to supply a definition and the other was to select a definition from multiple-choice. Prince attempted to assess learners' performance, made comparisons of new and old contexts, and proposed that performance should be better when subjects meet the same sentence context in the recall phase as in the study phase. The researcher of the current study made an effort to find whether this issue could be further investigated and supported by empirical evidence.

To sum up, test content influences learners' performance. Test content which is familiar to participants, i.e. old sentence contexts, used before the tests, produces better learner performance than the test content which is new to participants.

CHAPTER FIVE

CONCLUSIONS

This chapter consists of three parts. First, a summary of the present research and major findings is provided. Next, pedagogical implications are described. Limitations of the study and suggestions for further research are offered at the end of this chapter.

5.1 Summary of the Research and Major Findings

The chief purpose of the present study was to examine the vocabulary learning efficacy of different types of dictionaries and investigate factors affecting the experiment which included a translation task devised for the experiment, the L2 language levels of the learners, and the test items used in the study. The participants were 127 non-English-major freshmen, who were divided into 3 experimental groups across the two language levels, high and low. They received three treatments, namely monolingual dictionary exposure, bilingualized dictionary exposure, and bilingual dictionary exposure. The material for the treatment was a booklet constructed to simulate the use of dictionaries. The booklets contained 12 words, 3 which were used for instruction purposes, another 3 for which were used for practice and the remaining 6 were used for learners to self-study. The three treatments of the 3 groups were similar, each of which had identical presentations, beginning with a definition and ending with a translation task in a sentence context. In order to facilitate learners' comprehension of the text, the vocabulary used in the definitions was analyzed by VocabProfilers to ensure that only high frequency words were used. The translation task was so designed that the learners would examine, search and evaluate all the definitions provided in the booklet. In the

meantime, the translation task (was found to) enhance learners' attention and engagement in L2 vocabulary acquisition. After the treatment, a posttest was administered to the participants. A delayed posttest was arranged two weeks after the posttest in order to examine vocabulary retention. The instruments were devised to examine learners' recognition of receptive vocabulary. Learners' performance on the target words for self-study was used statistically to examine their vocabulary acquisition from the treatment.

The results of the analysis showed that the translation task facilitated vocabulary learning despite the different types of dictionaries consulted during the task. Furthermore, the dictionary type makes a significant difference in the vocabulary learning efficacy. Based on the gains on the *Posttest*, the monolingual and bilingualized dictionary groups appeared to outperform the bilingual group. However, upon closer inspection, no significant statistical difference was found between these two groups.

The current study also explored the effect of different types of dictionaries on learners of different proficiency levels. It was found that high achievers scored significantly higher than low achievers on both the *Posttest* and *Delayed posttest*, and that The Matthew Effect was not overcome in the present study. It is important to note that The Matthew Effect did not appear in the *Posttest* scores of the bilingual group. The difference of the performance between high and low groups was less significant when bilingual dictionaries were consulted by low achievers, indicating low achievers may benefit more from bilingual dictionaries than other dictionaries. On the other hand, high achievers experienced a significantly greater benefit from the monolingual and bilingualized dictionaries than the bilingual ones.

To investigate the influence of old and new sentence contexts on the understanding

of test items , the test items in the *Posttest* and *Delayed posttest* deliberately included old sentence contexts which had been used in the treatment along with new contexts which the participants did not see in the treatment.. The analysis of the research results showed that both old and new test contexts appeared to carry some weight in the understanding of target words, especially for the immediate posttest. That is, the inclusion of easier test items, i.e. target words which appear in recycled contexts, may have helped participants received higher test scores and as a result the posttest scores became exaggerated. In the delayed posttests, due to memory loss over time, the difficulty of test contexts may have little influence on the research results.

5.2 Pedagogical Implications

L2 Vocabulary acquisition undoubtedly plays a significant role in the SLA process, and the provision of the meaning of target words recently acquired words exerts an influence on word retention (Nation, 2001), in which noticing is regarded to be the key factor in the quality of vocabulary learning. Different tasks demand various degrees of engagement in the learning process the extent of explicitness is influential on intake, and the degree of awareness is highly correlated with the effect on intake (Rosa & O'Neill, 1999). These concepts are consistent with the Depth of Processing Hypothesis (Craik & Lockhart, 1972). Laufer and Hulstijn (2001) further proposed the Involvement Load Hypothesis, providing the operational definitions of the Depth of Processing Hypothesis. However, few experimental studies have examined the Involvement Load Hypothesis. The theoretical contribution of the present study is to offer empirical evidence that bears on the Involvement Load Hypothesis by incorporating the elements of the Involvement Load Hypothesis into the translation tasks. In addition to providing theoretical

implications, the present study confirms that the cognitive load embedded in the task has a significant impact on L2 vocabulary acquisition. Hill and Laufer (2003) contended that the time contributed towards learning is not time spent on the task, but the time spent on the target item. Luppescu and Day (1993) also demonstrated that there was almost zero correlation between the time taken to read a passage and performance on a subsequent test. That is, teachers are suggested to devise a task which directs learners' attention to the target words thus making good use of the Involvement Load Hypothesis. The present study also advocates the application of the Involvement Load Hypothesis toL2 vocabulary acquisition

Moreover, the Matthew effect occurred in the present study. Generally speaking, high achievers outperformed low achievers on the translation task across all three dictionary groups. Further, it is recommended by the researcher in the present study that EFL learners with different levels of language proficiency choose different dictionary types. The results of the current study show that high achievers should consult monolingual or bilingualized dictionaries, for they may benefit from the information in the entry and retain new vocabulary longer, while low achievers should not be pressed to use monolingual dictionaries. Instead, it appears that bilingual dictionaries which have traditionally been regarded as less valuable by some researchers and teachers actually play a constructive role in the learning process, especially for low achievers. Teachers may help learners of different language levels choose a dictionary which is appropriate for them in order to make full use of the information in the entries.

The last implication of the current study is drawn from the answer to the fifth research question, whether the old and new sentence contexts in the test make a significant difference in learners' performance on translation tasks. Learners' performance

on items in old/familiar sentence contexts is better than on items in new contexts. These findings imply that items used to measure learners' acquisition must be carefully devised, or the test results may be exaggerated.

5.3 Limitations of the Study and Suggestions for Further Research

Due to the implementation of the present experiment and reflection on the study, several limitations about the present study have been noted and are listed in this section, which is comprised of three major parts. These limitations are hoped to provide suggestions for future research.

First the number of the test items should also be increased. Although 12 test items were included in the posttest, only the results of 6 words are used for the statistical analysis. Therefore, increasing the number of the target words would have made the results and implications of the present study more reliable and more robust. Second, if the number of participants in the present study were increased, the reliability of the results and findings would have been enhanced.

Due to time constraints, the researcher in the present study did not consider the data from a qualitative standpoint. The translations written by participants in the booklets might have been examined in greater detail to supplement the analysis and conclusions made here. Although it was not the main purpose of the present study, it may have been rewarding to go through the translations done by each participant in order to review the learning process

The present research results show the beneficial outcomes of a task embedded with involvement load and examine the efficacy of different types of dictionaries for different L2 language learners. More studies are needed to validate further the Involvement Load

Hypothesis and its role in facilitating vocabulary acquisition for L2 learners. The current study provided empirical evidence supporting the Involvement Load Hypothesis and provided further supporting evidence for the beneficial effect of translation tasks. Moreover, it is demonstrated in this study that different types of dictionaries have different influence on learners with different L2 language proficiency levels. If this study can be replicated with a greater number of participants, and more target words in the experiment, the results should provide more solid and confirmative suggestions for educators.

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Appendix A
Pretest

請依你對每一個字認識的情況，在每一個字對應的格子裡勾選你認識該字的情形。

Please check the box which describes the extent to which you know the words.

編號 Item Number	單字 Vocabulary	1 不認識，從未看過 I don't know the word; I haven't seen it before.	2 看過，但不確定其字義 I have seen the word before, but I am not sure the meaning of it.	3 我認識，並知道其字義 I know the word and meaning of it.
1	accessible	☐	☐	☐ _____
2	accommodation	☐	☐	☐ _____
3	mint	☐	☐	☐ _____
4	seal	☐	☐	☐ _____
5	blast	☐	☐	☐ _____
6	bond	☐	☐	☐ _____
7	gut	☐	☐	☐ _____
8	capacity	☐	☐	☐ _____
9	scramble	☐	☐	☐ _____
10	stock	☐	☐	☐ _____
11	mellow	☐	☐	☐ _____
12	mechanical	☐	☐	☐ _____
13	mount	☐	☐	☐ _____
14	pit	☐	☐	☐ _____
15	possession	☐	☐	☐ _____
16	render	☐	☐	☐ _____
17	dim	☐	☐	☐ _____
18	foul	☐	☐	☐ _____
19	edge	☐	☐	☐ _____
20	discharge	☐	☐	☐ _____
21	neutral	☐	☐	☐ _____

Appendix B
Monolingual Booklet

Lesson 1

mellow
[ˋmɛlo]
adj.

1. soft and warm in colour

   _____

2. with a soft, smooth, and pleasant sound
   with a smooth full taste

   _____

3. a little drunk and relaxed _____
4. gentle, wise, and easy to talk to,
   especially because of age and
   experience _____

The mellow young man chatted with us about
（閒聊）
fishing in the pub all night.

那個_____ 整晚在 pub 跟我們閒聊關於釣魚的事。

2

Lesson 2

neutral
[ˋnjutrəl]
adj.

1. describing a country that is neutral does not get involved in a war between other countries；a neutral place is one where people do not support a particular group or team _____
2. not showing strong feelings or opinions in the way that you speak or behave _____
3. describing things that have a pale color such as cream or grey, or that have no color at all _____
4. describing things that are neither acid nor alkaline in chemistry _____

He <u>reacted neutral</u> toward the gifts we gave him.
（反應）

他對於我們送他的禮物_____。

3

Lesson 3

mint
[mɪnt]

n.

1. a herb with fresh-tasting leaves. _____
2. the place where a country makes its coins and paper money _____
3. a large amount of money _____

National mints produce millions of coins in a year.
（國家的） （錢幣）

_____每年製作好幾百萬個錢幣。

Exercise 1

seal
[sil]

n.

1. a large sea animal that eats fish and lives mainly in cold parts of the world. Seals can live both in water and on land _____

2. something such as a piece of sticky paper or wax that is fixed to a container or door and must be broken before the container or door can be opened._____

Make sure to <u>place a seal on the envelope</u>
（信封）
before mailing it.

在寄信前確定要_____。

5

Exercise 2

blast
[blæst]

v.

1. to damage or destroy something with a bomb or gun

   _____

2. to make a loud sound with a car horn

   _____

3. to criticize someone very strongly

   _____

Taxi drivers often <u>blast their horns</u> at
（喇叭）
pedestrians on the street.
（行人）

計程車司機常對街上的行人_____。

6

Exercise 3

accessible
[æk`sɛsəbɪ]

adj.

1. describing something that is easy for anyone to obtain and use

   _____

2. describing a person who is friendly and easy to talk to, even if they are in an important position _____
3. describing art, music, literature etc which is easy to understand and enjoy

   _____

These workers feel comfortable discussing
（自在舒服的）
problems with the accessible manager.
（經理）

那些工人覺得和_____ 討論問題時覺得很自在。

7

Vocabulary 1

stock
[stak]

n.

1. the goods that are available to buy in a shop

   _____

2. shares in the ownership of a company, or investments on which a fixed amount of interest will be paid.

   _____

3. cattle, sheep, pigs, or other animals which are kept by a farmer, usually ones which have been specially bred. _____

Convenience stores always keep a full stock of
（維持）
beverages.
（飲料）
便利商店總是_____。

Vocabulary 2

bond
[band]

n.

1. A bond between people is a strong feeling of friendship, love, or shared beliefs and experiences that unites them.

   _____

2. A bond issued by a government or company is used to borrow money from investors. The certificate which is issued to investors who lend money is also called a bond.

   _____

3. a legal document containing a promise that one person will pay money to another person

   _____

Fathers develop bonds with their children by reading them bedtime stories.

藉著唸床邊故事, 爸爸和他的小孩_____。

Vocabulary 3

discharge
[dɪs`tʃɑrdʒ]

v.

1. to be officially allowed or forced to leave an institution such as a hospital, a prison, or the army

   _____

2. to allow liquid or gas to leave a place, especially when this has harmful effects

   _____

3. to do everything that needs to be done to perform a duty or responsibility

   _____

4. to pay what you owe to someone

   _____

These soldiers got discharged after three years
（士兵）
of service.
（服役）
這些士兵在服役三年後_____。

10

Vocabulary 4

foul
[faʊl]

adj.

1. If something is foul, it is very dirty, or smelling or tasting unpleasant. _____
2. If someone has a foul move in a game, it is not allowed by the rules _____
3. If someone has a foul temper or is in a foul mood, they become angry or violent very suddenly and easily._____
4. If the weather is foul, it is unpleasant, windy, and stormy._____
5. If what someone uses is foul language, it is offensive and contains swear words or rude words._____

The plane <u>flew into foul weather</u> to detect the typhoon's direction.

那架飛機_____為要偵測颱風的動向。

11

Vocabulary 5

gut
[gʌt]

n.

1. A person's or animal's guts are all the organs inside them. _____
2. Guts is the will and courage to do something which is difficult or unpleasant, or which might have unpleasant results.
   _____
3. If you hate someone's guts, you dislike them very much indeed.
   _____

Dancing in front of the whole school takes guts.

在全校前跳舞_____。

Vocabulary 6

scramble
[ˋskræmbl̩]

v.

1. to climb somewhere using your feet and hands _____
2. to move somewhere quickly and in a way that is not graceful _____
3. to hurry or try very hard to get something, often competing with other people _____
4. to mix together the white and yellow parts of an egg and cook it _____

Photographers <u>scrambled</u> over the rocks looking for the perfect camera angle.

攝影師_____岩石為要找最佳的拍攝角度。

Appendix C
Bilingual Booklet

Lesson 1

mellow
[`mɛlo]
adj.

1. （光、色等）柔和的
2. （聲音）圓潤的；甘美的
3. 微醺陶然的
4. 沉穩和善的

The mellow young man chatted with us about
（閒聊）
fishing in the pub all night.

那個_____ 整晚在 pub 跟我們閒聊關於釣魚的事。

2

Lesson 2

neutral
[`njutrəl]
adj.

1. 中立的；中立國的；中立地帶的
2. 不帶強烈情感的
3. 非彩色的；略帶灰色的
4. 中性的

He reacted neutral toward the gifts we gave him.
（反應）

他對於我們送他的禮物_____。

3

Lesson 3

mint
[mɪnt]

n.

1. 薄荷

2. 造幣廠

3. 巨額(的錢)

National mints produce millions of coins in a year.
(國家的) (錢幣)

_____每年製作好幾百萬個錢幣。

4

Exercise 1

seal
[sil]

n.

1. 海豹

2. 封條

Make sure to place a seal on the envelope
（信封）
before mailing it.

在寄信前確定要＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿。

5

Exercise 2

blast
[blæst]

v.

1. 炸開、炸出、炸掉；擊斃

2. 大力地按喇叭

4. 嚴厲批評

Taxi drivers often blast their horns at
（喇叭）
pedestrians on the street.
（行人）

計程車司機常對街上的行人_____。

6

Exercise 3

accessible
[æk`sɛsəbl]

adj.

1. 可/易取得的
2. 親切的
3. 易被理解的

These workers feel comfortable discussing
（自在舒服的）
problems with the accessible manager.
（經理）

那些工人覺得和_____ 討論
問題時覺得很自在。

Vocabulary 1

stock
[stak]

n.

1. 進貨、庫存品、存貨

2. (公司的)股票、股份

3. 家畜

Convenience stores always keep a full stock of
（維持）
beverages.
（飲料）

便利商店總是_____。

8

Vocabulary 2

bond
[band**]**

n.

1. 結合力；聯結, 聯繫

2. 字據；債券；公債

3. 契約, 約定

Fathers develop bonds with their children by reading them bedtime stories.

藉著唸床邊故事, 爸爸和他的小孩_____。

9

Vocabulary 3

discharge
[dɪs`tʃardʒ]

v.

1. 允許...離開；釋放；解雇

2. 排出(液體,氣體等)

3. 履行

4. 償債

These soldiers got discharged after three years
（士兵）
of service.
（服役）

這些士兵在服役三年後_____。

10

Vocabulary 4

foul
[fa ʊl]

adj.

1. 骯髒的、惡臭的
2. 比賽中犯規的
3. 易怒的
4. 天氣惡劣的
5. 下流的, 惡語咒罵的

The plane <u>flew into foul weather</u> to detect the typhoon's direction.

那架飛機_____為要偵測颱風的動向。

11

Vocabulary 5

gut
[gʌt]

n.

1. 內臟

2. 勇氣,膽量

3. 本質

Dancing in front of the whole school takes guts.

在全校前跳舞_____。

Vocabulary 6

scramble
['skræmbl]

v.

1. 攀爬；匍伏前進

2. 倉促行動

3. 爭奪；搶奪

4. 炒(蛋)

Photographers scrambled over the rocks looking for the perfect camera angle.

攝影師_____岩石為要找最佳的拍攝角度。

Appendix D
Bilingualized Booklet

Lesson 1

mellow
[ˋmɛlo]
adj.

1. soft and warm in colour
   （光、色等）柔和的
2. with a soft, smooth, and pleasant sound
   with a smooth full taste
   （聲音）圓潤的；甘美的
3. a little drunk and relaxed 微醺陶然的
4. gentle, wise, and easy to talk to, especially because of age and experience 沉穩和善的

The mellow young man chatted with us about
（閒聊）
fishing in the pub all night.

那個_____ 整晚在 pub 跟我們閒聊關於釣魚的事。

2

Lesson 2

neutral
[ˋnjutrəl]
adj.

1. describing a country that is neutral does not get involved in a war between other countries；a neutral place is one where people do not support a particular group or team
   中立的；中立國的；中立地帶的
2. not showing strong feelings or opinions in the way that you speak or behave
   不帶強烈情感的
3. describing things that have a pale color such as cream or grey, or that have no color at all.
   非彩色的；略帶灰色的
4. describing things that are neither acid nor alkaline in chemistry 中性的

He reacted neutral toward the gifts we gave him.
（反應）
他對於我們送他的禮物_____。

3

Lesson 3

mint
[mɪnt]

n.

1. a herb with fresh-tasting leaves. 薄荷
2. the place where a country makes its coins and paper money 造幣廠
3. a large amount of money 巨額(的錢)

National mints produce millions of coins in a year.
(國家的) (錢幣)
_____每年製作好幾百萬個錢幣。

Exercise 1

seal
[sil]

n.

1. a large sea animal that eats fish and lives mainly in cold parts of the world. Seals can live both in water and on land 海豹

2. something such as a piece of sticky paper or wax that is fixed to a container or door and must be broken before the container or door can be opened. 封條

Make sure to place a seal on the envelope
（信封）
before mailing it.

在寄信前要確定要_____。

5

Exercise 2

blast
[blæst]

v.

1. to damage or destroy something with a bomb or gun
   炸開、炸出、炸掉；擊斃
2. to make a loud sound with a car horn
   大力地按喇叭
3. to criticize someone very strongly
   嚴厲批評

Taxi drivers often blast their horns at
（喇叭）

pedestrians on the street.
（行人）

計程車司機常對街上的行人_____。

6

Exercise 3

accessible
[ækˋsɛsəbl̩]

adj.

1. describing something that is easy for anyone to obtain and use 可/易取得的
2. describing a person who is friendly and easy to talk to, even if they are in an important position 親切的
3. describing art, music, literature etc which is easy to understand and enjoy 易被理解的

These workers feel comfortable discussing
（自在舒服的）
problems with the accessible manager.
（經理）

那些工人覺得和_____ 討論問題時覺得很自在。

Vocabulary 1

stock
[stak]

n.

1. the goods that are available to buy in a shop
   進貨、庫存品、存貨

2. shares in the ownership of a company, or investments on which a fixed amount of interest will be paid.
   (公司的)股票、股份

3. cattle, sheep, pigs, or other animals which are kept by a farmer, usually ones which have been specially bred. 家畜

Convenience stores always keep a full stock of beverages.
(維持) (飲料)

便利商店總是_____。

8

Vocabulary 2

bond
[band]

n.

1. A bond between people is a strong feeling of friendship, love, or shared beliefs and experiences that unites them.
   結合力；聯結, 聯繫
2. A bond issued by a government or company is used to borrow money from investors. The certificate which is issued to investors who lend money is also called a bond.
   字據；債券；公債
3. a legal document containing a promise that one person will pay money to another person
   契約, 約定

Fathers develop bonds with their children by reading them bedtime stories.

藉著唸床邊故事, 爸爸和他的小孩_____。

Vocabulary 3

discharge
[dɪs`tʃardʒ]

v.

1. to be officially allowed or forced to leave an institution such as a hospital, a prison, or the army
   允許...離開；釋放；解雇
2. to allow liquid or gas to leave a place, especially when this has harmful effects
   排出(液體, 氣體等)
3. to do everything that needs to be done to perform a duty or responsibility 履行
4. to pay what you owe to someone 償債

These soldiers got discharged after three years
（士兵）
of service.
（服役）

這些士兵在服役三年後_____。

10

Vocabulary 4

foul
[faʊl]

adj.

1. If something is foul, it is very dirty, or smelling or tasting unpleasant.
   骯髒的、惡臭的
2. If someone has a foul move in a game, it is not allowed by the rules 比賽中犯規的
3. If someone has a **foul** temper or is in a **foul** mood, they become angry or violent very suddenly and easily. 易怒的
4. If the weather is foul, it is unpleasant, windy, and stormy. 天氣惡劣的
5. If what someone uses is foul language, it is offensive and contains swear words or rude words.
   下流的,惡語咒罵的

The plane flew into foul weather to detect the typhoon's direction.
那架飛機_____為要偵測颱風的動向。

Vocabulary 5

gut
[gʌt]

n.

1. A person's or animal's **guts** are all the organs inside them. 內臟
2. **Guts** is the will and courage to do something which is difficult or unpleasant, or which might have unpleasant results. 勇氣,膽量
3. If you **hate** someone's **guts**, you dislike them very much indeed. 徹頭徹尾

Dancing in front of the whole school takes guts.
在全校前跳舞_____。

Vocabulary 6

scramble
[ˋskræmbl̩]

v.

1. to climb somewhere using your feet and hands 攀爬；匍伏前進
2. to move somewhere quickly and in a way that is not graceful 倉促行動
3. to hurry or try very hard to get something, often competing with other people 爭奪；搶奪
4. to mix together the white and yellow parts of an egg and cook it 炒(蛋)

Photographers scrambled over the rocks looking for the perfect camera angle.

攝影師_____岩石為要找最佳的拍攝角度。

13

Appendix E
Sentence Contexts for Each Word

Target word 1

mellow [ˋmɛlo] adj.

1. soft and warm in colour (光、色等)柔和的
2. with a soft, smooth, and pleasant sound
   with a smooth full taste (聲音)圓潤的；甘美的
3. a little drunk and relaxed 微醺陶然的
4. gentle, wise, and easy to talk to, especially because of
   age and experience 沉穩和善的

Sentence contexts：

1) The mellow young man chatted with us about fishing in the pub all night.
2) He'd had a few glasses of champagne and was fairly mellow.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	84.21%	21	
K2	13.16%	4	
AWL Words	2.63%	1	relaxed
Off-List Words	0.00%	0	

Total number of words (types) ＝ 26

Target word 2

neutral [ˋnjutrəl] adj.

1. describing a country that is neutral does not get involved in a war between other countries；a neutral place is one where people do not support a particular group or team
   中立的；中立國的；中立地帶的
2. not showing strong feelings or opinions in the way that you speak or behave
   不帶強烈情感的
3. describing things that have a pale color such as cream or grey, or that have no color at all.
   非彩色的；略帶灰色的
4. describing things that are neither acid nor alkaline in chemistry 中性的

Sentence contexts：

1) He reacted neutral toward the gifts we gave him.
2) Sally feels neutral about being accepted to college.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	84.21%	41	
K2	5.26%	4	
AWL Words	5.26%	3	neutral, involved, team
Off-List Words	5.26%	4	countries, acid, alkaline chemistry

Total number of words (types) ＝ 52

Target word 3

mint [mɪnt] n.

1. a herb with fresh-tasting leaves. 薄荷
2. the place where a country makes its coins and paper money 造幣廠
3. a large amount of money 巨額(的錢)

Sentence contexts：

1) National mints produce millions of coins in a year.
2) Our class visited the mint and learned how money is made.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	91.67%	18	
K2	4.17%	1	
AWL Words	0.00%	0	
Off-List Words	4.17%	1	herb

Total number of words (types) ＝ 20

Target word 4

seal [sil] n.

1. a large sea animal that eats fish and lives mainly in cold parts of the world. Seals can live both in water and on land 海豹
2. something such as a piece of sticky paper or wax that is fixed to a container or door and must be broken before the container or door can be opened. 封條

Sentence contexts：

1) Make sure to place a seal on the envelope before mailing it.
2) The seal on the box broke when it fell from the top of the bookshelf.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	94.64%	39	
K2	1.79%	1	
AWL Words	0.00%	0	
Off-List Words	3.57%	2	seals, sticky

Total number of words (types) = 42

Target word 5

blast [blæst] v.

1. to damage or destroy something with a bomb or gun
   炸開、炸出、炸掉；擊斃
2. to make a loud sound with a car horn 大力地按喇叭
3. to criticize someone very strongly 嚴厲批評

Sentence contexts：

1) Taxi drivers often blast their horns at pedestrians on the street.
2) My friend scared me with a blast from his car horn.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	76.92%	13	
K2	11.54%	3	
AWL Words	0.00%	0	
Off-List Words	11.54%	3	bomb, horn, criticize

Total number of words (types) = 19

Target word 6

accessible [ækˋsɛsəbl̩] adj.

1. describing something that is easy for anyone to obtain and use 可/易取得的
2. describing a person who is friendly and easy to talk to, even if they are in an important position 親切的
3. describing art, music, literature etc which is easy to understand and enjoy 易被理解的

Sentence contexts：

1) These workers feel comfortable discussing problems with the accessible new manager.
2) The new supervisor is very popular because he makes himself accessible to other employees.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	95.45%	30	
K2	0.00%	0	
AWL Words	2.27%	1	obtain
Off-List Words	2.27%	1	etc.

Total number of words (types) ＝ 32

Target word 7

stock [stɑk] n.

1. the goods that are available to buy in a shop
   進貨、庫存品、存貨
2. shares in the ownership of a company, or investments on which a fixed amount of interest will be paid.
   (公司的)股票、股份
3. cattle, sheep, pigs, or other animals which are kept by a farmer, usually ones which have been specially bred. 家畜

Sentence contexts：

1) Convenience stores always keep a full stock of beverages.
2) The store ran out of fruit juice stock last winter.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	84%	31	
K2	8%	4	
AWL Words	4%	2	available, investments
Off-List Words	4%	2	goods, bred

Total number of words (types) ＝39

Target word 8

bond [band] n.

1. A bond between people is a strong feeling of friendship, love, or shared beliefs and experiences that unites them. 結合力；聯結,聯繫
2. A bond issued by a government or company is used to borrow money from investors. The certificate which is issued to investors who lend money is also called a bond. 字據；債券；公債
3. a legal document containing a promise that one person will pay money to another person 契約,約定

Sentence contexts：

1) Fathers develop bonds with their children by reading them bedtime stories.
2) The experience created a very special bond between us.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	80.30%	36	
K2	4.55%	3	
AWL Words	13.64%	5	bond, issued, investors、legal, document
Off-List Words	1.52%	1	certificate

Total number of words (types) ＝ 45

Target word 9

discharge [dɪs`tʃardʒ] v.

1. to be officially allowed or forced to leave an institution such as a hospital, a prison, or the army
   允許...離開；釋放；解雇
2. to allow liquid or gas to leave a place, especially when this has harmful effects 排出(液體,氣體等)
3. to do everything that needs to be done to perform a duty or responsibility 履行
4. to pay what you owe to someone 償債

Sentence contexts：

1) These soldiers got discharged after three years of service.
2) My younger brother was discharged from the hospital.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	86.21%	32	
K2	12.07%	7	
AWL Words	1.72%	1	institution
Off-List Words	0.00%	0	

Total number of words (types) ＝40

Target word 10

foul [faʊl] adj.

1. If something is foul, it is very dirty, or smelling or tasting unpleasant. 骯髒的、惡臭的
2. If someone has a foul move in a game, it is not allowed by the rules 比賽中犯規的
3. If someone has a foul temper or is in a foul mood, they become angry or violent very suddenly and easily. 易怒的
4. If the weather is foul, it is unpleasant, windy, and stormy. 天氣惡劣的
5. If what someone uses is foul language, it is offensive and contains swear words or rude words. 下流的,惡語咒罵的

Sentence contexts：

1) The plane flew into foul weather to detect the typhoon's direction.
2) Our baseball game got canceled due to the foul weather.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	76.83%	29	
K2	14.63%	12	
AWL Words	0.00%	0	
Off-List Words	8.54%	2	foul, mood

Total number of words (types) ＝ 43

Target word 11

gut [gʌt] n.

1. A person's or animal's guts are all the organs inside them. 內臟
2. Guts is the will and courage to do something which is difficult or unpleasant, or which might have unpleasant results. 勇氣,膽量
3. If you hate someone's guts, you dislike them very much indeed. 徹頭徹尾

Sentence contexts：

1) Dancing in front of the whole school takes guts.
2) He does not have the guts to speak English in public.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	84.09%	28	
K2	9.09%	4	
AWL Words	0.00%	0	
Off-List Words	6.82%	1	guts

Total number of words (types) ＝ 33

Target word 12

scramble [ˋskræmbɪ] v.

1. to climb somewhere using your feet and hands
   攀爬；匍伏前進
2. to move somewhere quickly and in a way that is not graceful 倉促行動
3. to hurry or try very hard to get something, often competing with other people 爭奪；搶奪
4. to mix together the white and yellow parts of an egg and cook it 炒(蛋)

Sentence contexts：

1) Photographers scrambled over the rocks looking for the perfect camera angle.
2) The climbers scrambled up the steep mountain.

Vocabulary analysis by the VocabProfilers：

Types of words	%	Number of Words	Words
K1	82.35%	32	
K2	17.65%	9	
AWL Words	0.00%	0	
Off-List Words	0.00%	0	

Total number of words (types) ＝ 41

Appendix F
1000-word-level Vocabulary Levels Tests

The 1,000 Word Level VLT by Huang (1999)

Vocabulary Level Test: 1000 Word Level

姓名：　　學號：

系級：

※請把最適合題目字義的選項填入空格

This is a vocabulary test. You must choose the right word to go with each meaning. Write the number of that word next to its meaning.

	a) do
1. _____a metal of great value	b) far
2. _____smallest or youngest	c) gold
3. _____to make	d) clear
	e) human
	f) least

	a) me
4. _____at no time	b) or
5. _____can be done; can happen	c) run
	d) never
6. _____not big; little	e) small
	f) possible

	a) add
7. _____ a number of people or things	b) than
	c) tree
8. _____a tall plant with leaves ; wood comes from this	d) group
	e) concern
9. _____ to increase the number	f) whether

	a) sing
10. _____not controlled by others	b) sure
11. _____something that can help	c) prove
12. _____without doubt	d) college
	e) advantage
	f) independent

	a) dry
13. _____to take husband or wife	b) gas
14. _____to say something	c) corn
15. _____not wet	d) marry
	e) remark
	f) personal

	a) wise
16. _____a window is made of this	b) glass
	c) defeat
17. _____understanding	d) operate
18. _____a country without a king where people vote	e) republic
	f) statement

Appendix G
2000-word-level Vocabulary Levels Tests

The 2,000 Word Level VLT by Schmitt et al. (2001)

Vocabulary Level Test: 2000 Word Level

※請把最適合題目字義的選項填入空格

This is a vocabulary test. You must choose the right word to go with each meaning. Write the number of that word next to its meaning.

姓名：　　學號：

系級：

		a) copy
1. _____	end of highest point	b) event
2. _____	this moves a car	c) motor
3. _____	things made to be like another	d) pity
		e) profit
		f) tip

		a) accident
4. _____	loud deep sound	b) debt
5. _____	something you must pay	c) fortune
		d) pride
6._____	having a high opinion of yourself	e) roar
		f) thread

		a) coffee
7. _____	money for work	b) disease
8. _____	a piece of clothing	c) justice
9. _____	using the law in the right way	d) skirt
		e) stage
		f) wage

		a) arrange
10. _____	grow	b) develop
11. _____	put in order	c) lean
12. _____	like more than something else	d) owe
		e) prefer
		f) seize

		a) clerk
13. _____	a drink	b) frame
14. _____	office worker	c) noise
15. _____	unwanted sound	d) respect
		e) theater
		f) wine

		a) blame
16. _____	make	b) elect
17. _____	choose by voting	c) jump
18. _____	become like water	d) threaten
		e) melt
		f) manufacture

		a) dozen
19. _____	chance	b) empire
20. _____	twelve	c) gift
21. _____	money paid to the government	d) tax
		e) relief
		f) opportunity

		a) ancient
22. _____	not easy	b) curious
23. _____	very old	c) difficult
24. _____	related to God	d) entire
		e) holy
		f) social

		a) admire
25. _____	make wider or longer	b) explain
		c) fix
26. _____	bring in for the first time	d) hire
		e) introduce
27. _____	have a high opinion of someone	f) stretch

		a) slight
28. _____	beautiful	b) bitter
29. _____	small	c) lovely
30. _____	liked by many people	d) merry
		e) popular
		f) independent

Appendix H

Posttest

☆姓名(中文):_____ ☆學號:_____ ☆老師:_____

Matching

Please use the words below and match them to their corresponding sentence.

A. discharge B. stock C. bond D. neutral E. mint F. mellow

1. The _____ young man chatted with us about fishing in the pub all night.

2. He reacted _____ toward the gifts we gave him.

3. National _____ produce millions of coins in a year.

4. The store ran out of fruit juice _____ last winter.

5. The experience created a very special _____ between us.

6. My younger brother was _____ from the hospital.

G. foul H. blast I. accessible J. scramble K. gut L. seal

7. The plane flew into _____ weather to detect the typhoon's direction.

8. Dancing in front of the whole school takes _____ .

9. Photographers _____ over the rocks looking for the perfect camera angle.

10. The _____ on the box broke when it fell from the top of the book shelf.

11. My friend scared me with a _____ from his car horn.

12. The new supervisor is very popular because he makes himself _____ to other employees.

Appendix I

Delayed Posttest

☆姓名:_____ ☆學號:_____ ☆老師:_____

Matching

Please use the words below and match them to their corresponding sentence.

A. mellow	B. neutral	C. mint	D. seal	E. blast	F. accessible
G. stock	H. bond	I. discharge	J. foul	K. gut	L. scramble

1. He'd had a few glasses of champagne and was fairly _____ .
2. Make sure to place a _____ on the envelope before mailing it.
3. The store ran out of fruit juice _____ last winter.
4. These soldiers got _____ after three years of service.
5. Our baseball game got canceled due to the _____ weather.
6. National _____ produce millions of coins in a year.
7. My friend scared me with a _____ from his car horn.
8. He reacted _____ toward the gifts we gave him.
9. The new supervisor is very popular because he makes himself ___ to other employees.
10. Photographers _____ over the rocks looking for the perfect camera angle.
11. The experience created a very special _____ between us.
12. Dancing in front of the whole school takes _____ .

A. mellow	B. neutral	C. mint	D. seal	E. blast	F. accessible
G. stock	H. bond	I. discharge	J. foul	K. gut	L. scramble

1. The _____ young man chatted with us about fishing in the pub all night.
2. Sally feels _____ about being accepted to college.
3. These workers feel comfortable discussing problems with the ___ new manager.
4. My younger brother was _____ from the hospital.
5. Taxi drivers often _____ their horns at pedestrians on the street.
6. He does not have the _____ to speak English in public.
7. Fathers develop _____ with their children by reading them bedtime stories.
8. The _____ on the box broke when it fell from the top of the bookshelf.
9. The plane flew into _____ weather to detect the typhoon's direction.
10. The climbers _____ up the steep mountain.
11. Convenience stores always keep a full _____ of beverages.
12. Our class visited the _____ and learned how money is made.

Appendix J
Questionnaire

姓名：_____ 學號：_____ 班別：_____

Thanks again for participating in the research. Please fill out the following questions with honesty. Thanks for your help again! ^^
Wish you a wonderful day!

請問您曾經使用過英漢雙解字典嗎?英漢雙解字典是指，在那本字典中每一個英文單字裡，有英文和中文定義的解釋(definition)。請回想您使用英漢雙解字典的情況來回答問卷。可複選。如果沒有使用過可以直接進行下一部分的問卷。

☐ 大多時候『只』採用中文定義。
☐ 大多時候『只』採用英文定義。
☐ 大多時候中英文定義都會參考。
☐ 常常會留意到中英文定義的差異。
☐ 覺得中文定義不太對勁時，才會研究英文的定義。
☐ 當我看不懂英文定義時，才會採用中文的定義。
☐ 我大都時候會把中英文的定義看完。
☐ 我覺得中文定義對理解比較有幫助。
☐ 我覺得英文定義對理解比較有幫助。
☐ 其他 _____

以下是有關使用字典的行為與態度調查，請勾選以下哪一種陳述最能反應你對於使用字典的觀點。(請單選)

A、關於喜不喜歡查字典
☐ 很喜歡
☐ 喜歡
☐ 沒有特別喜歡或不喜歡
☐ 不喜歡
☐ 非常不喜歡

為什麼非常不喜歡?
請勾選以下的選項或填下您的想法。
☐ 太耗時 ☐ 過程很麻煩
☐ 想看也看不懂
☐ 其他_____

B、關於查字典的行為
☐ 基本上能免則免
☐ 偶爾查
☐ 常常查
☐ 盡可能每個字都查
☐ 其他_____

C、關於查什麼字
☐ 極關鍵時才會查
☐ 重覆遇見的字會查
☐ 發覺重要的字都會查
☐ 大多的時候每個字都想查
☐ 其他_____

你覺得查字典有甚麼幫助？請勾選以下哪一種陳述最能反應你對於使用字典的觀點。

A、我覺得整體上查字典是否對學單字有幫助(請單選)
☐ 沒有幫助
☐ 沒有太大的幫助
☐ 有幫助
☐ 很有幫助

B、哪些方面的幫助 (可複選)
☐ 無幫助
☐ 很快地記住字義(meaning)
☐ 很快地記住拼字(spelling)
☐ 幫助我知道單字使用的情境
☐ 幫助我區別混淆的定義
☐ 長時間來看有查過的單字比較容易背起來
☐ 其他_____

Appendix K
Participants' Performance on K1and K2

No.	Class	Group	Level	K1	K2
1	Joyce	1	1	14	26
2	Joyce	1	1	16	27
3	Joyce	1	1	18	26
4	Joyce	1	1	15	18
5	Joyce	1	1	14	25
6	Joyce	1	1	16	21
7	Joyce	1	1	16	29
8	Joyce	1	1	16	29
9	Joyce	1	1	16	29
10	Joyce	1	1	16	27
11	Joyce	1	1	17	24
12	Joyce	1	1	16	26
13	Joyce	1	1	18	29
14	Joyce	1	1	16	25
15	Joyce	1	1	13	23
16	Joyce	1	1	17	26
17	Joyce	1	1	16	25
19	Joyce	1	1	17	25
19	Joyce	1	1	17	25
20	Joyce	1	1	17	26
21	Joyce	1	1	16	23
22	Joyce	1	1	16	23
23	Joyce	1	1	17	27
24	Joyce	1	1	16	26
25	Liu	2	1	17	29
26	Liu	2	1	17	14
27	Liu	2	2	14	16
28	Liu	2	2	13	18
29	Liu	2	1	17	24
30	Liu	2	1	17	22
31	Liu	2	1	12	20
32	Liu	2	1	15	21
33	Liu	2	1	13	22
34	Liu	2	1	16	20
35	Liu	2	2	11	15
36	Liu	2	1	16	23
37	Liu	2	1	16	25
38	Liu	2	1	15	10
39	Liu	2	1	17	26
40	Liu	2	1	17	29
41	Liu	2	1	17	25
42	Liu	2	1	15	25
43	Liu	2	1	14	24
44	Liu	2	1	17	26
45	Liu	2	1	15	18
46	Liu	2	1	18	30
47	Liu	2	1	16	24
48	Liu	2	1	17	26
49	Wu	3	1	13	21
50	Wu	3	2	14	16
51	Wu	3	1	14	26
52	Wu	3	2	12	17
53	Wu	3	1	14	28
54	Wu	3	2	10	11
55	Wu	3	2	13	13
56	Wu	3	1	18	23
57	Wu	3	1	16	23
58	Wu	3	1	16	29
59	Wu	3	2	13	14
60	Wu	3	1	17	26
61	Wu	3	2	12	17
62	Wu	3	1	15	26
63	Wu	3	1	13	21
64	Wu	3	1	12	25
65	Wu	3	1	11	24
66	Yang	2	2	7	17
67	Yang	2	1	16	22
68	Yang	2	2	12	16
69	Yang	2	2	12	11
70	Yang	2	1	17	18
71	Yang	2	2	13	23
72	Yang	2	2	12	14
73	Yang	2	2	13	21
74	Yang	2	2	9	16
75	Yang	2	2	14	14
76	Yang	2	2	17	16
77	Yang	2	1	16	23
78	Yang	2	2	13	16
79	Yang	2	2	12	17
80	Yang	2	1	16	27
81	Yang	2	1	15	22
82	Yang	2	1	17	23
83	Betty	1	2	12	13
84	Betty	1	2	14	23
85	Betty	1	1	15	21
86	Betty	1	2	13	24
87	Betty	1	2	13	22
88	Betty	1	2	14	24
89	Betty	1	2	14	15
90	Betty	1	1	17	26
91	Betty	1	1	17	26
92	Betty	1	1	16	27
93	Betty	1	1	17	25
94	Betty	1	1	16	26
95	Betty	1	2	13	20
96	Betty	1	1	17	24
97	Betty	1	1	15	26
98	Betty	1	1	15	20
99	Betty	1	2	14	29
100	Betty	1	2	13	25
101	Betty	1	1	17	29
102	Betty	1	2	14	24
103	Betty	1	2	14	19
104	Yang 2	3	2	13	24
105	Yang 2	3	2	12	17
106	Yang 2	3	2	13	12
107	Yang 2	3	1	16	23
108	Yang 2	3	2	14	24
109	Yang 2	3	1	16	25
110	Yang 2	3	2	10	14
111	Yang 2	3	1	15	18
112	Yang 2	3	2	12	13
113	Yang 2	3	2	13	15
114	Yang 2	3	2	12	17
115	Yang 2	3	1	16	25
116	Yang 2	3	2	9	10
117	Yang 2	3	2	12	14
118	Yang 2	3	2	15	16
119	Yang 2	3	2	15	13
120	Yang 2	3	2	14	11
121	Yang 2	3	2	13	18
122	Yang 2	3	1	15	23
123	Yang 2	3	1	16	23
124	Yang 2	3	2	14	26
125	Yang 2	3	1	16	24
126	Yang 2	3	2	15	17
127	Yang 2	3	2	16	15