Are Academic English Words Learned Incidentally? A Canadian Case Study

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Abstract

This study at a Canadian university grew out of the need to know whether students acquired academic vocabulary incidentally through text exposure (extensive reading) in class. The ability to explicitly teach all the words on the academic word list is an unreasonable expectation for a one-semester course. This study, therefore, investigated whether thirteen English as an additional language (EAL) students in a capstone foundation course (academic reading and writing) acquired vocabulary simply through exposure to a variety of different academic texts (such as policy papers, essays, journal articles, and book chapters) in class. Students assessed their own vocabulary knowledge and development through Paribakht and Weschke's (1993) *Vocabulary Knowledge Scale (VKS)* at the beginning of the study (Week 3) and again at the end of the semester (Week 13). Results indicated a vocabulary gain for almost all students, even with word exposure frequencies as low as one to four. Further research on incidental academic vocabulary acquisition is needed using other instrumentation to confirm the findings.

Introduction

The important role lexical knowledge plays in an additional language learner's linguistic development cannot be underscored enough. In fact, a number of linguists believe vocabulary development is *the* key to language learning. Lewis (1993), Schmitt (2010), Nation (2006), and Folse (2004)—to name but a few prominent experts—all believe that vocabulary knowledge is central to language acquisition. Wilkins (1972) goes one step further and makes the claim that "…while without grammar very little can be conveyed, without vocabulary *nothing* can be conveyed" (pp. 111-112).

With so much emphasis in the literature on the importance of vocabulary learning, the question to ask, then, is—how is this best done? There are two overarching approaches to teaching vocabulary: explicit teaching of vocabulary items (which is a conscious effort) or incidental acquisition through exposure to words in authentic contexts (an unconscious effort). The latter type of acquisition is not a mindful act but rather a result of natural contact with language (Ellis, 1994). Incidental vocabulary learning tends to take place when learners are able to understand the context of a word in its authentic setting. In the case of academic vocabulary, however, words are often multi-syllabic and abstract in meaning—possibly making incidental acquisition of academic words more difficult than non-academic ones.

When non-native English-speaking students come to universities in English speaking countries, they often lack the academic language needed to succeed (Aldawsari, 2017; Galloway & Jenkins, 2005). This is true for international students at institutions in British Columbia as well (Keefe, 2016). Yet, they are placed by their institutions into high-level academic reading and writing foundation courses to prepare them for entry into university. In some cases, no lists of academic words appear in the syllabi of these courses, leaving instructors to determine which

words, if any, to teach explicitly. With 570 word families on the Academic Word List (Coxhead, 2000), it makes it nearly impossible for a teacher to explicitly teach all the words in one semester. This near impossibility means a good number of academic words *have to* be acquired incidentally by the students. But is this even possible?

The aim of this case study is to determine if English as an additional language (EAL) students in a foundation class at a Canadian university acquire academic vocabulary incidentally through exposure to a variety of academic texts in class.

Literature Review

The incidental learning of vocabulary is widely believed to be linked to extensive reading (Huckin & Coady, 1999; Pigada & Smith, 2006). Before a thorough review of incidental vocabulary acquisition through reading can take place, it is first important to understand what is meant by the act of reading. Since an extensive review of all the existing reading theories is beyond the scope of this paper, only a brief review and definition will be given here. This review is important in that it contextualizes the learning of incidental vocabulary.

According to Johns (2010), the first occurrence of the act of reading and its original purpose remains unknown. However, reading is believed to have originated with the Sumerians thousands of years ago at which time the act of reading referred to many different things: counting, memorizing, reciting, reading aloud, and calculating (Fischer, 2003). But, the definition of reading has changed with the passage of time. What was first understood to be a simple task of interpreting visual information is now understood to be much more complex in nature. At some point in time, the act of reading morphed into more of a process than end result, meaning it became more of an interaction between the reader and text (Alderson, 2000). This interaction moved beyond that of the literal decoding act to include inferencing and critical evaluation. Rumelhart's (1977) interactive model of reading is an example of this. In this model, the literal level of reading is viewed as an automatic operation, like tying your shoe or riding a bicycle. Beyond this, however, lie many other complex processes. In other models (see Klein, Peterson, & Simington, 1991), readers are seen as "strategists" where they engage in a number of different tasks. These include looking at text type, establishing the purpose of the text, and making predictions before, during, and after text interaction. This paper looks at incidental vocabulary acquisition through this lens of reading.

The meaning of incidental vocabulary learning also needs to be examined. Although some linguists make a clear distinction between learning and acquisition (Krashen, 1982), this study will use the two terms interchangeably to mean a change in knowledge, capability, expertise, or behaviour. This definition is fashioned from those originally proposed by Gagne (1977) and Knowles et al. (2015). Incidental vocabulary learning in this study refers to the *unintentional* acquisition of new singular words as a result of reading. It is not the result of direct instruction but simply a by-product of exposure to written discourse. Research shows that much of the vocabulary acquisition that takes place in second language learning is a result of this exposure (Huckin & Coady, 1999).

Although incidental vocabulary learning has already been proven to occur, there are several conditions that need to be in place before it does. Firstly, according to Huckin and Coady

(1999), the reader must have knowledge of between 3000–5000 word families for general English language learning. In the case of academic level learning—as is the focus of this study—students may require knowledge of up to 10,000 word families. Secondly, incidental vocabulary acquisition is known to occur more frequently if students have interest in the texts they are reading (Grabe & Stoller, 1997; Parry, 1993, 1997). Thirdly, it is believed that multiple exposure to a word in context is needed for incidental vocabulary learning to take place. According to Nation (1990), this can be anywhere between five to sixteen exposures. However, Brown (1993) noted the context in which a word appears and its importance within this context plays a much more important role than the number of exposures to a word. Zahar et al. (2001) contended advanced learners of English should spend much of their time reading contextually rich work to broaden their vocabulary. Ideally, students should understand around 98% of a text for incidental vocabulary learning to take place, regardless of frequency of exposure. In a study conducted by Pellicer-Sanchez and Schmitt (2010), however, advanced learners were able to recognize, spell, and recall a good number of words incidentally only after *at least ten exposures* in an authentic text. Stahl (2003) believed the learning of vocabulary through contextual exposure does not occur all at once, but rather incrementally through a number of exposures as well. As readers engage with new words, they slowly begin to understand the meaning of the words. In fact, no real consensus can be found in the literature in terms of the ideal number of exposures to new words. According to Uchihara et al. (2019), the wide variation in the studies can be attributed to a number of factors, including learner variables, different methodologies, and treatment variables in the different studies.

To further support the notion that incidental vocabulary learning takes place through the act of reading, Krashen (1989) drew on the findings of 144 studies. Only two of these, however, focus on second language acquisition. Ferris's study (as cited in Krashen, 1989) had EAL students at the University of Southern California read *Animal Farm*. Ferris found that those who read the book made greater gains in vocabulary than those who had not. Pitts, White, and Krashen (as cited in Krashen, 1989) had similar results to Ferris with the use of *Clockwork Orange* in a university EAL class. In this study, the incidental vocabulary gain was close to 7%.

More recently, Ponniah (2011) conducted a study on adult EAL students at the National Institute of Technology in India. Students were divided into two groups: one group read a short story for comprehension only and one group made use of a dictionary while reading. Post-test results indicated that the students who learned the words incidentally were able to use the newly-acquired words in sentences whereas those who had used a dictionary were generally unable to do so. An earlier study conducted by Kweon and Kim (2008) in Korea on EAL students studying at the Pohang University of Science and Technology showed similar results. In this study, students read three chapter-books without dictionaries or explicit vocabulary instruction. The post-test indicated that a significant number of words were learned incidentally and retained. In fact, the pure word gain rate came in at 40%.

Most of the studies found in the review focused on the reading of literature. Studies on academic vocabulary learning were few and far between. One study (Shin, 2006), however, used selected readings from textbooks instead. This study revealed that only 3.6 out of 40 new words were acquired incidentally. This number seems low in comparison to the other findings. Parry (1991) also used textbooks for her study on a group of four students and found similar results. In

her study, reasonable vocabulary gains were made with the use of an anthropology textbook. Lastly, Vidal (2011) tested EAL students at a university in Madrid, Spain in incidental vocabulary acquisition in both listening and reading. In terms of the reading, students were given academic lectures on tourism in written form. This part of the study involved 80 students. The listening part of the study involved 112 students and used three authentic video-taped lectures on tourism. The control group who partook in neither treatment consisted of 38 students. Results indicated that incidental vocabulary acquisition and retention was greater in reading than in listening. Beyond these studies, not much exists in the literature in terms of English for academic purposes (EAP) students and incidental vocabulary acquisition, particularly in context of Canadian universities. This case study, therefore, aims to fill this gap in the literature.

Methodology

Although a number of ways could have been used to test for incidental vocabulary acquisition, this particular case study used a self-survey scale test. The reason for this choice is that the students rate their own knowledge of a given word rather than the instructor—which is a more student-focused view of analysis. For this reason, this method of investigation was used. The survey scale test used, outlined in detail later in this section, has also been used successfully in previous studies, thereby adding to this study's reliability. In fact, the reliability of the scale has been shown to be 0.89 despite some of its short-comings (Schmitt, 2010). Firstly, the scale is not meant to measure a student's overall lexical knowledge just that of singular words. Nor is it meant to describe how a word is learned. Where the higher levels require a student to produce (verify) knowledge of the word, the lower levels do not. As a result, the researcher needs to trust the student's self-assessment at the lower levels as no verification is possible.

Participants

The participants in this case study came from one academic reading and writing capstone class at a foundation program at a university in the Lower Mainland of British Columbia, Canada. In total, 13 students took part in the study. They were a mix of international students and recently landed immigrants aged 19 to 29—two hailed from India, two from the Middle East, and the rest from China. Their *estimated* levels of English proficiency fell between 5.5 and 6 IELTS in writing, according to the researcher.

Instrumentation

There were two parts to the study, both of which used a tried and tested instrument of measurement created by Paribakht and Wesche (1993): *The Vocabulary Knowledge Scale* (VKS). The VKS measures the degree of word knowledge a student has through a self-perceived reporting format and the use of production questions. It speaks to the notion that vocabulary is developed through various stages, moving from initial word recognition to eventual mastery of use (Waring, 2002). The original 1993 VKS consisted of the following five categories:

I.   I don't remember having seen this word before.
II.   I have seen this word before but I don't know what it means.
III.   I have seen this word before and I think it means ___. (synonym or translation)

IV.   I know this word. It means ___. (synonym or translation)
V.   I can use this word in a sentence: ___.

Level I categorizes what the learner does not know. Levels II–IV measure word recognition and level V measures production.

The original VKS was adapted to the following for the purpose of this study:

I.   I have never seen this word before.
II.   I have seen this word before but don't know what it means.
III.   I have seen this word before and I think it means ___.
IV.   I know this word. Here is a sentence with it: ___.

      The VKS initially set out to measure the knowledge of 15 words found in academic texts. These words were chosen by the researcher/instructor from a variety of texts to be read in class. The words were chosen for their level of difficulty and common usage in academic writing as determined by the researcher/instructor. Academic text types included such things as policy papers, book chapters, essays, and journal articles ranging anywhere between 750–7000 words. A variety of academic texts was chosen to expose students to different formats and prepare them for university courses. There was to be no explicit teaching of these words in the course; students engaged with the material on their own, in groups, or with the instructor in class where approximately 50% of class time was spent working with texts and 50% was spent on writing their own texts. After the pre-test, two words had to be removed from the test due to lack of data (words 8 and 15). The final words analyzed on the VKS were (note the number following indicates frequency of exposure):

      1. factor   (4)
      2. perspective   (3)
      3. emerge   (4)
      4. phenomenon   (3)
      5. substantial   (2)
      6. notable   (2)
      7. theory   (4)
      9. sustainable   (3)
      10. cite   (2)
      11. illustrate   (2)
      12. collective   (1)
      13. significant   (4)
      14. correlation   (1)

      The reason for the limited word choice is two-fold: to counteract test fatigue in students and to limit the class time spent on the test as production questions in level 4 require a significant amount of response time.

Procedures

Students were given the pre-test in week 3 of class and the post-test in week 13. They were not allowed to use a dictionary or thesaurus or speak to one another during the test. Both times, the tests were given at the start of class by the researcher/instructor. Students were exposed to the words to varying degrees through the texts given in class from weeks 4 to 12. Only the texts for the study were used in class between weeks 4 and 12; there was no textbook.

Analysis

The VKS tests were scored using a 1–5 point system, depending on what level the student chose and how he or she performed on the higher levels. The bold explanations under each level was used to assess the students' responses.

1 POINT	I.	I have never seen this word before. **The word is not familiar at all to student.**
2 POINTS	II.	I have seen this word before but don't know what it means. **The word is familiar but its meaning is not known to student.**
3 POINTS	III.	I have seen this word before and I think it means ___. **A correct synonym or definition is given here by student.**
4 POINTS	IV.	I know this word. Here is a sentence with it. **The word is used with semantic appropriateness in a sentence.**
5 POINTS	IV.	I know this word. Here is a sentence with it. **The word is used with both semantic appropriateness and grammatical accuracy in a sentence.**

For example, if a student wrote a sentence using the word in question both semantically and grammatically correct, the score of 5 would be given. If, however, only the meaning was correct in the sentence, then a score of 4 would be given. If the sentence had neither correct, a score of 2 would be given. An example of this can be seen in the following sentence for the word "sustainable," where the student is familiar with the word but does not know its true meaning (as is evidenced by the nonsensical meaning): "The sustainable energy required effort." A sentence such as this, would be graded as a 2 as it makes very little sense. The grading begins at level 5 because the student has written a sentence. But since the word is not used appropriately semantically, it cannot be given a 5 or 4. Therefore, there is no choice but to assign 2 points. A score of 3 is given if a student chooses this level and gives a correct synonym or definition. If the answer is incorrect, then a score of 2 is given. A score of 2 is automatically given if the student chooses level 2. A score of 1 is automatically given if the student chooses level 1. Once the analysis was done and points were assigned, the results in the pre-test and the post-test were compared to see if there was a difference.

Findings

The pre-test results (see Table 1) show the number of points given per word per student. As discussed earlier, the points represent the level of vocabulary knowledge of a given word. Each student also has an average vocabulary point range. For example, Student A has an average of 2.9/5 on vocabulary knowledge. This means, overall, the student has seen the words before but needs to guess at their meanings. In contrast, Student F has an average score of 1.8. This shows his/her vocabulary knowledge is very limited, having seen the words before but not knowing any of their meanings.

Table 1

Pre-test Results

Student	W1	W2	W3	W4	W5	W6	W7	W9	W10	W11	W12	W13	W14	AVG
A	2	5	4	2	2	2	5	2	2	4	2	4	2	2.9
B	4	5	5	5	2	2	2	5	4	2	2	2	1	3.2
C	5	2	2	2	2	2	2	2	2	3	2	5	2	2.5
D	2	5	2	2	2	2	2	3	2	2	2	2	2	2.3
E	5	5	2	2	2	2	5	5	5	5	2	5	2	3.6
F	2	2	2	3	2	1	2	2	1	1	2	2	1	1.8
H	2	2	2	5	2	5	2	2	1	5	2	2	2	2.6
I	5	2	1	5	2	2	5	2	2	1	2	3	2	2.6
J	5	3	2	2	2	2	5	2	5	5	2	2	1	2.9
K	2	5	2	2	2	2	2	5	5	2	2	5	1	2.9
M	5	5	2	2	1	2	5	2	2	5	5	5	2	3.3
N	2	5	5	5	2	2	5	2	5	5	2	5	2	3.6
O	2	5	1	5	2	5	5	2	2	5	2	5	1	3.2
AVG	3.3	3.9	2.5	3.2	1.9	2.4	3.6	2.8	2.9	3.5	2.2	3.6	1.6	

The post-test results are calculated, analyzed, and displayed in exactly the same manner (see Table 2).

Table 2

Post-test Results

Student	W1	W2	W3	W4	W5	W6	W7	W9	W10	W11	W12	W13	W14	AVG
A	2	5	4	5	2	2	5	5	5	5	5	4	2	3.9
B	4	4	2	5	2	5	5	4	5	4	2	2	1	3.5
C	5	2	2	2	5	2	5	2	5	5	2	5	2	3.4
D	2	5	2	2	5	5	4	4	4	5	2	2	3	3.5
E	5	5	2	2	5	5	5	2	5	5	2	5	5	4.1
F	5	5	5	2	5	2	5	2	2	2	2	2	2	3.2
H	4	2	2	5	2	2	5	2	1	5	2	2	2	2.8
I	5	2	3	5	2	2	5	2	3	2	2	5	2	3.1
J	5	3	2	2	2	2	3	2	5	5	2	5	1	3.0
K	5	5	1	2	1	2	4	1	5	2	4	5	2	3.0
M	5	5	2	2	1	2	5	2	2	5	5	5	2	3.3
N	4	5	2	5	2	2	5	2	5	5	2	5	5	3.8
O	5	5	3	2	2	5	5	2	5	5	3	5	3	3.9
AVG	4.3	4.0	2.5	3.2	2.8	2.9	4.7	2.5	4.0	4.2	2.7	4.0	2.5	

Upon comparison, individual student scores showed some significant increases. Student F, for example, scored 18 more points on the post-test than on the pre-test. Student D scored 15 more and Student A 13 more. In fact, all students except for one (who had made no gains at all) showed an increase in points to some degree, ranging from 1 to 18 (see Table 3 next page).

Since these findings show a clear increase in individual vocabulary level gains for almost all students, it can be concluded that academic vocabulary is indeed learned incidentally through the reading of academic texts—at least in the context of this study. Moreover, these gains occurred despite the different frequencies of exposure to the word, which ranged from 1 to 4, a relatively low exposure rate. For example, the word "correlation" (Word 14) only appeared once in the readings, yet six students reported an increase in understanding, with two students jumping three levels. The word "substantial" (Word 5) also saw a jump in levels of understanding, with four students reporting an increase of three points. This word, however, appeared only two times in the readings. A word that appeared four times (significant) saw only one such jump with most remaining students reporting no gains.

Table 3

Individual Student Vocabulary Gain

WORD	A	B	C	D	E	F	H	I	J	K	M	N	O
factor	0	0	0	0	0	+3	+2	0	0	+3	0	+2	+3
perspective	0	-1	0	0	0	+3	0	0	0	0	0	0	0
emerge	0	-3	0	0	0	+3	0	+2	0	-1	0	-3	+2
phenomenon	+3	0	0	0	0	-1	0	0	0	0	0	0	-3
substantial	0	0	+3	+3	+3	+3	0	0	0	-1	0	0	0
notable	0	+3	0	+3	+3	+1	-3	0	0	0	0	0	0
theory	0	+3	+3	+2	0	+3	+3	0	-2	+2	0	0	0
sustainable	+3	0	0	+1	-3	0	0	0	0	-4	0	0	0
cite	+3	+1	+3	+2	0	+1	0	+1	0	0	0	0	+3
illustrate	+1	+2	+2	+3	0	+1	0	+1	0	0	0	0	0
collective	+3	0	0	0	0	0	0	0	0	+2	0	0	+1
significant	0	0	0	0	0	0	0	+2	+3	0	0	0	0
correlation	0	0	0	+1	+3	+1	0	0	0	+1	0	+3	+2
GAINS	+13	+5	+11	+15	+6	+18	+2	+6	+1	+2	0	+2	+8

Discussion

The aim of this study was to determine if academic vocabulary could be learned incidentally through reading various academic texts. Although students had varying scores, all but one increased their vocabulary knowledge level. These findings support other studies that claim incidental vocabulary learning can and does take place through extensive reading—even when using academic texts. The one anomaly in this study was a student who had very little interest in the course and only did the minimal work. Perhaps the lack of interest in the texts/topics/course affected the student's ability to acquire words incidentally. This would support the findings of Parry (1993; 1997) and Grabe and Stoller (1997) which state interest plays an important role in incidental vocabulary acquisition. One noteworthy finding, however, is that some students recorded a negative vocabulary gain score for some words. This indicates that whatever knowledge they originally had of the word was re-examined through the reading of the texts. One word in particular was affected by this: sustainable. One student recorded a drop of three levels of understanding while another recorded a drop of four. According to Green (1989) and

Nagy (1997) this could be explained by the notion that learning a new word is multi-dimensional, not linear on a continuum. Perhaps as words are encountered in new and different contexts, they are re-examined, questioned, and re-defined. The word "sustainable," according to the Merriam-Webster Online Dictionary (2019) has a long and varied history. It first appeared in 1775 and originally meant *maintained over a long period of time without pause.* Now the word has a myriad of meanings and is often featured in environmental discourse. Synonyms for this word now include defendable and justifiable in addition to maintainable. The new exposure to the word "sustainable" (there were three instances) could have prompted students to question the meaning of the word and therefore dropped *down* in levels of understanding, rather than moving up. More research is needed into the processes involved in vocabulary learning to understand the anomaly better.

Conclusion

Although this study was limited in terms of the number of students and vocabulary items to be learned, it does suggest that academic vocabulary can be learned incidentally through the act of reading, even with little repeated exposure. This finding is important for instructors to know as it alleviates the pressure to teach the academic word list to students in their academic English classes. Making students aware of this finding also alleviates pressure on them to learn the word list on their own. Some students, depending on their educational background, were trained to memorize lists of words every day in their home countries. Rote memorization, for example, is a popular way of teaching vocabulary in China. According to Yang and Dai (2011, p. 62) "for most Chinese students, learning English means memorizing a certain number of words a day and reciting as much of the book as possible." Perhaps these findings will allay the fears of both instructors and students that vocabulary must be taught or self-memorized.

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