INTERNET TECHNOLOGY AS AN AID TO TRADITIONAL METHODS IN THE DEVELOPMENT OF FRESHMAN STUDENTS' USE OF ACADEMIC WORDS

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Abstract. *English language preparatory programs' focus on academic vocabulary provides university students with the threshold of lexical competence to embark on their freshman studies. However, a lack of interest in a systematic approach to increasing students' lexical competence can result in limited academic development and cause frustration and boredom among freshman students. The problem can be magnified when instructors' teaching styles are not geared towards the learning styles of students who often use computer technologies. This paper outlines an initiative taken to tackle this very issue in the local context of the Petroleum Institute (PI) in Abu Dhabi, UAE. It presents results from the corpus analyses conducted on texts used in one of the freshman courses at PI and from students' writing papers, as well as students' thoughts on the use of traditional and technology-aided teaching materials and activities. The effectiveness of the initiative is discussed, and suggestions are offered to support EAP students' lexical competence.*

Key words: *AWL, lexis, vocabulary, instruction, technology, academic vocabulary*

1. INTRODUCTION

The vast number of lexical items in English is a formidable challenge for learners of English as a foreign language. The magnitude of the problem can be even greater for university students who have to grapple with academic and technical vocabulary on top of advanced general English words. This prompts university preparatory programs to devise a lexical strand for their courses, as in the example of Sabanci University in Turkey (Deveci & Simpson, 2013). The nature of such programs allows for form-focused instruction in terms of grammar and vocabulary. However, some students graduating from preparatory programs with required proficiency examination results may assume that they do not have to worry about language-focused studies any longer. Should this assumption by students be coupled with a freshman program's lack of interest in form-focused instruction at the expense of teaching content, their language development may be only incidental. It has been well-documented in the literature that students lacking essential English vocabulary, syntax and grammar, cannot effectively meet academic demands such as reading textbooks and other literature, writing essay assignments and

participating in discussions with faculty and peers (Kinsella, 2005). However, freshman instructors choosing to incorporate some elements of form-focused instruction with an emphasis on vocabulary may still face the challenge of deciding which words to focus on (Kinsella, 2005), as well as the kind of methodology to follow in teaching vocabulary. Although intuition can be of some help, a systematic approach to choosing lexis is required. The same is true for instructional design. Not all freshman instructors may be equipped with the contemporary theoretical and practical knowledge to engage in vocabulary instruction. As a result, they may opt for traditional methods devoid of new technologies, limiting their ability to address different learning styles. Taken together, these factors could easily lead to students losing interest in learning and cause frustration for both students and instructors. The current study targeted this relatively less investigated aspect of freshman studies. With this purpose, this paper describes how internet technology can help in analyzing assigned texts in a given course, and presents the results of a piece of action research incorporating a traditional and internet-aided teaching approach.

2. BACKGROUND

2.1. Words to learn

It goes without saying that grammar knowledge is essential to be able to speak English as a foreign language. However, vocabulary knowledge is equally important, if not more so. There seems to be a limit to the amount of grammatical knowledge a language learner can acquire; however, vocabulary in English seems so vast that there may not be an easy end to learning vocabulary whatever one's proficiency level may be. This feature of the English language can be a serious challenge for learners, creating frustration for even more advanced learners. Several initiatives have been taken to help guide learners in terms of the kind of lexical items they should acquire as they progress. One such initiative is the General Service List (GSL) created by Michael West (1953). The GSL was put together with a careful study of the lexical items most frequently used for general purposes and therefore considered appropriate for learners of English to learn. The GSL is comprised of 2,000 headwords, knowledge of which is believed to help learners understand 90% of spoken and 80% of written texts in English. These words have been commonly used in EFL course books, graded readers and dictionaries. Considering the sixty-three year gap since the GSL was first produced, it is only natural to expect certain words such as 'headdress' and 'shilling' to have become less frequent, and some others like 'television' to have gained more popularity. Due to such concerns, the GSL has been updated recently by Brezina and Gablasova (2013) who created the (new) GSL which consists of 2,494 lemmas and is argued to represent current language use better.

The (new) GSL is certainly a great help for learners of English for academic purposes (EAP) since they are required to master most frequently used general words. However, the GSL alone is insufficient since university students are also required to learn lexical items that appear in academic written and spoken texts. This necessity has prompted scholars to devise vocabulary lists targeted for EAP students. For instance, Xue and Nation (1984) developed the University Word List (UWL) which consisted of an 808-family list of words from academic texts from various disciplines. It was divided into 11

levels arranged from the most to the least frequent words. Coxhead (1998) later created the Academic Word List (AWL) which replaced the UWL. Coxhead analyzed a corpus of 3.5 million running words coming from texts in disciplines such as Science, Arts, Commerce and Law, and identified 570 headwords that would be essential for EAP students to acquire on top of the GSL words. Coady and Huckin (1997) state that a typical academic text would cover certain percentages of the GSL, AWL, technical and low frequency words, as shown in Table 1 below.

Table 1 Vocabulary coverage in a typical academic text

Level	Coverage
High frequency words (top 2000)	87
Academic vocabulary	8
Technical vocabulary	3
Low frequency words	2

2.2. Approaches to vocabulary instruction

As can be seen in the table above, language instruction for EAP students requires special attention to the GSL words; however, this should not be at the expense of the AWL or technical lexis. Otherwise, students will be denied the opportunity to acquire necessary academic knowledge. However, the availability of the above-mentioned word lists alone will not guarantee that students will learn the lexical items necessary for their studies. Instructional design, in EAP programs in particular, should consider adopting a certain approach to incorporating vocabulary. One of the approaches is that of explicit instruction which "involves diagnosing the words learners need to know, presenting words for the first time, elaborating word knowledge, and developing fluency with known words" (Hunt & Beglar, 2002, p. 258). Hanson and Padua (2011) state that explicit instruction helps students acquire the in-depth knowledge necessary for them to understand the meaning of words. They suggest four strategies for explicit instruction of words: providing student-friendly definitions, using words in context, providing multiple exposures, and offering opportunities for active involvement. However, explicit instruction has also been criticized on the grounds that it is more teacher-centered, can be time-consuming and can be too laborious for learners (Wu, 2009).

Another approach is incidental learning which occurs when "the mind is focused elsewhere, i.e. learning without conscious attention or awareness, such as on understanding a text" (Shakouri, Mahdavi, Mousavi & Pourteghali, 2014, p. 523). In the words of Longhurst (2013), incidental vocabulary learning occurs when "a student acquires vocabulary through the mere use and exposure to the language while focusing on the more important aspects of communicative language ability" (p. 15). Hollingsworth and Ybarra (2013) argue that this approach, through reading in particular, can be very useful for learning vocabulary mainly because there are very many words in the English language and one cannot assume that teachers can teach all these words to students. Research suggests that extensive reading assists language learners in learning lexis through the incidental learning approach. Incidental learning encourages learners to guess the meaning of words they encounter when reading, which according to Nation (2001) is the most important source for vocabulary learning. Nation and Wang (1999) also argue

that extensive reading reinforces the words students have already been studying and exposes them to more vocabulary items. This lends further credence to Krashen's (2003) 'comprehension hypothesis' suggesting that learners need comprehensible input to reinforce the language skills and knowledge they have already been exposed to and develop new ones.

It is quite possible that instructors can embed elements of incidental and explicit learning in their instruction. Schmitt (2000) states that "the proper mix of explicit teaching and activities from which incidental learning can occur" (p. 145) would benefit learners greatly. According to empirical evidence, using both approaches when teaching vocabulary facilitates learning new items with longer retention (Shakouri, Mahdavi, Mousavi & Pourteghali, 2014). Ellis (2010) also notes that it can be very difficult to divorce explicit instruction from incidental learning. This is because explicit instruction can result in incidental learning when learners notice instances of language in the instructor's explanation.

2.3. Technology use in teaching vocabulary

It is often the coursebook that decides how the target lexis should be taught in any given language classroom. However, this does not prevent more independent and resourceful teachers from exploiting different ways of teaching the lexis. These instructors tend to have a variety of vocabulary teaching tools and activities at their disposal. With the recent developments in educational technologies and the growth of the internet, more teachers may resort to utilizing these resources. It has been argued that students' attitudes, confidence and motivation can be improved significantly through the use of computer technologies (Ferris & Hedgcock, 1998). These technologies also lend themselves to explicit, implicit and incidental vocabulary teaching approaches. Ma and Kelly (2006) note that instructional design incorporating computer technology should aim at both explicit and implicit vocabulary learning by training students to become active learners.

It is beyond the scope of this study to list all the available technologies that could be utilized for vocabulary instruction. However, among the most commonly used digital technologies are iPads, smartphones and SMARTBoard, each of which has multiple applications dedicated to learning. Moreover, the internet houses an infinite number of Web 2.0 tools, interactive games, exercises and quizzes, dictionaries, and online platforms where students and teachers interact with the aim of developing various language skills including vocabulary competence. At the most basic level, computer technology provides contextual and visual presentation of new vocabulary items through a simple search on the web for graphics, images, and stories that put them in context, which allows students to learn lexis more successfully (Wise, 2015). On the other hand, corpus analysis with the help of internet tools such as Antconc and Lexical Tutor enables the identification of word frequencies and coverages in a given text or a subject area. Students having instant online access to different corpora can enjoy the exposure to target vocabulary items as much as they want, and they can obtain ample data on how these items are used in real life, while familiarizing themselves with the morphological variations of the lexis (Zhou, 2012).

It seems difficult to say whether computer technologies could replace traditional methods and materials for teaching vocabulary. However, research offers indications of how online vocabulary teaching may be superior to traditional methods. For instance, Kilickaya and Krajka (2010) compared the use of traditional vocabulary notebooks and

cards to WordChamp, a vocabulary management system. They found that those who used the online application performed better on the immediate vocabulary test as well as on a delayed post-test. Similarly, Tamjid and Moghadam (2012) investigated the effects of a vocabulary learning software (Narsis) in comparison to only using a coursebook. They also found that students in the experimental group mastered the target vocabulary items better than those in the control group. Taken together, these studies indicate that technology use has a positive effect on students' vocabulary acquisition.

Other studies, on the other hand, investigated how a combination of traditional methods with educational technologies affects learning. For instance, Khazaei and Dastjerdi (2011) found that students who experienced such a blended approach outperformed those who studied vocabulary only in the traditional way. Kilickaya and Krajka (2010) agree that language instructors should exploit both traditional materials as well as computer resources in their attempts to teach vocabulary learning strategies.

3. THE RESEARCHER'S CONTEXT AND THE RATIONALE FOR THE STUDY

The impetus for the current study comes from the researcher's personal observations in the freshman English program where he teaches at the Petroleum Institute (PI) in Abu Dhabi, UAE. PI is a university offering degrees in various engineering disciplines including Chemical Engineering, Electrical Engineering, Mechanical Engineering, Materials Science and Engineering, Petroleum Engineering, and Petroleum Geosciences. Students whose English level is not at an adequate level spend a year learning academic English in the Academic Bridge Program prior to their freshman studies. This is followed by their freshman studies in the College of Arts and Sciences, which hosts the Communication Department among many other departments aiming to equip students with the basic knowledge and skills required before embarking on their engineering education.

The Communication Department offers two freshman courses: COMM101 and COMM151. The former is an introductory course teaching the language and communication skills required for undergraduate study. Students in this course develop their critical reading, writing and oral presentation skills through a context of humanities and social research projects. The latter course, on the other hand, builds on the skills acquired in COMM101 and further enhances their academic literacy skills through projects students undertake to address social and technical issues. There is also an emphasis on communication theories including effective listening, inter- and intrapersonal communication, and intercultural communication. Both courses put a heavy emphasis on the soft skills engineering students need to acquire. Students engage in both individual and team work to develop various communication skills. With this purpose, instructors in the Communication Department focus on grammar and vocabulary in their classes where and when the need arises. However, a specific language component does not exist, and it is left to the discretion of individual teachers. Although there may be no harm in individual teachers using their judgment on their students' needs and taking action accordingly, a general roadmap that provides flexibility might help guide them.

This study mainly focuses on vocabulary since the researcher believes that students' communication skills can be enhanced during their freshman year studies if their instruction has a strong lexical strand. This is also because the students were expected to be fairly at ease with grammar at the proficiency level they had attained before embarking on their freshman studies. However, the researcher did not ignore the fact that grammatical rules

for lexical items such as morphemes and spelling might still challenge some students, and therefore, this current research did not disregard grammar altogether. Hunston, Francis and Manning (1997) state that "all words can be shown to have patterns, and words which have the same pattern tend to share aspects of meaning [… which] contribute to the teaching of both grammar and vocabulary" (p. 208). Students whose grammar knowledge is at a certain level can also be expected to divert more of their attention to lexis at the mastery level, which makes them more flexible and precise at a productive level (Deveci, 2015). Although grammar and lexis cannot be divorced from each other, limited attention to lexis can become a serious barrier to the overall development of students' linguistic competence.

The PI has recently launched an initiative to utilize technology more fully for educational purposes, with a heavy focus on laptop use. For this purpose, the students are provided with laptops with certain specifications, and the instructors are encouraged to enhance the students' learning by making them use the laptops both inside and outside of the classroom. Despite this heavy emphasis on technology, neither the students nor the instructors seem to have a clear understanding of what to do or how best to integrate technology into the teaching and learning process. While some instructors wish to do away with traditional methods altogether, others still stick to their old ways of teaching. The students, on the other hand, do not seem to be particularly enthusiastic about laptops. This is partly because they are already familiar with them and see nothing groundbreaking with the new initiative. However, it seems that the majority of the students are only accustomed to using their laptops for social purposes or for typing their assignments. It seems that they are not really aware of the variety of educational opportunities available to them.

Also, a small-scale study the researcher previously conducted with COMM151 students showed that the heavy course-load challenged the students in general, and the situation was further complicated by some students' limited linguistic competence, causing them to be bored (Deveci, 2016). In order to alleviate the problem, the current research aimed at developing a vocabulary strand for COMM151 supported by technology-enhanced instruction. The research also aimed at engaging students in inquiry learning through the use of certain online learning tools with a view towards promoting their independent and lifelong learning skills. This was believed both to help increase their linguistic competence and to decrease boredom levels. Furthermore, the research aimed at identifying students' preferences for traditional teaching materials versus online tools, which was hoped to shed light on their perceptions of different kinds of educational materials and activities.

4. METHODOLOGY

4.1. Participants

A total of 34 freshman students participated in this study. Of these students, 19 (56%) belonged to the experimental group that received the vocabulary training described in detail below. On the other hand, the control group included 15 (44%) students who did not receive any kind of focused instructional intervention regarding lexis. The participants' ages ranged between 19 and 21, with a mean age of 20. All the participating students were male. Note that PI is a gender-segregated university, and the researcher of this study was teaching only the male students at the time of the research, which may be regarded as a limitation of the study.

4.2. Instructional design and evaluation method

A variety of instructional activities and materials were used with the experimental group. These are as follows.

a) Self-assessment: This included a self-assessment test taken by the students in the experimental group twice. The first one was in the form of a diagnostic survey asking the students to reflect on their knowledge of particular lexical items. It was hoped that this would raise the students' interest in the planned vocabulary intervention strand of the syllabus and encourage the students to devise a learning plan for themselves to close the gaps in their lexical knowledge. The students completed the same survey a second time at the end of the course to reflect on their development.

b) Classroom activities: In order to increase the students' engagement with the target lexical items, various traditional and technology-friendly activities were used in class. These included the following:

1) Handouts: These were mainly in the form of exercises that focused on the meanings of the target words. The students had to do tasks such as matching, filling in blanks, and multiple-choice tests. These were given to students before or after they read the seminar texts in order to raise their schemata and/or revise the words they had been exposed to.

2) Games: These included fun activities to revise the target vocabulary items. There was an emphasis on both meaning and form, with a particular attention to spelling since it appeared to be a challenging aspect of vocabulary learning for Arab students in particular. Games were used as warm-up activities at the beginning of the classes and as wrap-up activities at the end of the classes. They also served as time-fillers.

3) Online vocabulary analysis activities: These were mainly done using online education software available free of charge at http://www4.caes.hku.hk/vocabulary/tools_cp.htm. The students were trained to use these tools. They were asked to analyze the words in their texts for the seminars. However, they were not always able to do so when their texts were in pdf format. They were also asked to use various concordancers, such as the one at http://ec-concord.ied.edu.hk/paraconc/monoconcE.htm to learn more about how words were used in context, their collocational forms and their grammatical surroundings. (See appendix for sample activities.)

Class-time was also allocated to online AWL word exercises at http://www.englishvocabularyexercises.com/AWL/, which contains more than 200 exercises to review and recycle academic words categorized according to sublists. In this way, the students received immediate feedback on their answers. (See appendix for sample activities.)

4) Vocabulary journals: The students were asked to keep vocabulary journals where they kept track of the words they learned with their meanings, word forms, example sentences, etc. They were also asked to do some creative writing using the words they had learned. Their journals were regularly collected for feedback.

5) Peer-tests: In order for students to take an active role in their own and their peers' learning processes, they were asked to prepare vocabulary exercises similar to the ones which the researcher provided them.

Overall, these activities, exercises and tools were believed to have increased both the number and the quality of exposures to the target words. It was hoped that this engagement with the words would increase the students' retention rates.

c) Evaluation methods: This instructional intervention was evaluated in various ways. First, the students' second reflective writing exam papers on interpersonal and intrapersonal communication were analyzed using http://www4.caes.hku.hk/vocabulary/tools_cp.htm in

order to determine whether or not the instructional intervention made a difference in their active use of the target AWL words.

The effect of the intervention was also evaluated using an end-of-course vocabulary quiz. This quiz was comprised of three sections. Section A required the students to fill in the blanks with the words provided. This section was expected to be the least challenging section. However, in order to increase the difficulty level, some extra words were included. The second section focused on word building, which the students had found difficult at the beginning of the course. The last section, on the other hand, included 15 questions requiring the students to utilize their collocational knowledge of the target words. This section was expected to be the most challenging section since the students were not provided with any options from which to choose. Student's t-test was used to compare the quiz results of the experimental and control groups. A p-value less than 0.05 was considered statistically significant.

Semi-structured interviews were held with volunteering students to collect qualitative data on students' perceptions on the overall initiative.

5. RESULTS

One of the aims of this research was to identify the vocabulary profile of the seminar texts in the COMM151 course using online software. This was done to determine whether or not they possessed the characteristics of typical academic texts as identified by Coady and Huckin (1997). The results of the data analysis conducted with this purpose can be seen in Table 2.

Table 2 Vocabulary Profile of COMM 151 seminar texts

	1-1000 words		1001-2000 words		AWL words		UWL words		Off-list words		*Total*	
	f	%	f	%	f	%	f	%	f	%	f	%
Text 1 (Effective Listening)	1,871	83.27	150	6.68	114	5.07	1	0.04	111	4.94	2,247	100
Text 2 (Interpersonal Communication)	825	75.14	47	4.28	151	13.75	0	0	75	6.83	1,098	100
Text 3 (Intrapersonal Communication)	602	79.32	37	4.88	82	10.8	0	0	38	5	759	100
Text 4 (Cross-cultural Communication)	1,744	79.28	84	3.83	258	11.74	0	0	113	5.15	2,199	100
Total	5,042	79.99	318	5.04	605	9.6	1	0.02	337	5.35	6,303	100

Table 2 shows that the first seminar text on effective listening includes a total of 2,021 words, 89.95% of which were part of the top 2,000 high-frequency words; this percentage is about 3% higher than Coady and Huckin's expectations of a typical

academic text. The number of academic words in this text, on the other hand, was found to be 114 (5.07%), which is about 3% lower than what is expected of a typical academic text. The higher number of GWL words compared to the AWL words in this text may not be a cause for concern. This is because this very first text the students are assigned could be perceived as less challenging by the students and could help activate their lexis with a greater focus on GWL words. This can be of particular help in the case of students who have limited experience reading academic texts.

When the numbers for the second text on interpersonal communication are considered, it is seen that the number of AWL words in this text (151) is about 6% higher than the expected number of AWL words for a typical academic text (13.75% vs. 8%). Such an exposure to academic words in this text can only increase the students' AWL competency if their attention is explicitly drawn to these items. In comparison to Coady and Huckin's (1997) expectations, the number of GWL words in this text, with a total percentage of 79.42, was found to be lower. The 7.58% difference was not expected to cause the students to face difficulties in understanding the text, especially because they were offered guidance on the AWL and off-list words.

Similarly, the third text on intrapersonal communication included slightly more academic words (10.8%), and slightly fewer GWL words (84.7%) in comparison to the expectations in the literature (Coady & Huckin, 1997). Table 2 also shows that the total number of words in this text (759) is comparatively lower than the number of the words in the other three texts.

The last seminar text on cross-cultural communication was the second longest text with a total number of 2,199 words, 83.11% of which were found in the top 2,000 high-frequency words. The number of AWL words, on the other hand, was found to be 258 (11.74%), which is 3.74% higher than what would be expected of a typical academic text.

Taken together, the relatively higher number of academic words in the seminar texts of the COMM 151 course, compared to Coady and Huckin's (1997) findings, was challenging for certain students, especially those with lower English proficiency exam results.

The actual academic words in each of the seminar texts were also identified. The corpus made up of the four seminar texts included a total of 169 head academic words. It is also important to note that quite a few of these words were used in different forms across the four texts. Examples include 'assume-assumption', 'external-externalize', 'image-imagery', 'function-functional', 'major-majority', 'participate-participant', 'valid-validity', and 'vary–variation–variable'. Certain words have also been identified in different texts. For example, the words 'accurate' and 'establish' appeared in three of the texts, while different forms of 'interact' were found across all four texts. Similarly, the verb 'involve' was used in all four texts. This is particularly important since multiple exposures to a lexical item can increase students' likelihood of acquiring the word. Horst, Cobb and Meara (1998) state that students encountering a word between 8 to 12 times will be more likely to learn it. Schmitt (2008), meanwhile, acknowledges the importance of more exposure, but warns that active engagement with words needs to take place in order to ensure retention. With this in mind, various instructional activities were planned and executed, descriptions of which are given above, to reinforce the students' acquisition of the AWL words in the seminar texts.

Another aim of this research was to identify the effects of instructional activities on the students' vocabulary development. First of all, the results of the self-assessment test indicated that the students thought that they experienced an overall development, reflected by an overall 0.4 increase in their self-evaluation of lexical competence. Although their average ratings went down slightly (ranging from 0.1 to 0.2) for certain vocabulary items such as 'achieve' and 'dynamic', they felt that they had more control over the majority of the AWL words targeted by the intervention. In general, the increase in ratings for the target AWL words varied between 0.1 and 1.2. Although every single increase is valuable in itself, the researcher of this study tends to regard a change of 0.5 or more as significant since it suggests a substantial improvement. See Table 3 for a list of these words.

Table 3 Increased feeling of empowerment over AWL words

AWL Words	Average Rating		Increase	
	Before	After	Rate	%
hierarchy	1.8	3	1.2	30
notion, subordinate	2.3	3.5		
reliance	2.5	3.5	1	25
rely	2.8	3.4	0.9	22.5
conflict	3.1	3.9	0.8	20
crucial, norm	2.4	3.2		
commitment	2.8	3.5		
consensus	2.2	2.9		
emerge	2.5	3.2	0.7	17.5
inevitable	1.8	2.5		
passively	2.9	3.6		
qualitative	2.8	3.4		
core	3.1	3.7	0.6	15
guideline	3.2	3.8		
interpret	2.9	3.5		
vary, aspect, dominate	3	3.3		
contrast, integrate, apparent	2.5	3.3		
bond	3.1	3.6	0.5	12.5
clarify	3.2	3.7		
contrary	2.1	2.6		

This instructional intervention was further evaluated by analyzing the students' second reflective writing examination papers on interpersonal and intrapersonal communication in order to determine whether or not the instructional intervention made a difference in their active use of the target AWL words. Table 4 below summarizes the quantitative results of the analyses conducted for both the experimental and the control groups.

As can be seen in Table 4, the two groups of students used lexis with more or less similar percentages. Given the general aim of the instructional intervention, one unexpected result is the slightly higher frequent occurrence of AWL words in corpus two when comparing the control group's to the one by the experimental group (10.4% and 10% respectively). The difference between the two groups is minimal, but the experimental group had been expected to use more AWL words. However, the experimental group,

instead, was found to have used more of the first 1,000 GWL words (78.2% vs. 77.8%). The number of off-list words used by the experimental group was also found to be slightly higher compared to the number of off-list words used by the control group (7.5% vs. 7.2%).

Table 4 Quantitative comparison of lexis-use by the experimental and the control group.

	CORPUS 1 (Experimental Group N=19)		CORPUS 2 (Control Group N=15)	
	f	%	f	%
1-1000 words	5,463	78.2	4,491	77.8
1001-2000 words	299	4.3	236	4.6
AWL words	703	10	600	10.4
UWL words	0	0	0	0
Off-list words	522	7.5	414	7.2
Total	6,987	100	5,830	100

The AWL words in the two corpora were further compared to detect other differences. The results of the analysis conducted with this purpose showed that the corpus from the experimental group included a higher number of AWL 'headwords' (122) compared to the corpus derived from the control group (102). That is, the AWL words in corpus 2 were less varied with more frequent use of certain words. Although this was found to increase the AWL density in this corpus, it limited lexical dexterity. This suggests that the students in the experimental group tended to use a greater variety of AWL words despite the comparatively lower overall number of AWL words in their responses to the exam question. The words that were found to be unique in corpus 1 were as follows: 'academic', 'appreciated', 'aspects', 'attribute', 'beneficial', 'bond'.

It also emerged that out of 102 AWL headwords used in corpus 2, only 14 of them (13.7%) were used in different word forms. This number was found to increase to 20 out of 122 words (16.4%) in the case of corpus 1. This shows that the students in the experimental group had a greater tendency to vary the word forms they used, which suggests slightly more lexical dexterity. The different word forms detected in corpus 1 can be seen below:

'achieve, achievement'; 'category, categorize'; 'establish, establishment'; 'evaluate, evaluation'; 'global, globalization'; 'individual, individually'; 'interact, interaction', interactively'; 'motivation, motive'; 'occur, occurrence'; 'process, processing'; 'react, reaction'; 'research, researchers'; and 'similarly, similarity'.

Taken together, these data suggest that the instructional intervention increased the tendency of the students in the experimental group to use a variety of AWL words, as well as different word forms, despite the relatively lower percentage of AWL words used in their corpus.

In order to determine whether or not the instructional intervention had any further positive effect on the students' use of AWL words, some qualitative analyses were conducted comparing the two corpora. As mentioned above, the online concordancer at http://www4.caes.hku.hk/vocabulary/concordancer.htm was used to identify the sentences and the context in which the students used the AWL words. The results of this analysis supported the more frequent occurrence of different word forms in corpus 1. It also emerged that the students in the experimental group paid greater attention to the collocational surroundings of the AWL words. They used more varieties of word

combinations. Examples of collocations were 'academic life,' 'achieve goals/personal targets/more and more,' 'the concept of,' 'establish an identity/a conversation/functions,' and 'seek knowledge.' There were also, however, instances of inaccuracies as in 'achieve personal needs,' 'interact through/to someone,' 'an affect on,' and 'make research,' some of which seem to be fossilized errors in the interlanguage of these students.

In terms of writing mechanics, spelling mistakes with the AWL words were less frequent in corpus 1 than in corpus 2. Some common spelling mistakes included 'commincation', 'achive', 'breif' 'defind', 'occurance', 'princepl', and 'proceses'. In addition, the students in the experimental group made comparatively fewer grammar mistakes in their use of the AWL words. The following mistakes were found to be less frequent, or nonexistent, in corpus 1: 'researches', 'informations', 'many evidence' and 'unrelevant'.

The effect of the intervention was also evaluated using an end-of-course vocabulary quiz. The quiz was given to both the experimental and the control group to determine the effect of the intervention. The results of the analyses done with this purpose can be seen in Table 5 below.

Table 5 Quiz results

Experimental Group (N=19)				Control Group(N=15)				p
Section A	Section B	Section C	Average	Section A	Section B	Section C	Average	
60	75	51	62	53	57	49	53	0.1157

$$p < 0.05$$

According to Table 5, the average grade for the experimental group (62) is higher than that of the control group (53). However, the t-test conducted to compare the two data sets revealed that the difference was not at a statistically significant level (p= 0.1157 > 0.05). Despite this, the detailed analysis of the average scores in both groups showed that 60% of the students in the control group was ≤ 50, while only 38.9% of those in the experimental group had a score of ≤ 50. Also, the students' average marks in the control group varied between 22.5 and 85. However, the average marks in the experimental group varied between 22.5 and 100. Taken together, these suggest that the instructional intervention had a positive effect on the students' quiz results despite the lack of a statistically significant difference between the two data sets.

A closer look at the different sections of the quiz reveals that in all three sections the students in the experimental group scored higher than those in the control group. The most striking difference appears to be in section B, with a difference of 18 marks. This suggests that the students in the experimental group did, in fact, improve their word-building skills, which is often regarded as a challenging task. Another noteworthy result is that the students in both groups scored the least in section C with a difference of 2 points between the two groups. This seems to suggest the instructional intervention did not have the desired effect on the students' collocational competence. This was further observed in the students' vocabulary journals, where they generally left the section for collocational uses of the target words blank. In the interviews, some students mentioned that it took them much longer to complete the journals if they engaged in intense analyses of the words. Related to this, the students' reluctance to investigate collocations was found to have an impact on their active use of AWL words in their reflective writing

papers. The qualitative analyses of their exam papers revealed that they often utilized incorrect collocations, as exemplified above.

Another form evaluating the intervention was a survey the students in the experimental group filled in at the end of the course to give their perceptions on the instructional intervention.

This survey included sections on their perceived lexical competence before and after the intervention, their motivation levels regarding vocabulary learning before and after the intervention, their thoughts on the vocabulary activities and materials used in class.

The results of the survey showed that the majority of the students (89.5%) felt that the intervention had a positive effect on their vocabulary development. However, two of the students signified that they felt otherwise. In order to identify possible reasons for this, interviews were held with them. One of the students, who missed a substantial amount of class time, remarked that the main reason was his lack of control over his learning throughout the term due to reasons outside of class. The other student, on the other hand, said that he already knew a lot of vocabulary, and that he still could have received a high mark from the quiz without having participated in the vocabulary strand. However, he added that he did enjoy the games they played to reinforce vocabulary.

The results of the data analyses regarding how much their motivation had increased as a result of their engagement in the vocabulary strand can be seen in Figure 1 below.
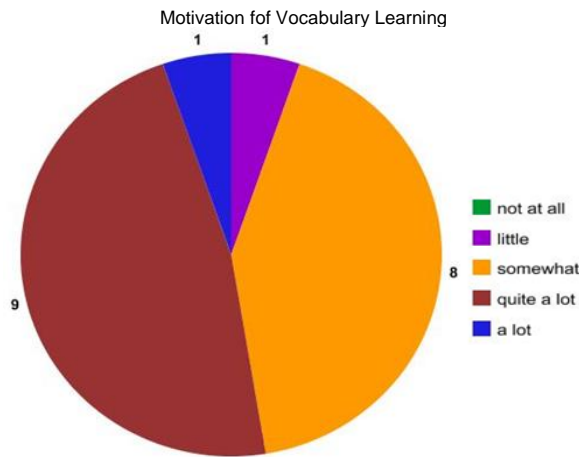

Fig. 1 Increase in motivation for vocabulary learning

Figure 1 shows that an overwhelming majority of the students (94.7%) expressed that they became more motivated to learn vocabulary as a result of their engagement in the intervention.

The survey also aimed at identifying the students' opinions on how different types of activities contributed to their vocabulary development. Table 6 below presents the findings on this in order of importance as perceived by the students.

Table 6 Students' opinions on the extent to which learning activities
contributed to their vocabulary development

	not at all		little		somewhat		quite a lot + a lot	
	f	%	f	%	f	%	f	%
Exercises created by the instructor	0	0	0	0	2	10.5	17	89.5
Vocabulary lists provided	0	0	3	15.8	0	0	16	84.2
Quizzes prepared by other students	1	5.3	1	5.3	2	10.5	15	78.9
Vocabulary journal	1	5.3	1	5.3	3	15.8	14	73.7
Writing exercises	0	0	1	5.3	5	26.3	13	68.4
Vocabulary games	1	5.3	1	5.3	5	26.3	12	63.2
Online vocabulary analysis software	2	10.5	2	10.5	6	31.6	9	47.4
Online vocabulary exercises	2	10.5	2	10.5	6	31.6	9	47.4
Self-assessment test	0	0	3	15.8	9	47.4	7	36.8

As can be seen in Table 6, vocabulary exercises created by the instructor were the most popular type of activity, with 89.5% of the students believing that they benefited from them to a great extent. This is followed by the vocabulary lists, which were also put together by the instructor (84.2%). During the interviews held with some of the participants, it was often mentioned that the lists gave the students a reason for studying, and provided them with a definite path for learning. Of the students, 78.9% also felt that the quizzes their peers wrote contributed to their vocabulary development. They often stated that when they had to produce vocabulary quizzes themselves, they had to engage in mental activities which helped them practice the target words and process a variety of language skills.

Vocabulary journals also appeared to be popular with the students, with 73.7% of them believing that keeping a journal reinforced their learning. Furthermore, some students stated that the template they were provided with helped them organize their work more efficiently. Finally, writing exercises and vocabulary games seemed to attract a similar number of students' interest (68.4% and 63.2% respectively).

An unexpected result was that only 47.4% believed that they greatly benefitted from technology-enhanced instruction, that is, the software and online vocabulary activities. This finding is particularly important since the researcher had assumed that incorporating internet technology in his instruction would enhance students' interest in the vocabulary strand. The qualitative data collected in the interviews revealed that the particular type of online activities posed a challenge to the students. They thought it took too long to finish the exercises requiring too much mental processing. Some were also intimidated by more capable students' pace with assigned tasks, causing them to have a negative attitude towards the online work. This feeling appeared to increase when they could not analyze their texts in PDF. In this study, it also appeared that the students in the experimental group felt overwhelmed with the number of outside-of-class tasks assigned. They often made the remark that the coursework was significantly greater due to the online tasks they were required to perform. Some indicated that the exercises in the traditional paper format were just fine although they did see the point in using the online exercises.

The least popular learning tool was the self-assessment test administered at the beginning and end of the course. The students often expressed their dissatisfaction with the length of this tool.

Beyond all this, the students were asked to rate the overall efficiency of the vocabulary strand of the curriculum. Their responses can be seen in Figure 2 below.
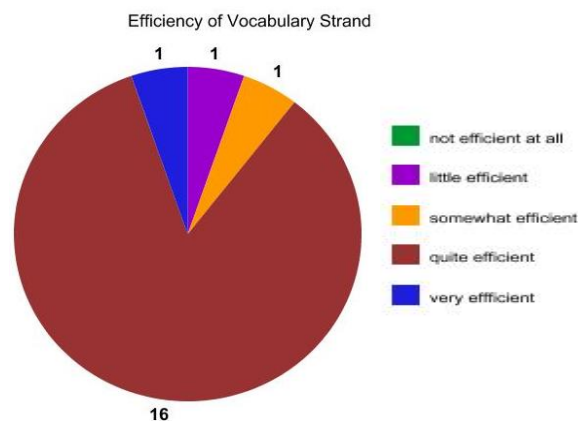

Fig. 2 Students' opinions on efficiency of vocabulary strand

Figure 2 shows that an overwhelming majority of the students (84.2%) rated the vocabulary strand as 'quite efficient,' and one student felt that it was 'very efficient.' However, one other student rated it as 'a little efficient.' This was the very student who had missed quite a bit of classroom time due to outside issues. Therefore, his opinion could be biased.

When asked for their opinions on how to improve the vocabulary strand of the curriculum, most students seemed to hold the belief that more frequent quizzes would help them reinforce the words they study. Interestingly, some of these students stated that they would rather receive quizzes prepared by their instructor rather than their peers. Their justification for this was the poor quality of quizzes written by their peers. Games were also found to be popular with students, some of whom stated that a game would be good in each class. Additionally, a student expressed his interest in online language games. Meanwhile, other students suggested that more writing exercises requiring them to use the target words would enhance their lexical competence.

6. CONCLUSIONS

The fact that university students need to master a large number of academic as well as subject-specific words can be a formidable challenge for freshman students who have not had much exposure to academic language yet (Wu, 2014). This is especially true for those admitted to their freshman studies with minimum proficiency exam scores. Therefore, students need to be provided with opportunities to develop their language skills through both traditional and technology-aided instructional activities focusing on lexis. This belief was the impetus for the current study.

The effects of the study were evaluated in different ways. It was found that there were not always significant differences between the experimental and control groups in terms of the percentages of academic words they used in their exam papers and their quiz results. However, the results also indicated that students did benefit from the intervention, varying the academic words they used, reducing the number of mistakes and attempting to use a comparatively wider range of collocations. Students also reported an overall satisfaction with having greater engagement in their own learning due to the intervention. They seemed to develop a sense of empowerment regarding their learning as a result of their raised awareness of various learning tools. Further, they came to the realization that activities in the form of games can increase their motivation for learning more generally.

Despite these positive results, almost half of the students did not think the use of technology enhanced their learning. One of the reasons for this was found to be the intellectually challenging nature of the chosen web-based applications. The students disliked the amount of time these applications required. This was coupled with other complications when they could not work on their PDF texts using these applications. Taken together, it can be understood why the internet-based instructional activities were not popular with these students. Previous research has also found that having to use new online tools has the potential to result in functional and psychological obstacles (Lin & Yang, 2011). Some other students, though, believed the technology-related tasks added to their academic load, which they felt was not necessary had they only used traditional materials and methods for vocabulary learning. Research by Lavin, Korte and Davies (2010) also revealed that removing technology from courses would not necessarily have a negative effect on student behaviors such as attendance and interaction with the instructor. Jordan and Sanchez (1994) further note that students' performance may not be improved significantly by using technology and other innovations in the classroom. It appears that at least some of the students in the current study might have been expected to benefit from traditional methods whether or not the technological aspects were removed. One reason for the unpopularity of the online learning environments with these students may be their perceived impersonal nature; this has been found to be the case in earlier research (Weber & Lennon, 2007). Shelly, Cashman, Gunter and Gunter (2008) also warn that successful integration of technology and learning is dependent on students' perception of it. They note that today's students are technologically savvy, and should they feel challenged working through exercises they will likely get bored or frustrated, thus developing a dislike for the technological tool being utilized. Other researchers have also noted that the internet generation may not be as inclined to participate in internet technology as they appear to be (Jones, Ramanau, Cross & Healing, 2010).

The nature of the Communication courses at PI allows for language-focused interventions. However, the other departments could also consider assuming some responsibility for developing their students' academic and subject-specific lexical competence. This could be done by adopting some of the instructional initiatives taken in this study, with an emphasis on analytical skills. This will surely have a positive effect on the students' comprehension of content matter as well as their foreign language competence.

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APPENDIX – ONLINE LEARNER TRAINER MATERIALS

RESEARCH TOOLS

Go to the following address to see the research tools we will be using to analyze the lexis in our seminar texts. http://www4.caes.hku.hk/vocabulary/tools_cp.htm

Research Tools

Cut and paste tools

These are based on Paul Nation's Vocabulary Profiler, developed at Victoria University of Wellington, New Zealand and adapted by Tom Cobb at UQAM Canada. This section contains a Frequency Analyser and a Vocabulary Profiler.

The **Frequency Analyser** allows researchers to copy and paste in chunks of text to identify the frequency of occurrence of the words. The results can be sorted in ascending or descending order.

The **Vocabulary Profiler** will identify words according to Nation's Word Frequency Lists of 1,000 words, 2,000 words, academic words and 'off list' words.

In addition, a **Concordancer** allows researchers to find examples of the usage of particular words, or parts of words, in a text. This works best with a very large amount of text, but can still be useful even with shorter texts, such as student essays.

Cut and Paste Tools	Frequency Analysis Vocabulary Profiler Concordancer

Concordancer

Go to the following page to learn the collocational surroundings
of the words you want to learn.
http://www4.caes.hku.hk/vocabulary/concordancer.htm

Concordancer

This program searches words from a text that you paste into the word. Enter the text in the big box below and the search word in the small box. You can use OR (in capital letters) for boolean searches.

```
friend because you've shown an interest in them.
They'll forgive us if we sound a little
patronizing--they're used to it.
        Making a tape recording of a
conversation, if you can find a willing partner,
can also help you evaluate your performance.
With a tape of a conversation, you can examine
each response you give in detail, without relying
on your memory.
```

word: [   ]

location: [any part of word ▾]

sort by: [order of appearance ▾]

[Start] [Reset]

Study the sample concordance lines below. What two verbs are used with the noun 'conflict'?

Concordancer - Results

trust in you, you will reduce conflict, you will better understand h
he frequency of interpersonal conflict and increases the likelihood
ases the likelihood that when conflicts emerge they will be resolved

Total Matches: 3

Frequency Analysis

Go to the following address to see the frequency of words in your seminar texts.
http://www4.caes.hku.hk/vocabulary/frequency.htm

Frequency Analysis

Enter your text in the following text box and then click "Start". Our program will then tell you how many times each word appears in the text. You could specify the way in which the results are sorted in the list box.

```
friend because you've shown an interest in them.
They'll forgive us if we sound a little
patronizing--they're used to it.
        Making a tape recording of a
conversation, if you can find a willing partner,
can also help you evaluate your performance.
With a tape of a conversation, you can examine
each response you give in detail, without relying
on your memory.
```

Results are sorted by: frequency

Start   Reset

Study the sample frequency list from the effective listening seminar text.
Do you realize that you know many of the high-frequency words?
What content words do you think you should pay closer attention?

Frequency Analysis – Results

Frequency	Percentage	Word
91	4.0498%	TO
68	3.0263%	THE
64	2.8482%	THAT
63	2.8037%	A
61	2.7147%	YOU
50	2.2252%	AND
34	1.5131%	OF
31	1.3796%	WE
29	1.2906%	IS
28	1.2461%	I
27	1.2016%	IT
24	1.0681%	THEY
23	1.0236%	WHAT
21	0.9346%	BE
20	0.8901%	CAN
20	0.8901%	FOR
19	0.8456%	T
19	0.8456%	IN
18	0.8011%	LISTENING
17	0.7566%	WHEN
16	0.7121%	THEIR
16	0.7121%	OR
16	0.7121%	EFFECTIVE
15	0.6676%	ADVICE
15	0.6676%	HAVE
15	0.6676%	ARE
14	0.6231%	REFLECTING
14	0.6231%	WILL
14	0.6231%	TIME

Vocabulary Profiler

Go to the following page to see the vocabulary profile of your chosen text.
http://www4.caes.hku.hk/vocabulary/profile.htm

Vocabulary Profiler

Enter your text in the following text box and then click "Start". Our program will then tell you how many word types the text contains from the following frequency levels:

1. the list of the most frequent 1000 words,
2. the list of the most frequent 1001 - 2000 words,
3. the Academic Word List (AWL), (Coxhead 1997),
4. the remaining words in Xue and Nation's (1984) University Word List not included in the AWL, and
5. the words that do not appear in any of the preceding lists.

Start   Reset

Online AWL Exercises

Go to the following address to practice more academic words.
http://www.englishvocabularyexercises.com/AWL/