2017-03-01

Quizlet Flashcards for the First 500 Words of the Academic Vocabulary List

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A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

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ABSTRACT

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The Academic Vocabulary List (AVL) was produced by a rationale for word inclusion improved from the methodology used to generate Coxhead's AWL (Gardner & Davies, 2014). It offers a comprehensive view of high frequency academic vocabulary that could greatly benefit ELLs if implemented into ELL curricula (Gardner & Davies, 2014). However, because of the newness of the list, there are few learning resources currently utilizing the AVL. The major objective of this thesis project was to create digital flashcards for the first 500 words of the AVL to increase the list's accessibility to ELLs and teachers worldwide. These flashcards were made available through *Quizlet's* online interface. This paper describes the two types of flashcards developed: AVL words paired with simplified English (learner) definitions, and AVL words paired with L1 translations into seven languages. It further describes an evaluation of these flashcards by ESOL teachers working at a U.S. intensive English program, and concludes with suggestions for the future development of AVL learning resources.

Keywords: ELL, AVL, academic vocabulary, flashcards, word lists, Academic Vocabulary List, English for Specific Purposes

ACKNOWLEDGEMENTS

I wish to thank the Department of Linguistics and English Language for their gracious financial contribution to this project. I also wish to thank my friends, colleagues, and professors for their feedback, encouragement, and inspiring examples through which I have gained critical knowledge, insight, and motivation. This project would not have been possible without them. In particular, I thank my thesis chair, Dr. Gardner, for his guidance in completing this project, and my thesis committee for their helpful suggestions and advice.

I am very thankful to my husband, whose programming expertise automated processes in this project that otherwise would have consumed countless extra hours. His technical support was eclipsed only by his moral support, for which words of gratitude do not suffice.

Finally, I thank my parents, whose belief in and support of me has been foundational to this and every other endeavor in my life.

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CHAPTER ONE

INTRODUCTION

From the outset of any attempt to understand the nature of English language learning, one almost necessarily gives pause at the enormity of the task of acquiring competence with the English lexicon. This is keenly felt by the increasing numbers of English language learners (ELLs) endeavoring to undertake academic studies in English. It is estimated that the average high school senior knows about 80,000 words (Anderson & Nagy, 1992). Efforts to grapple with this number in preparation for English academic study beg the question: Which of these words are the most frequent and thus likely the most important for academically-aspiring ELLs to know?

Researchers have attempted to provide answers to this question in the form of vocabulary lists of words that are frequently present in academic texts. Among such lists is Coxhead's Academic Word List (AWL), which represents the top 570 word families in an approximately 3.5 million-word corpus (Coxhead, 2000). While this widely-adopted list has provided valuable guidance in the identification of highly frequent academic words, Gardner and Davies (2014) have more recently presented a new list, known as the Academic Vocabulary List (AVL). Their list offers improvement from the AWL in several significant ways. Through advances made in electronic corpora, a much larger corpus was used to create the AVL than any corpus available at the time of the AWL's conception (Gardner & Davies, 2014). Additionally, Gardner and Davies chose to use lemmas (word forms and their inflections) rather than word families (word forms with their inflectionally and derivationally-related forms) in determining word frequency. The AVL also stands independently from any other previously created lists, unlike the AWL, which was built on top of the General Service List (GSL) (Coxhead, 2000; Gardner & Davies, 2014).

Because the AVL is relatively new on the English language learning and teaching scene, there remains great need for resources to help teachers and learners utilize it. Nation & Webb (2011) stated that one of the most obvious reasons for current widespread use of the AWL is that it is "readily available in a variety of formats" (p. 534). Increasing the number and availability of such materials for the AVL would likely make the adaptation of this newer list into curricular and classroom considerations more feasible for programs and teachers with limited time and resources.

The present thesis project was undertaken to address this need by creating freely available and easily accessible digital flashcards for the first 500 words of the AVL. *Quizlet* was chosen as the host platform for these flashcards. Two types of flashcards were created: (1) flashcards with the AVL definition on one side and a simplified English (learner) definition on the other, and (2) flashcards with the AVL word on one side and an L1 translation on the other. Eight sets of flashcards were created of the latter type for seven languages—one set for each of six languages, and two sets for Mandarin Chinese (one set for traditional Chinese characters, and one set for simplified Chinese characters).

This new AVL tool can be utilized for individual or classroom study in a variety of interactive formats provided by *Quizlet's* online interface. It provides support to those who would like to use the AVL for learning and teaching English, and is a contribution to a growing body of AVL resources that will help ELLs learn many important words needed to succeed in academic settings.

CHAPTER TWO

REVIEW OF LITERATURE

Content Rationale

Academic Language and Vocabulary. Assisting ELLs to successfully read, comprehend, and produce academic text has been the focus of much research. In attempting to understand the unique linguistic challenges facing ELLs in academic settings, experts have noted that there are characteristics common to academic texts which are not often encountered in social conversation. They have suggested that there is an academic language, or a language of schooling (Corson, 1997; Nagy & Townsend, 2012; Snow & Uccelli, 2009). These experts agree that one of the unique features of academic language is its vocabulary, and that facility with this vocabulary is vital to academic success. Academic vocabulary has been widely discussed in terms of general academic vocabulary, or vocabulary common to all disciplines, and discipline-specific vocabulary (Nagy & Townsend, 2012).

The development of general academic word lists. In an attempt to identify which words should be deemed general academic vocabulary, several word lists have been developed, each with its own methodology for including certain words and excluding others. Some of these lists are collections of words that researchers compiled from ELLs' textbook annotations (Ghadessy, 1979; Lynn, 1973). However, the more influential approach to creating these lists became counting word frequencies in collections of varied academic texts (Campion & Elley, 1971; Coxhead, 2000; Gardner & Davies, 2014; Praninskas, 1972). The first lists were limited in their scope because all text analysis had to be completed by hand. After several lists had been developed, Xue and Nation (1984) analyzed and compiled them to form a meta-collection of general academic vocabulary that they called the University Word List (UWL). This list became

popular, but it was affected by the limitations of the lists from which it had been built, and because it was created from several different lists, it lacked a unifying methodology for word inclusion (Coxhead, 2000). As advances in technology made the creation of larger digitalized collections of text (electronic corpora) possible and their analysis much less tedious, more sophisticated methodologies were developed to create lists representative of a higher percentage of words in a wider range of texts. Using a larger and more balanced corpus of academic texts than had been used to create previous lists, Coxhead (2000) developed the Academic Word List (AWL). Coxhead's (2000) study in which the AWL was unveiled demonstrated that although the AWL was a smaller list than the UWL, words from the AWL accounted for 10% of the words in her academic corpus, while the UWL accounted for only 9.8%. Because of its advantages over previous lists, the AWL became a very widely used list, and it continues to be prominent in academic vocabulary teaching and learning today.

From the AWL to the AVL. Since the AWL's inception, experts have confirmed a significant presence of AWL words in varied academic texts. Vongpumivitch, Huang, and Chang (2009) report 11.5% coverage in a corpus of applied linguistics texts; Ha (2015) and Li and Qian (2010) report 9.85% and 10% coverage respectively in finance corpora; Chen and Ge (2007) report approximately 10% coverage in a corpus of medical research articles; and Martínez, Beck, and Panza (2009) report 9.06% coverage in a corpus of agricultural articles. However, as the AWL has been used and evaluated by many experts and educators, some have challenged aspects of the AWL's methodology. One criticism of the AWL is that word frequencies were calculated on the basis of word families, which means that a word form with all derivationally and inflectionally related forms in all parts of speech were counted as one word (Gardner & Davies, 2014; Nagy & Townsend, 2012). This was done on the basis of the assumption that knowledge

of one word in a word family is enough to intuit the meanings of the others. However, while this may be true in the cases of some word family relationships, there are many for which this is likely not true (Gardner & Davies, 2014; Nagy & Townsend, 2012; Newman, 2016). For example, in AWL Sublist 1 the headword *consist* is found. Included in this word family is *inconsistency*. Knowledge of one of these words seems unlikely to lead to an understanding of the meaning of the other. If it is true that words within words families such as *consist* and *inconsistency* must in reality be learned separately by ELLs, understanding their relative frequencies distinct from one another would seem more useful in deciding which should be learned first, or at all. Hyland and Tse (2007) point out that this difficulty is further compounded when the multiple meanings of words across disciplines are considered.

An additional criticism of the methodology used to develop the AWL is that it deliberately excluded words appearing on the General Service List or GSL (West, 1953)—an already-existing (non-academic) word list (Gardner & Davies, 2014; Nagy & Townsend, 2012). This is problematic because many words on the GSL are also words with significant academic meaning; a previously created frequency list designed for general purposes should not delimit what words are considered academic vocabulary. And while instruction could encourage mastery of the GSL before the AWL, requiring this of ELLs would mean time spent learning many words unimportant to academic language (Gardner & Davies, 2014).

To create an improved general academic word list that addressed concerns with the AWL, Gardner and Davies (2014) developed a new frequency-based methodology and with it a new list, which they termed the Academic Vocabulary List (AVL). The corpus they used to create the AVL was the academic portion of the Corpus of Contemporary American English (COCA) (Davies, 2008)--a corpus nearly 35 times larger than that used to create the AWL

(Gardner & Davies, 2014). To address concerns with counting words as word families, Gardner and Davies counted words as lemmas. A lemma is a base form and words related to the base form by part of speech and inflectional morphology only. This means that the word forms *consist*, *consists*, *consisted*, and *consisting* could all be considered the same word (lemma), because these are all inflectional forms of the same verb, *consist*. However, *consist* and *inconsistency* would not be considered the same lemma, because they are different parts of speech and are related only derivationally. Gardner and Davies also chose to build their list independently from any other previously created word lists. In order to eliminate high-frequency non-academic words from their list, they included words occurring 50% more frequently in their academic sub-corpus than in the non-academic portion of COCA. In order to eliminate technical (specialized) academic words, they used several dispersion statistics to ensure word coverage across a wide range of disciplines, rather than in one or two disciplines only. This methodology resulted in the AVL—a list of 3,015 core academic lemmas.

In order to compare the AVL's coverage of academic text to the AWL's, Gardner and Davies organized their list into word families to match the word family structure of the AWL. They used only the top 570 AVL word families to match the AWL's 570 word families. Their analysis of the academic sub-corpus of COCA and the British National Corpus (2007) revealed that the top 570 AVL families had nearly twice as much coverage as the AWL in both corpora. Other studies have also confirmed potential advantages of the AVL over the AWL; Newman (2016) analyzed a corpus of academic textbooks and found that the AVL covered 13.40% of the total text compared to the AWL's 6.67%. In a different type of analysis, Olsson (2015) tracked the number of academic words ELLs used in their writing over time using two instruments--the AWL and the AVL. She concluded that "the AVL appears to be a more extensive and finely

tuned instrument than the AWL for the purpose of investigating progress in students' use of academic vocabulary" (p. 67).

The AVL's superior coverage of academic text is what drives the current thesis project. While there are many digital and paper-based resources for learning words on the AWL, there are not nearly as many resources currently available for the AVL. Because the AVL is the next step in defining core academic vocabulary after the AWL, this thesis project creates a resource to increase its accessibility.

What general academic words lists are not. Although many experts agree that general academic vocabulary deserves the attention of scholars, curriculum developers, and teachers because of its impact in ELLs' preparedness to succeed academically, there are also those who have questioned the usefulness of the construct of a general academic vocabulary. Most notably, Hyland and Tse (2007) have argued that what is considered to be general academic vocabulary as defined by the AWL has too much meaning variation within word families and across disciplines to be considered a core academic vocabulary, equally beneficial to ELLs in all disciplines. Furthermore, they suggested that AWL words do not occur frequently in some disciplines compared to others, and that focusing on AWL study for ELLs in these disciplines would not be effective. They instead suggested that discipline-specific vocabulary lists should be used. Likewise, Martinez et al. (2009) have argued for a move away from general academic vocabulary lists in favor of a discipline-specific list for ELLs in graduate study setting who need to quickly develop English vocabulary in their areas of research.

Some of the criticisms of a general academic vocabulary were mitigated by the introduction of the AVL, but there remain those that still take issue with the idea of a general academic vocabulary (e.g. Durrant, 2016; Huang, Chen, Tsau & Wibley, 2015). In this

researcher's view, data from these studies does not suggest that the notion of a general academic vocabulary is not useful or valid, but rather that lists such as the AWL and AVL are not designed to be employed in the same way and with the same emphasis in all academic English programs or courses of study. That they are not of equal value to all does not mean that they are not of significant value to many. Studies challenging the notion of a general academic vocabulary serve as good reminders that tools such as the AWL and AVL should not be utilized as major elements of any curriculum unless warranted from actual analyses of the texts and tasks that the target learners must be prepared for (Gardner, 2013), and externally-developed vocabulary lists of any kind should be viewed as primarily facilitative rather than prescriptive in curriculum development.

Delivery Rationale

Incidental versus deliberate vocabulary learning. Much language learning research has compared the effectiveness of deliberate versus incidental approaches to vocabulary learning. These comparisons are important for second language teachers and learners because deliberate vocabulary learning activities and incidental learning activities differ. Deliberate learning occurs in an activity whose primary objective is to intentionally learn vocabulary. Direct, teacher-fronted instruction about a word would be an example of a classroom practice designed to promote deliberate vocabulary learning (Gardner, 2013). Using flashcards to engage in a word-learning activity is another example (Gardner, 2013). In contrast, incidental word learning occurs in the context of an activity that is not specifically focused on learning vocabulary. It is often approached in research through L2 reading activities, particularly extensive (out-of-class, high volume, low difficulty) reading, although it has also been researched in other language learning classroom activities (Hulstijn & Laufer, 2001).

Researchers have not always agreed about which learning approach should receive greater focus. This has impacted how deliberate vocabulary learning activities have been viewed. One criticism of deliberate learning has been that the explicit knowledge gained from this type of learning is a different type of knowledge than the implicit knowledge gained from incidental learning, and that explicit knowledge about words does not necessarily help learners productively use them in context (Nation, 2013). However, Elgort (2011) concluded through an examination of priming effects that mental representations of L2 words learned exclusively in a deliberate learning context do not seem to differ from the mental representations of other known L2 words. This suggests that words learned deliberately can be accessed and integrated into L2 production just as words learned in other ways. Another criticism of deliberate learning is that it cannot cover all the words language learners must acquire (Nation, 2013). This is likely true; however, incidental learning has been shown to be even less time efficient in terms of vocabulary gain (Mondria, 2003). For these reasons, a balance of both types of vocabulary learning has been advocated (Nation, 2013; Schmitt, 2000).

What is the appropriate balance of incidental and deliberate learning? This is an area in which more research is needed (Chacón-Beltrán, Abello-Contesse, & Torreblanca-López, 2010). Academic vocabulary learning in particular may deserve special consideration because academic words are not the core high-frequency words of the language; as a result, they may not be as frequently encountered in activities common to incidental vocabulary learning (Corson, 1997; Worthington & Nation, 1996). For this reason, deliberate learning activities in which academic words can be targeted may play a larger role in the optimal balance of deliberate and incidental learning for ELLs with an academic focus.

Flashcards as a vocabulary learning tool. Flashcard use in L2 vocabulary learning is a deliberate learning activity. As such, its effectiveness has been compared to other deliberate vocabulary learning activities. In particular, words presented in a list format offer an interesting comparison because both activities provide similar information to the learner (paired-word associates), but with different delivery. Studies comparing the effectiveness of words lists to flashcards have consistently shown flashcards to be more effective (Kuo & Ho, 2012; Nakata, 2008). Reasons for this may be largely due to the flexible presentation order of flashcards; the order of words can be varied with flashcards so that learning based on one presented word order does not occur (Nation, 2013). Additionally, flashcards allow learners to spend more time reviewing words they have difficulty with while setting known words aside (Nakata, 2008). This characteristic of flashcards, along with their usually convenient size, also makes them prime tools in spaced repetition, an effective word memorization technique (Nation, 2013). A last reason for interest in the flashcard may be that students prefer them. In Kuo and Ho's (2012) study of Taiwanese junior high school students using flashcards and word lists, 70 percent of students assigned to use flashcards said they would continue to do so after the study's conclusion. Only 50 percent of the students who were asked to use word lists in the study said that they would continue using the word list method.

Monolingual vs. bilingual learning mode. Vocabulary learning tools can be designed in a monolingual or a bilingual learning mode. In a monolingual learning mode, information is presented only in the learner's L2, whereas bilingual mode involves both the L1 and L2. Most of the research about monolingual vs. bilingual vocabulary learning has come from the use of L1 and L2 glosses in incidental vocabulary learning. Research in this area has been inconclusive regarding which type of gloss produces better vocabulary retention. Some studies have suggested

no significant difference in vocabulary retention of L2 vocabulary learners using L1 glosses versus those using L2 glossses (Yoshii, 2006). Others have shown that L1 glosses produce better retention for lower proficiency learners, while L2 glosses produce better retention for higher proficiency learners (Hu, Vongpumivitch, Chang, & Liou, 2014; Watanabe, 1997).

Flashcards can also be designed in either monolingual or bilingual learning mode. Monolingual flashcards display the target L2 word (the word to be learned) on one side and an L2 definition on the reverse side. This means that the entire flashcard, front and back, is in the learner's L2. In contrast, bilingual flashcards display the target L2 word (the word to be learned) on one side and an L1 translation on the reverse side. Elgort and Piasecki (2014), in the only study known to this researcher comparing the effectiveness of monolingual vs. bilingual flashcards, did not offer any clearer suggestions regarding which learning mode was most beneficial for learners. They examined formal-lexical (orthographic) and lexical semantic priming effects with words learned through the use of bilingual flashcards and compared these results to Elgort's previous study (2011) examining these priming effects with monolingual flashcards. They found that formal-lexical priming effects for words learned with bilingual flashcards did not differ from those learned with monolingual flashcards. That is, there was evidence that the mental representations of the orthographic form of the learned words were represented in learners' minds similarly for words learned with bilingual flashcards and monolingual flashcards. However, lexical semantic priming effects differed between the studies. Learners with lower proficiency in their L2 did not develop lexical semantic representations of words when using bilingual flashcards, but learners with higher proficiency in their L2 did. This finding contrasted with Elgort's (2011) previous study with monolingual flashcards in which lexical semantic priming occurred with participants of all proficiency levels. All of this together

suggests the very opposite of studies such as Watanabe (1997) and Hu et al. (2014) in their work with L1 versus L2 glosses, and instead indicates that low proficiency L2 learners may benefit more from learning new words from definitions in their L2 than higher proficiency learners, who may benefit equally from learning from an L1 translation.

Yoshii (2006) suggested that the apparent contradictions in research regarding monolingual versus bilingual learning mode may be resolved with more careful consideration of the instruments used in assessing retention. It may be true that L1 translations and L2 definitions favor the retention of various aspects of vocabulary knowledge that have not been well controlled for in previous studies. It is clear that more research needs to be done to more clearly understand the potential benefits and drawbacks of monolingual and bilingual learning modes in L2 vocabulary learning. Accounting for variability in the research about what language learning mode best serves ELLs, this thesis project included two flashcard learning modes: (1) monolingual learning mode, through flashcards with AVL words on the fronts with English definitions on the reverse sides, and (2) bilingual learning mode, through flashcards with AVL words on the fronts with L2 translations on the reverse sides.

Flashcards and CALL. Vocabulary has been a focus within CALL (computer-assisted language learning) since its beginnings (Warschauer & Healey, 1998). Drills were strongly emphasized in language teaching paradigms in the 1960's and 1970's when CALL began, and these types of activities are easily managed with simple programming (Warschauer & Healey, 1998). Although there has been movement away from a drill-only application of technology in language learning toward exploring the communicative potential of technology (Warschauer & Healey, 1998), flashcard technology solutions continue to be popular with language learners and teachers, and many tools have been developed to offer these. Some are specifically designed for

language learning, while others are often used for language learning but were created for more general purposes. Many of these digital flashcard tools have been developed with capabilities beyond what is possible with paper flashcards (Nakata, 2011).

Quizlet. *Quizlet* is one of the most well-known technology-based flashcard tools, and is available in browser-based and mobile app versions, with 40 million users per month (*Quizlet*, n.d.). Although not designed specifically for language learning, it has many features that make it language-learning friendly. Nakata (2011) formed a list of criteria for evaluating digital flashcards from a review of 17 studies on flashcard learning. Table 1 summarizes this researcher's analysis of *Quizlet's* performance in each of the areas identified by Nakata. Nakata used the criteria he developed to analyze several flashcard tools, including *Quizlet*. Of these, he determined that the tool *iKnow!* met the most of his criteria. However, *iKnow!* currently requires users to pay for its service, making it a much less accessible tool than *Quizlet*, which is free with optional paid upgrades available. Nakata did not name a second-best tool in his study, but he found that *Quizlet* met the majority of his criteria. Since the time of his study, *Quizlet's* functionality has been further developed.

In Language Learning Research. Although *Quizlet* is widely used for language learning, little formal research has been conducted evaluating the use of *Quizlet* for English vocabulary learning purposes. Imrie (2014) investigated whether a class of Japanese university students studying English would perform better on a vocabulary exam after using *Quizlet* to study 100 target words selected from the semester's coursework than a similar class of students using paper flashcards. Three classes of intermediate students with no statistically significant difference in scores on Nation's (2007) Vocabulary Size Test were given the 100-word list at the beginning of the semester and told that they would be tested on these words at the end of the semester.

Table 1
Quizlet's Performance on Nakata's (2011) Digital Flashcard Criteria

Criteria (Nakata, 2011)	Met by *Quizlet*	Unmet by *Quizlet*
Flashcard creation: Can learners create their own flashcards?	X	
Multilingual support: Can the target words and their translations be created in any language?	X	
Multi-word units: Can flashcards be created for multi-word units as well as single words?	X	
Types of information: Can various kinds of information be added to flashcards besides the word meanings (e.g. parts of speech, contexts, or audios)?	Images and audio supported	
Support for data entry: Does the software support data entry by automatically supplying information about lexical items such as meaning, parts of speech, contexts, or frequency information from an internal database or external resources?	Meaning supported in many languages	
Flashcard set: Does the software allow learners to create their own sets of flashcards?	X	
Presentation mode: Does the software have a presentation mode, where new items are introduced and learners familiarise themselves with them?	X	
Retrieval mode: Does the software have a retrieval mode, which asks learners to recall or choose the L2 word form or its meaning?	X	
Receptive recall: Does the software ask learners to produce the meanings of target words?	X	
Receptive recognition: Does the software ask learners to choose the meanings of target words?	X	
Productive recall: Does the software ask learners to produce the target word forms corresponding to the meanings provided?	X	
Productive recognition: Does the software ask learners to choose the target word forms corresponding to the meanings provided?	X	
Increasing retrieval effort: For a given item, does the software arrange exercises in the order of increasing difficulty?		X
Generative use: Does the software encourage generative use of words, where learners encounter or use previously met words in novel contexts?		X
Block size: Can the number of words studied in one learning session be controlled and altered?	X	
Adaptive sequencing: Does the software change the sequencing of items based on learners' previous performance on individual items?	X	
Expanded rehearsal: Does the software help implement expanded rehearsal, where the intervals between study trials are gradually increased as learning proceeds?		X

Class 1 was instructed to use *Quizlet* to study the words, Class 2 was instructed to use provided paper flashcards, and Class 3 served as a control and was not instructed about how to learn the words. At the end of the semester, the students in all three classes were tested on their knowledge of the 100 target words. Class 1, who had studied using *Quizlet*, scored an average of 97% on this test; Class 2 scored an average of 69%, and Class 3 scored an average of 56%. Surveys of the students revealed that the students in Class 1 studied the words most frequently, with an average of 2 times per week, while the students in Class 2 studied the words only an average of once every two weeks. Class 3 studied the words least. While this study was limited in its number of participants and in its generalizability to other groups of learners, it provides preliminary empirical insight into the potential benefits of using *Quizlet* for vocabulary learning.

Overview of Current Functionality. *Quizlet* users can search for existing flashcard sets and interact with them without having a *Quizlet* account. Figure 1 is a screenshot of the browser-based version of the search page. To save their progress in activities with a flashcard set, as well as to make an editable copy of a set, users must create a free account.

With an account, users can also create their own sets. Figure 2 shows the browser-based version of the flashcard set creation page. Sets can be designated as editable by only one user, or they can be created collaboratively with other users.

Once an existing set is imported or a new set is created, users can choose from a variety of activities on the set landing page to help them learn the words in the set. On this and on other pages, users can star words that they would like to set apart and study separately in the set. They can also see statistics about their progress with individual words in the set. *Figure 3* is a screenshot of the browser-based version of the set landing page.

On the *Flashcards* page, Users can review the words as they would review paper flashcards. Figure 4 is a screenshot of the browser-based version of the *Flashcards* page. Options include audio on/off if audio was included by the card creator or if *Quizlet* supplies audio for the language of the flashcard text, and a choice about which side(s) of the card to display. If the user chooses to display only one side of the cards, the other side of a card can be shown by clicking.

On the *Learn* page, users see one side of the card and are asked to type the text of the other side. *Figure 5* is a screenshot of the browser-based version of the *Learn* page. A tally is kept of correct and incorrect responses. Cards for which a user supplies an incorrect response will reoccur more frequently until the user can successfully supply the correct text.

On the *Spell* page, users hear the audio (if available) of one side of the card and are asked to correctly type what they hear. Users are able to see the other side of the card as they complete this activity. *Figure 6* is a screenshot of the browser-based version of the *Spell* page. Users are able to select which side of the cards they would like to use to practice correct spelling.

The *Test* page automatically creates a test using the terms from the flashcards. *Figure 7* is a screenshot of the browser-based version of the *Test* page. Three types of questions are generated: fill-in-the-blank, multiple choice, and true-false. After completing the test, users can review their performance.

Users can also play games to help them practice flashcard sets. *Figure 8* is a screenshot of the browser-based version of the *Match* page. On the *Match* page, users drag corresponding sides of flashcards in a set together to make them disappear. The object is to make all of the tiles disappear as quickly as possible.

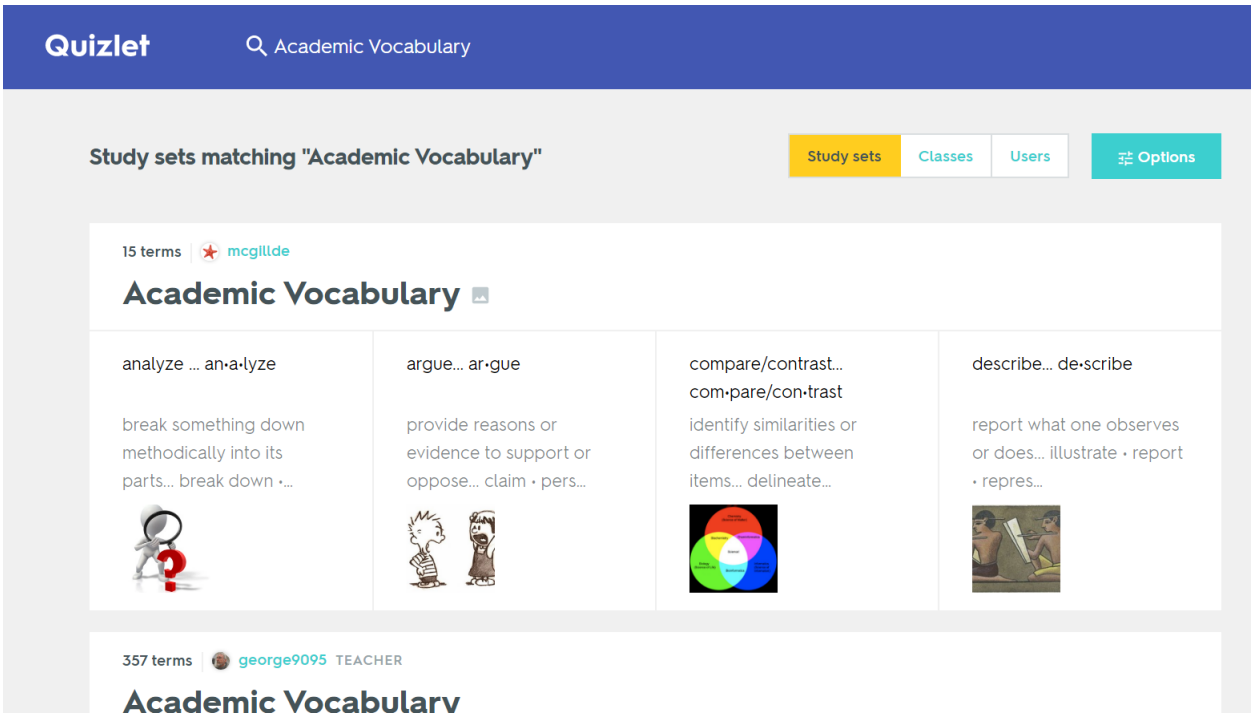

Figure 1. Quizlet's search page for existing flashcard sets.

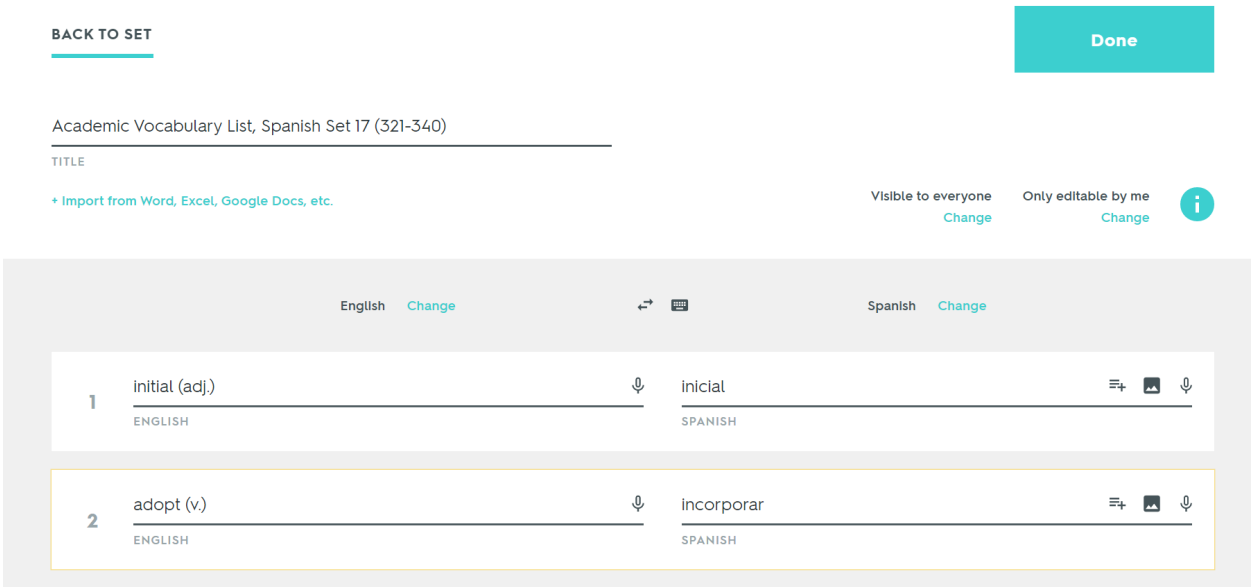

Figure 2. Quizlet's flashcard creation page

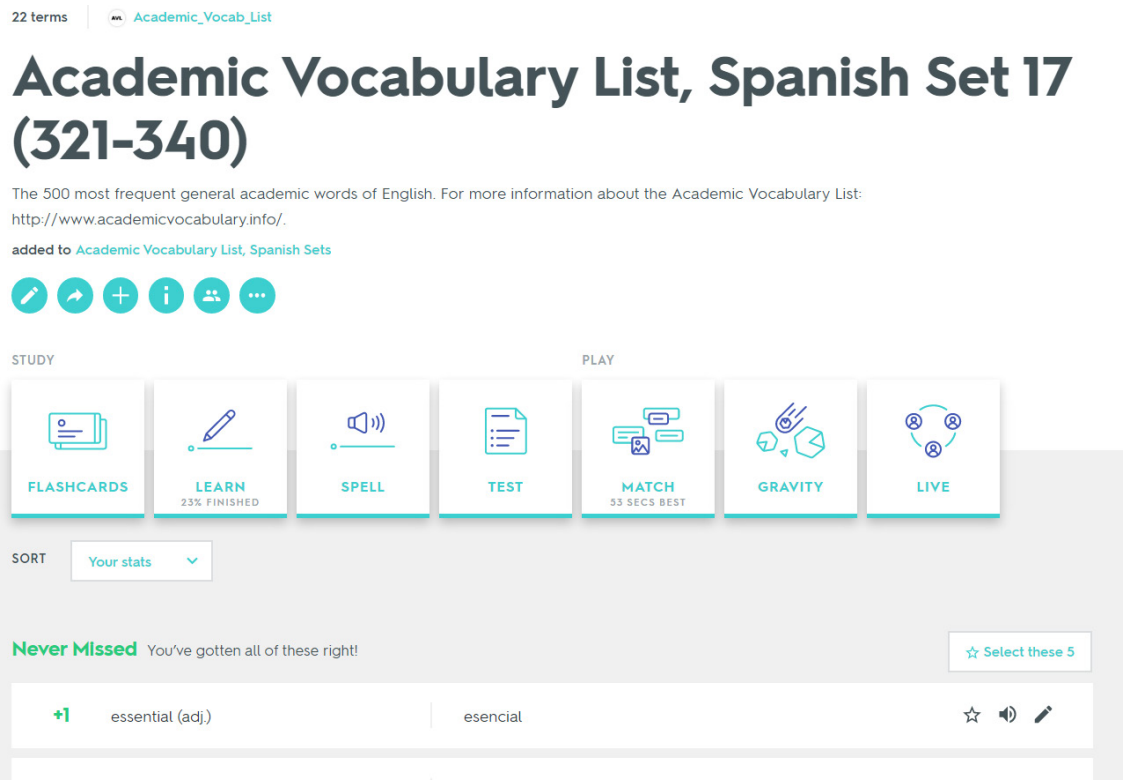

Figure 3. *Quizlet's* flashcard set landing page

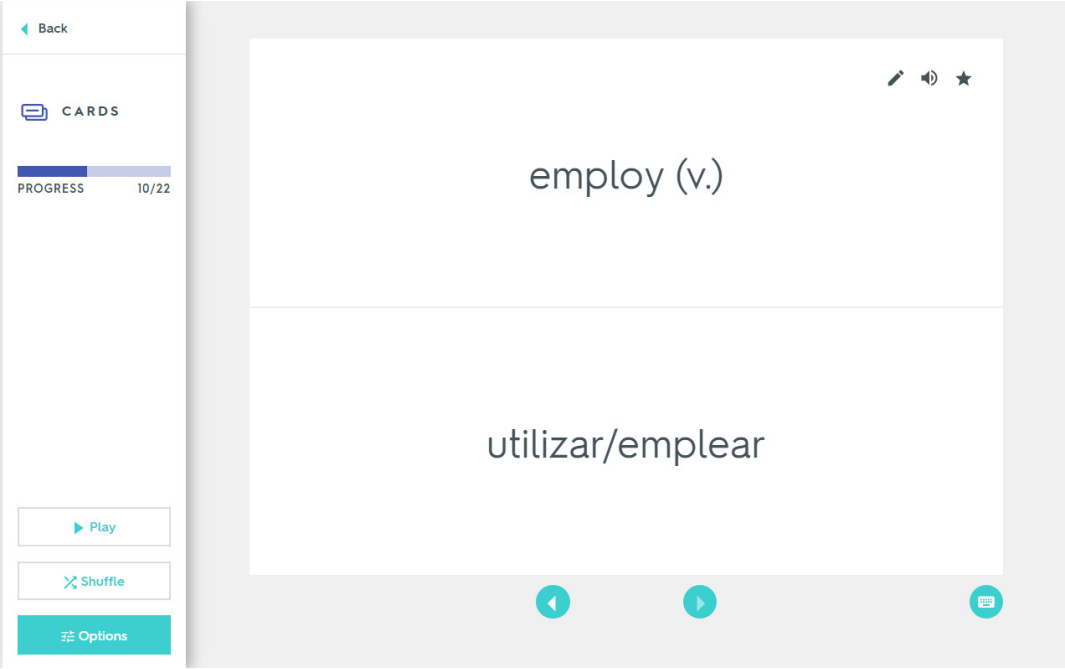

Figure 4. *Quizlet's Flashcards* page

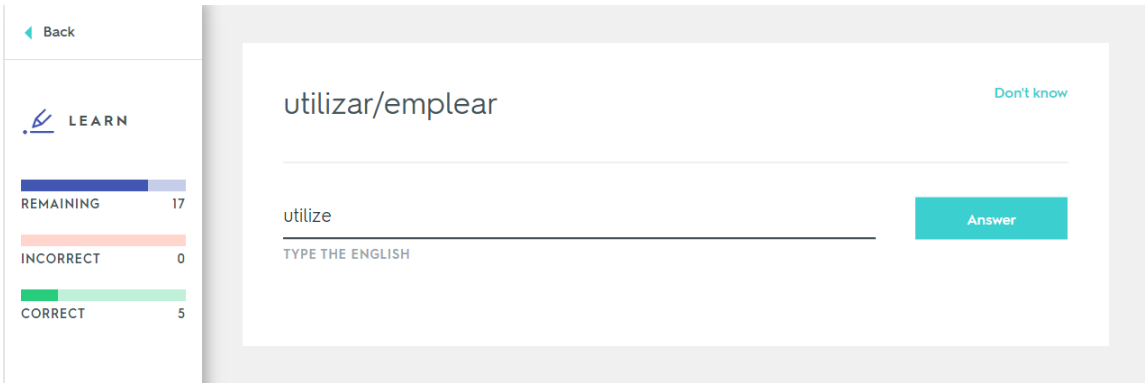

Figure 5. Quizlet's Learn page

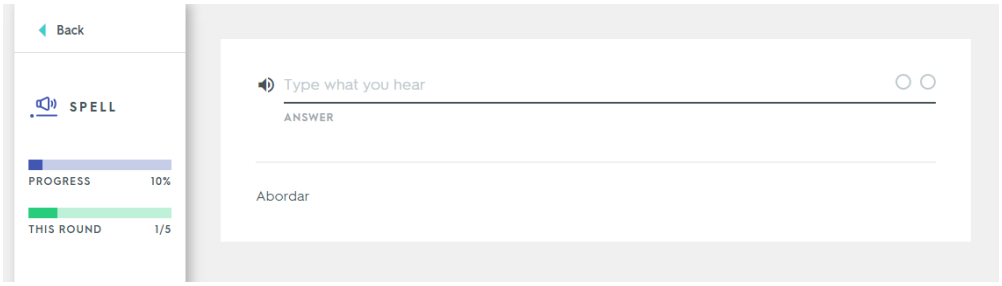

Figure 6. Quizlet's Spell page

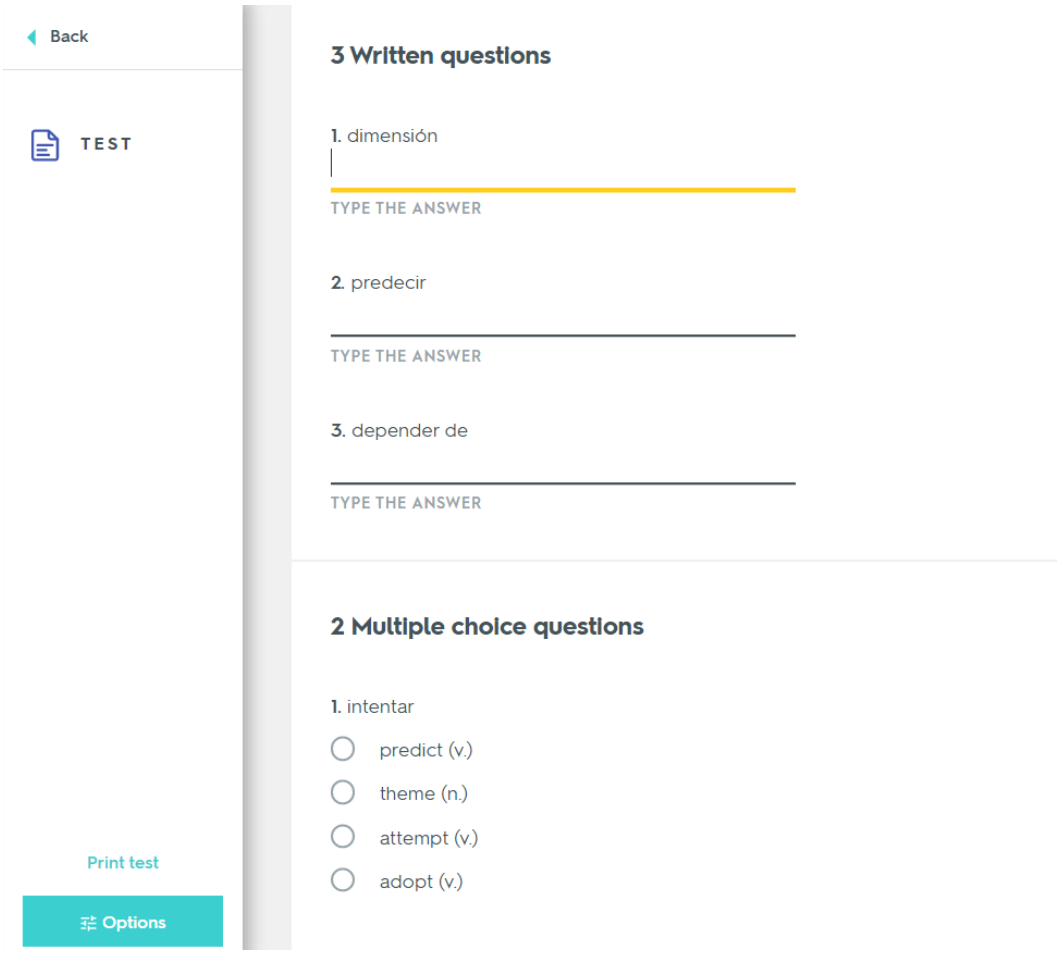

Figure 7. Quizlet's Test page

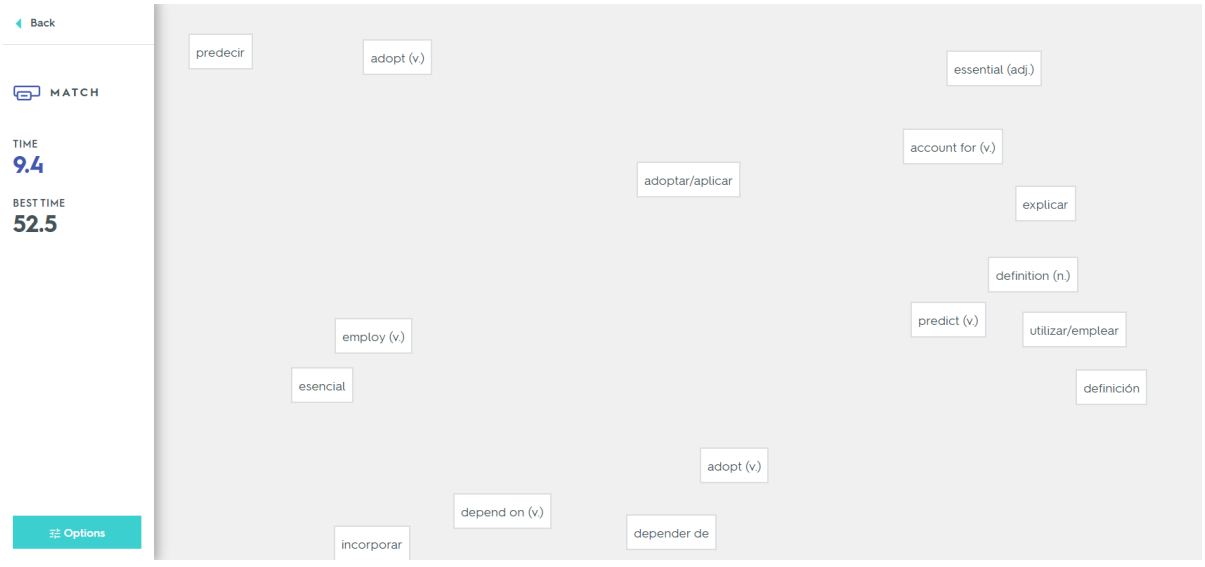

Figure 8. Quizlet's Match page

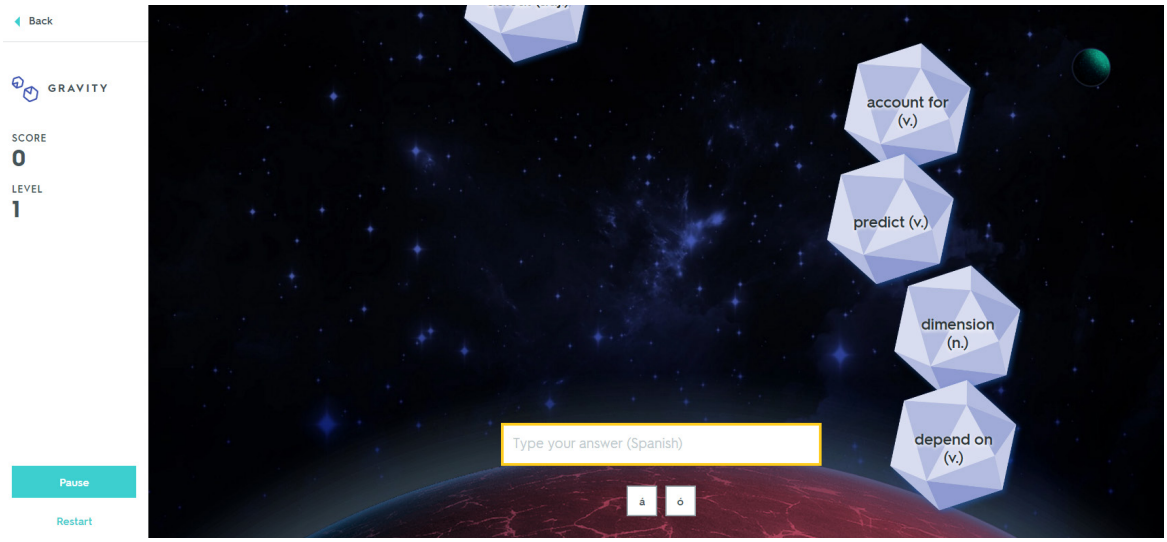

Figure 9. *Quizlet's Gravity* page

On the *Gravity* page, users must correctly type the opposite side of the card for terms that are falling on asteroids to destroy them before they hit the planet. *Figure 9* is a screenshot of the browser-based version of the *Gravity* page. As a user progresses in the game, the asteroids drop more frequently and quickly. Users are awarded points as they destroy the asteroids, and the object of the game is to accrue as many points as possible.

Quizlet's newest feature is a live classroom activity, designed to be initiated by an instructor, in which teams of students work together to supply the correct match (the other side of the card) for a displayed side of a card. Players each have four cards with one side displayed, and team members cannot see each other's cards. A side of one card is displayed to all team members, and team members must decide whether they have the other side of that card in their four cards. If a team member supplies an incorrect match to the displayed card, all of the cards are re-shuffled and the game begins again. The object of the game is to supply matches for all of the displayed cards using all of the team's cards.

This overview was provided to demonstrate that *Quizlet* allows learners to practice working with target vocabulary in a variety of pedagogically relevant formats. In particular,

Quizlet enhances the learning experience beyond what is possible with paper flashcards in at least two important ways: (1) learners can hear as well as see the information presented on the cards; and (2) users can engage in several activities in which they must type from memory one side of a card when the other side is presented to them, requiring them to do more than passively review the cards. All of this is made available through a website that is intuitive to use. *Quizlet* is already a very popular tool, and all functionality described above is free. For these reasons, *Quizlet* was chosen to be the host platform for the AVL flashcards created in this thesis project.

Aims of the Current Study

This thesis project was initiated to create a tool to help ELLs learn the first 500 words of the AVL through digital flashcards available through *Quizlet*. The following chapters detail how each of the cards types (English definition and L1 translation) were developed, including how English definitions were chosen and how translations were acquired. This development process may be instructive for those wishing to create similar digital flashcard resources. Feedback from the evaluation of these flashcards by TESOL instructors in a U.S. intensive English program is also presented and discussed. This study concludes with a discussion of some limitations of this tool, suggestions for potential applications of the tool in pedagogical practice, and mention of a few challenges and possibilities in the future development of digital vocabulary learning resources for the AVL.

CHAPTER THREE

METHODS

This chapter details the methodology developed to create two types of flashcards: AVL words paired with their simplified English (learner) definitions (hereafter referred to as English definition flashcards), and AVL words paired with their translations into seven languages (hereafter referred to as L1 translation flashcards).

Creation of English Definition Flashcards

The English definition flashcards contain an AVL word on one side of the cards with a simplified English (learner) definition on the other. Two major considerations to be dealt with in the creation of these cards were (a) what definitions would be selected for use on the flashcards, and (b) how the definitions could be effectively presented to ELLs within the flashcard format, especially in cases of multiple definitions per word.

Selection of Learner Definitions. The first step in creating the English definition flashcards was to find simple definitions of the target words that ELLs could easily understand. To this end, several learner dictionary publishers were contacted regarding the inclusion of their definitions on the flashcards. Of those contacted, Merriam-Webster was the only publisher that granted permission for use of their definitions; for this reason, definitions were primarily sourced from the Merriam-Webster Learner's Dictionary, found online at www.learnersdictionary.com. (The few exceptions to this will be discussed later.) Merriam-Webster gave permission for use of their definitions with the stipulation that their definitions not be modified. In almost all cases, this was strictly adhered to; however, because *Quizlet* does not support rich text formatting of flashcards, minor adaptations were made to the formatting of some definitions to maintain clarity. For example, bolded text in the original Merriam-Webster definitions could not be

displayed as bold in the flashcards, so quotation marks were used in the *Quizlet* flashcards to set off bolded text.

In cases of words with more than one definition in Merriam-Webster Learner's Dictionary, it was necessary to decide which definition(s) to include on the flashcards. In personal correspondence with the researcher, a Merriam-Webster editor indicated that definitions in the learner dictionary were generally arranged "with logic and frequency in mind. The first sense of any given word is typically the most commonly used, and it is sometimes the source from which further senses developed" (E. Vezina, personal correspondence, September 13, 2016). This information initially seemed to suggest that using the dictionary's first entry for each word might be feasible. However, further investigation revealed that some of the dictionary's entries had common non-academic definitions listed before those that were academically relevant, making the first entries the less suitable definitions for the purposes of this project. Additionally, some AVL words had multiple definitions with obvious academic relevance. In some cases, these definitions for a single word were so distinct from one another that a learner with an understanding of only one of the definitions would not be able to intuit the other(s) from context. Again, choosing only the first definition in these cases would not capture important academic meanings of these words. Given these realities, the following procedure was developed to select the definitions that would be most useful and relevant to general academic vocabulary learning:

1. For any word with multiple definitions, all definitions were considered by the researcher in terms of their academic relevance. Definitions without academic relevance were excluded.

2. All definitions with academic relevance were considered in terms of whether a learner with an understanding of only one of the definitions would be able to intuit the other(s) upon contact with the word in a context fitting the unknown definition(s). Definitions that were judged by the researcher to subsume other definitions (i.e., they could be used to intuit others) were selected, while the subsumed definitions were not.
3. Selected definitions were also evaluated by the researcher in terms of relevance to general academic vocabulary. Definitions that were clearly discipline-specific were excluded.

It became apparent during the execution of this procedure that some AVL words needed to be treated differently. These words fell into 4 categories, with one exception.

Category 1: Words needing part of speech adjustment. Adjustments needed to be made to the part of speech listed for two words in the AVL, likely because the AVL was generated from a process involving a large corpus with an automated part-of-speech tagger. The word *both* is listed in the AVL as an adverb, but a COCA corpus query of *both* as an adverb returned contexts with *both* used as a conjunction together with *and* (for example, "*Both* teachers *and* students were excited about the summer break"). The Merriam-Webster learner definition for *both* as a conjunction seemed to match the contexts found in the COCA query: "— used before two words or phrases connected with and to stress that each is included" (both [conjunction], n.d.). On the basis of this information, the part of speech for *both* was changed from adverb to conjunction. The other word needing similar adjustment was *i.e.*, which had also been tagged as an adverb. The Merriam-Webster Learner's Dictionary designated *i.e*. as an abbreviation, and so the part of speech designation for this word was changed from adverb to abbreviation for the purposes of this project.

Category 2: Hidden prepositional verbs. Because prepositional verbs do not have a unique tag in COCA, no prepositional verbs were originally included in the AVL. However, as the definitions of the AVL words were reviewed, it became apparent that some of the included verbs were either always used as prepositional verbs, or much more commonly used as such. For example, although the verb *engage* can be used without a preposition ("He *engaged* the man in a lively discussion") it is much more commonly encountered with the preposition *in* ("They are *engaged in* negotiations"). It was decided that verbs of this type would be included with their prepositions. Where a verb had more than one possible preposition it could be paired with (for example, *engage in* and *engage with*), the most frequently appearing pairing in COCA was selected. Table 2 shows these verbs with their adjustments.

Table 2
AVL Verbs Adjusted to Prepositional Verbs

Original AVL Verbs	Adjusted Prepositional Verbs
consist	consist of
account	account for
rely	rely on
base	base on
associate	associate with
engage	engage in
depend	depend on

The word *general*—the exceptional AVL word not described by these four categories—is perhaps most similar to words in Category 2. In the AVL, *general* is listed as an adverb, because this is how it was tagged by the part-of-speech tagger in COCA. However, an actual COCA query revealed that *general* tagged as an adverb in the corpus was in reality the adverbial *in general*. Therefore, *general* (adv.) was changed to *in general* (adv.) for purposes of the AVL flashcards. To emphasize, these few changes represent rare exceptions in which the part-of-

speech tagger used in COCA returned part-of-speech designations for AVL words which needed to be manually corrected.

Category 3: Words with no definitions. The definition selection procedure revealed several words for which there was no definition provided in the Merriam-Webster Learner's Dictionary. All but one of these words did appear in entries for inflectionally-related words (for example, there is no definition for *approximately* in the dictionary, but there is for *approximate*). However, due to the request of Merriam-Webster that no definitions be modified, original definitions were created for all of these words rather than modifying existing definitions to fit the appropriate part of speech. The words to which this applied were *environmental* (adj.), *researcher* (n.), *African* (adj.), *interaction* (n.), *European* (adj.), *participation* (n.), *regional* (adj.), *frequently* (adv.), *currently* (adv.), *existing* (adj.), *German* (adj.), *increasing* (adj.), *increased* (adj.) *previously* (adv.), *strongly* (adv.), *implementation* (n.), and *testing* (n.). To delineate which definitions were sourced from Merriam-Webster and which were the researcher's own definitions, an asterisk in parentheses was added to the end of the Merriam-Webster definitions. Parentheses in particular were used because Quizlet has been designed so that text within parentheses does not have to be reproduced by the user when typing text during flashcard learning activities.

Category 4: Words with other preferred definitions. For a few AVL words, original definitions were included because the researcher opted to create a more general definition subsuming two or more of the Merriam-Webster definitions. Words in this category were *likely* (adj.), *express* (v.), and *above* (adv.).

Exclusion of Example Sentences. Included in the Merriam-Webster Learner's Dictionary are example sentences for each definition. Because examples of words in context can

be very helpful for understanding how to use a word, including these example sentences on the flashcards was considered. However, presenting a large amount of text (such as multiple example sentences) on one side of a flashcard makes it cumbersome to view and practice. The alternative of including only one example sentence was also considered, but presenting only one example sentence to learners may influence them to interpret the meanings of words more narrowly than is accurate. This would be especially likely to occur if learners were using the flashcards autonomously. These were reasons why example sentences were not included on the flashcards.

Presentation of the Definitions. For AVL words with only one definition, the presentation of that definition was a simple matter of including the word on one side of the card and the definition on the reverse side. For AVL words with multiple selected definitions, only one definition was included per card. This means that a given AVL word was represented on 1-4 flashcards, depending on the number of definitions selected for that word. For example, the AVL word *movement* (n.) has two definitions included in the flashcards (see Figure 10). The fronts of these cards are identical, while the reverse sides each contain a distinct definition of the word. The choice to keep only one definition per flashcard was made so that the text on each card would remain relatively short and easy to work within the flashcard format. Additionally, including only one definition per card allows teachers and learners who wish to save and modify copies of these sets to easily delete flashcards with definitions they are not aiming to teach or learn.

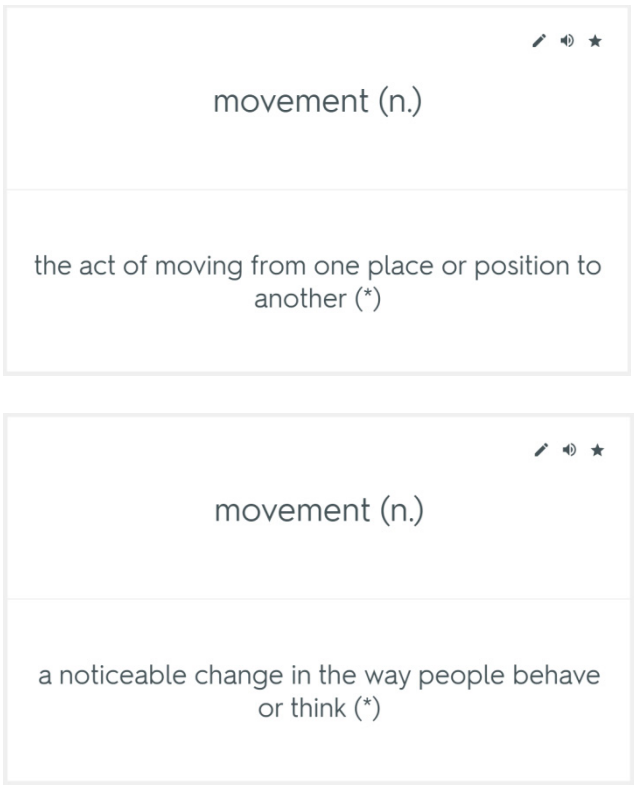

Figure 10. The fronts and backs of two *Quizlet* flashcards for *movement* (n.)

Creation of L1 Translation Flashcards

Determination of L1 Target Languages. While it was intended that the English definition flashcards would be a tool for all ELLs, the creation of the L1 translation flashcards required a determination about what languages the flashcards would be developed for. Criteria were formed to select languages that would serve both U.S. and global interests.

The first criterion was that the flashcards should ideally be developed in the L1s of majority groups of international students studying in the USA. Information from the *2016 Open Doors Report* issued by the Institute of International Education was consulted to ascertain candidate languages satisfying this criterion. According to this report, the following ten countries represent the countries of origin of the greatest number of international students in the United States during the 2015-2016 academic year (Institute of International Education, 2016):

1. China
2. India
3. Saudi Arabia
4. South Korea
5. Canada
6. Vietnam
7. Taiwan
8. Brazil
9. Japan
10. Mexico

From this list, India and Canada were eliminated from consideration because English is an official language in these countries.

The second criterion was that the languages represent priority languages as defined by U.S. federal agencies. To this end, the government-issued document *Consultation With Federal Agencies On Areas Of National Need* (U.S. Department of Education) was consulted. This document contained a summary of U.S. federal agencies' recommendations of priority languages for the year 2014. From this summary, the researcher analyzed which languages were recommended by the greatest number of agencies. The results of this analysis appear in Table 3. Chinese and Korean were the most frequently recommended languages, followed by Arabic and Russian.

A comparison of the data collected from both sources revealed considerable overlap in the languages of countries with large numbers of international students and languages listed as high priority by many federal agencies. In fact, Vietnam was the only country in the top ten list

of international student home countries whose most commonly spoken language was not designated high priority by three or more agencies. Russian was the only language receiving mention by five or more agencies that did not have a representative country of origin in the top ten list of international student home countries.

Table 3
Most Frequently Recommended Priority Languages by U.S. Federal Agencies in 2014

Dept. of Education	Dept. of Defense	Dept. of Health & Human Services	Dept. of Justice	Dept. of Labor	Dept. of State	**Total**
Chinese	Chinese	Chinese	Chinese	Chinese	Chinese	**6**
Korean	Korean	Korean	Korean	Korean	Korean	**6**
Arabic	Arabic	Arabic	Arabic		Arabic	**5**
Russian	Russian	Russian	Russian		Russian	**5**
	Turkish	Turkish	Turkish		Turkish	**4**
	Farsi	Farsi	Farsi		Farsi	**4**
		Spanish	Spanish	Spanish		**3**
	Portuguese	Portuguese	Portuguese			**3**
Japanese	Japanese	Japanese				**3**
	Dari		Dari		Dari	**3**

More decisive criteria were then developed: that the flashcards would be created for (a) languages represented in both sources, or (b) languages receiving five or more recommendations as priority languages from federal agencies. Using these narrowed criteria, the researcher determined to develop AVL Word – L1 Gloss flashcard sets for the following languages:

- Chinese (Mandarin)
- Korean
- Arabic
- Japanese
- Spanish (Latin)
- Portuguese (Brazilian)

- Russian

Although these languages could not possibly represent the scope of languages for which this tool would be highly useful, it is hoped that these choices are well representative of languages for which there is great need in terms of both national (U.S.) and international interests.

AVL Translation Process. In order to include L1 translations of the AVL words in the flashcard sets, it was necessary to obtain accurate translations of these words in each of the seven target languages. It should also be noted that because some Chinese speakers read traditional Chinese characters while others read simplified characters, both were included as separate flashcard sets. This made a total of eight translation tasks to be completed. The translation tasks were outsourced to the language technology company *InWhatLanguage,* which offers translation services provided by tested and independently reviewed translators who are native speakers of the target languages (InWhatLanguage, n.d.). Included as its clients are companies such as Boeing, HP, Cisco, IBM, and XEROX (InWhatLanguage, n.d.).

In order to make the English definition flashcards and the L1 translation flashcards congruent, the translations needed to be appropriate for the senses of the AVL words established by the definitions on the English definition flashcards. An excel spreadsheet with the AVL words, their parts of speech, and the selected definitions were provided to the translators for this purpose. Additionally, example sentences sourced from the Merriam-Webster Learner's Dictionary were included on the spreadsheet for each definition to be used as an aid when translating. For definitions not sourced from Merriam-Webster, the researcher created original example sentences.

The translators were instructed to pay close attention to the part of speech, definition, and example sentences provided for each word in order to provide a translation that would be

congruent to sense(s) of the word represented in the learner definition(s). In cases of AVL words with multiple definitions, translations associated with each definition were completed. In cases where an exact one-to-one translation was not possible for an AVL word and a given definition, the translators were instructed to include multiple target language words, and/or a brief explanation of the AVL word in the target language.

Deduplication of Translations. For some AVL words with multiple definitions, the translations for all of the definitions in a given language were identical. In these cases, only one instance of the AVL word with its translation was created in the *Quizlet* flashcards. For example, the AVL word *control* (n.) has three English definitions included in the flashcards. In Spanish, the word *control* (n.) was translated as *controla* in all three cases. As a result, deduplication (deletion of duplicate data) occurred. This resulted in only one card for the AVL word *control* (n.) and its Spanish translation, *controla*. It is important to note that deduplication did not occur in cases where the AVL word form was identical, but the part of speech differed. For example, the AVL words *review* (n.) and *review* (v.) were never candidates for deduplication in any language. Deduplication also did not occur in cases where a translation for a given word was included in but not identical to another translation of the word. For example, the AVL word *challenge* (n.) has two definitions. One definition's associated Spanish translation was *desafío*, and the translation associated with the other definition was *desafío*/*reto*. These translations were not candidates for deduplication.

Universal Considerations

Part of Speech Indication. For all flashcards, it was important to determine how to indicate part of speech. This was particularly true because discrimination of word forms by lemma--which is a part-of-speech-specific delineation--sets the AVL apart from other vocabulary

lists (Gardner & Davies, 2014). It seemed advantageous to have part-of-speech indicated on only one side of the card, as this would allow students to test themselves on their knowledge of part of speech as they interacted with the flashcards. The front of the card was ultimately chosen to display the part of speech because of a consideration specific to the L1 translation flashcards: it seemed most appropriate to place an English part of speech designation on the English side of these cards. For uniformity, the part of speech was also included in parentheses on the front (AVL word) sides of the English definition flashcards.

Set Size. All flashcards in *Quizlet* are created in study sets. These sets are lists of flashcards that are used together to populate learning activities. Only one set can be worked with by a user at a time, although users can merge existing sets to create new, custom sets. For the purposes of these flashcards, it was decided that each study set would cover all cards for 20 AVL words. This means that the actual number of cards per set varies, because some AVL words have more than one definition, and thus more than one card. The actual range of cards per set in all AVL flashcard sets created in this project is between 20 and 32 cards per set.

Ordering. It was determined that the AVL words would be presented in flashcard sets by order of their frequency rankings in the AVL. Thus, Set 1 of the English definition flashcards comprises the AVL words with frequency rankings 1-20, set 2 comprises the AVL words with frequency rankings 21-40, and so forth. The same pattern was followed for the L1 translation flashcards.

Importing Data to *Quizlet*. In total, 5724 *Quizlet* flashcards were created for this project. An automated approach was taken to import the flashcard data from an excel spreadsheet into *Quizlet*, as manual entry of the flashcards would have been extremely time consuming and prone to human error.

CHAPTER FOUR

RESULTS

Tool Description

The *Quizlet* flashcards for the first 500 words of the AVL include:

- 25 sets of flashcards with the AVL words and English learner definitions.
- 25 sets of flashcards with AVL words and their translations for each of the following languages: Arabic, Chinese (Simplified and Traditional), Japanese, Korean, Portuguese, Russian, and Spanish.

The username Academic_Vocab_List was used to create the flashcards, and this username can be searched within *Quizlet* to view and select all flashcard sets. The sets can also be accessed from https://*Quizlet*.com/Academic_Vocab_List. All folders, sets, and flashcards are public and freely available to all *Quizlet* users.

Flashcard sets are labeled according to the following naming scheme: Academic Vocabulary List, *Set-type Set-number* (*AVL-frequency-range-of-set*). Two set names are provided here as examples:

- Academic Vocabulary List, English Definition Set 21 (401-420)
- Academic Vocabulary List, Portuguese Set 9 (161-180)

Tool Evaluation

Description of Evaluators. Those asked to review the AVL *Quizlet* flashcards were all current or former teachers at the English Language Center (ELC) of Brigham Young University. Because all ELC teachers are required to incorporate the AVL into their instruction, it was felt that they would have a better understanding of the use of this tool than teachers or others not familiar with the AVL. For this reason, only ELC teachers were asked to participate in the

review. It should also be noted that most teachers at the ELC are required to demonstrate a minimum level of proficiency in a second language equivalent to completion of a fourth-semester university language class. However, proficiency in a foreign language was not controlled for in selection of the evaluators. Evaluators could review the flashcards whether or not they had proficiency in any of the languages for which the tool was developed.

Method of Evaluation. Invitations to review the flashcards were sent to ELC teachers via an email. This email contained links to the flashcards and a Qualtrics survey (see Appendix A). In total, 20 teachers completed the survey, though some did not provide responses to all of the survey items. The survey included two types of items. Type 1 was a multi-select item in which evaluators read a series of positive statements regarding the tool and reported the degree that they agreed or disagreed with each statement (possible response options were "I don't know/ not applicable," "Somewhat disagree," "Neither agree nor disagree," "Somewhat agree," "Mostly agree," and "Strongly agree"). Two Type 1 items appeared on the survey: one regarding the English definition flashcard sets, and the other regarding the language sets. Type 2 items were short answer, and were intended to elicit explanations for the responses evaluators provided in the Type 1 items. Except for a final, general question asking for last comments, Type 2 items also asked evaluators to give feedback about the English definition and the language sets as independent tools.

Summary of evaluation results

Type 1 items. 18 evaluators completed the Type 1 item regarding the English definition flashcards, and 16 evaluators completed the Type 1 item regarding the L1 translation flashcards.

Included in Table 4 are the numbers of each response received for statements with the highest numbers of "strongly agree" responses and the highest number of "somewhat disagree" responses (the only level of disagreement that was selected) for both Type 1 items.

Table 4
Summary of Selected Responses for Type 1 Items

		I don't know / not applicable	Somewhat Disagree	Mostly Agree	Strongly Agree
English Definition Flashcards	*Quizlet* is an effective platform for these flashcards.	0	0	4	12
	I would recommend these flashcards to learners.	0	0	3	12
	The definitions are easy to understand.	0	2	8	4
Language Flashcards	*Quizlet* is an effective platform for these flashcards.	0	0	5	10
	I would recommend these flashcards to learners.	0	0	4	10
	To my knowledge, the language flashcards that I previewed contained accurate translations.	2	2	5	5

Type 2 items. Because evaluators often provided insights regarding both English definition and L1 translation flashcards when responding to items asking about only one type, notable trends in evaluators' comments are discussed for both types of flashcards together.

A frequently mentioned effective characteristic of all flashcards was their availability on *Quizlet*. Evaluators commented on *Quizlet's* multiple learning activities, easy access, and intuitive design. Below are two of these comments:

- "They are a pre-made set of flashcards for students to use on the go. *Quizlet* itself as many options on how to use the flashcards to memorize and learn the words."
- ">> *Quizlet* provides lots of interesting, motivating review activities for students, and it's easy for students to review via smartphone, tablet, etc."

Other effective characteristics mentioned were clear, simple definitions (for English definition sets), learner access to translations in their own language (for language sets), inclusion of part of speech on the cards, the organization of the cards into sets, and the inclusion of one card per definition of a word.

The most frequently mentioned suggestion for improvement was to include example sentences in the flashcards. Other frequently mentioned areas of concern were long and unclear definitions and translation accuracy. Following are five representative comments:

- "I think they are as good as they can be. The only thing would maybe be example sentences? As a writing teacher, I tend to focus on use in actual language rather than the definitions. But that would be a huge task. Maybe something for someone in the future to add."
- "One thing that could help clarify things here is an example sentence. Although example sentences are hard to think of, if there was one for each word, particularly the difficult ones, I'm sure the learners would learn better."
- "Some of the definitions to the first set of English cards were too long even for me to know what word they were referencing. Less of a definition would be more clear."
- "I think that sometimes the definitions were hard to understand even as a native English speaker. There was one where I read the definition and I wasn't able to think

of the word. Maybe it's just me on that though. I do think the easier the definition and the clearer it is, the better."

- "Translation definitions are tricky. I think may have variance in effectiveness depending on language. I looked at a couple of Korean sets. With each set there were several pairings that I disagreed with. It may be better to not try to limit the translation to a one to one."
- "The translations provided for the Japanese language set were not `incorrect`, [*sic*] but they were not the most precise at times."

Discussion

Overall, survey responses in both Type 1 and Type 2 items indicated that the ELC teachers who evaluated the flashcards felt they were a helpful tool that they would recommend to learners. *Quizlet's* functionality in particular was viewed as a strength of the tool. The survey results also show that the definitions and translations were aspects of the tool most frequently suggested for improvement, and a repeated suggestion was made to include example sentences on the cards.

Feedback about the learner definitions was that they "were too long… to know what word they were referencing," and that "less of a definition would be more clear." This is a very valid point. Because Merriam-Webster definitions could not be altered for the purposes of this tool, a different definition source would need to be found to incorporate this feedback--an appropriate avenue to be explored in a future iteration of the flashcards.

Several comments received about translations expressed that they were not entirely accurate. With this feedback, the researcher approached *InWhatLanguage* to ask that the

translations be reviewed. *InWhatLanguage* reviewed all of their translations and returned with 150 changes to their original work, and the *Quizlet* flashcards were updated with these changes.

In response to concern about the need for example sentences, it may be helpful to point out that it was not the aim of this project to create a flashcard tool that offers all the information and practice required to develop complete receptive and productive knowledge of a word. In fact, this may be an unrealistic goal for any flashcard tool. Therefore, decisions had to be made about what type of word knowledge this tool would target. These flashcards are likely most useful in the acquisition of receptive vocabulary, and are designed to prepare learners for the possible meanings of AVL words that they will encounter in their own academic English texts. In sum, this tool does not contain contexts, but instead prepares learners for contexts.

CHAPTER FIVE

CONCLUSION

The creation of *Quizlet* flashcards for the first 500 words of the AVL is a good beginning to the possibilities of digital resources for the AVL. The flashcards are available wherever there is an internet connection, and they contain translations into seven important world languages. The translation process was designed to ensure accurate translations that target general academic senses of the AVL words. All of the flashcards are hosted by a powerful online learning platform that allows learners to quickly access and practice the content.

Pedagogical Implications

There are many possibilities for use of these flashcards in the classroom and in self-study; these are only a few ideas for consideration. One suggestion to explore for teachers with students whose native language(s) are included in this resource may be to introduce students to an English definition set together with its complementary L1 translation set(s). This would allow students to practice the words in both L1 and L2 learning modes, and it may help bridge a difficult gap for some students for whom AVL words are actually new concepts not yet known in their L1. Teachers can also take advantage of their ability to merge and modify flashcard sets saved to their *Quizlet* account in order to create custom sets of AVL words which are targeted to their students' needs. Lastly, these flashcards can only be useful to the extent that teachers and learners know about them; for this reason, it is hoped that teachers and learners will share this tool, as well as their suggestions for its use, with others who could benefit from it.

Limitations

As discussed previously, the difficulty of obtaining permission to use definitions from learner dictionaries meant that the source for definitions was limited to only one dictionary, and

these definitions could not be modified. Because of this, some definitions could likely be improved. Furthermore, judgments about which dictionary definitions to include and exclude were made by the researcher alone, which means that potential reliability could have been improved with additional researcher perspectives. Another obvious limitation is that only seven languages were included in the translations sets, but there are many more languages for which this tool would be useful. And although the translations included in this project were professionally completed and all translations received a second review after initial feedback suggested they could be improved, they are likely still not perfect. Additional external review would further validate the quality of the translations. Unfortunately, within *Quizlet* there is not a mechanism to allow users to comment or flag flashcards to improve, and so it is not possible to receive feedback to improve the tool directly through the *Quizlet* platform.

Suggested Future Directions

Three areas in particular seem like logical next steps in future AVL resource development: expanding the scope of this tool or a similar resource to the complete AVL (3015 words), addressing the need for more context-based AVL resources, and providing additional/improved L1 support for the AVL. However, the large amount of generated text needed for contexts and the translation expertise needed for L1 language support could pose significant challenges. It would also be important to consider how this content could be presented in a pedagogically relevant way.

A few possible solutions could be proposed here. One approach to developing needed content and translations could be through crowdsourcing. A tool to this end could be a website that allows users to view AVL words and provide contexts and L1 translations, as well as to promote or demote existing content. In terms of presentation, a three-sided digital flashcard may

be an interesting possible option to explore. A flashcard platform that allowed for three-sided flashcards with learning activities similar to *Quizlet* would be able to store important information about a word, such as contextual examples, that could be optionally viewed and used to populate learning activities in combination with the AVL word and/or its translation and definition. Flashcards of this type could present contextual examples to users without overwhelming them with the amount of text on each card side. To this researcher's knowledge, no free online flashcard platform currently supports a set of features like those described here, but this does not preclude the development of an AVL-specific web resource with this functionality.

It is hoped that the AVL *Quizlet* flashcards created in this project and the methodology developed to create them can inform plans for future AVL resources, as many of the same concerns raised in this project will likely need to be considered. And it is hoped that these future projects, building on the resource developed in this project, will continue to increase ELLs' access to tools that can help them effectively develop AVL word knowledge.

References

Anderson, R.C. & W.E. Nagy (1992). The vocabulary conundrum. *American Educator: The Professional Journal of the American Federation of Teachers*, *16*(4), 14-18, 44-47.

Both (conjunction). (n.d.). In *Merriam-Webster Learner's Dictionary*. Retrieved from http://www.learnersdictionary.com/definition/both

The British National Corpus, version 3 (BNC XML Edition). (2007). http://www.natcorp.ox.ac.uk/

Campion, M. & Elley, W. (1971). An Academic Vocabulary List. *Wellington New Zealand Council for Educational Research.*

Chacón-Beltrán, R., Abello-Contesse, C., & Torreblanca-López, M.M. (2010). Vocabulary Teaching and Learning: Introduction and Overview. In R. Chacón-Beltrán, R. Abello-Contesse, & M.M. Torreblanca-López (Eds.), *Insights into non-native vocabulary learning and teaching* (pp. 1-12). Bristol, UK: Multilingual Matters.

Chen, Q. & Ge, G.C. (2007). A corpus-based lexical study on frequency and distribution of Coxhead's AWL word families in medical research articles (RAs). *English for Specific Purposes, 26,* 502-514.

Corson, D. (1997). The learning and use of academic English words. *Language Learning, 47*, 671-718.

Coxhead, A. (2000). A new academic word list. *TESOL Quarterly, 34*, 213-238.

Davies, M. (2008-). *The Corpus of Contemporary American English: 520 million words, 1990-present*. Available online at http://corpus.byu.edu/coca/.

Durrant, P. (2016). To what extent is the Academic Vocabulary List relevant to university student writing*?*. *English for Specific Purposes, 43,* 49-61.

Elgort, I. (2011). Deliberate learning and vocabulary acquisition in a second language. *Language Learning, 61*(2), 367-413.

Elgort, I., & Piasecki, A. E. (2014). The effect of a bilingual learning mode on the establishment of lexical semantic representations in the L2. *Bilingualism, 17*, 572-588.

Gardner, D. (2013). *Exploring vocabulary: Language in action*. New York, NY: Routledge.

Gardner, D., & Davies, M. (2014). A new academic vocabulary list. *Applied Linguistics, 35,* 305–327.

Ghadessy, P. (1979). Frequency counts, words lists, and materials preparation: A new approach. *English Teaching Forum*, *17*, 24-27.

Ha, Y. (2015). *Technical vocabulary in finance : a corpus-based study of annual reports and earnings calls* (Doctoral Dissertation). Retrieved from University of Hong Kong, The HKU Scholar's Hub.

Hu, S., Vongpumivitch, V., Chang, J. S., & Liou, H. (2014). The effects of L1 and L2 e-glosses on incidental vocabulary learning of junior high-school english students. *ReCALL : The Journal of EUROCALL, 26*(1), 80-99.

Huang, P., Chen, C., Tsao, N. & Wibley, D. (2015). The development of a corpus-based tool for exploring domain-specific collocational knowledge in English. *Taiwan Journal of TESOL, 12*(2)*,* 117-141.

Hulstijn, J. H. & Laufer, B. (2001). Some empirical evidence for the involvement load hypothesis in vocabulary acquisition. *Language Learning, 51,* 539-558.

Hyland, K. and Tse, P. (2007). Is there an "Academic Vocabulary"?. *TESOL Quarterly, 41*, 235-253.

Imrie, A. (2014). Using *Quizlet* Flashcards to Study Vocabulary. In P. McLaren, M. Al-Manly, C. Combe, P. Davidson, C. Gunn, & S Troudi (Eds.) *The Proceedings of the 19th TESOL Arabia Conference,* 25-34.

Institute of International Education. (2016). Fact Sheet by Country: 2016. Retrieved from http://www.iie.org/opendoors

InWhatLanguage. (n.d.). FAQ. Retrieved from http://www.inwhatlanguage.com/faq/

Kuo, Y, & Ho, H. (2012). Effects of word card strategy versus word list strategy on Taiwanese EFL junior high school students' vocabulary retention. *Electronic Journal of Foreign Language Teaching, 9*(1), 26-45.

Li, Y. & Qian, D. D. (2010). Profiling the Academic Word List (AWL) in a financial corpus. *System, 38,* 402-411.

Lynn, R. W. (1973). Preparing word lists: a suggested method. *RELC Journal, 4*(1), 25-32.

Martínez, I. A., Beck, S. C., & Panza, C. B. (2009). Academic vocabulary in agriculture research articles: A corpus-based study. *English for Specific Purposes, 28,* 183-198.

Merriam-Webster Learner's Dictionary. (n.d.). Retrieved from www.learnersdictionary.com

Mondria, J. (2003). The effects of inferring, verifying, and memorizing on the retention of L2 word meanings. *Studies in Second Language Acquisition, 25*, 473-499.

Nagy, W. & Townsend, D. (2012). Words as tools: learning academic vocabulary as language acquisition. *Reading Research Quarterly, 47*, 91-108.

Nakata, T. (2008). English vocabulary learning with word lists, word cards and computers: Implications from cognitive psychology research for optimal spaced learning. *ReCALL: The Journal of EUROCALL, 20*(1), 3-20.

Nakata, T. (2011). Computer-assisted second language vocabulary learning in a paired-associate paradigm: a critical investigation of flashcard software. *Computer Assisted Language Learning, 24*(1), 17-38.

Nation, I.S.P. (2013). *Learning vocabulary in another language*. (2nd ed.). New York, NY: Cambridge University Press.

Nation, I.S.P. & Beglar, D. (2007). A vocabulary size test. *The Language Teacher*, 31(7), 9-13.

Nation, I. S. P., & Webb, S. (2011). *Researching and analysing vocabulary*. Boston, MA: Heinle Cengage.

Newman, J. A. (2016). *A Corpus-Based Comparison of the Academic Word List and the Academic Vocabulary List* (Thesis). BYU ScholarsArchive. (6080).

Olsson, E. (2015). Progress in English academic vocabulary use in writing among CLIL and non-CLIL students in Sweden. *Moderna Språk, 109*(2), 51-74.

Praninskas, J. (1972). American university word list. London: Longman.

Quizlet. (n.d.). Our Mission. Retrieved from https://*Quizlet*.com/mission

Schmitt, N. (2000). *Vocabulary in language teaching*. New York, NY: Cambridge University Press.

Snow, C. E., & Uccelli, P. (2009). The challenge of academic language. In D. R. Olson & N. Torrance (Eds.), *The Cambridge Handbook of Literacy* (112-133). Cambridge: Cambridge University Press.

U.S. Department of Education. (2014). *Consultation with Federal Agencies on Areas of National Need*. Retrieved from http://www2.ed.gov/about/offices/list/ope/iegps/consultation-2014.pdf

Vongpumivitch, V., Huang, J., & Chang, Y. (2009). Frequency analysis of the words in the Academic Word List (AWL) and non-AWL content words in applied linguistics research papers. *English for Specific Purposes, 28,* 33-41.

Warschauer, M., & Healey, D. (1998). Computers and language learning: An overview. *Language Teaching*, *31*, 57-71.

Watanabe, Y. (1997). Effects of single and multiple choice glosses on incidental vocabulary learning. *JACET Bulletin, 28*, 177-191.

West, M. (1953). *A general service list of English words*. London: Longman.

Worthington, D. & Nation, P. (1996). Using texts to sequence the introduction of new vocabulary in an EAP Course. *RELC Journal 27*(2), 1-11.

Xue, G., & Nation, P. (1984). A university word list. *Language Learning and Communication, 3,* 215-229.

Yoshii, M. (2006). L1 and L2 glosses: Their effects on incidental vocabulary learning. *Language Learning & Technology, 10*(3), 85-101.

APPENDIX A

AVL Flashcard Survey

Thank you for providing feedback about the Academic Vocabulary List flashcard sets available on *Quizlet*! After you have looked through and tried out some of the English definition and language flashcard sets, please continue.

1. Answer these questions about the Academic Vocabulary List **English definition flashcard sets** available on *Quizlet*.

	I don't know / not applicable	Strongly disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Strongly agree
The AVL English definition flashcard sets are a helpful tool for English language learners								
The AVL English definition flashcard sets are a helpful tool for English language teachers.								
The definitions are easy to understand.								
The flashcard sets are organized well.								
Quizlet is an effective platform for these flashcards.								
I would recommend these flashcards to learners.								
I would recommend these flashcards to teachers.								

2. If you marked "somewhat disagree," "mostly disagree," or "strongly disagree" for any of the items above, please explain why.

3. What is effective about the **AVL English definition** flashcard sets?

4. How could the AVL **English definition** flashcard sets be improved?

5. Answer these questions about the Academic Vocabulary List **language flashcard sets** available on *Quizlet*.

	I don't know / not applicable	Strongly disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Strongly agree
The AVL language flashcard sets are a helpful tool for English language learners								
The AVL language flashcard sets are a helpful tool for English language teachers.								
To my knowledge, the language flashcards that I previewed contained accurate translations.								
The flashcard sets are organized well.								
Quizlet is an effective platform for these flashcards.								
I would recommend these flashcards to learners.								
I would recommend these flashcards to teachers.								

6. If you marked "somewhat disagree," "mostly disagree," or "strongly disagree" for any of the items above, please explain why.

7. What is effective about the AVL **language flashcard sets**?

8. How could the AVL **language flashcard sets** be improved?

9. Please share any additional comments or suggestions about the Academic Vocabulary List flashcard sets.