Electronic dictionaries in the ESL composition class

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ELECTRONIC DICTIONARIES IN THE ESL COMPOSITION CLASS

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By
Rebecca Lynn Rudd
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ABSTRACT

This thesis examines the use of electronic dictionaries by ESL students. In particular, it considers how, when and why students use electronic dictionaries in their writing processes. It also explores the extent to which students use words found in an electronic dictionary appropriately in their texts and whether electronic dictionary use influences their long-term acquisition of vocabulary. Finally, it considers whether writing instructors should encourage, perhaps even integrate into their classes, the use of electronic dictionaries.

In order to address these issues, a study was conducted of the use of electronic dictionaries by four ESL students enrolled in the American Culture and Language Program at California State University, San Bernardino. The study consisted of multiple instruments, including a language use survey, personal interviews with the participants, participant writing samples, a vocabulary knowledge assessment, and a short follow-up interview with one of the participants.

The findings revealed that the participants used their electronic dictionaries while writing for several reasons: to look up a word for expressing a desired meaning in
English, to confirm that they used a word correctly, and to check their spelling. The study also showed that the participants used words they looked up in an electronic dictionary successfully in their writing the great majority of the time.

The thesis concludes by suggesting strategies language teachers can use to help students best make use of electronic dictionaries.
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I would also like to thank the faculty and students of the American Culture and Language Program for their willingness to participate in the study contained within this thesis.
DEDICATION

This thesis would never have been written were it not for the patience and support of my husband, Stephen, and my children, Andrew and Bethany. Thanks for always being there and rejoicing (almost as much as I did) when it was done.
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CHAPTER ONE
LITERATURE REVIEW

Introduction

Over the past several decades, second language (L2) research has increasingly foregrounded vocabulary acquisition as a field of study, a field that is viewed by some as "another large subdivision of applied linguistics, producing more books and papers than anyone can keep up with" (Zahar, Cobb, & Spada, 2001, p. 542). This focus has resulted from the increased awareness by researchers of the importance of lexical acquisition in language learning, not merely for increasing vocabulary size but also for its positive influence on production and comprehension. Additionally, on the practical level, "learners and native speakers recognize the importance of getting the words right" (Gass & Selinker, 2001, p. 374). In this growing area of scholarship, L2 vocabulary researchers have been interested in such questions as what constitutes a sufficient second language vocabulary and how vocabulary is best acquired.

One topic that has received little attention is the role of electronic, hand-held dictionaries in L2 vocabulary
acquisition. These compact resources are affordable, easily acquired and fairly simple to use, and have become a ubiquitous presence in the second language-learning classroom, with varying degrees of support from teachers. Since many second language learners seem to rely on these dictionaries for communicating, a closer look at how they help students is important. Moreover, the available research on language dictionaries has focused on L2 vocabulary development and reading comprehension (Liou, 2000), and little has been said about their effect on other language skill areas, including writing. My thesis aims to explore the impact of electronic dictionaries in ESL writing through a study of their use by international students in ESL writing classes at CSUSB. I begin this chapter with a survey of previous research on L2 vocabulary learning and instruction, focusing first on categories of vocabulary acquisition, including lexical knowledge involved in L2 vocabulary acquisition and incidental and intentional learning. This is followed by a discussion of incidental and intentional vocabulary acquisition in L2 reading, and dictionary use as a tool for vocabulary acquisition. The chapter concludes with a review of the
impact of dictionary use on the writing process, and a call for more research in this area.

Vocabulary Acquisition

One of the most crucial communicative needs of students of English as a second language is to acquire a sufficient level of vocabulary knowledge in English. Determining what this level is has been a concern of numerous researchers. Based on the number of words in Webster's Third International Dictionary (1963), researchers have concluded that there are approximately 54,000 English word families (Dupuy, 1974; Goulden, Nation & Read, 1990, cited in Nation & Waring, 1997, p. 7). Of these, researchers have estimated that an average native speaker knows approximately 20,000 word families (Nation & Waring, 1997, p. 7). In considering what words are necessary for a second language learner to be able to function at close to native-like levels, researchers have considered the frequency with which a word appears in the normal use of spoken and written English. They have found that "a small number of the words of English occur very frequently and if a learner knows these words, that learner will know a very large proportion of the running words in a
written or spoken text” (Nation & Waring, 1997, p. 9). Some research has shown that “under favourable conditions, a vocabulary size of 2,000 to 3,000 words provides a very good basis for language use,” although that use may be limited to productive use such as for speaking and writing. In order to have a good basis for comprehension, the number is closer to 3-5,000 word families (Nation & Waring, 1997, p. 10).

In order to ascertain a list of those words which most native speakers know, and therefore important for L2 learners to know, researchers have compiled word lists based on various corpora. For example, The General Service List (West, 1953), which contains 2,000 headwords representing the most frequent words in English, is based on a written corpus of 5,000,000 words. Although developed in the 1940s, it is viewed by some as “the best of the available lists because of its information about frequency of each word’s various meanings” (Nation & Waring, 1997, p. 13). The American Heritage Word Frequency Book (Carroll, Davies and Richman, 1971), based on 5,000,000 words from U.S. school texts from a range of grades and subject areas, moves away from general use words towards those found in educational texts. Finally, in a more academically focused
list, Coxhead (1998) developed The Academic Word List, consisting of 570 word families, compiled from "3.5 million running words of written academic text by examining the range and frequency of words outside the first 2,000 most frequently occurring words of English" (Coxhead, 2000, p. 213). These lists are often looked to by ESL teachers for information as to what word families are most important for ESL student acquisition for comprehension and production of academic and non-academic texts.

In discussing the lexical challenges that ESL learners face in acquiring a functional vocabulary size, Singleton (2000) states that "all aspects of the words they encounter are new to them, which clearly presents those responsible for designing and teaching the lexical component of second language programmes with a challenge of some magnitude" (p. 210). One way in which teachers and researchers have addressed this challenge is by looking at both the kinds of knowledge that learners have about vocabulary in their second language as well as the ways in which this knowledge is gained. Each of these two areas of vocabulary acquisition research will be discussed below. It is important to note, however, that while they are often
discussed separately, these issues are intertwined and impact the strategies observed and used in the classroom.

**Vocabulary Knowledge**

Learner lexical knowledge is commonly divided into receptive and productive vocabulary. Receptive vocabulary is described as those words which the learner "recognizes and understands when they occur in a context, but which he cannot produce correctly" (Haycraft, 1978, cited in Hatch & Brown, 1995, p. 370). Productive vocabulary is described as those words which the learner "understands, can pronounce correctly and use constructively in speaking and writing" (Haycraft, 1978, cited in Hatch & Brown, 1995, p. 370). A similar classification of word knowledge is that of active versus passive. Active vocabulary refers to those words "which can be produced at will," while passive vocabulary are those words that the learner can only recognize but are not able to use (Gass & Selinker, 2001, p. 375). In an attempt to refine the division of passive and active knowledge, Laufer and Paribakht (1998) define passive vocabulary as those words for which the learner understands the most frequent meaning. They then divide active vocabulary into one of two categories: (1) controlled-active words, which the learner can recall when
cued, such as in a CLOZE activity; and (2) free-active words, which the learner can use spontaneously (cited in Gass & Selinker, 2001, p. 375).

While the concepts of receptive and productive vocabulary have been widely accepted by both linguists and teachers, researchers have also pointed to problems in viewing them dichotomously. For example, Gass and Selinker argue that "[l]exical knowledge cannot be captured by means of a simple dichotomy. Rather, Teichroew [1982] proposed that vocabulary knowledge can best be represented as a continuum with the initial stage being recognition and the final being production" (p. 375). Finally, Hatch and Brown (1995) further point out that "the division between receptive vocabulary and productive vocabulary is not always real; lack of production may be due to choice and not simply lack of knowledge" (p. 370).

In response to these problems with the dichotomy model for vocabulary acquisition, there has been a shift toward viewing the relationship between receptive and productive knowledge as that of a continuum through which the learner moves—sometimes forward and sometimes backward. For example, when encountering a familiar word in a new context, the learner may review or reevaluate his or her
receptive knowledge prior to using it productively, even though they have previous productive knowledge of that word. This kind of movement supports a view of the process as a continuum rather than a dichotomy.

**Vocabulary Learning**

How ESL students acquire receptive and productive knowledge of a sufficient number of words in order to understand and communicate in spoken and written English has also been a subject of much research. In this area, researchers have found that ESL students acquire vocabulary through two main forms of learning: incidental and intentional. Incidental learning is described as "what takes place when learners are focused on comprehending meaning rather than on the explicit goal of learning new words" (Wesche & Paribakht, 1999, p. 176), whereas intentional learning is that which is "designed, planned for, or intended by teacher or student" (Hatch & Brown, 1995, p. 368). These two forms of vocabulary learning, along with learner and teacher strategies for both, are discussed below.

**Incidental Learning.** Some researchers propose that "more attention needs to be given to the issue of incidental vocabulary learning" (Hatch & Brown, 1995, p.
They argue that with respect to what learners need to know, too few words can be taught intentionally (Hatch & Brown, 1995, p. 368). Nagy (1997) also supports this view stating that “people pick up much of their vocabulary knowledge from context apart from explicit instruction” (p. 68-69). However, if we accept the idea that learners “pick up” words incidentally, the question arises as to how many exposures to a word are required for that acquisition to take place. Some researchers have concluded that words can be acquired after as few as six exposures (Saragi, Nation, and Meister, 1978, cited in Schmitt, 2000). Others, however, have estimated the number to be as high as sixteen (Nation, 1982) or even twenty (Herman, Anderson, Pearson, and Nagy, 1987). In an attempt to resolve the inconsistencies of these findings, researchers have also taken into consideration the additional factor of the L2 learner’s level of vocabulary knowledge and have found that the more words a learner knows, the fewer exposures they need to acquire additional vocabulary (Zahar, Cobb, and Spada, 2001). While this research does not provide a definitive answer as to the number of exposures required for acquisition, it does suggest that perhaps a range
between six and twenty exposures—dependent on word knowledge—may be needed.

**Intentional Learning.** Although incidental learning is an important component of vocabulary acquisition, it cannot stand alone as a means of acquiring sufficient vocabulary, as "some explicit learning is probably necessary to reach a vocabulary size 'threshold' that enables incidental learning from reading" (Schmitt, 2000, p. 120). Whereas incidental learning does take place in the context of meaningful communication, "it is slower and more gradual, lacking the focused attention of explicit learning" (p. 120).

Over the years, intentional learning has been encouraged through many forms of instruction. "The time-honoured way of dealing with vocabulary in L2 teaching is to instruct one's pupils simply to learn off lists of L2 words together with their L1 translation equivalents" (Singleton, 1999, p. 50-51). However, one criticism of this practice is that even when students master form and meaning outside of any meaningful context, such as through word lists, there is no guarantee that they have learned the words to the degree that they can recognize and/or use them in context (Singleton, 1999, p. 51). More effective
intentional learning strategies that call for a deeper level of processing by the learner include such activities as (1) integrating new words with old, usually by placing similar words into groups; (2) direct teaching of a word’s meaning concept; and, (3) teaching of word families, rather than individual words, by simply introducing the derivations of the word at initial exposure (Schmitt, 2000). Similarly, Sökmen (1997) states that vocabulary teaching research encourages instructors to “build a large sight vocabulary, integrate new words with the old, provide a number of encounters with words, promote a deep level of processing, facilitate imaging and concreteness, use a variety of techniques, and encourage independent learner strategies” (p. 239).

Singleton (1999), in summarizing the research of Ellis (1994a; 1994b), criticizes a reliance on only intentional learning and argues that both intentional and incidental learning are necessary to fully acquire a word, since "the acquisition of semantic aspects of words necessarily involves conscious explicit learning, whereas the acquisition of formal aspects of a word is essentially implicit and unconscious in nature" (Singleton, 1999, p. 152). Thus, vocabulary instruction, to effectively assist
learners in acquiring the necessary vocabulary, should consist of opportunities for both types of learning to occur.

In order to take advantage of the benefits of both incidental and intentional strategies, Seal (1991) supports the use of "unplanned vocabulary teaching." This occurs when either the student asks for a definition of a word or when the teacher realizes the student needs clarification. Seal suggests that teachers take advantage of this unplanned opportunity by using what he calls the "Three C's": (1) convey the meaning, (2) check for understanding, and (3) consolidate understanding by relating to another word or context (cited in Hatch & Brown, 1995, p. 403). These opportunities for intentional vocabulary instruction take place in the framework of a lesson, rather than through separate activities which often provide little or no context for the vocabulary being learned.

As in most aspects of language instruction, balance is probably the key to successful instruction and learning. Clearly, to provide students with the level of exposure to new vocabulary necessary to develop an adequate L2 vocabulary, both intentional and incidental learning
opportunities need to be provided. As Singleton (2000) states, "both incidental learning and learning based on ostension have their place . . . and . . . both context-based and individual word-focused approaches are efficacious in formal instructional settings" (p. 213).

Vocabulary Learning Through Reading

One way in which L2 vocabulary is acquired incidentally is through reading and reading-based activities. Schmitt (2000) states that "written discourse . . . tends to use a wide variety of vocabulary, making it a better resource for acquiring a broader range of words" (p. 150). Additionally, compared to word lists that often consist of frequently used words, "written language makes more use of infrequent vocabulary" (Schmitt, p. 120). Likewise, Nagy (1997) emphasizes the importance of the incidental learning that occurs while reading stating, "I consider it unlikely that instruction accounts for anywhere near as much vocabulary growth as does incidental acquisition from context during reading" (p. 75).

In an attempt to understand the benefits of incidental learning while reading, Parry (1991) compared the vocabulary learning of two ESL students in an introductory
anthropology class. The students were asked to (1) take a preliminary vocabulary test, (2) keep a list of words they read and which were difficult for them, (3) write down their proposed meanings of the words, and (4) write down the definitions they found if they looked the words up in a dictionary. Through this study, Parry found that one of the students read substantially more than the other and thus showed knowledge of “a large proportion of the words, especially of the more frequent ones” (p. 649), whereas the other student, who read much less of the class textbook, indicated as difficult “a higher proportion of words than did any of the other students. Amongst those words there were also proportionately many more of relatively high frequency” (p. 649). Parry argues that based on these findings, “there is, as we have always suspected, a strong correlation between how much people read and how many words they know” (p. 649). She concludes, therefore, that when working with ESL students, “we should encourage our students to read as much as they can” (p. 649).

Some researchers, however, do not agree that the incidental learning that takes place while reading provides the best means for vocabulary development. Raptis (1997) argues that based on her survey of research on incidental
learning through reading, several studies were questionable because of methodological problems. She concludes that "while we can state that incidental vocabulary learning is possible, we are not able to say whether this approach is more or less effective than any other" (p. 577). Because of these and other arguments, research has begun to move in the direction of exploring ways that reading can be supplemented so as to assist in vocabulary acquisition.

Those interested in intentional learning and L2 vocabulary knowledge have focused on a variety of strategies for explicitly learning and teaching L2 vocabulary, including as part of the reading process. In an effort to look at vocabulary development as a result of reading-based exercises, Wesche and Paribakht (2000) conducted a study of ten intermediate-level ESL students. Their study allowed them to gather data—through the use of think aloud and immediate and delayed retrospection—about the process their participants went through to complete a set of text-based activities designed to increase vocabulary knowledge. There were eight activities in which students were asked to: (1) find specified (target) words in their reading text, (2) identify "connectives" (or transition words and phrases) in a list of words and in the
text, (3) match target words with their definition, (4) complete a chart of word derivations (noun, verb, and adjective forms) for the target words, (5) find a word in the text which matched a given definition, (6) replace underlined words in a given group of sentences with underlined words from the class text, (7) identify transition words as being either an example of cause and effect or contrast, and (8) unscramble a set of words, which included some target words, to form a complete sentence. The results of the study were that "most of the tasks succeeded at least partially in eliciting attention to the relevant features of the target words" (p. 204) and that "for some learners, at least initial learning of some kind was taking place for some words in the different tasks" (p. 205). In discussing the use of multiple intentional strategies, Wesche and Paribakht point out that "[u]nlike thematic reading for comprehension, such tasks ensure not only repeated meaningful exposure to target words, but require that learners deal with different aspects of the words' meanings and uses" (p. 206), thus encouraging the preferred deeper processing.

Wesche and Paribakht also compare these findings to their prior research (Paribakht & Wesche, 1999), which
looked at what learners do when they encounter an unknown word while reading for meaning. In their previous research, no supplemental activities were provided. They conclude that the activities included in their 2000 study "appeared to make more target words salient to learners" (p. 207) and thus their findings "support the conclusion of other researchers that multiple exposures to words are normally required for their acquisition" (p. 207). They also confirm "the unquestioned value of extensive thematic reading in the long-term development of L2 language proficiency, including lexical development" (p. 208). However, Wesche and Paribakht also conclude that "the unpredictability of gains in word knowledge makes sole reliance on extensive reading a questionable instructional strategy" (p. 208). They state further that even when teachers make every effort to select texts that will provide their students with multiple encounters with key terms, "many important words will not be learned incidentally, or they may be inaccurately learned, or, at best, learned only to a recognition level in context" (p. 208). Their research, while it encourages reading as a means of acquiring vocabulary, supports the use of intentional learning strategies for text-based learning—not
only through reading, but also through other activities
designed to increase vocabulary acquisition.

Zahar, Cobb, and Spada (2001) also address the
question of whether reading alone or direct instruction
provides the necessary exposure for sufficient vocabulary
learning to take place. They explored the replicability of
the findings of previous research that claimed that "after
reading, participants can typically select a definition for
a little more than one out of every 12 words tested" (p.
543). They also considered using these findings as a
measure of the effectiveness of reading in developing
sufficient second language vocabulary for production,
taking into consideration text size and the time available
for exposure.

Zahar, Cobb, and Spada’s (2001) participants were 144
male ESL students at a private Montreal French language
high school. They were first administered a vocabulary
knowledge test which identified students as falling into
one of five groups (Levels 1 through 5, with Level 1
participants having the lowest vocabulary knowledge).
Students were then provided a narrative text containing
words that they were not expected to know. The
researchers then selected thirty focus words from the text
and tested the participants' knowledge of these words. Approximately two weeks later, the students (1) heard the story on audiotape while following along in the written text, and (2) were given the remainder of their class period to reread the story independently. Two days later, a post-test was given (a second administration of the pre-test). Zahar et al. then looked at the number of target words learned and found that their results (one word learned out of fourteen), confirmed previous research that produced similar numbers and, therefore, supported the idea that "there appears to be some measure of regularity to incidental vocabulary acquisition through reading" (p. 558). The authors also point out that this rate (between 1.82 out of 30 words for lower level learners) does not provide sufficient learning for acquiring the level of vocabulary knowledge that enables learners to read independently. In discussing implications for classroom practices, Zahar et al. propose that a more productive method of helping students acquire the necessary vocabulary is through supplementing with direct instruction (p. 560). However, they admonish teachers not to "replace contextual learning with vocabulary drills" (p. 560), but to find ways
to make contextualized learning more efficient through supplementing any activities with direct instruction.

Dictionary Use in Vocabulary Acquisition

One often-used strategy for supplementing incidental vocabulary learning through reading is the use of dictionaries. Native speakers, for example, rely on dictionaries for such things as checking spelling and learning about an unknown word. In much the same way, many ESL students rely on dictionaries to learn more about English vocabulary. Vocabulary researchers have also examined the effectiveness of dictionary use in acquiring vocabulary. For example, in a study looking at how the use of dictionaries impacted vocabulary acquisition while reading, Luppescu and Day (1993) started from the position that dictionary use contributed very little in the acquisition of vocabulary. They asked their subjects (EFL students at two different Japanese Universities) to simply read a passage and then to take a test on selected vocabulary immediately after reading. The participants were divided into two groups: one in which students were not allowed to use a dictionary while reading and the other in which students were provided bilingual dictionaries and
told they could use them as they read. Contrary to their original hypothesis, "the mean score of the dictionary group was considerably higher than that of the group that did not use dictionaries" (p. 269). Luppescu and Day conclude that "the use of a bilingual dictionary by EFL students while reading can significantly improve indirect or incidental vocabulary learning" (p. 271).

Despite these positive results, however, Luppescu and Day also point to two problems related to dictionary use. First, students did not always get a clear sense of the meaning of the word based on the definitions offered when compared to the word in their text. This problem seemed to be more likely to occur as the number of definitions available increased. Second, the time students needed to read while using a dictionary was almost double that of the students who read without a dictionary. Luppescu and Day suggest that in order to mitigate these issues, teachers should "not assume that a student knows how to use a dictionary" (p. 277) but, instead, include activities designed to instruct students in dictionary use. This will both enhance the students' understanding of the multiple definitions which are often provided and encourage the most efficient, time-saving ways to use a dictionary.
In a similar study, Knight (1994) investigated whether there is "a significant difference between the vocabulary learning scores of students who use a dictionary and those who do not" (p. 287). In this study, 105 English-speaking students of Spanish were divided into two groups: low and high verbal ability. Within each ability grouping there were two groups: dictionary or non-dictionary condition. The students, two weeks prior to reading the selected texts, were given a vocabulary test on forty-eight targeted words to verify that the participants did not know them. The participants were then given the two texts on a computer disk which had been either programmed for dictionary access or non-dictionary access. As the students read and—for those with access—looked up words, the software recorded what words they looked up as well as how long it took the student to read each article. Participants were asked, after completing the reading, to write down what they remembered reading in English. Finally, two weeks later, participants took "a delayed supply-and select-definition test over the same targeted words encountered in their text-set in order to measure long-term retention" of the words (p. 290).
Knight found that "although all subjects learned more words when they were exposed to them in context than when they were not, those who had dictionary access learned the most" (p. 291). The participants' performance in the pre-reading assessment also supports the importance of being exposed to new words in a meaningful context, since "all subjects, regardless of verbal ability level, were unable to correctly supply many word meanings without first being able to see the targeted words in context" (p. 291). A supplementary finding in this research was that dictionary use "appeared to give the low verbal ability group a special advantage" (p. 293). Compared to both groups of non-dictionary access participants, where the average percentage of words learned varied by an average of eight percent, the variation between the two verbal ability groups in the dictionary use condition was only four percent. For example, on the immediate-select-definition test, "the dictionary condition enabled the low verbal ability students to learn almost as many words as the high verbal students in the same condition (51% and 55%, respectively)" (p. 293), pointing to the overall benefits of dictionary use, especially for those students classified as having lower verbal ability.
Knight also confirmed findings of previous research that participants who had dictionary access took more time (41%) to read and look up the words compared to the participants in the no-dictionary condition. Additionally, with respect to the relationship between vocabulary learning and reading comprehension, reading comprehension scores were also higher for those with dictionary access than for those who guessed meaning from context. Knight, therefore, concludes that "the common practice of encouraging all students to guess word meaning from context must be re-examined" and "dictionary use should be encouraged" (p. 295).

In addition to looking at the effectiveness of dictionary use in acquiring vocabulary, research has also examined the ways in which students use a dictionary. For example, Hulstijn (1993) looked at how Dutch high school students, from two different grade levels of English as a foreign language (EFL), used dictionaries as part of the reading process by "looking up the meaning of unfamiliar words encountered while reading a FL text" (p. 139). His study relied on a computer-based program that allowed him to observe the process unobtrusively. Students were provided a text in both print and on a computer. As they
read, they had the ability to click on a word in the text on the computer and see a translation in their first language. Hulstijn examined factors influencing look-up behavior and found the following:

Whereas the decision to look up the meaning of a word in a FL text is clearly influenced by the perceived relevance of the word, it is only modestly influenced by the reader's vocabulary knowledge, and it is not influenced by the reader's ability to infer word meanings from contextual information. (p. 146)

Based on his findings—which indicate that students of varying ability look up words for multiple reasons—Hulstijn suggests that teachers should not only provide students with many strategies for comprehending meaning from a text, but that they should also allow them "considerable freedom in choosing whether they want to try to infer the meaning of an unfamiliar word before deciding whether to look up its meaning, or to look up the word right away, or even to ignore the word altogether" (p. 146).

Other research has compared the effectiveness of dictionary use with other intentional vocabulary learning support. Hulstijn, Hollander, and Greidanus (1996)
examined the acquisition level of sixteen target words by three groups of Dutch first-year university students of French in different research conditions. One group was given the text with "marginal glosses" (marginal translations into the participant's first language) for the targeted words. Participants in the second group were provided with a French-Dutch dictionary, which they were told they could use freely. The final group served as the control group and was given no supplementary materials. After reading the text (a short story), the participants were asked to (1) answer yes or no as to whether each word appeared in the text (students in the dictionary group were also asked whether they had looked each word up); (2) indicate if before reading the text they were familiar with the word; and (3) provide meanings or definitions for the targeted words which were provided in the context of lines from the original text. Based on these results, Hulstijn et al. found that

The effect of marginal glosses will be greater than that of dictionary use because readers often do not make use of the dictionary. However, when readers do use the dictionary, the incidence of vocabulary learning will be as good
as, or even better than, when they are provided with marginal glosses. (p. 336)

However, Hulstijn et al. (1996) also found that even with dictionary use, marginal glosses, and multiple exposures to an unknown word, learners typically only recall the meanings for a little less than half of the new words they are exposed to. While the primary focus of their research was intentional strategies used during reading, they also reaffirm previous research which states that "incidental vocabulary learning during reading does occur and it has the potential of contributing substantially to an incremental process of vocabulary acquisition (Nagy, Herman, & Anderson, 1985)" (p. 337).

Since dictionary consultation is a strategy that students of varying levels of fluency indicate they use, researchers have also explored students’ perceptions of the value of this strategy for learning new vocabulary. Gu and Johnson (1996) found that students tend to rely on what they call "meaning-oriented strategies," including the "skillful use of dictionaries for learning purposes (as opposed to looking up for comprehension only)" (p. 668). As part of their research, the participants (using a scale of 1 to 7, with 1 being "Untrue of me" and 7 being
"Extremely True of Me") ranked seventeen statements related to their use of meaning-oriented, dictionary strategies in three categories. The first category, dictionary strategies for comprehension, included statements such as "When I see an unfamiliar word again and again, I look it up" (p. 676). The second category, extended dictionary strategies, included statements such as "I pay attention to the examples of use when I look up a word in a dictionary" (p. 676). Finally, the third category, looking-up strategies, included statements such as "If the new word is inflected, I remove the inflections to recover the form to look up (e.g., for created, look for create)" (p. 676). Their participants' responses to these questions resulted in the following averages (based on the seven-point scale) for each of the three categories in the dictionary use section of their survey:

- Comprehension mean of 4.97
- Extended Dictionary Strategies mean of 4.82
- Looking-Up Strategies mean of 4.55

In fact, the participants ranked dictionary use higher than all other vocabulary learning strategies surveyed (p. 653).
In comparing students' perceptions of the usefulness of vocabulary learning strategies to their actual usefulness, as evidenced by their performance on multiple tasks, Fan (2003) found that students reported they "use the dictionary to find out the context meaning of the new word" (p. 228) and that "they had a preference for dictionary strategies" (p.229). In fact, students ranked dictionary use as the second most useful strategy for learning vocabulary, even though it ranked lower (fourth out of nine) in reported frequency of use. The researchers, based on the study's assessments, concluded that "reviewing and using words newly learned, in particular, and consulting the dictionary are important to the learning of words at all frequency levels" (p. 232). Orsini (1999) also found that students regard dictionary use as a valuable vocabulary learning strategy, despite the fact it is time consuming (p. 269).

Electronic Dictionaries and Concordancers

Previous work, albeit in a somewhat limited fashion, has also investigated how and when students use electronic dictionaries and concordancers, as well as the effectiveness of these tools for different kinds of L2 learning while reading. In a study of fourteen ESL
students at various levels of English development, Liou (2000) considered the effect of students' use of an on-line bilingual dictionary linked to each word in a selected text. Students were provided a 435-word on-line text to read as well as an introduction to the context of the reading, three pre-reading questions, six post-reading questions, and one multiple-choice post-reading question which they read and responded to independently on a computer. An observer recorded time spent on each task and observed and noted other reading behavior. Liou found that students with higher English language ability tended to look up fewer words, read more quickly, and comprehend texts at higher levels than students of lower English language ability who looked up more of the words but were more likely than the higher level learners to select an incorrect definition for a word.

Liou (2000) also focused on learners’ preference of dictionary type by asking participants to compare the use of the on-line, text-linked bilingual dictionary to an electronic, hand-held dictionary. Their responses indicate that 75 percent of the participants preferred the on-line version to the electronic, hand-held dictionary because of the ease of use and efficiency during reading. She also
questioned participants about their preference between a paper dictionary and the on-line version and found that 83.3 percent preferred the on-line version. Liou proposes that implications from her study include the recommendations that "language teachers should facilitate the burden of dictionary use" and that "[e]lectronic dictionaries are superior to their paper versions as long as the electronic counterparts have equally comprehensive and detailed information" (p. 474-475).

Concordancers are another type of computer-based program that have provided researchers with opportunities to explore learning strategies used by second language learners. Concordancers are "a tool for text analysis which can generate lists of the words contained in a text or text collection (corpus)" (Gabel, 2001, p. 269). They also show the surrounding lexical contexts for each instance of a targeted word contained in the corpus. In an attempt to address what he describes as the choice between breadth and depth of vocabulary acquisition, Cobb (1999) compiled a concordance that contained vocabulary from the class texts. The control group in the study was provided with a word list and a dictionary while the experimental groups used the computerized concordance software to create
their own dictionaries of the words they accessed. Cobb found that "[l]earning large numbers of words from a word list and a dictionary produced strong gains in definitional knowledge in the short term. However, this knowledge was not well retained, and students were not very successful at applying learned words to gaps in a novel text" (p. 352). Those students in the experimental group, however, exhibited "both definitional knowledge and transfer of comprehension to novel texts, short and long term" (p. 352). Additional assessments at later intervals "consistently revealed that control groups did not retain their definitional knowledge, while the concordance groups if anything increased theirs with time" (p. 354). Based on his findings, Cobb argues that through the use of a concordancer, students are able to close the gap between the breadth and depth of vocabulary acquisition.

Gabel (2001) supports Cobb's conclusions and further argues that the use of concordancers helps language learners to "bridge the gap between their own performance and that of native speakers" (p. 269). Concordancers are effective because they provide opportunities for students to compare hypotheses they have made about the target language, including vocabulary, with native speaker uses of
the vocabulary as reflected in the lists of target words in authentic contexts. This, Gabel states, is the rationale behind the use of concordancers. He further believes that concordancer use and its "exploration of the target language will also support and supplement acquisition processes" (p. 270). Since electronic dictionaries usually provide users with the ability to add new words, they can also take on concordancer-like qualities, allowing students to develop a personal corpus from the texts to which they've been exposed.

In sum, while reading without any intentional strategies has proven beneficial for vocabulary acquisition because of the incidental learning that does take place, researchers have also pointed to the need for intentional strategies, given the limitations of relying solely on reading for vocabulary acquisition. As previous research suggests, teachers attempting to assist learners in L2 vocabulary acquisition should provide a mixture of both incidental and intentional learning opportunities, including the use of dictionaries, electronic dictionaries and concordancers, in order to enhance vocabulary acquisition, especially as part of the reading process.
Dictionary Use and Writing

While the research on dictionaries has focused primarily on dictionary use during reading, there has been some research on the role between dictionary use and written production. Laufer and Hadar (1997), for example, compared the effect on comprehension and production of targeted words by Hebrew learners of English of using three different dictionary types. The dictionaries they focused on included a standard English monolingual dictionary, an English-Hebrew bilingual dictionary (which provided a translation from English to Hebrew), and an English-Hebrew bilingualized dictionary (which provided a definition and sentences in English as well as a Hebrew translation). To measure comprehension, the participants were provided a list of 15 target words and asked to complete a multiple-choice test on these words. To measure production, the participants were asked to write original sentences using the target words. Using the participants' "dictionary use skill" as a measure, rather than their language proficiency, Laufer and Hadar divided the participants into three groups: 1) unskilled dictionary users, 2) average dictionary users, and 3) good dictionary users (p. 193). The results showed that overall, "significantly higher
scores were almost always obtained when consulting the bilingualized dictionary” (p. 195). Based upon their findings, Laufer and Hadar state that “learners have to be taught to exploit all available information in the entry before deciding on the meaning of the new word” and that “a good ‘bilingualized’ dictionary is suitable for all types of learners” (p. 195). This is especially relevant to the current study in that electronic dictionaries typically attempt to mirror the information available in a bilingualized dictionary.

In an attempt to trace the dictionary practices of participants during the writing process, Bland, Noblitt, Armington, and Gay (1990) provided their ten participants with computer software which included a bilingual dictionary, a grammar reference, and a set of vocabulary arranged thematically to be used as a resource while completing composition assignments. This software also had the capability of recording the types of queries the participants made in the resources including “the words and phrases asked for both successfully and unsuccessfully; the query language (e.g., French or English); 3) the query location (e.g., the editor, dictionary, grammar explanations, vocabulary explanations, functional
information); 4) the query path (e.g., the sequence of moves through the reference material)” (p. 441).

Bland et al. (1990) found that “one of the most pervasive features of the linguistic behavior of the beginning language learner is the attempt at direct translation. The initial assumption by the learner seems to be that for every word in L1 there is a one-to-one lexical match in L2” (p. 440), which they label “the Naïve Lexical Hypothesis.” This assumption, then, leads to the learner tendency to refer to resources—such as dictionaries—for a translation.

Finally, in a study looking at the use of bilingual dictionaries during the writing process, Ard (1982) concluded that while ESL students’ use of them “frequently leads to errors of certain types. . . . [e]rrors of similar types occur when bilingual dictionaries are not consulted” (p. 16-17). Ard further points out that error-free writing is not the immediate goal of ESL writing. In fact, he contends that by limiting the opportunities for students to make errors, “they never develop skills required on more difficult, but more common, tasks and they find it hard to expand the horizon of language with which they are ‘familiar’” (p. 17-18). Ard, therefore, concludes that
"there may be a role for bilingual dictionaries as a part of an overall complex of strategies for developing more active expressive abilities" (p. 18). As other researchers have concluded, Ard proposes that the successful use of bilingual dictionaries while writing requires that teachers and students understand how dictionaries can be used most productively.

Purpose of the Present Study

As evidenced in the research reviewed in this chapter, while researchers have focused on the effectiveness of dictionary use during L2 reading (and benefits for vocabulary acquisition that arise from the practice), comparatively little work has focused on the role of dictionary use in the writing process. In particular, research that explores the use of hand-held electronic dictionaries and L2 writing has not been undertaken. Since many ESL students rely on this technology for both reading and writing in English, the present study aims to provide an initial exploration of the impact of electronic dictionaries on L2 lexical development for ESL writers. The following chapter details the research questions and procedures of the study.
CHAPTER TWO

METHODOLOGY

The Current Study

The study reported here focuses on the use of Electronic Dictionaries (EDs) by ESL writers and the impact of such use on these writers' vocabulary acquisition. Specifically, the study aims to address the following research questions:

1. How, when and why do students use EDs in composing their papers? For example, what kinds of words do they look up, and in what ways do they rely on EDs during their writing processes? Do they perceive EDs to be helpful for particular stages of these processes?

2. To what extent do they use words found through EDs appropriately in their texts?

3. How does ED use influence the students' long-term knowledge of the vocabulary that they look up?

4. Should writing instructors encourage and/or integrate into their classes ED use, and if so, how?
These research questions aim to address various issues on dictionaries, vocabulary acquisition and ESL writing that have not yet been fully explored in the literature. Research question 1 considers the L2 learners' practices in using their EDs as part of their writing processes, including, for example, their choices in the types of words they look up. Although many researchers have examined student practices in dictionary use while reading (Hulstijn, 1993; Knight, 1994; Luppescu & Day, 1993), little has been said about the practices of students while writing. Through research question 2, I wished to explore whether looking up words in an ED leads to appropriate word choices or incorrect word form choices for L2 learners' texts. In other words, how successful are students in using their ED to select appropriate vocabulary for a given context in their text? This is of particular interest in light of previous research that concludes that the use of bilingual dictionaries often leads to learner errors (Ard, 1982), and some instructor's fear that EDs lead to inaccurate or non-idiomatic phrasing. Research question 3 focuses on the influence of ED use on the L2 learners' long-term acquisition of the words that they look up when writing. Examining the effects of EDs on learners'
receptive and productive vocabulary is especially pertinent as previous research has encouraged the use of intentional strategies, such as dictionary use, for enhancing the incidental vocabulary learning during reading but has not yet fully explored the effects of writing-based dictionary use on vocabulary acquisition. Finally, question 4 focuses on the role of EDs in the ESL writing classroom, building on previous research encouraging teachers to include explicit instruction on the effective use of dictionaries (Liou, 2000; Luppescu & Day, 1993), yet also taking into consideration potential problems and/or limitations of EDs as instructional tools.

Participants

The participants were students from two different classes in the American Culture and Language Program (ACLP) at California State University, San Bernardino. Based on their TOEFL scores, students in the ACLP are placed into classes that span six levels: Level 1, 2, 3, 4, 5, and pre-MBA. One class from which participants were drawn was a Level 3 (intermediate) class in which the average TOEFL score was 450. The second class consisted of Level 5 (advanced) students with an average TOEFL score of 515.
In order to recruit participants with substantial experience using EDs and to elicit information about participants' linguistic background, a Language Use Survey was distributed to all of the students in both classes who were willing to complete it (see Appendix A for the Language Use Survey). The Language Use Survey was adapted from a similar instrument used by Goen, Porter, Swanson, and vanDommelen (2001) and consisted of four sections: (1) the participant's background, including place of birth, time in the United States, and native language; (2) the participant's education in English; (3) the participant's language use, including (a) all languages known by the student and their self-assessed ability to understand, speak, read, and write each language, including English; (b) the participant's frequency using a language other than English in eleven different situations; (c) the student's "best" language; and (d) the language the student is most comfortable using for speaking, reading, and writing; and, (4) the participant's use of EDs, including how many times he uses his ED per day, what percentage of time he uses his ED while reading, speaking, writing, and listening; how frequently he enters words in his L1 versus in English; whether he saves words he has looked up in his ED or
records the words elsewhere for future reference; and, whether he looks up words or phrases more often. The participants’ responses to the Language Use Survey were then compared for each question to observe any similarities, differences, or other patterns that emerged among the participants.

Sixteen students completed surveys and from those, five were selected for the remaining research activities: three from the Level 3 class and two from the Level 5 class. These five participants indicated in their surveys that they used their EDs 20+ times per day and, therefore, it was anticipated that they would provide richer data regarding how ED use may impact ESL writing and vocabulary acquisition than those participants who used their EDs less often. Of these five participants, one student from the Level 5 class declined to participate in further research activities, leaving four remaining participants.

Data Collection and Analysis

Participant Interviews

The four selected participants were each interviewed about their ED use. The questions used in the interviews are attached as Appendix B. Each tape-recorded interview
lasted approximately 20-30 minutes and focused on the participants’ experiences using EDs.

In order to obtain information for research question 1, as to how the participants use their EDs, several questions were posed to the participants regarding the frequency with which they use their EDs and their reasons for using them (e.g. “How often do you use your electronic dictionary per day? Why do you use your electronic dictionary? In what situations do you find it helpful?”). To gather information about the participants’ prior use of other forms of dictionaries, they were asked whether they had used a print form of a bilingual dictionary while reading and writing and, if so, whether they preferred the print or electronic format. Focusing on the timing of their use of EDs during their writing processes, the interviewer asked the participants, “At what times when you are writing, if any, do you thing that using an electronic dictionary is helpful? When you organize your thoughts? When you are writing a rough draft? When you are revising?” Additionally, the participants were asked if there were times they found using an ED was not helpful. Finally, as a way to elicit how their perceptions of EDs might be similar or different for reading and writing, the
participants were asked if they also found the use of the ED helpful while reading.

To address research question 2, the participants were asked about their previous success in selecting a correct word when using an ED: "Have you looked up a word to use when writing and later the teacher or a tutor told you that it was not the correct word to use? When that happened, what did you do to find a better word to use?"

Finally, in regards to research question 3, the participants were asked whether using an ED helped them to learn more English vocabulary either during reading or writing and, if not, why they believed it was or was not helpful in learning vocabulary.

The transcripts of the interviews were read repeatedly in order to identify themes addressing the research questions as well as similarities and differences among the participants' responses.

Writing Samples

In order to explore both the kinds of words and phrases participants looked up while writing (research question 1) as well as the extent to which they use these words or phrases appropriately in their writing (research question 2), the participants were asked to provide a
writing sample in which they had used words found through an ED. The writing samples came from existing assignments from their classes and were selected by the participants. Participant 1’s sample is in response to two prompts, one which asked for him to write about someone he considered a hero and the second in response to an assignment to write a classification essay. Participant 2’s writing sample is also a response to the prompt to write about a hero. Participant 3’s writing sample responds to a prompt which asked him to describe his favorite place. Participant 4’s writing sample responds to a prompt to compare and contrast "Your attitude toward a social custom or political belief and your parents’ (or grandparents’) attitude toward that belief or custom."

The participants were instructed to underline or highlight any words in their sample that they looked up with their ED. These writing samples also served as the basis for the final vocabulary knowledge assessment portion of this study described below.

The writing samples were reviewed for the words and/or phrases that the participants indicated they had looked up in their EDs. Each of these words and/or phrases was then analyzed for (1) the word class to which it belonged, and
whether the word was appropriate in the context of the sample.

Vocabulary Knowledge Assessment

To address research question 3, a post-writing assessment was developed to investigate whether individual participants had retained some level of receptive and/or productive knowledge about the words they had highlighted in their writing sample. The first five words marked by the participant in her writing sample were selected for the assessment, which consisted of two parts. The first section, focusing on receptive knowledge, asked the participant to match each of the words to its correct definition. The second section, focusing on productive knowledge, asked the participant to use each of the words in an original sentence. (See Appendix C for the vocabulary knowledge assessment.) Although a separate assessment was developed for each participant based on his/her writing sample, due to the unavailability of several participants, the vocabulary knowledge assessment portion of the study was completed by only one of the four participants who had been interviewed and provided a writing sample. The assessment was given to this student approximately one-week week after the writing sample was written and the words and
phrases highlighted. Although, given this time frame, the assessment is limited in what it can reveal about the participant's retention of the selected vocabulary over a very extended period, it does provide a window into her receptive and productive knowledge of these words beyond a 24-hour period.

A brief follow-up interview was conducted immediately after the assessment to gain further information about how the participant used her ED while writing (research question 1), specifically in relation to the words she had looked up when completing her writing sample. (See Appendix D for the follow-up interview questions.) The participant was asked (1) when she wrote the sample, (2) when she looked up the highlighted or underlined words (during or after writing), (3) when she marked the words, (4) why she decided to look up the marked words, (5) what process she used when looking the word up, and (6) how confident she was in selecting one or two of the words from her text. Finally, she was asked to orally provide a definition for the word with which she seemed the least confident in the assessment.

The transcript of this post assessment interview was analyzed to determine how and when the participant had
completed the writing sample and looked up words in her ED, as well as to ascertain her level of confidence in regards to the five selected words from her text on which she was assessed and her retention of knowledge about those words.
CHAPTER THREE
RESULTS AND DISCUSSION

This chapter reports on the findings from the various instruments in the study and how these results inform the research questions. The chapter begins with a summary of information gleaned from the Language Use Survey, which was completed by a total of 16 participants, four of whom were selected to complete the remaining instruments. The results of the participant interviews are then summarized in relation to each of the research questions. Third, the participants' writing samples are described and analyzed. Finally, the vocabulary assessment and post-assessment interview are discussed.

Language Use Survey

The Language Use Survey provided information in response to research question 1 as to how and when students use EDs in composing their papers. I wish to note here an apparent misinterpretation of the original intent of part of the survey. When asked to provide the percentage of time they used an ED for the tasks of reading, speaking, writing, and listening (which was intended to elicit a division of the total time they used their EDs among the
four tasks), three of the participants provided responses that exceeded the total of 100%. Thus Participants 1, 2, and 4 apparently interpreted the questions to be asking for what percentage of the time when they perform each task do they use their EDs. While the participants apparently interpreted the questions differently, they all reported—as Table 3 shows—that they used their EDs most frequently when reading (with the exception of Participant 4) followed closely by writing. Only one participant (Participant 2) indicated that she used her ED fifty percent or more of the time when speaking or listening. The participants are equally divided in whether or not they store or somehow save a word they look up in their EDs for future reference. Finally, most of the participants reported that they used their EDs to look up a single word most frequently, rather than phrases.
Table 1. Participant Electronic Dictionary Use

<table>
<thead>
<tr>
<th></th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>Participant 3</th>
<th>Participant 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of ED Per Day</td>
<td>20+</td>
<td>20+</td>
<td>20+</td>
<td>20+</td>
</tr>
<tr>
<td>Use While Reading</td>
<td>100%</td>
<td>80%</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Use While Writing</td>
<td>50%</td>
<td>80%</td>
<td>40%</td>
<td>70%</td>
</tr>
<tr>
<td>Use While Speaking</td>
<td>0%</td>
<td>70%</td>
<td>20%</td>
<td>30%</td>
</tr>
<tr>
<td>Use While Listening</td>
<td>0%</td>
<td>50%</td>
<td>0%</td>
<td>20%</td>
</tr>
<tr>
<td>Enter word in L1</td>
<td>50%</td>
<td>80%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Enter word in English</td>
<td>50%</td>
<td>15%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Save or record word for future reference</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Most frequently look up words, phrases, or both</td>
<td>Words</td>
<td>Both</td>
<td>Words</td>
<td>Words</td>
</tr>
</tbody>
</table>

Participant Interviews

The participant interviews provided an opportunity to take a more in-depth look at the participants’ use of EDs and respond further to research question 1. As described more fully in Chapter 2, some of the questions addressed during the interviews focused on the participants’ level of use of an ED; when and why they use an ED while writing, reading, or in other situations; their perception of the usefulness of an ED in learning English vocabulary; and how they approach correcting words which their teacher, indicates they have used incorrectly. While the participants tended to have trouble responding to open-ended questions, their responses to my more pointed questions offered insight into their dictionary use patterns.
Reasons for Electronic Dictionary Use

The participants who, as mentioned in Chapter 2, all reported using EDs 20 or more times per day in their Language Use Survey, noted similar reasons for their frequent ED use, including the fact that they find the EDs superior in efficiency and comfort to print dictionaries, as reflected in the responses below.

Participant 1: “It’s better than, you know, the book . . . long time to find the word.”

Participant 2: “I think it’s really comfortable . . . and I think it’s very small, not heavy. . . . Because if I open book, I can use only Thai—it’s English/English one book. If I use digital dictionary, I can have English/Thai, English/English, and maybe idioms example in one.”

Participant 3: “So if you use the dictionary, is not going to take you a lot of time like a book—a dictionary book, because it’s faster.”

Participant 4: “Because I don’t remember the spelling and meaning. . . . This one compact—easier to carry. A dictionary, book type, very heavy. This one convenient.”
Participants also indicated that they felt their EDs was an important part of their being successful in learning English.

Participant 1: “If I don’t use this, I don’t do well.”

Participant 3: “Everything depends on the situation because sometimes we have homeworks. Like, for example, we have to find out different words. So if you don’t know the words, you have to use it.”

The participants’ responses also reflected the fact that they used an ED to find an English word to express a desired meaning, to get a definition while reading for an English word they do not know, or to check the spelling of an word they wish to use. Some examples of how participants explained their use of EDs to find a desired word are:

Participant 1: “I want to find some . . . words but I don’t know the words.”

Participant 2: “If I don’t know this, some word [in English], I can use it to see that word.”

Participant 3: “I use the dictionary because when you’re learning some new language, you don’t know everything, so you have to find out for yourself.”
Participant 4 indicated he used an ED to check for spelling as seen in the following response:

Participant 4: "Because I—I don't remember the spelling and meaning."

Electronic Dictionary Use While Writing

When asked whether they found using an ED helpful while writing, the majority of the participants indicated that they rely on them for finding necessary vocabulary for their compositions.

Participant 1: "When I am writing and I don't know a word, I can go [points at ED]. I want to know sky I, I write [enters on ED] sky."

Participant 3: "I try not to use a lot. I try to guess the word first. But if the word doesn't sound correct, or doesn't—yeah, I check. If I'm not sure, I check."

Although he admits that his writing in English is slow, Participant 1 believes using the ED helps him to write faster than he would without its help.

Participant 1: "I can write pretty slow, I am slow. But it [ED] helps me."
Participant 2 also indicated that her ED provided a sample sentence using the word which she found helpful for knowing how she could use the word in her writing.

Participant 2: "[My ED] have a example and I can learn about example and I use--adapt for mine."

When asked about experiences when the ED did not help while writing, generally the Participants felt that the use of an ED did not hinder them when writing,

Participant 1: "No, it helps me a lot. Yeah. Very, very helpful."

However, Participant 3 did mention a complaint about EDs that he had heard from teachers.

Participant 3: "Sometimes it doesn’t help you because, like many teachers say this dictionary doesn’t give you the exactly form for the word, so sometimes you have to find out what that word is."

Although Participant 3’s opening clause suggests that he believes that EDs are not always helpful, it should be pointed out that he still uses his ED in 20 times per day or more.

Another issue that Participant 4 pointed out is that EDs sometimes provide numerous words which can make it difficult to choose the correct one.
Participant 4: "Japanese word here [pointing to ED], but have lot of word meanings [in English]—and words, something like that. Several meaning."

Electronic Dictionary Use While Reading

In response to questions about the use of an ED while reading, the participants all indicated that they used their EDs to look up unfamiliar words, as seen in the following:

Participant 3: "[S]ometimes when you’re reading, you don’t know—when you don’t know a lot—when it’s a new reading for you, you don’t know the words and you have to find out because if you don’t find out, you don’t understand the reading."

Participants 1 and 4 also indicated that when they are reading and do not understand a word, they do not stop and look it up at that time. Instead, they look up the unfamiliar words after they have read the text all the way through. Participant 4 reported that she tended to use her ED to look up words that were crucial for understanding.

Participant 4 confirmed this approach to using an ED while reading as follows:

Participant 1: "[T]eacher says . . . first read, don’t use dictionary and second time use your
dictionary. So you—you look at this, do this—you can guess word if you don’t know the word, but you can get through. I can use the dictionary after one time.”

Electronic Dictionary Use and Vocabulary Acquisition

Three of the four participants reported that using an ED helped them to learn more English vocabulary. Use in general—whether while reading, writing, or listening—was seen as providing an opportunity to learn new vocabulary by having a way to look it up when they are exposed to it.

Participant 2: “Sometime I want to know about a lot of words . . . I use this and can—I can know about words . . . synonyms, and more and more.”

The participants, when asked whether they believed their EDs were more helpful during reading or writing, felt that their vocabulary learning while reading was greater than when writing.

Participant 1 stated that he always used his ED while reading compared to about half the time while writing and as a result, he learned more words while reading. Participant 2: “Reading, because I can—if I have a word I don’t know I can—but reading sometimes I don’t use because I have some of words.”
Participant 3 also pointed out, as seen below, that because EDs often have a function that allows the user to store new words, she was able to learn more vocabulary.

Participant 4: "But, sometimes I have words—keeping—they have a capture words. So sometimes I understand the meaning. Yeah, I put in the meaning so I can learn more English."

In contrast, Participant 3 did not think that the ED helped him to learn more words. He felt that actually using the language was more helpful in learning new words.

Participant 4: "Because if you practice, then you are talking with other persons, for example. In English, it is very different because little by little you taking words from the TV, from the radio, from people, from everywhere. So sometimes does help you, sometimes not."

Participant 1 explained that he also found that his use of an ED while listening to class lectures, where it is difficult to stop the instructor and ask for an explanation for a word, also helped him learn new vocabulary, as he explains in the following:
Participant 1: “I don’t know the words and the teacher just teaching so—too many others in classroom. I can find the words in Korean, so I would look up.”

Electronic Dictionary Use and Word Choice Issues

Participants were asked what strategies they generally used for finding a more appropriate word when a teacher indicates they have used an incorrect word. Three of the participants indicated they used their EDs to find a more appropriate word.

Participant 1: “Just, you know, hard—it’s just—then use dictionary. Don’t go teacher. . . . I still use this.”

Participant 2: “I use digital translator.”

Participant 4: “Yeah, I—sometimes I have mistake, yeah. So, just the teacher correct my—to check out, we use an electronic dictionary, so it not exactly correct.”

Participant 4 also indicated that teachers have commented on the correctness of words she finds in her ED.

Participant 4: “But then she say ‘oh, sometimes electronic translate wrong word, just more correct [referring to a word the teacher provided].’”
However, Participant 3 found other resources for determining a more appropriate word for his writing.

Participant 3: “I’ll ask my teacher or my family, my uncles or my cousins. So I try to figure out first. Problem with this is like, uh, like you don’t have everything here. So—for example, slang. You don’t have—you can’t find in the dictionary slang. So sometimes people talk with slang words, so you’re like ‘what?’ So—and if you try to look up, you can’t find it in the dictionary, even the book, because it’s slang. Sometimes you have to ask people.”

An important caveat to the successful use of EDs while writing (or even whether students are allowed to use them), according to one participant, is the teacher’s attitude toward them.

Participant 1: “I use the dictionary and write. She thinks it helps because is new word to me. But next quarter, new teacher, everything change. Depends on teacher.”

Thus, as the participant interviews generally indicate, participants by and large found their EDs to be a valuable tool in many facets of their learning and use of English. Not only do some find EDs more useful than print.
dictionaries, but they also indicate that they can be a helpful tool for writing by providing them a way to express their intended meaning in English within the context of their own writing, and additionally exposing them to words they are unfamiliar with and which they can add to their lexicon.

Writing Samples

Writing samples from class assignments were collected and analyzed in order to examine the lexical categories of words participants looked up in their EDs, as well as the extent to which they used these words appropriately in their texts (Research question 2). Table 2 below shows the number of words each participant indicated they had looked up in an ED broken down by lexical category as well as the actual words looked up. The final column indicates the number of words that the participants looked up in their EDs out of the total words in the writing sample. This is then converted to a percentage.
Table 2. Types of Words Looked Up

<table>
<thead>
<tr>
<th>Participant</th>
<th>Nouns</th>
<th>Adjectives</th>
<th>Adverbs</th>
<th>Verbs</th>
<th>Prepositions</th>
<th>Phrases</th>
<th>TOTAL/SAMPLE TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>4 or 9/166 = 5.42%</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>a person of great capacity</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Excessively drinking</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3/163 = 1.84%</td>
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<td></td>
<td></td>
<td>resucer</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>malefactors</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>gratitude</td>
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<tr>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4 or 5/271 = 1.48%</td>
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<td></td>
<td></td>
<td>lagoons</td>
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<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>jet skiing.</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>varieties</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>12</td>
<td>36 or 55/649 = 8.47%</td>
</tr>
<tr>
<td></td>
<td>technology</td>
<td>welfare</td>
<td>enormous</td>
<td>closely revised</td>
<td>through</td>
<td>cell phones</td>
<td>in point of</td>
</tr>
<tr>
<td></td>
<td>generation</td>
<td>military</td>
<td>rapidly released</td>
<td>patriot</td>
<td>switched to</td>
<td>electrical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>environment</td>
<td>refriger-</td>
<td>dirty</td>
<td>back</td>
<td>flat TV</td>
<td>self-defense</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ator</td>
<td></td>
<td></td>
<td>force</td>
<td>force</td>
<td></td>
</tr>
<tr>
<td></td>
<td>treasures</td>
<td>economic.</td>
<td></td>
<td></td>
<td>fought with</td>
<td>complex</td>
<td></td>
</tr>
<tr>
<td></td>
<td>wealth</td>
<td></td>
<td></td>
<td></td>
<td>relationship-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>constitution</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ships between</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>at the same time</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>near my house</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>affected by</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>hasn’t completely</td>
<td></td>
</tr>
</tbody>
</table>

Total 14 (30%) 8 (17%) 5 (11%) 4 (9%) 1 (2%) 15 (31%) (100%)
Categories of Words Looked Up

As shown in Table 2, participants looked up more nouns than any other word type, 30% of the total words or phrases looked up in their EDs. The words looked up least were prepositions, which represented only 4% of the total. (This is not surprising given the fact that there are only a few dozen prepositions in English.) However, phrases were actually looked up with the highest frequency, 31% of the total. Of all the phrases indicated by the participants to have been looked up in their EDs, seven, or 46%, were noun phrases (e.g., a person of great capacity, jet skiing, cell phones, electrical appliances, flat TV, self-defense force, and complex relationship between) and another five, or 33%, were verb phrases (excessively drinking, switched to, fought with, affected by, and hasn't completely). Prepositional phrases account for only three, 20%, of the phrases looked up (in point of, at the same time, and near my house), corresponding to the low incidence of participants looking up prepositions. Participant 4 looked up the highest percentage of words (8.47%). Participant 3, who had indicated in his interview the least reliance on and ED of all the participants,
looked up the smallest percentage of words from his writing sample (1.48%).

In looking at the level of appropriate use of the words or phrases that the participants used while drafting their writing samples, I found that of the 47 words and phrases looked up in an ED, 40 were used in an acceptable manner, given the context of the writing, and only seven were used inappropriately. The instances of incorrect use are seen in the following, where the words or phrases looked up in an ED are indicated in italics:

1. Another kind of skate is aggressive skate that use for conjuring trick. Between second wheel and third wheel has small hole, so it combines with stair rail.

   Here the use of the word conjuring is a poor word choice for describing a skating maneuver. However, it is difficult from the context to determine what the author had in mind.

2. I don’t agree with the idea that technology is always good for the future. I would like to compare my generation’s attitude with my grandparents in point of technology, war, and environment.
The phrase here in point of is not one that native speakers would use and therefore is incorrect regardless of its context. In this sentence, the correct phrase would be something more like in the areas of.

3. One of my Korean friends told me that before entering there, he didn’t have a patriotic mind. However, since he finished it, he has kept it. Korean people feel the war closely, while Japanese people don’t think about it seriously. Moreover, we don’t think about even our country.

Here, the participant’s use of the word closely does not collocate well with the verb feel. Instead a native speaker would most likely use the verb hold with the adverb closely, a collocation that would not work in this context. Instead, the adverb deeply might be more appropriate. However, despite the non-native use of the word closely, it still does convey the sense of intensity or the feeling, and thus this incorrect ED word still works somewhat communicatively.

4. Through fifty years, we can obtain the peace, but I wonder that we lost an important mind like patriotic.
The use of the preposition *through* here renders the entire sentence unclear. If, however, the participant intended the meaning of *through the last fifty years*, then the use of the word *through* would be appropriate since, as I gathered from the context of her writing, she meant that during the last fifty years citizens had lost their sense of patriotism.

5. Second, the system of *Self-defense Force* in my country has greatly been changing for fifty years. My grandfather was one of solders at the World War 2.

Participant 4 used the phrase *Self-defense Force* several times in her writing sample, along with the word *military*, which she also looked up in her ED. Because she did use *military* throughout, it can be assumed that there is a separate meaning she was trying to convey by using the term *self-defense force*. This example appears to be a case of the participant attempting to get a direct translation of a term for which there is no direct translation in English.

6. Our government revised the law of military system and couldn't send solders to the other countries for war by constitution. As the result of this change, our generations don't have a patriotic
spirit even though many people in my grandparents’ generation had it greatly.

The use of the word constitution in this sentence is questionable since it generally refers to the document representing rules that govern a country. However, if she instead said because of our constitution or by constitutional law, the use would be acceptable.

Despite the errors discussed above, the participants primarily showed appropriate use of the words they looked up in an ED, as indicated by italics in the following sentences:

1. It has five big wheels and light boots. It also has a highly efficient bearing. This skate is generally very expensive.

2. Second, he is a person of great capacity. He manages a grocery story. The store had got a deficit before he undertook the store. He did a structural reform and it was success.

3. Second, spider man is a rescuer because he rescues people from harm and danger. For example, he helps the police catch criminals or malefactors, but he doesn’t want to be repaid.
4. Finally, he has *gratitude*. Although he doesn’t have parents he loves and respects his uncle and aunt.

5. For example, the road is very special, because when you are on the top of the mountain, it is very cold, and you can see a lot of vegetation, and lagoons. We have around 200 lagoons in this area. When you come down little by little, you can see different climates.

6. For example, during the day, you can go to the beach and meet a lot of pretty girls, and practice a lot of fun water sports, like water skiing and jet skiing. At night, you also have fun things to do. For instance, you can meet girls and go to the beach and make a little bonfire. In Salinas you can also find a lot of varieties of seafood. The taste is very good.

7. Most people believe that our lives have gone better since the World War 2 from several aspects such as technology, welfare, and society. For instance, nowadays most people have own *cell phone equipped* the camera function. (Note: Although the phrase
cell phone equipped is correct, it is missing the preposition with.)

Although the focus for the writing samples was to discover how the participants use words they look up in an ED in their texts, it is also interesting that while the majority of the time words or phrases looked up in an ED resulted in appropriate use, three of the participants exhibited instances in their writing where they used a word or phrase inappropriately that they had not looked up in the ED. For example, Participant 1’s writing sample includes the following (italics indicate word or phrase used questionably):

1. The store had got a deficit before he undertaked the store.

2. When we don’t have ice place, we can play skate.

Participant 2’s writing sample includes the following:

3. [H]e always uses both in the rightway suitable.

Finally, Participant 4’s writing sample includes the following:

4. Many people in my grandparents’ generation had it greatly.

5. I wonder that we lost an important mind like patriotic.
6. Our society hasn't completely improved well for future because we still have serious problems such as military system or pollution even though technology made our lives wealthy.

Despite the belief often held by some teachers that EDs lead to incorrect, non-idiomatic uses of words in students' writing, these results point to a very high percentage (40 out of 47) of words being used appropriately in the writing samples. In addition, the fact that participants made word choice errors without the aid of the ED would seem to indicate that the cause and effect relationship often assumed with ED use may need to be looked at more closely.

Vocabulary Knowledge Assessment

Unfortunately, only Participant 4 was available to complete the assessment portion of the study. The vocabulary assessment was administered one week after Participant 4 had written the writing sample. The assessment was based upon five of the thirty-six words and phrases in her writing sample which she had marked as having been looked up in her ED. It was designed to provide information related to research question 3 as to
the degree to which the participants' use of an ED influences their retention of the vocabulary they look up. The first five words appearing in her text were used for the assessment; they were *technology, welfare, environment, particular*, and *treasures*. She was then asked to match each of the words to its meaning and to then write an original sentence using these five words. I limited the assessment to the five in order to ensure that she could complete these tasks as well as the follow-up interview on the words she had looked up within the 45 minutes she had consented to for his part of the study.

In the matching portion of the assessment, Participant 4 correctly matched the definitions to the words *technology, environment, and treasures*, but switched the definitions of *welfare* and *particular*. However, in the portion of the assessment that asked her to then produce an original sentence using the five words, she wrote sentences that indicated she had an understanding of the meanings for all five words, as seen in the following:

1. *Technology* - our technology has improved rapidly.
2. *Welfare* - I can't live on without welfare.
3. *Environment* - We have to save our environment as far as we live in the earth.
4. **Particular** - I have a particular book about economy.

5. **Treasures** - I found treasures in the island.

Participant 4's confusion over the words *particular* and *welfare* in the matching exercise may indicate that her receptive knowledge of these two words has not quite developed fully. However, looking at her ability to use the words accurately in a sentence, it would appear that she does have at least a basic productive knowledge of all the words.

As a follow-up to the vocabulary assessment, a short interview was conducted with Participant 4 to further discuss her use of an ED, particularly in regards to both her writing sample and her performance on the vocabulary assessment. When asked why she used her ED to look up the thirty-seven words and phrases she had marked in her writing sample, she provided multiple reasons. Although she did not indicate which ones she had looked up for a given reason, she indicated that for some of the words she needed to find an English word to express her desired meaning and for others she was checking the spelling. In looking at her writing sample during the interview, she indicated that:
1. Some of these words [pointing to the word
appliances] I never—I never used. I found my
dictionary.

In explaining how she selected the phrase electrical
appliances, Participant 4 indicated that she entered the
word electrical in Japanese and based on the information
that she was given by the ED, chose appliance as the
appropriate word to use. Based on her response, it may be
that her ED provided her with a collocation for electrical
that included the phrase electrical appliance.

Participant 4 also stated that she looked up the
preposition of to verify that she was using it correctly by
entering the meaning in Japanese to get the English
translation as seen in the following:

2. This one [pointing to of in writing sample], yeah,
I don’t know how to use . . . I typed in meaning in
Japanese.

Finally, Participant 4 also explained her use of an ED
for spelling as follows:

3. I have—my dictionary have special function,
spelling check, so for example . . . I go into
spell check [enters English word incorrectly in
ED].
These responses confirm previous information gleaned from the participant interviews which indicates that the participants use an ED for multiple reasons and purposes, primarily focusing on both understanding the word and being able to use it correctly.

When asked about her level of confidence when using words found in her ED in her writing, Participant 4 stated that she generally believes that the word she selects is the best word to use. One issue that she said is problematic is that there are phrases used in Japanese that are not used in English, which can make translation difficult.

4. Sometimes, I find I can—I cannot translate in English exact meaning. For example, some phrase, sometimes we use in Japanese, but American doesn’t—do not use that phrase. Sometimes we cannot translate exactly.

Finally, she also indicated that at times she uses a word found in her ED even if she’s not sure at all that it is the correct word for a given situation.

5. Sometimes I use the word even I don’t know.
So for this participant, at least, the use of an ED provides opportunities to both learn and experiment with new vocabulary, especially in the context of writing.

Discussion

This study sheds light on how ESL learners use an ED while writing in English (Research question 1). In particular, the four participants who were interviewed indicated that they used the EDs when writing for three main reasons: (1) to translate a word or phrase they want to use in their writing from their L1 to English, supporting Bland et al.'s (1990) findings that second language learners tend to assume that there is a direct translation in English for a word in their L1; (2) to confirm that a word they have used is appropriate to convey the intended meaning; (3) to check the correct spelling of a word which they think they already know and would like to use in their writing but are not sure of the spelling. Participants 1, 2, and 4 also indicated that they use their EDs when they are told that they have used a word incorrectly or inappropriately in their writing to help them find a more appropriate word. Participant 3, however, indicated that he usually tries to ask a teacher or a
family member for a more appropriate word, rather than using the ED further. These findings mirror, in part, those of Hulstijn (1993) in which students used a dictionary to look up words unknown to them while reading. Similarly, participants in the present study used their EDs to look for English words to convey a meaning they wanted to express in their writing.

As to the question of the kinds of words the participants tend to look up in their EDs, a large portion (47%) were nouns or adjectives, the types of words that often carry the most meaning in a sentence. Phrases of various types make up the next largest category, suggesting that second language learners may often use EDs to find collocations or idiomatic chunks in the target language to express their meanings.

Measuring the degree to which the participants experienced any long-term acquisition of the vocabulary they look up in their EDs is a difficult task and one that requires further study to fully address. In particular, because only Participant 4 completed the vocabulary assessment and debriefing interview that followed it, the results in this area are limited, but they offer a window into whether individual learners may acquire vocabulary
through the use of an ED. In looking at the question of receptive and productive knowledge, Participant 4 demonstrated a higher level of productive knowledge than receptive knowledge for the words in the assessment. These results support the conclusions drawn in previous research that while receptive and productive knowledge were once viewed as the two ends of a linear progression in vocabulary learning—starting with receptive and leading to productive—in actuality learners may display both types of knowledge in varying degrees given different contexts and/or tasks (Gass & Selinker, 2001; Hatch & Brown, 1995).

The results of the vocabulary assessment raise an additional interesting question. Even though Participant 4 did the matching portion prior to the section which required her to write an original sentence, the process of writing out the sentences did not fully clarify her confusion over matching the meanings for the words welfare and particular. Indeed, after she had completed both tasks she still asked the interviewer for clarification of the meaning of the word welfare.

Overall the results of this study seem to indicate that, as previous research has found, dictionary use can be a useful tool for second language learners, particularly in
helping them to develop a sufficient lexicon to function both receptively and productively (Luppescu & Day, 1993; Knight, 1994; Laufer & Hadar, 1997). In particular, the writing samples, and the participants’ tendency to use words found in an ED appropriately in their writing approximately 85% of the time, should be seen as indications that ED use can be beneficial while writing.

Implications for the Classroom

These findings may help us reconsider the attitudes of both teachers and students regarding second language learners using an ED while writing. When I initially proposed the research to the teachers in the American Culture and Language Program, they generally responded negatively to ED use. One teacher in particular indicated that he did not allow them in his class and that he could tell immediately which words his students had looked up in an ED. The teachers’ concerns were that students would find a word and just insert it, not taking into account such aspects as the word’s tense, number, gender, connotation/denotation, or word form. However, as the writing samples provided from the participants in this study indicate, by and large, students, even those not yet
at an advanced level, can and do use words they look up correctly in their texts.

Further, rather than assuming that dictionary use is too time consuming to be beneficial, instructors should consider providing instruction on how best to use a dictionary (Luppescu & Day, 1993), and, in relation to this study, how to use electronic dictionaries while writing. Most students are quite proficient in basic use of their EDs and this knowledge could be supplemented with instruction and practice in how to read entries provided by an ED and to determine the appropriate use of a word in their own text.

Discussed below are two activities that teachers could use in their classroom to help student understand how their EDs can assist them in learning and using new vocabulary. **Verbal and Visual Word Association Strategy**

Eads and Cockrum (1985) devised a Verbal and Visual Word Association Strategy to be used to help L1 students in learning vocabulary. It consists of a set of four boxes. In one box the student writes the vocabulary word. In the second box, the students writes a dictionary definition for the word. In the third box, the student writes a personal association they make to that word. Finally, in the fourth
box, the student writes an association of something that is not an example of the vocabulary word. Eads and Cockrum suggest using a modified version for second language learners, who may not have the background knowledge needed to develop a negative example, by exchanging the non-example square with one in which the students draws a graphic representation of a visual association they make with the word. With respect to EDs, this strategy can also help students by providing them an opportunity to use their EDs in an explicit learning activity focused on acquiring knowledge about a specific word. This, then, can help them to see the word in contexts other than the isolated entry found on their EDs. In a variation designed specifically for use with an ED (see Appendix E), in the first box, the student would enter the vocabulary word in English and in their L1. In the second box, the student would enter the information on the word they find in their ED, including related words and possibly collocations, resources not often present in a print dictionary. The third box would allow the student to make a personal association with the word, and in the final box the student would draw some type of graphic representation of the word. Taking the information found in the ED and putting it in the context
of other information the student has about the word can then deepen both the receptive and productive knowledge the student has of that word.

Writing Vocabulary Log

Another strategy that could be helpful would be to have students maintain a log of the vocabulary they look up in their EDs while writing. I have attached a copy of an example of a log (see Appendix F) that could be used by students to help them in learning new vocabulary by using their EDs when writing. First, the students write down the target word, in either English or their L1. They next write out the information on the word they found in their EDs. They then develop their own definition of the word and/or make personal connections with the word. This is followed by writing out the sentence in which they use the word in their text. Finally, a space is provided on the worksheet for them to later reflect on their understanding of the word based upon feedback they get from the teacher, a tutor, or peer on the use of the word. This strategy, like the Verbal and Visual Word Association Strategy, provides an opportunity for the student to think about the vocabulary they are learning on multiple levels, both outside and within the context of their own writing.
Additionally, it encourages reflection and self-correction based on feedback from others on their use of the new vocabulary word in their text.

These are just two proposed strategies for taking advantage of EDs within the classroom writing tasks. Ultimately, however, teachers must decide if they are going to invest time to help students better use a tool that many of them already use. Even those students who are not permitted to use them in the classroom rely on them when working independently. Based on the findings of this study, the response to research question 4 seems to be that, rather than banning EDs from the classroom based on perceptions that they are not helpful, teachers should consider how, with support, they can be used as a beneficial part of their students' vocabulary learning.

Further Research

A longitudinal study of the retention of knowledge about vocabulary which students look up in an ED while writing could be fruitful, especially for informing classroom practice. Additionally, a fuller look at how the use of EDs influences the correct use of words across a larger sample of student writing could be helpful in
guiding classroom practices that focus on vocabulary acquisition and use. Finally, research that evaluates classroom activities that take advantage of EDs would prove helpful in both developing effective teaching strategies and verifying the usefulness of EDs for vocabulary acquisition in a classroom setting.
APPENDIX A

LANGUAGE USE SURVEY
Adapted from: Goen, Porter, Swanson, vanDommelen, San Francisco State University
CCCC 2001: Finding Common Ground: Composition Meets ESL

Language Use Survey

Name

Note: If you are a native speaker of English and do not speak any other languages (excluding those studied in high school or college as school subjects), please answer questions 1-7 only.

1. MY BACKGROUND

1. I was born in the United States Yes _____ No _____

2. I was not born in the United States. I was born in ___________________________ what country

3. I was not born in the United States, but I came here when I was:

   _____ Under 5 years old
   _____ 6-12 years old
   _____ 13-18 years old
   _____ over 18 years old

4. English was the first language I learned to speak. Yes _____ No _____
   If not English, I first learned to speak: ___________________________ what language

5. English was the first language I learned to write. Yes _____ No _____
   If not English, I first learned to write: ___________________________ what language

6. English was the first language I learned to read. Yes _____ No _____
   If not English, I first learned to read: ___________________________ what language

7. I am a native speaker of English. Yes _____ No _____

8. I am a non-native speaker of English. Yes _____ No _____

9. I speak English as a second language. Yes _____ No _____

10. I am an ESL student. Yes _____ No _____

11. I am bilingual Yes _____ No _____

12. I am neither an ESL student, nor bilingual. I am: ___________________________ what best describes your language background

85
II. MY EDUCATION

13. How old were you when you began learning English? ______ years old.

14. How many years have you been learning English? _______ years.

15. Where have you learned English? At home _____ At school ____ Both _____
   Other __________________________________________

16. If you have studied English in school, what grade were you in when you first started learning
   English? ______ grade.

III. HOW I USE LANGUAGE

17. Please list in the chart what languages you know. (Don’t include languages you studied only as a
   school subject.) Tell how well you understand, speak, read, and write these languages by circling
   the appropriate number that corresponds to the following:

<table>
<thead>
<tr>
<th>Language</th>
<th>understand</th>
<th>speak</th>
<th>read</th>
<th>write</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. English</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td>2. ________</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td>3. ________</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td>4. ________</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
</tbody>
</table>
18. Please indicate how much you use any language other than English in the following situations by circling the appropriate number that corresponds to the following:

1 = not at all  2 = less than half the time  3 = half the time
4 = more than half the time  5 = all the time

<table>
<thead>
<tr>
<th>Situation</th>
<th>not at all</th>
<th>less than half the time</th>
<th>half the time</th>
<th>more than half the time</th>
<th>all the time</th>
</tr>
</thead>
</table>
a) talking to my parents | 1 | 2 | 3 | 4 | 5 |
b) parents talking to me | 1 | 2 | 3 | 4 | 5 |
c) talking with my brothers and sisters | 1 | 2 | 3 | 4 | 5 |
d) talking at work | 1 | 2 | 3 | 4 | 5 |
e) talking with friends | 1 | 2 | 3 | 4 | 5 |
f) reading/writing at home | 1 | 2 | 3 | 4 | 5 |
g) reading/writing at school | 1 | 2 | 3 | 4 | 5 |
h) reading/writing at work | 1 | 2 | 3 | 4 | 5 |
i) writing to my friends (e.g., email, letters) | 1 | 2 | 3 | 4 | 5 |
j) reading for pleasure | 1 | 2 | 3 | 4 | 5 |
k) dreaming | 1 | 2 | 3 | 4 | 5 |

19. When I take into consideration all the situations where I use language (my home life, my work life, my social life, my school life, etc.), I would say that, overall, my **best language** is:

________________________
what language

20. When I take into consideration all the situations where I use language (my home life, my work life, my social life, my school life, etc.), I would say that, overall, I am **most comfortable**:

________________________
what language

________________________
what language

________________________
what language
21. How many times do you use your electronic translator per day?

- □ Less than 5 times per day
- □ 5-10 times per day
- □ 10-20 times per day
- □ 20+ times per day

22. Of the total number of times you use your electronic translator, approximately what percentage of these times do you use it to help you while reading? ______% 

23. Of the total number of times you use your electronic translator, approximately what percentage of these times do you use it to help you while speaking? ______% 

24. Of the total number of times you use your electronic translator, approximately what percentage of these times do you use it to help you while writing? ______% 

25. Of the total number of times you use your electronic translator, approximately what percentage of these times do you use it to help you while listening? ______% 

26. What percentage of the time do you type in a word in your native language to find the word in English? ______% 

27. What percentage of the time do you type in a word in English to find the word in your native language? ______% 

28. Once you use your translator, do you save the word or phrase in the electronic translator?

- □ yes
- □ no

29. If you answered no to question 25 above, do you write down words you have looked up with your electronic translator somewhere for future reference?

30. Which do you look up more often, words or phrases?

- □ words
- □ phrases
- □ both the same
APPENDIX B

INTERVIEW QUESTIONS
Interview Questions

1. How often do you use your electronic translator per day? A lot? A little?
2. Why do you use your electronic translator? In what situations do you find it helpful?
3. Have you used a printed bilingual dictionary in the past to help you in learning English? If so, did you use it when reading and writing? Which do you prefer: the printed dictionary or an electronic translator? Why?
4. How does your electronic translator work? Can you show me? What functions does your translator have? Which do you use regularly?
5. At what times when you are writing, if any, do you think that using a translator is helpful? For example, when you organize your thoughts (brainstorming)? Writing a rough draft? Revising?
6. At what times when you are writing, if any, do you think that using a translator is NOT helpful? For example, when you organize your thoughts (brainstorming)? Writing a rough draft? Revising?
7. In what ways, if any, do you think that using a translator is helpful when reading?
8. Do you feel that you have learned more English vocabulary by using a translator while reading? If so, why? If not, why not?
9. Do you feel that you have learned more English vocabulary by using a translator while writing? If so, why? If not, why not?
10. Have you looked up a word to use when writing and later the teacher or a tutor told you that it was not the correct word to use? When that happened, what did you do to find a better word to use? For example, did you ask a friend, a tutor, or the instructor for suggestions?
11. Do you have any other comments or experiences about using an electronic translator that you would like to share?
APPENDIX C:

VOCABULARY KNOWLEDGE ASSESSMENT
Vocabulary Knowledge Assessment

Part One – Matching:

1. Technology ___ a. Riches; valuable objects.
2. Welfare ___ b. Relating to a specific person, idea, or item.
3. Environment ___ c. Science and engineering used in practical applications.
4. Particular ___ d. One’s general condition; well-being.
5. Treasures ___ e. The air, land, water, and surroundings that people, plants, and animals live in.

Part two – Original sentences:

1) Technology

2) Welfare

3) Environment

4) Particular

5) Treasures
APPENDIX D

FOLLOW-UP INTERVIEW QUESTIONS
Follow-up Interview Questions

1. When did you write this paper?

2. Was this your first draft? Was this the first one the teacher saw?

3. Did you look up the words you marked when you were writing, as you were writing?

4. Are there different reasons why you looked up some words? Why did you look each of the words up?

5. When you looked these up, did you enter them in your electronic dictionary in Japanese or English?

6. Does your electronic dictionary ever give you more than one word that would be correct?

7. When you use your electronic dictionary, how confidant are you that you are using the correct word?

8. What do you think the word welfare means?
APPENDIX E

VERBAL AND VISUAL WORD ASSOCIATION STRATEGY
Verbal and Visual Word Association Strategy

<table>
<thead>
<tr>
<th>WORD</th>
<th>GRAPHIC/PICTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Modified from Eeds and Cockrum (1985)
APPENDIX F

WRITING VOCABULARY LOG
<table>
<thead>
<tr>
<th>Word in L1 or English:</th>
<th>Electronic Dictionary Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Explanation (in your own words)/Connections</td>
</tr>
<tr>
<td></td>
<td>Sentence word is used in.</td>
</tr>
<tr>
<td></td>
<td>Feedback</td>
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<td>Feedback</td>
</tr>
</tbody>
</table>
REFERENCES


Goen, Porter, Swanson, & van Dommelen (2001, March). Finding common ground: composition meets ESL. Presented at the Conference on College Composition and Communication, Denver, CO.


