WORKING WITH VOCABULARY CARDS IN THE CLASSROOM

Marie-Claude Martine Toriida

University of Calgary, Qatar

mcmtorii@ucalgary.edu.qa

Abstract

Vocabulary knowledge is a very important component of language proficiency and is crucial to student success in transnational university settings. This article outlines how vocabulary flashcards were used as part of a vocabulary acquisition program in English for Academic Purposes Nursing Foundation program at university in the Middle East. Best practice recommendations by Nation (2013) are outlined regarding choosing words, and making and using word cards for explicit vocabulary learning. Explanations are given on how these recommendations were put into practice in the classroom. It is hoped that the explanations provided will serve to guide interested educators in developing vocabulary acquisition program using flashcards in their classroom.

Keywords

Vocabulary Acquisition, Vocabulary Flashcards, Corpus Linguistics, Paul Nation, Space Repetition, Interval Learning

1. Introduction

Vocabulary is an important component of language proficiency. Words are the basis of communication and expression. This is especially important for students in a transnational setting who are expected to pursue tertiary education in their second language. Lack of vocabulary knowledge is a deterrent to reading comprehension and the ability to express thoughts and ideas in an academic setting (Ihara & Ihara, 2017; Laufer, 1989; Laufer &

Ravenhorst-Kalovski, 2010). In fact, research on reading comprehension shows that a vocabulary size of 8000-9000 word families is needed to be able to read authentic academic texts unassisted and have acceptable level of comprehension (Nation, 2006).

Krashen postulated that "comprehensible input" in low anxiety situations was the best way for second learners to interact with language in order to learn (Jarvis & Krashen, 2014, Krashen, 2003; 2011). According to this view, learners learn new words when the language is slightly over their current knowledge. In such a case, it would take much exposure to level appropriate materials, and progress would be very slow. Incidental learning of vocabulary can and does occur when exposed to materials in a second language. However, to be able to quickly learn, explicit deliberate learning is necessary. As stated by Nation (2013) "research has shown the deliberate learning of vocabulary to be such an efficient and effective way of learning that, in terms of speed of vocabulary growth, a course which includes both incidental learning from message-focused activities and deliberate learning will be much better than one that relies only on incidental learning " (pp 437). Choosing appropriate target vocabulary then becomes a pressing pedagogical matter.

Corpus-based research has shown that not all words are created equal. Some words are more useful than others, as they are more often used in language. The advancement of computers software and electronically available materials have made the scientific, evidenced-based research of language more popular in the last few decades. This has enabled researchers to analyze large amounts of texts and compile the frequency of occurrence of the words in them. As a result, many frequency-based vocabulary lists have been developed over the years to help guide language teachers in their quest to help students learn efficiently, and reap the best benefits for time spent in their studies. Interested readers are directed toLessard-Clouston (2012-2013) for a brief history of corpus linguistics and a list of important recent word lists for English language teaching.

Many word lists are now available for general English, and numerous specialized vocabulary lists have been developed, such as for Medical English (Wang, Liang, & Ge, 2008; Lei & Liu, 2016), Engineering (Ward, 2009), and Nursing (Budgell, Miyazaki, O'Brien, Perkins, & Tanaka, 2007; Nor Mohamad & Ng (2013); Yang, 2015). These can guide teachers in developing an explicit vocabulary learning program for their students/classes.

Using word lists effectively in the classroom also requires pedagogically sound methods of studying. Educators can teach study methods proven to enhance the rate of

learning. Using flashcards and spaced repetition, also called interval learning, is such an approach (Nation, 2013).

The purpose of this paper is to exemplify how vocabulary flashcards can be used as part of a vocabulary acquisition program in a classroom setting while following Nation's (2013) best practice recommendations.

2. Context

A vocabulary acquisition program was developed in the English for Academic Purposes (EAP) program at our institution in the Middle East. The program is based on a nursing corpus and frequency-based annotated word lists that were developed in-house. It runs across the three tiers of our one-year program. Class size is a maximum of 16 students, and we have an average of 144 contact hours per term. Each tier consists of 2 courses: Academic Writing and Grammar, and Academic Reading and Vocabulary. Students must pass both courses to move to the next tier. Shimoda, Toriida, and Kay (2016) described the context of our EAP program, the rational for the vocabulary acquisition program, and the steps taken to develop the corpus and the annotated vocabulary lists. A brief description was also given of how a spaced repetition learning software was used as a study method in the classroom. Toriida (2016) further provided step-by-step explanations of how we used a concordance program and other freely available tools to develop the annotated word lists, which include for each word, the part of speech and colocations most frequently used in the corpus, a definition based on how the word is used, and a simplified sample sentence. The implementation of the vocabulary acquisition program using handmade flashcards was also briefly described.

The present paper aims to give a more detailed description of how to set up and use an interval learning study method and flashcards (also referred to as *word cards* hereafter) for vocabulary learning. First, Nation's (2013) recommendations when using a word card strategy for vocabulary learning are presented. The instructions that have been used at our institution will then be explained, exemplifying how Nation's recommendations can be applied when choosing words to study, in making flashcards, and in using the cards for study and testing. Finally, some practical classroom considerations, drawbacks and possible solutions are discussed.

3. Paul Nation's Recommendations on Working with Word Cards

Paul Nation is probably the most prolific researcher in the field of vocabulary acquisition. In a recent book, *Learning Vocabulary in Another Language,* Nation (2013)

dedicated one chapter to discussing Deliberate *Learning from Word Cards.* Of particular interest are the steps and principles he laid out for selecting words, making, and using vocabulary flashcards cards. These are presented in Table 1.

Table 1: *Nation's (2013) Steps and principles involved in the word card strategy, p.446*

1. Choosing words to learn	- Learn useful words. - Avoid interference.
2. Making word cards	- Put the words or phrases on one side and the meaning on the other to encourage retrieval. - Use L1 translation. - Also use of pictures where possible. - Keep the cards simple. - Suit the number of words in the pack to the difficulty of the words
3. Using the word cards	- Use retrieval. - Space the repetitions. - Learn receptively, then productively - Start with a small packs (or blocks) of words and increase the size as learning become easier. - Keep changing the order of the words in the pack. - Put known words aside, and concentrate on the difficult words. - Put the word or phrase in a sentence or with some collocations. - Process the word deeply and thoughtfully using the mnemonic techniques of word parts, or the keyword techniques where feasible.

The following details how we made use of these principles in the classroom.

3.1 Choosing Words to Learn

According to Nation (2013), educators and learners should select useful words to learn. They should also avoid interference, such as learning synonyms or antonym at the same time. Using corpus-based frequency lists addresses both of these points. The frequency-based lists assure that words of high frequency are useful (Nation, 2016), and that they are not grouped semantically. As there are numerous vocabulary lists available, educators must consider the purpose of their vocabulary program and choose a list accordingly. Our program initially used the Academic Word List (Coxhead, 2000). A more specific nursing corpus and annotations for the first 2500 words were later compiled (Shimoda, Toriida, & Kay, 2016; Toriida, 2016) to better address the vocabulary learning needs of our students.

Another consideration of usefulness is whether all students should be assigned the same list to learn, or if students should select their own words to learn. Our vocabulary

program functions on two levels. First, words highlighted in class materials are the same for all class members. The flashcard system described in this paper constitutes the second level, were each student selects the words they need to learn. By doing this, all students learn at the same rate of 10 or 15 new words a week. Students choose words in order of frequency of occurrence in the corpus. In this way, students learn the most frequent, and hence most useful words first. Students are asked to keep a log of their selected words over the term on a one-page record sheet.

3.2 Making Word Cards

Deciding what to put on the cards and how to use the cards depends on your learning goals. The explanations below show how we implemented the first four points of Nation's (2013) recommendations for making word cards.

3.2.1 Receptive vs. Productive Knowledge

Some teachers and learners aim to acquire receptive knowledge of words, that is, be able to recognize and understand the meaning of the words when encountered. This may be a good study method when the goal is to be able to read in the target language. Productive knowledge refers to being capable of recalling and using the word when needing to, which is more difficult.

3.2.2 What to Put on the Cards to Test for Receptive Knowledge.

Side 1 (prompt): Key word in English

Side 2 (answer): Equivalent in L1, definition, meaning, collocation etc.

3.2.3 What to Put on the Card to Test for Productive Knowledge

Side 1 (prompt): Key word in L1, or definition in L1 or L2

Side 2 (answer): Key word

We used vocabulary flashcard to test primarily for receptive knowledge of words, as the aim of our program is to improve reading compression. Students should understand the meaning of words when encountered in a reading. Students were asked to put the word to be remembered on one side, and the part of speech, definition, and collocation and/or simplified sentence on the other side (taken from the annotated lists). L1 equivalent and pictures can also be included on this side. Productive knowledge is also emphasized on tests, as students have to produce a collocation or sentence.

3.3 Using the Word Cards

Nation emphasizes spacing the repetitions when learning new words. This approach is referred to as spaced repetition or interval learning.

3.3.1 What Is Spaced Repetition?

Spaced repetition is based on the research of Ebbighaus (1964) who developed the concepts of learning and forgetting curve. By plotting of the rate at which he learned and forgot nonsensical words, Ebbinghaus noticed that reviewing words at progressively long time intervals lead to better long-term retention than reviewing once for the same amount of study time. The time needed to initially learn words is the longest. Re-learning words take a progressively shorter amount of time after each repetition.

Pimsleur (1967) and Leitner (1972) are often cited as the first theorists who applied this technique to language learning. Consistent short periods of study using spaced repetition have repeatedly been found to produce more beneficial effects than mass presentation. (Crowder, 1976; Dempster, 1989). More recently, a meta-analysis comparing learners who used spaced repetition and those who learned by mass presentation showed that the former group outperformed the latter on various memory tests 67% of the time (Donovan & Radosevich, 1999). The nature of the task, the interval time, the interaction of the variables, and the methodological rigor of the studies led to variations in the differences found between the two groups.

Spaced repetition systems can utilize handmade flashcards (Leitner, 1972; Mondria & Mondria-De Vries, 1994). Digital applications, such as Anki (https//ankiweb.net), Mnemosyne (http//mnemosyne-proj.org) and SuperMemo (https//supermemo.com) are also available. They have the benefit of keeping performance and study data for each user. In these programs, interval review times are calculated by an algorithm based on the student's responses to prompts regarding the ease of recall. This ensures that students are optimizing their time and are not over or under studying words.

Both handmade flashcards and a computer-based application were used in the vocabulary acquisition program at our institution. Students, however, reported a strong preference for handmade flashcards, so this is what we are currently using.

3.3.2 Studying Using Spaced Repetition

The method explained below is based on Mondria & Mondria-De Vries (1994)'s hand computer method. Figure 1 gives a visual representation of their method based on Leitner's work (1972).
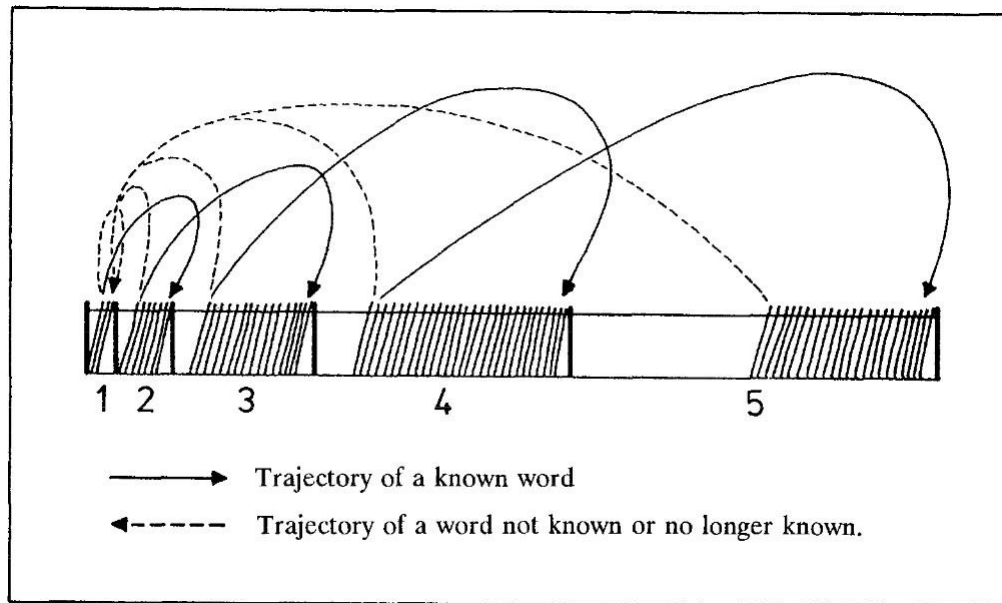
Figure 1: *Mondria & Mondria-De Vries (1994)'s hand computer method*

The figure represents a shoebox divided in five sections of increasingly larger size. All words to be remembered are put on cards. New words to be studied are placed in *Section 1*, 30 to 40 words at a time. When the words are learned, they are moved to *Section 2*, and new words are placed into *Section 1*. After some time (Mondria & Mondria-De Vries (1994) do not specify the time interval), *Section 2* gets filled, and this becomes the right time to test out *Section 2* words. Words that are still remembered then get moved to *Section 3*. Words that are not remembered get placed back in *Section 1*. Throughout this process, new words are added to *Section 1*. When *Section 3* gets full, a knowledge test is done. Words that are remembered are moved to the next section and words that have been forgotten are moved back to *Section 1*. This process continues until all five sections have cards in them. After five consecutive times of having remembered a word at increasingly long time intervals, knowledge is said to be transferred to long term memory.

The method and tests mentioned above are for individual, self-directed learning. When a person tests out cards from a section, it is done based on the learner's opinion of his/her learning. In adapting this method to a classroom setting, graded tests also had to be implemented.

The method employed at our institution makes use of an accordion, multi-section file. Students are instructed to label five sections as one to five. Table 2 gives a summary of review and self-directed test (not graded) frequencies for each section.

Table 2: *Review and Individual Test Frequency Instructions*

Section	Review	Self-directed test
Section 1	every day	once a week
Section 2	every two days	once a week
Section 3	every three days (once mid-week)	once a week
Section 4	(at test)	once a week
Section 5	(at test)	once every 2 weeks
Section 6	(at test)	once a month

Words in *Section 1* are to be studied every day for a week. After a week, students test out the words and move known words to *Section 2*. They keep words that are still unknown in *Section 1*. New words are added to *Section 1* every week, at a rate of 10 or 15 new words a week, and students study them every day, while words in *Section 2* are to be reviewed approximately every two days. Individual tests are done every week for each section, and word cards are moved either to the next section, or back to *Section 1*, based on recall. Words in *Section 3* are to be reviewed every three days (and tested once a week). Words in *Section 4* are to be reviewed once a week (at test), and words in *Section 5* can be reviewed and tested every two weeks. If desired, a sixth section can be added and reviewed once a month. The self-directed tests were usually done after the graded tests.

3.3.3 Study Instructions when Using the Cards

The following are the study instructions given to student in our program. They show how study repetition can be built-in while following four of Nation's (2013) recommendations: suit the number of word cards to the difficulty of the words, start with smaller packs of words and build up to larger packs as the learning becomes easier, change the order of word cards, and put know words aside by concentrating on difficult words. Added information based on memory research is also presented.

1. Study no more than 5 cards at a time when studying for the first time.

Memory research supports the need to do so in order to attain best time efficiency. A seminal view of short-term, or working, memory asserted that we have a capacity of seven plus or minus two chunks of information (Miller, 1956). More recent research has shown that working memory is limited to three to five chunks of information (Cowan, 2001; Cowan, 2010; Mathy & Feldman, 2012). When learning a word for the first time, close repetition will increase the chance of keeping the information in short term memory, and as one repeats this information, the information will be retained.

2. After studying a word, make a decision as to how likely you think you will remember it. If you think it will be easy to remember, place the card at the back of the pile you are studying. If you think the word will be difficult to remember place it toward the front of the pile, perhaps even in second place.

This step is important for many reasons. First, it helps to avoid a primacy and recency effect (Murdock, 1962). When studying words in the same order, words found a beginning of the pack (primacy) and at the back of the pack (recency) are more likely to be remembered. Second, it creates more study repetition for words that are more difficult to remember.

4. Continue until the whole pack is remembered.

This initial study time should be the longest "learning time". Each subsequent review of the materials should take a shorter amount of time, as per the Ebbighauss' forgetting curve.

5. Follow the same steps for a second pack of 3-5 cards.

6. When 2 packs have been once fully remembered, mix the two packs, and review them before moving on the next pack.

7. Follow the review and individual test frequency scheduling (presented above in Table

4. Nation's Advice not followed

The use of mnemonic devices was not directly taught in our program. Students are explained that deeper processing will enhance the chance of recall (Craik & Lockhard, 1972; Laufer & Rozovski-Roitblat, 2015). Students are also encouraged to use new words in their writing or outside of class, and told this will help them remember the vocabulary item and how to use it.

5. Graded Tests

Individual graded tests are conducted in class weekly or bi-weekly, during a class where students are individually working on either a writing or reading assignment. Tests are cumulative within a tier, and have been cumulative across tiers for some groups, adding to the repetition of study. Both oral and written tests have been used. About five words are selected at random from the accordion file or the student's vocabulary record sheet. Written tests can also be prepared by collecting the record sheets ahead of time. In general, graded tests account for 10% of the Academic Reading and Vocabulary component of a tier.

6. Pedagogical Challenges and Possible Solutions

6.1 Class Management Time

The relatively small class sizes (maximum 16 per class) at our institution and the numerous contact hours a week have enabled us to run such a program. Individual oral testing requires much class time, but the interaction allows for deeper explanations and processing of words. Paper tests also require much preparation.

An alternative approach could be to introduce peer tests. This could work if pairs are changed at every test, and if grading is done leniently. The benefits of the learning process itself must be emphasized. Pair testing should not take more than 15 minutes of class time, and can help ensure students come to class on time. A final composite paper test could be prepared individually at the end of term and be given more weight than the peer tests.

6.2 Academic Integrity

Some students (although very few) selected words that they already knew. Some students also took out cards from their file before oral tests. The vocabulary record sheet helped with these two issues. Students were asked to show the list each week at testing, and words to be tested could be randomly selected from this list (as opposed to selecting a flashcard). When the instructor suspected that students where choosing words they knew, or not selecting commonly unknown words, the instructor addressed these issues in a friendly manner with students. It was emphasized that students should choose words they don't know, the importance of developing their vocabulary for future success, and the importance of learning higher frequency unknown words.

7. Closing Comments

Using vocabulary flashcards in the classroom can help students increase their vocabulary size at a rapid pace when choosing high frequency vocabulary and using spaced repetition, a methodology shown to be efficient. This paper was written to describe and give ideas of how a vocabulary acquisition program can be implemented in the classroom following the best practice advice of Paul Nation. It is hoped that this will inspire teachers and instructors to use word cards in the classroom.

References

Anki (2017). Anki (Version anki-2.0.45) [Software]. Available from https://ankisrs.net/

Budgell, B., Miyazaki, M., O'Brien, M., Perkins, R., & Tanaka, Y. (2007). Developing a corpus of the nursing literature: A pilot study. *Japan Journal of Nursing Science*, *4*(1), 21-25. https://doi.org/10.1111/j.1742-7924.2007.00071.x

Cowan, N. (2001). The magical number 4 in short-term memory: A reconsideration of mental storage capacity. *Behavioral and Brain Science*, *24*, 87-185. https://doi.org/10.1017/S0140525X01003922

Cowan, N. (2010). The magical mystery four: How is working memory capacity limited, and why? *Current Directions in Psychological Science*, *19*(1), 51-57. https://doi.org/10.1177/0963721409359277

Coxhead, A. (2000). A new academic word list. *TESOL Quarterly*, *34*(2), 213-238. https://doi.org/10.2307/3587951

Craik, F. I., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*, *11*(6), 671-684. https://doi.org/10.1016/S0022-5371(72)80001-X

Crowder R., G. (1976). Principles of learning and memory. Laurence Erbaum Associates Inc.

Dempster, F. N. (1989). Spacing effects and their implications for theory and practice. *Educational Psychology Review*, *1*(4), 309-330. https://doi.org/10.1007/BF01320097

Donovan, J. J., & Radosevich, D. J. (1999). A meta-analytic review of the distribution of practice effect: Now you see it, now you don't. *Journal of Applied Psychology*, *84*(5), 795-805. https://doi.org/10.1037//0021-9010.84.5.795

Ebbinghauss, H. (1964, originally published, 1885). *Memory: A contribution to experimental psychology*. New York: Dover.

Ihata, A.C., & Ihata, T. (2017). Reading in English as a foreign language: Relative contributions of vocabulary and phonological awareness. *PEOPLE: International Journal of Social Sciences*, *3*(3), 675-692. https://doi.org/10.20319/pijss.2017.33.694711

Jarvis, H., & Krashen, S. (2014). Is CALL obsolete? Language acquisition and language learning revisited in a digital age. *TESL-EJ, 17*(4), 1-6.

Krashen, S. (2003). *Explorations in language acquisition and language use: The Taipei lectures*. Portsmouth: Heinemann Publishing Company.

Krashen, S. (2011). *Free voluntary reading*. Westport: Libraries Unlimited.

Laufer, B. (1989). What percentage of text-lexis is essential for comprehension? In C. Lauren & M. Nordman (Eds.), *Special language: From humans thinking to machines* (pp.316-323*)*. Clevedon, U.K.: Multilingual Matters. https://doi.org/10.1177/1362168814559797

Laufer, B., & Ravenhorst-Kalovski, G. C. (2010). Lexical threshold revisited: Lexical text coverage, learners' vocabulary size and reading comprehension. *Reading in a Foreign*

Language, *22*(1), 15-30.

Laufer, B., & Rozovski-Roitblat, B. (2015). Retention of new words: Quantity of encounters, quality of task, and degree of knowledge. *Language Teaching Research*, *19*(6), 687-711. doi:10.1177/1362168814559797

Lei, L., & Liu, D. (2016). A new medical academic word list: A corpus-based study with enhanced methodology, *Journal of English for Academic Purposes, 22,* 42-53. doi:10.1016/j.jeap2016.01.008

Leitner, S. (1972). *Solerntmanlernen.* Freiburg, Wien, Basel: Herder.

Lessard-Clouston (2012/2013). Word lists for vocabulary learning and teaching. *The CATESOL Journal*, *24*(1), 287-304.

Mathy, F., & Feldman, J. (2012). What's magic about magic numbers? Chunking and data compression in short-term memory. *Cognition*, *122* (3), 346-362. https://doi.org/10.1016/j.cognition.2011.11.003

Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, *63*(2): 81–97. https://doi.org/10.1037/h0043158

Mnemosyne (2015) [Software]. Available from http://mnemosyne-proj.org./

Mondria, J. A., & Mondria-De Vries, S. (1994). Efficiently memorizing words with the help of word cards and "hand computer": Theory and applications. *System*, *22*(1), 47-57. https://doi.org/10.1016/0346-251X(94)90039-6

Murdock, B. B. (1962). The serial position effect of free recall. *Journal of Experimental Psychology*, *64*(5), 482-488. https://doi.org/10.1037/h0045106

Nation, I. S. P. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review*, *63*, 59–82. https://doi.org/10.3138/cmlr.63.1.59

Nation, I. S. P. (2013). *Learning vocabulary in another language.* (2nd ed.). Cambridge: Cambridge University Press https://doi.org/10.1017/CBO9781139858656

Nation, I. S. P. (2016). *Making and using word lists for language learning and testing.* John Benjamins Publishing Company. Amsterdam/Philadelphia. https://doi.org/10.1075/z.208

Nor Mohamad, A.F., & Ng, Y. J. (2013). Corpus-based studies on nursing textbooks. *Advances in Language and Literary Studies*, *4*(2), 21-28. https://doi.org/10.7575/aiac.alls.v.4n.2p.21

Pimsleur, P. (1967). A memory schedule. *Modern Language Journal*, 73-75. https://doi.org/10.2307/321812

Shimoda, J., Toriida, M.-C., & Kay, D. W. (2016). Improving learning outcomes: Creating and implementing a specialized corpus. *Perspectives*, *24*(1), 22–28.

SuperMemo (2015) [Software]. Available from http://supermemo.com/

Toriida., M.-C. (2016). Steps for creating a specialized corpus and developing an annotated frequency-based vocabulary list, *TESOL Canada Journal*, *34*(11), 87-105. doi:1018806/tesl.v34i1.1255

Wang, J., Liang, S. L., & Ge, G. C. (2008). Establishment of a medical academic word list. *English for Specific Purposes*, *27*(4), 442-458. https://doi.org/10.1016/j.esp.2008.05.003

Ward, J. (2009). A basic engineering English word list for less proficient foundation engineering undergraduates. *English for Specific Purposes*, *28*(3), 170-182. https://doi.org/10.1016/j.esp.2009.04.001

Yang, M. N. (2015). A nursing academic word list. *English for Specific Purposes*, *37*, 27-38. https://doi.org/10.1016/j.esp.2014.05.003