MEASURING LEXICAL RICHNESS IN THE WRITINGS OF ESL LEARNERS AT A TERTIARY INSTITUTION IN MALAYSIA

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Abstract: This study aims at measuring the lexical richness of first semester students from Universiti Teknologi MARA Cawangan Pahang with the research objectives of measuring the use of 1000-, 2000-word level and AWL level in the writings and comparing the lexical profile in the writings of students from different disciplines. The study employed a quantitative approach to data analysis, whereby the corpus data were analysed using a lexical analysis software AntWordProfiler and descriptive statistics were applied to obtain the frequency and percentage of the results. The corpus data, which were the compilation of the writings from 241 first semester students, stood at 106, 015-word tokens. The findings reveal an overall high (87%) GSL1 level and low GSL2 and AWL (5% and 2% respectively) in the student writings, while there is also almost no difference in results between disciplines in GSL1, GSL2 and AWL levels. The study concludes that the participants in general have insubstantial lexical knowledge that may affect their ability to function independently in the academic setting.

Keyword: English as Second Language (ESL), Language Frequency Profile (LFP), lexical richness, writing.

Introduction

Lexical knowledge over the recent years has been placed center stage in the language research as it has been both recognised and attested by researchers as the backbone of learners' success in a target language (see e.g. Alqahtani, 2015; Nation, 2011; Schmitt & Schmitt, 2020). Numerous studies attested to the interrelation of lexis to the successful response to the four language skills; reading (see e.g. Ha, 2021; Karami, 2012; Karami & Salahshoor, 2013; Stæhr, 2008), writing (see e.g. Ha, 2019; Laufer & Nation, 1995; Xie & Shen, 2015; Zhai, 2016), speaking (e.g. Hilton, 2008; Kiliç, 2019; Koizumi & In'nami, 2013) and listening (see e.g. Bonk, 2000; Cheng & Matthews, 2018; Ha, 2021; Stæhr, 2009). The studies highlight the prominent role played by lexical knowledge in ensuring learners reach proficiency in the target language. As pointed out by McCarthy decades ago in his book, learners would not be able to express a wider range of meaning and communicate meaningfully without words, regardless of how well they learn grammar or master the sounds of L2 (McCarthy, 1990). What is required in ensuring success in a target language is a solid foundation of lexical knowledge, which has been attested by past studies is still lacking among the L2 learners of English. Laufer and Yano (2001) stressed that educated non-native speakers of English only possess approximately one third of the 20,000 word families or 70,000 words that the native-speakers have or expected to have in their lexical repertoire (as cited in Mokhtar et al., 2016).

In Malaysia, researchers consent to the generally limited lexical knowledge among the ESL learners in the country, with many concluded learners possessing lexical knowledge below the threshold proposed by experts and the institutions they are affiliated to (e.g. Haryati et al., 2016; Ibrahim et al., 2019; Mokhtar et al., 2016). Lexis poses serious threats to the students' success in the academic setting as many are not only ill-equipped with the Academic Word List-AWL (Coxhead, 2000), but also in the general vocabulary list-GSL (West, 1953). Despite having had approximately 12 years of formal instruction in the English language, the learners' lexical size is far below the 2000-word level that is required of them to effectively function in the academic setting (Schmitt, 2000). Goulden et al. (1990), stressed that measuring the academic vocabulary is crucial to indicate ESL learners' ability to be successful academically (as cited in Olmos, 2009). By looking at the lexical breadth of language learners, appropriate academic plans can be made based on learners' needs and requirements.

This study aims at measuring the lexical richness of first semester students from a Universiti Teknologi MARA Cawangan Pahang to determine their preparedness in their academic endeavour in an institution where English is the medium of instruction. In short, the study is aimed at fulfilling the following research objectives:

1. To measure the use of 1000-, 2000-word level and AWL level in the writings of first semester diploma students at UiTM Cawangan Pahang.
2. To compare the lexical profile in the writings of students from different disciplines.

Literature Review

Lexical Richness and Writing Performance

Lexical richness refers to the 'vocabulary use in context' (O'Dell, Read., & McCarthy, 2000) or the 'vocabulary size reflected in use' (Laufer & Nation, 1995). According to Schmitt (2008), one important component in L2 language acquisition is vocabulary size (as cited in Ha, 2019). A language program's main goal is to put students' vocabulary knowledge in use, and they are anticipated to see a relationship between explicit measures of learners' vocabulary size and the lexical richness in their linguistic output when they are in a scenario where they are expected to use what they have already learnt (Laufer & Nation, 1995). Nonetheless, Cobb (1995) claimed that language courses in schools generally do not aim for students to learn more than a few thousand words because it is anticipated that they would keep acquiring additional vocabulary by themselves; however, nobody knows for sure the extent of lexicon development or help given to them to assure that their vocabulary acquisition progresses over the course of their academic years (as cited in Ibrahim et al., 2019).

Ever since the development of Language Proficiency Profile (LFP) (Laufer & Nation, 1995), lexical richness has always been deemed crucial in measuring the quality of L2 learners' writing. Lexical richness indicators could help in the comprehending of the connections between lexical understanding and usage, as well as the elements that determine how excellent a writing is, which are the two main reasons for the growing interest in these measures. (Ha, 2019) claimed that lexical richness can be used to gauge the students' quality of vocabulary as it accounts for the number of different words used in their written texts also discovered that lexical richness played the most significant role that correlates to greater writing quality; her correlation study revealed that lexical diversity, sophistication, and fluency all have an impact on writing quality and can be held to a different standard in a text depending on the score range. She added that lexical richness in written text reflects a person's fundamental lexical skills, which can be useful in academic writing (Ha, 2019). This way, students can improve their writing abilities by using common and relevant terminology with a range of functions in the right setting.

According to Zhai (2016), linguist and language teaching research have focused more on vocabulary size, vocabulary learning strategies, receptive lexical ability, and not much on productive lexical ability. Hence, it is vital to do research on learners' vocabulary proficiency in English writing as it is considered as an important productive lexical ability for English language learners. Zhai (2016) also noted that it has been concluded by much research that learners with lower writing ability used more repeated vocabulary compared to those with higher writing ability (e.g. Bao, 2008; Olinghouse & Wilson, 2013). In her study, she found that there is a negative relationship between writing quality and the use of 1st 1000 words. However, writing quality showed significant positive correlation with lexical variation. She concluded that learners' writings become more interesting to the readers when they use different and changeable words to express the same meaning which also gives them higher scores compared to those who use ordinary and high-frequency words (Zhai, 2016). Similar findings were also reported in Usman and Abdullahi (2018) and Xie and Shen (2015). The former reported a significant relationship between learner productive vocabulary and writing quality in their investigation on the relationship between the vocabulary knowledge and the writing quality of ESL university learners in Nigeria, The researchers posited that productive vocabulary is a good predictor of writing quality. While the latter, who measured timed compositions of 56 senior English majors with four indices of lexical richness, including text length, high frequency words, lexical density, and lexical sophistication, reported that the four indices of lexical richness can distinguish between the higher-scoring

compositions and lower-scoring compositions and concluded that lexical richness correlates with the quality of English writing.

Past studies have also raised the importance of focusing on the accuracy of the productive vocabulary when analysing learner writing. Johnson et al. (2016) for instance, suggested that instead of total productive vocabulary, stronger L2 writing performance relates to accurate productive knowledge of the most frequent word families. In assessing text quality, a writing sample which has more sophisticated words indicates a higher lexical knowledge and better writing ability (Monteiro et al., 2021). Read (2000) described a good writing as having a large vocabulary size, lexical sophistication, high lexical density and less lexical errors (as cited in Zhai, 2016).

Past research has confirmed that the overall quality of a text can be determined by lexical richness (Usman & Abdullahi, 2018; Xie & Shen, 2015). In some studies, where sample essays of high stakes proficiency examination were used, a correlation between vocabulary used and lexical richness were determined. The findings revealed moderate to strong correlations independent measure of lexical knowledge and writing quality (Ha, 2019; Usman & Abdullahi, 2018; Xie & Shen, 2015).

Past Studies in Malaysian Context

Over the last decade there has been quite a number of research conducted on ESL learners' vocabulary knowledge in Malaysia, among the most recent include Ibrahim et al. (2019), Mokhtar et al. (2016), Haryati et al. (2016), Ashrafzadeh & Nimehchisalem (2015) and Sulaiman et al. (2018). The studies involved mainly tertiary students of varying levels of studies from pre-diploma (Haryati et al., 2016) to third-year undergraduates (Ibrahim et al., 2019; Mokhtar et al., 2016).

The studies reviewed reported generally a limited lexical knowledge among the students. Ibrahim et al. (2019) in their examination of lexical richness of the writings of first-year and third-year university students found that third-year students use a higher percentage of 1,000-level terms than their first-year counterparts, who, on the other hand, use a higher percentage of 2,000-level words than the third-year students; however, third-year students use a higher percentage of academic word level (AWL) words than their first-year peers. Similar finding was also obtained by Ibrahim et al. (2019), who found that 87.1% of the pre-diploma students involved in their study had a vocabulary size of less than the desired 8000-word families, which led to their conclusion that the students might not be lexically well equipped to successfully undertake a diploma programme in the university where English is used as the medium of instruction.

Mokhtar et al. (2016), who examined the receptive and productive English vocabulary knowledge of 360 tertiary students who were first-, second- and third-year students in a local university using Vocabulary Levels Test (VLT) encompassing of three tests namely Passive Vocabulary Test (PVT), Controlled Active Vocabulary Test (CAVT), and Free Active Vocabulary Test (FAVT found that the majority of the students has limited passive vocabulary knowledge and are still weak in controlled active vocabulary. As for their free active lexical, their writings consisted mainly of high-frequency words with limited use of the low-frequency words.

Ashrafzadeh & Nimehchisalem (2015) in their examination of written summaries produced by 69 students from a Malaysian university, also discovered that students' limitation of knowledge in organization and lexical range had led to poor paraphrasing skill in their summary writing. Based on the results, over 97% of the respondents obtained a 'fair to poor' vocabulary score in their writing task. Sulaiman et al. (2018) presented similar results in their investigation on the knowledge of AWL of a group of ESL learners of a research university in Malaysia. The research concluded that the AWL knowledge of Malaysian ESL undergraduates is still low based on the number of unknown AWL words reported, which ranged from 35% to 83% in 10 sub lists.

The findings from these studies indicate most importantly that the ESL learners in Malaysia are generally lexically challenged, with most faring below the threshold of 8,000 word families that is needed for understanding unsimplified spoken and written texts (Nation, 2006) or below the vocabulary size of more than 2000-word level with marginal to low scores in AWL, which would seriously affect their ability to successfully operate in the academic setting (Schmitt, 2000).

Language Frequency Profile (LFP)

The Language Frequency Profile (LFP) developed by Laufer and Nation (1995) categorises the percentage of words a learner uses at different vocabulary frequency levels and according to which frequency band each word belongs to. The words are classified into groups of K1; the first 1000 most frequent words, K2; the second 1000 most frequent word families from the general service list (GSL) (West, 1953) and 570 academic word lists (AWL) developed by Coxhead (2000) and an off-List or less frequent words outside these two lists of words. Cobb and Horst (2004) has established a standard for LFP indexes by correlating the levels in their comparative study of native and non-native speakers' vocabulary profile.

RANGE program developed by Heatley, Nation and Coxhead (2002) is best known for measuring the LFP by analysing the word token (Token), word types (Type Token) and word families (as cited in Ibrahim et al., 2019). By using RANGE, up to 32 different texts can be compared for their lexical differences. It presents a range or distribution figure, a headword frequency figure, a family frequency figure, and a frequency figure for each of the texts the word occurs in. Before the texts are run into the RANGE program, words that are misspelled need to be corrected and retained. Proper names need to be taken out as they are not covered in the frequency level.

Recently, a freeware tool for profiling the vocabulary level and complexity of texts; AntWordProfiler, was developed by Laurence Anthony (Anthony, 2021) as an alternative to RANGE. It has the same functions as RANGE, but more user friendly and well supported (Pauwels, 2017). The current study employed AntWordProfiler in measuring the lexical richness in the writings of ESL learners involved as the software is better suited and more stable for analysing large data.

Materials and Methods

Participants

This study employed a convenience sampling method. 241 first semester students undertaking various diploma courses in UiTM Cawangan Pahang were chosen as the participants. All the participants enrolled in an English proficiency course (Integrated Language Skills 1) taught by the researchers. Integrated Language Skills I is designed to develop students' listening, speaking and reading skills and to raise students' proficiency to the intermediate level. Participants have met the minimum entry requirement of the university which is a credit in the English subject in the Malaysian Certificate of Education (Sijil Pelajaran Malaysia).

The participants were categorised according to two main disciplines; social science and humanities and science and technology as summarised in Table 1 below:

Table 1. Participants Categorised According to Disciplines

Discipline	Number	%
Social Science & Humanities (SSH)	132	54.8
Science & Technology (ST)	109	45.2
Total	**241**	**100**

Corpus Data

The data were students' written responses to two short stories, which they were assigned to listen to for a listening log or LIRA, which stands for Listen, Interact, Reflect and Answer. Students were given two weeks to listen to a selected story, at the end of which they were assigned to write a personal response of the story. The length of the responses was between 120-200 words. Since students were required to write two responses (one for each story), there were altogether 482 responses compiled amounting to a corpus of approximately 106, 015-word tokens.

The texts that were originally in word documents were converted to txt. format. The data went through a cleaning process which involved removing proper nouns and correcting minor spelling mistakes. They were then analysed using AntWordProfiler (Anthony, 2021) to obtain the percentages of type/token ratio (TTR) of words of the text that fall into the first thousand most common, the second

thousand, the Academic Word List, and off-list words. A token refers to the number of word forms that occur in a text, while a type is the word form that is counted only once (Cobb & Horst, 2004).

Computational Tool

AntWordProfiler (Anthony, 2021) was utilised to analyse the data. It can be downloaded at https://www.laurenceanthony.net/software/antwordprofiler/. The software has the same functions as the Range program developed by Nation, Heatley and Coxhead (2002), but more user friendly and well supported (as cited in Pauwels, 2017). It comes with the first 1000 and second 1000 most frequent word families from the general service list (GSL) (West, 1953), Coxhead's (2000) 570 academic word lists (AWL) and 'not-in-the-lists' (off-list) or word list consisting of words not contained in any of the other levels (Pauwels, 2017). In summary the software calculates the proportion of words according to these 4 levels:

1. GSL1- first 1000 most frequent word families
2. GSL2- second 1000 most frequent word families
3. AWL- 570 academic word list
4. Off-list

Result and Discussion

Overall Distribution of Lexis in Student Writings

Table 2 below summarises the overall distribution of vocabulary in the student texts according to the 4 levels analysed. The figures indicate that about 87% of the student texts comprise vocabulary from the GSL1 level and only about 5% and 2% from GSL2 and AWL respectively. The finding suggests that students possess limited lexical repertoire for academic reading and writing due to the lack of AWL level vocabulary and they tend to overly depend on the GSL1. The ratio of type/token of GSL1 of about 1:48 also suggests frequent repetitions in student texts. The higher scores from the GSL category does not equate to lexical richness since the category is made up of most frequent easy words in English (Karami & Salahshoor, 2013). Nation & Waring (1997) stressed for academic purposes learners require less words from GLS categories, but more from AWL and less-frequent words categories to function well in academic context.

Table 2. Overall Distribution of Lexis According to Levels

WORD LIST	TOKENS	%	TYPES	%	FAMILIES
GSL1	92370	87.13	1887	40.33	814
GSL2	5579	5.26	921	19.68	500
AWL	2217	2.09	495	10.58	279
OFF-LIST	5849	5.52	1376	29.41	1376
Total	**106015**		**4679**		

This finding is consistent with past studies (Ha, 2019; Haryati et al., 2016; Ibrahim et al., 2019; Usman & Abdullahi, 2018). Ha (2019) for instance, reported a generally higher percentage (87.82%) of GSL1 in the data of Korean undergraduate students' academic writing she analysed. Similar findings were also reported in previous studies involving Malaysian ESL learners. Ibrahim et al. (2019) and Haryati et al. (2016) in their investigations on the lexical knowledge of ESL undergraduates in Malaysia reported the learners lagging in vocabulary knowledge, majority of whom only fell between 1000 to 2000 mastery levels, therefore, far below the university threshold (Haryati et al., 2016; Ibrahim et al., 2019).

Distribution of Lexis in Student Writings by Disciplines

In exploring the differences in the vocabulary knowledge between students of fields of studies, the data were analysed according to disciplines: science and technology (ST) and science social and humanities (SSH). This analysis was carried out to discover if there are differences in the lexical profile of students from different fields of studies since they might be exposed to different reading materials outside the English classroom context. Table 3 below summarises the findings:

Table 3. Distribution of Lexis According to Disciplines

ST	WORD LIST	TOKENS	%	TYPES	%	FAMILIES
	GSL1	46806	87.34	1360	46.45	651
	GSL2	2757	5.14	555	18.95	335
	AWL	1247	2.33	331	11.3	203
	OFF-LIST	2783	5.19	682	23.29	682
	Total	**53593**		**1871**		
SSH	**WORD LIST**	**TOKENS**	**%**	**TYPES**	**%**	**FAMILIES**
	GSL1	45564	86.92	1594	46.79	758
	GSL2	2822	5.38	652	19.14	416
	AWL	970	1.85	303	8.89	203
	OFF-LIST	3066	5.85	858	25.18	858
	Total	**52422**		**2235**		

Table 3 displays almost similar proportions of vocabulary levels in the texts from both disciplines with both recording about 87% and 5% for GLS1 and GSL2 respectively. Texts from both disciplines also contained the least percentage of AWL. This finding is consistent with the finding reported in Sulaiman et al. (2018), who also reported that Malaysian ESL undergraduates scored low in the AWL. However, there appears to be a slight difference (about 0.5%) in the score for AWL between disciplines in this study; with ST recording a marginally higher percentage than SSH. Nonetheless, the dominance of the GLS1 vocabulary over the AWL as shown in Table 3 indicates an overall limited vocabulary knowledge of the students. Words in the AWL category are essential in the comprehension of English academic texts (Cobb & Horst, 2004; Nation & Waring, 1997). The AWL, according to previous research (e.g. Chen & Ge, 2007; Cobb & Horst, 2004; Coxhead, 2000) provides around 10% coverage of academic written texts and when combined with GSL provides approximately 90% coverage of academic written text (Nation, 2004).

Over-reliance on GSL1 and insubstantial knowledge of AWL as reflected by the figures in both Table 2 and 3 suggest that the students are still far below the vocabulary size of more than 2000-word level that is required of them to function independently in the academic context (Ibrahim et al., 2019; Schmitt, 2000).

Conclusion

The study concludes that the lexical knowledge of the participants in this study is considerably limited due to low level AWL vocabulary in their writings and there is no significant difference in the lexical profiles of participants from both ST and SSH disciplines. The findings indicate the need to equip students with the AWL that would enable them to perform well in the academic writing course; ELC231- Integrated Language Skills III which is a mandatory course for third semester diploma students in the UiTM system. The findings from the current study would provide ESL instructors with the valuable data and insights in designing suitable teaching materials that would enable students to

increase their AWL competency and reach the level that is required of them to perform independently and effectively in the academic setting.

As this is intended to be a longitudinal study, future research into the learners' vocabulary learning process can be conducted by examining their vocabulary learning strategies. It is important to investigate students' vocabulary strategies to find out their contribution on vocabulary knowledge and language proficiency in general as findings from several research found that combinations of different vocabulary strategies correlate with different levels of vocabulary achievement (Ma, 2012). Findings from such research will also be helpful in creating awareness among instructors of their students' vocabulary acquisition so that they would be able to provide informed and effective guidance in their efforts to improve the students' academic writing ability.

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