Productive Vocabulary Size Test as a Predictor of L2 Learners' Success in Academic Writing Skill

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ABSTRACT

In this study, an attempt has been made to investigate if vocabulary tests may predict L2 learners' writing scores in IELTS. 131 postgraduate international students studying at Universiti Teknologi Malaysia (UTM) who obtained the minimum score of 6 in IELTS as a requirement for enrollment were participants of the study. Two vocabulary size tests (PVLT & Lex30) together with a test of vocabulary depth (WAT) were given to participants. Then, participants' scores from three tests were correlated with their scores in the writing section of IELTS. The results of the study revealed a significant correlation between productive vocabulary size and academic writing skills. Moreover, the findings of Multiple Regression indicated that the productive vocabulary levels test (PVLT) could be a good predictor for IELTS academic writing. Furthermore, scatter plots revealed a threshold of 2000 words for an L2 learner to get 7 in IELTS academic writing. The findings drawn from the study enable teachers to predict their learners' competency in writing skills through various vocabulary tests.

KEYWORDS: Productive vocabulary; Vocabulary size; Academic writing; IELTS

1. Introduction

Investigations into the vocabulary size of second language (L2) learners have greatly increased our understanding of the importance of vocabulary in language use. One consistent finding is that vocabulary size – the number of words a person knows – is a good predictor of proficiency in a second language. It has been found that vocabulary size in English correlates highly with general language proficiency (Milton, 2009; Nasir et al., 2017), reading comprehension (Aliabadi et al., 2022; Qian, 2002), writing ability (Alsager & Milton, 2016; Laufer & Nation, 1995), examination grades on listening, reading and writing papers (Afshari & Tavakoli, 2017; Staehr, 2008) and academic success (Morris & Cobb, 2004). The relationship between vocabulary size and language performance is so close that Alderson (2007), after an analysis of the correlation between a test battery of vocabulary skills and language proficiency, concluded that "...the size of one's vocabulary is relevant to one's performance on any language test, in other words, ...language ability is to quite a large extent a function of vocabulary size" (p. 88). Similar findings on word frequency and vocabulary size have also been reported for French as a second language (Milton, 2009).

If vocabulary size is closely related to second language ability, learners' vocabulary size could be used to predict how well a learner may perform in second language examinations. We believe this predictive potential of vocabulary size is worth exploring for two reasons. Firstly, learner performances in second language examinations (for example, IELTS, TOEFL, etc.)

are crucial for many of the stakeholders – learners, teachers, parents, and school administrators. The results are used for important decision-making related to acceptance into programs of study abroad, award of sponsorship, or simply, learner readiness for study in a second language. If vocabulary size is found to be a good predictor of performance in second language examinations, tangible vocabulary size targets could be set for both learners and teachers.

1.1. Challenges and contextual constraints initiating the study

As Nation and Laufer (2001) indicate "vocabulary is not usually learned for its own sake" (p. 2), an important goal of learning vocabulary is to use vocabulary knowledge communicatively. On the importance of the role of vocabulary in communication, Wilkins (1972) notes that "Without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (p. 111). All people involved in language teaching/learning processes agree on the essential role of vocabulary as a part of language learning mastery. This role is more apparent when learners try to use their language in real contexts and it is usually evident in "learners carry around dictionaries and not grammar books" (Schmitt, 2010, p. 4). One crucial aspect of communication is writing in an academic context. Foreign students, studying in international universities, particularly for postgraduate degrees, in which students need to write academic papers in their related areas, must possess and use many academic skills. Certain parts of these academic endeavors include writing assignments, dissertations, and/or academic papers. To be successfully engaged in these activities, foreign students need an excellent command of vocabulary knowledge and academic writing skills. In this matter, Mohan and Lo (1985) highlight the importance of vocabulary in academic writing and believe that some of the difficulties that L2 learners usually face in academic writing are problems at the sentence level, some of which are grammatical but most are lexical. Ultimately, it has been found that non-native students who are equipped with richer word knowledge tend to have better performance in academic education.

Further, from second language learners' points of view, L2 learners have continually reported their lack of vocabulary knowledge as the fundamental aspect of their writing quality (Lee & Rethinasamy, 2017; Leki & Carson, 1994). This issue is particularly evident among foreign students majoring in fields in which the medium of instruction is a language other than their mother tongue. Examples of such students are Iranian students studying in universities in Malaysia. Most Iranian students equate language learning in general, and writing skills in particular, with learning an adequate knowledge of syntax (Baleghizadeh & Golbin, 2010). Consequently, vocabulary is assigned a trivial role. Unfortunately, the lack of vocabulary knowledge has disadvantaged many Iranians studying in higher education (Moghadam, 2012; Shareie, 2001). In a preliminary survey among 20 lecturers from the faculties of education, science, and computer science in a university in Malaysia, (Universiti Teknologi Malaysia – UTM) conducted by the researcher as part of the process of problem identification for this study, the majority of the respondents were dissatisfied with the academic writing ability of their international postgraduate students. They believed that these students, do not generally possess the required academic writing skills to meet the demands of their studies.

2. Theoretical framework

Vocabulary knowledge tends to be tightly associated with language proficiency. Studies on vocabulary knowledge reveal the fact that vocabulary is an underlying principle that enables learners to be successful in learning a second language (Laufer & Nation, 2001). On the importance of vocabulary size in language proficiency, Meara (2003) depicts that "all other things being equal, learners with big vocabularies are more proficient in a wide range of language skills than learners with smaller vocabularies" (p. 37). More specifically, some researchers believe in the role of vocabulary size as a predictor for certain language skills (Milton, 2009). Thus, according to Laufer (2010), Meara (2010), and Schmitt (2010), if the correlation between vocabulary size and language skills is significant, a test of vocabulary size can be a good instrument for measuring language skills.

A consistent and reliable correlation between vocabulary size and reading comprehension has been established in many studies (Baleghizadeh & Golbin, 2010; Llach & Gallego, 2009; Nation, 2011). Qian (2002), for example, correlated scores collected from Vocabulary Levels Test (VLT) with the reading comprehension of the TOEFL test administered to 44 Korean and 33 Chinese speakers learning English. The findings of his study figured an even stronger correlation (i.e., 0.78) than that of Laufer (1992) which was .50.

Vocabulary size has been also correlated with writing skill and determined significant correlations. Llach and Gallego (2009) in a study examined the relationship between receptive vocabulary size and written skills (i.e., reading & writing) with two vocabulary size tests (i.e., Word Test & Vocabulary Levels Test), a reading comprehension test and a timed composition, which administered to 274 primary schools Spanish EFL learners. The findings reflected a significant correlation between receptive vocabulary size and reading comprehension (.155 & .156 respectively). However, the results revealed that receptive vocabulary knowledge plays a trivial role in the quality of writing and the estimated correlation was not very strong.

Contrary to written skills**,** very few studies measured the relationship between vocabulary size and oral skills. Staehr (2008) correlated students' grades on listening, reading, and writing papers with their scores in vocabulary size tests. Similarly, the results suggested a low correlation for listening (0.69) and a high one for reading (0.83) and writing (0.73) skills.

Vocabulary size has been also correlated with speaking skills. "Spoken communication has access to gestures and contextual information which written text usually lacks" (Milton, 2009, p. 177), so it is different from other skills. The results of previous studies suggest that oral skills (i.e., listening & speaking) are not firmly affiliated with vocabulary knowledge.

However, since the focus of this study was mainly on the relationship between vocabulary size and academic writing, and also finding a threshold of vocabulary to predict academic writing skill, some studies on this particular issue are viewed. Academic writing is a type of writing usually used in higher levels of education and for academic purposes. Although interest in academic writing research has increased during the last two decades, the number of studies in this field is not very noticeable. The results of available studies investigating the relationship between vocabulary knowledge and academic writing demonstrate that word knowledge may be a good predictor of academic performance (Laufer & Nation, 1995; Zhu, 2004).

2.1. Studies on the threshold level of vocabulary

The vocabulary threshold is the boundary between having and not having enough vocabulary knowledge for language proficiency (Nation, 2007; Tran, et al, 2020). In other words, it is the number of words an L2 learner needs to know in order to be considered as a proficient language user in different language skills. Some studies investigated the relationship between vocabulary size and L2 learners' performance in proficiency tests such as IELTS and Cambridge First Certificate in English (FCE). The findings of these studies have introduced different vocabulary thresholds. Staehr (2008), for example, suggested that at least knowledge of 2000-2500 vocabulary is required for learners to get a score of 5 or better on IELTS speaking and listening sub-skills. However, it is not obvious in his data whether significantly higher vocabulary scores contribute to higher IELTS grades. Moreover, he did not suggest such a threshold for IELTS writing. The present study, first, tried to investigate a correlation between IELTS writing and vocabulary tests. It, then, investigated a vocabulary threshold for academic writing by proposing the two following questions:

1. Is there a significant correlation between productive vocabulary size and academic writing skills?

2. What is the threshold level of vocabulary to predict L2 academic writing skills?

3. Methodology

3.1. Participants

131 International postgraduate students who obtained the minimum academic (not general) IELTS score essential to get Uiversiti Teknologi Malaysia (UTM)'s acceptance to enroll in a postgraduate program (i.e., 6 IELTS band score and above) were participants of this study. Due to the validity extension of the IELTS score, only students with IELTS less than 2 years from the date of issuance of their results were chosen as the participants. These students also were chosen randomly from among international students enrolled in postgraduate programs in UTM whether male or female, Ph.D. or Master.

3.2. Instruments

Three vocabulary measures were used in this study:

Productive Vocabulary Levels Test (PVLT) measures the size of L2 learners' productive word knowledge. In PVLT format, half of the word is presented and students complete the word. In fact, they produce the word as they do in writing and speaking skills. The format of PVLT is as follows:

I'm glad we had this opp_____ to talk.

Five different frequency levels are included in the test (i.e.,1-2000, 2000-3000, 3000-5000, University Word List, and 5000-10,000-word level). Each includes eighteen items which makes a total of 90 questions. In previous studies using PVLT, answers were scored as correct ones if students wrote the correct form of the word considering part of speech, even with some mistakes in grammar or spelling. However, since the purpose of the current study was to measure academic writing ability which is a necessary skill for higher levels of education, the way of scoring was different from the previous research; only those responses which were correct in part of speech, spelling (either American or British spelling), and grammar were considered as correct answers.

Word Associates Test (WAT) prepared by Read (1998), designed to measure the depth of vocabulary knowledge by evaluating three important vocabulary components: synonymy, polysemy, and collocation. WAT consists of 40 items. Each

item includes a stimulus word, which is an adjective, and two boxes, each containing four words. The format of WAT is as follows:

Sudden

Beautiful **quick surprising** thirsty   **Change** doctor noise school

For example, in the above table the underlined words are the correct answer. The words '*qu''''* and '*surprssnrg'* from the left box are synonymous with the word '*suddnn'* and the words '*hhang''* and '*noss''* from the right box are the collocations (i.e., noun(s) that may come after an adjective in a sentence) of the word '*suddnn'*. This instruction reduces the opportunity of guessing.

The test taker can choose just four words from two boxes as the collocations of the stimulus word. For example, in the above table, the underlined words are the correct answer. The total score is a number out of 160.

Lex30 designed by Meara and Fitzpatrick (2000) to measure L2 learners' productive vocabulary size includes 30 stimulus words. All the stimulus words are highly frequent words taken from Nation's (1983) first 1000 wordlist. Any response outside Nation's first 1000-word list is considered as infrequent words. Generally, there is no predetermined answer for stimulus words. The score is a number out of 120. Any mistakes in part of speech or spelling or grammar were considered as the wrong answer. The reliability of Lex30 is 0.84 estimated by the designers.

In this study, the above three tests were gathered in one test called Vocabulary Test including three parts; each vocabulary test i.e., PVLT, WAT, and Lex30 was considered as one part of the test. The reliability of the new test i.e., Vocabulary Test was .88.

3.3. Procedures and research design

Based on the proposed questions, the vocabulary test was first given to participants to measure their vocabulary size. Then, the results of each part of the test were scored and checked for normality using probability plots. The result illustrated that the data were normal and quite suitable for data analysis. In the next stage, the scores obtained from each test were separately correlated with students' scores in the IELTS writing section. Further, Multiple Regression was used to investigate whether participants' score on three tests of vocabulary may predict their writing scores in IELTS.

Afterward, participants' composite scores from the Vocabulary Test including the three tests (i.e., PVLT, WAT, & Lex30) was correlated with their IELTS writing score. Moreover, a Linear Regression analysis revealed if participants' composite score may predict their writing scores in IELTS.

To find the threshold, the first step was to identify which score students are required in IELTS writing to be considered as competent in academic writing. Based on IELTS descriptors, band score 7 is considered the Good User of language showing that the language learner has operational command of the language, though with occasional inaccuracies, in some situations and generally handles complex language well. This band score is in parallel to the aim of this study i.e., evaluating the writing ability of postgraduate students who are expected to be competent in their language skills, especially writing.

In the second step, since PVLT measures the size of productive vocabulary, it was used as the only instrument in this part; the relationship between IELTS writing score and different frequency levels of PVLT was shown using simple scatter plots. Then, the participants' mean score at each frequency level of PVLT was calculated. Finally, the number of productive vocabularies was estimated for each frequency level of PVLT using this formula: (participants' mean score × total words at the level of frequency ÷ 18 (Zimmerman, 2004).

4. Result

4.1. Result of correlation study

The results of the two-tailed Pearson Product Moment correlation coefficient analysis are summarized in the following table:

Table 1. Correlations coefficients between variables

Components of Vocabulary Size	Components of Academic Writing
	IELTS writing score
PVLT	.943**
WAT	. 938**
Lex30	.796**

**. Correlation is significant at the 0.01 level (2-tailed).

From the table, it is clear that relationships among the variables were statistically significant. PVLT (r=.943), WAT (r=.938), and Lex30 (r=.796) correlated significantly with students' IELTS writing scores.

4.2. Results of multiple regressions

To see if vocabulary tests were able to predict students' scores in IELTS writing, all the variables were analyzed using Multiple Regression (table 2).

Table 2. Results of Multiple Regressions

Model	Standardized Coefficients Beta	R	R Square
(Constant)			
Productive Vocabulary Test	.447		
Word Associates Test	.436	$.970^a$	.942
Lex30	.140		

a. predictors: (constant), LEX30, WAT, PVLT
b. dependent variable: IELTS writing score

The table demonstrates the variance of IELTS writing scores from the square of correlation coefficients, i.e. Beta scores. PVLT, for instance, holds the largest variance in IELTS writing (.44) meaning that almost 44% of students' variation in IELTS writing score is predictable by PVLT. WAT possesses the second-largest variation in IELTS writing scores (.436). However, Lex30 could predict a smaller portion of IELTS writing score variation (.140) than the two other tests. Evidently, the results of Multiple Regression revealed that totally a high portion (.97) of the variance of students' IELTS writing scores was predicted by the three tests.

The above-mentioned analyses showed that not only there was a significant correlation coefficient between vocabulary size and academic writing skills, but also the vocabulary tests used in this study especially the Productive Vocabulary Levels Test (PVLT) were able to predict students' results in IELTS writing scores quite well.

4.3. Result of the composite score

In order to "tap into different facets of lexical knowledge" (Schmitt, 2010, p. 154), multiple measures were used to measure different aspects of vocabulary (i.e., knowledge of form, meaning, and use). Therefore, participants' composite score from the three tests was calculated and then correlated with their score in IELTS writing.

Table 3. Correlation Coefficients between Composite score & IELTS writing score

	IELTS Writing
Composite Score	$.965^{**}$
N	131

**. Correlation is significant at the 0.01 level (2-tailed).

From the table, the correlation coefficients between participants' IELTS writing score and their composite scores from the tests were highly significant (r=.965, P<.01) signifying that any variance in IELTS writing scores relates to any variance in students' composite scores.

A precise comparison between the correlation coefficients of the composite score and IELTS writing with those obtained from each vocabulary test individually (PVLT, WAT, & Lex30) summarized in Table 4, demonstrates that the correlation coefficients between the composite score obtained from the Vocabulary Test was a bit bigger than the three tests on their own. Moreover, the results of Linear Regression (table 5) revealed that a high portion (.96) of the variance of IELTS writing score was predicted by students' composite scores. It simply means that the composite score is a better predictor of IELTS writing scores than the individual tests.

Table 4. Correlation Coefficients between IELTS writing score and PVLT, WAT, & Lex30

Components of Vocabulary Size	Components of Academic Writing
	IELTS writing score
PVLT	.943**
WAT	.938**
Lex30	.796**
Composite Score	.965**

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5. Coefficients between Composite score and IELTS writing score

Model	Standardized Coefficients Beta	R	R Square
1 (Constant) Composite Score	.965	.965[a]	.931

a. Dependent Variable: IELTS
b. Predictor: (Constant), Composite score

The results shown in the tables support the idea that investigating vocabulary knowledge from different aspects provides us with a comprehensive picture of L2 learners' word knowledge.

4.4. Results of threshold

To find the threshold, first, the mean of participants' scores at each frequency level of PVLT was calculated as presented in Table 6. Then, the number of productive vocabularies was estimated for each frequency level of PVLT using this formula: (participants' mean score × total words at the level of frequency ÷ 18 (Zimmerman, 2004)).

Table 6. The mean scores and percentage for each band scores of IELTS writing

IELTS Writing Band Scores n	PVLT (90)		Level 2,000		Level 3,000		Level 5,000		Level 10,000		WAT (160)		Lex30 (120)	
	Mean	%	Mean	%	Mean	%	Mean	%	Mean	%	Mean	%	Mean	%
8 7	73.14	81	18.0000	100	13.2857	74	13.1429	73	11.1429	62	141.71	89	115.86	97
7.5 20	69.35	77	17.6500	98	15.3500	85	13.2000	73	6.8000	38	125.95	79	92.70	77
7 22	52.32	58	16.9091	94	11.6364	65	8.6818	48	3.0000	17	120.27	75	93.18	78
6.5 22	48.50	54	15.2727	85	10.0000	56	8.6364	48	3.0000	17	99.55	62	86.82	72
6 21	42.62	47	14.5714	81	8.9048	50	6.7143	37	1.8095	10	91.29	57	73.48	61
5.5 19	30.11	34	11.3158	63	5.9474	33	4.0526	23	.9474	5	69.53	44	69.89	58
5 20 Total 131	23.35	26	9.6500	54	4.6500	26	2.5000	14	.4000	2	53.15	33	60.50	50

Accordingly, the relationship between IELTS writing score (i.e., vertical axis; 1=IELTS band score 5; 2= IELTS band score 5.5; 3= IELTS band score 6; 4= IELTS band score 6.5; 5= IELTS band score 7; 6= IELTS band score 7.5; and 7= IELTS band score 8.) and different frequency levels of PVLT (i.e., horizontal axis) was identified using simple scatter plots.
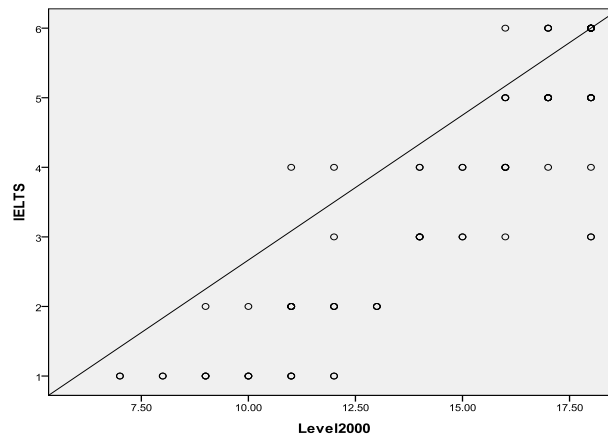
Figure 1. IELTS scores at 2000 frequency level

     The above graph (figure 1) indicates that participants in band 7 of IELTS writing could answer 14 to 18 questions out of 18 at level 2,000 of PVLT correctly. It means that they knew approximately 1,777 words at this level ($16 \times 2,000 \div 18 = 1,777$). This number was derived by converting the raw scores into an estimated number of words by multiplying the mean score by the related number of frequency levels and dividing by 18 (i.e., the number of items in each frequency level). The result was the total number of words known by participants at that level. Based on this formula, the number of words known by the learners at different levels of frequency is calculated and summarized in Table 7.

Table 7. Estimated Productive Vocabulary Size for different IELTS writing band scores

IELTS Writing Band Scores	n	Word Frequency Level			
		2000	3000	5000	10000
5	20	1,000	666	555	0
5.5	19	1,222	833	1,111	522
6	21	1,555	1,333	1,666	555
6.5	22	1,666	1,666	2,222	1,666
7	22	1,777	1,833	2,222	1,666
7.5	20	1,888	2,500	3,611	3,333
8	7	2,000	2,166	3,611	6,111

     The table shows that the number of words known by participants increases slightly through different IELTS writing band scores. It means that those participants who knew more words could get a higher score in academic writing of IELTS.

     However, the point is that based on Nation's descriptor of his test which is provided in http://www.lextutor.ca/tests/levels/productive/10ka.html, and summarized in table 8., the percentage of the mean score of participants at band score 7 of IELTS writing for level 2000 is 94% that is remarkably above the cut of score for that level i.e. 83% identified by Nation (2001). While for other levels the estimated percentage is below the cut of score. It means that participants with a band score of 7 in IELTS writing could pass the first level of frequency i.e., 2000 in PVLT.

Table 8. Descriptors for frequency levels of PVLT

Frequency Levels of PVLT	Threshold Level (accepted percentage)	Percentages obtained in this Study for participants with 7 in IELTS Writing
Level 2000	83%	94%
Level 3000	83%	65%
Level 5000	83%	48%
Level 10,000	80%	17%

To sum up, looking at the findings of this study it could be concluded that a full knowledge of 2,000 words would lead to getting 7 in IELTS writing. In other words, 2000 productive words are the threshold level of vocabulary for academic writing skills. It means that if an L2 learner wishes to be competent in academic writing skills, s/he should have full knowledge of 2000 productive words. Therefore, the answer to the second question of this study was also identified.

5. Discussion

In light of the results of the Pearson correlation analysis which was related to the first question proposed in this paper, a significant and strong correlation coefficient was established between students' writing scores and their scores in tests of vocabulary (i.e., Productive Vocabulary Levels Tests, Word Associates Test, & Lex30) (r=.94, .93, & .79 respectively; p< .05). The results indicate that generally there is a highly significant relationship between productive vocabulary size and academic writing skills. These results are analogous to the prior findings by Zimmerman (2004) who found a high correlation (r = .60) between students' scores on the Productive Vocabulary Levels Test (PVLT) and their scores on the writing test that was considerably lower than the one of this study (.96). The reason for this big difference may lie in this fact that receptive vocabulary is not well related to academic writing. Thus, we might safely argue that productive vocabulary size is more correlated with writing skills rather than receptive vocabulary size.

Multiple Regression analysis revealed that there was a statistically significant interaction between IELTS writing scores and vocabulary tests (F=68, p>0.001). Therefore, it appears that PVLT, WAT, and Lext30 may predict grades in the IELTS writing examination well, among which PVLT specified the most variation of participants' academic writing (t=8.729). The findings of this study which are in line with a study carried out by Meara and Milton (2003) in which vocabulary size has been proved to predict participants' performance in English language Tests, highlighted the significant relationship between vocabulary knowledge and L2 learners' performance in English skills.

As discussed earlier, multiple measures were used to measure special aspects of word knowledge. PVLT and Lex30 measured the size of productive vocabulary, while WAT evaluated knowledge of the depth of vocabulary. This study has succeeded in showing that depth, as well as the size of vocabulary knowledge, is well related to academic writing ability. The composite score, which was the participants' total score from the three tests i.e., PVLT, WAT, and Lex30, also showed a significantly high correlation coefficient (.96) with their IELTS. However, in other studies using multiple instruments (Akbarian, 2010; Zimmerman, 2004; & Webb, 2008), no attempt was made to calculate the composite score.

The highly significant correlation coefficients established in this study support the idea that multiple tests should be used to provide us with a more comprehensive picture of students' vocabulary knowledge. Therefore, the current study was probably unique in using the composite score to measure L2 learners' word knowledge. Further, the significant correlation coefficients between participants' composite score and their IELTS writing scores (.96) indicate that academic writing skills are highly interrelated with the size and depth of L2 learners' word knowledge. However, the significant correlation coefficients between vocabulary tests and participants' academic writing should not blind us to the fact that academic writing is a complex skill that may not be measured by using vocabulary tests. Being good writers, L2 learners should know other basic skills of writing such as prewriting, planning, using transitions, producing a clear thesis statement and topic sentences, developing paragraphs, and controlling punctuation. Moreover, knowledge of the conventions of academic writing, thorough knowledge of the discipline, the type of research/topic written on, and the nature of the field itself interact in a complex way with language proficiency, especially on the quality of academic writing. Therefore, using vocabulary tests to measure academic writing may challenge only one dimension of academic writing i.e., vocabulary.

The results of Scatter Plots and Descriptive Analysis revealed a threshold level for vocabulary knowledge which was the focus of the second question of this study. The scatter plots indicate that participants who obtained a band score of 7 in IELTS writing which was identified as the competent level of academic writing skill based on the IELTS band score descriptor were competent in the first 2000 level of frequency. In other words, full mastery of 2000 words is most likely required for an L2 learner to get a band score of 7 in IELTS writing. A vocabulary size below this threshold i.e., 2000 words is probably insufficient for competency in academic writing skills which was much less than that obtained in Meara and Milton's (2003) who estimated a threshold of 3500 words for being accepted in Cambridge First Certificate in English (FCE). Two main reasons tended to strongly influence the vocabulary threshold identified in this study. First, the threshold identified in this study was based on the number of learners' productive word knowledge since it was believed that productive vocabulary is more related to academic writing skills rather than receptive vocabulary and is usually smaller than receptive one. A second reason is based on the idea that academic writing is a skill for higher levels of education in which a higher level of English literacy is demanded, a very strict scoring system which was used to evaluate participants' full word knowledge in academia. However, it seems that the result is still consistent with Staehr's (2008) who reports a threshold level of 2000 words that must be crossed if learners are to gain an average score or above in writing.

Eventually, such co-relational studies may only give a small piece of a larger picture; an indication of the extent of vocabulary knowledge needed for academic writing. Future research might include other aspects involved in academic writing such as individual variation or learners' motivation.

6. Conclusion

An appropriate final word would seem to be that vocabulary is highly related to communicative skills such as speaking and writing. In a bigger picture, the more vocabulary L2 learners know, the better they may operate in English. With these considerations, successful learners are likely those who manage their vocabulary acquisition by increasing the size of their vocabulary knowledge as well as learning other aspects of vocabulary such as vocabulary depth, word association, and collocation. On the part of the learner, a deliberate effort is required to acquire a huge amount of vocabulary over an extended time. However, the volume of acquired vocabulary may vary from one context to another. For example, in a context in which English is spoken as a second language learners' exposure to English is much greater than in a context in which English is considered as a foreign language. Apparently, researchers should be careful when generalizing the findings of vocabulary measurements from one group of participants to a wider population. On the part of teachers, it is highly recommended that they, first, include teaching vocabulary explicitly in their teaching syllabus. Secondly, it would be a good practice if they teach students about other aspects of vocabulary such as association and collocation when they present new words. On the whole, the findings of this study highlight the importance of vocabulary knowledge in learning a second language.

Three limitations were identified in this study. First, the number of participants was not equal and sufficient for each of the IELTS writing band scores. For example, there were only 8 participants for band score 8, while for other band scores, this number was between 19 and 22 people. Moreover, no participants were identified with IELTS writing band scores of 8.5 and 9. The limited number of participants in each IELTS writing band score may reduce the reliability of the results.

Considering the participants of the study, a second limitation is that the majority were Iranian students who had learned English as a foreign language. Consequently, the generalization of the results of this study to second language learners should be done with caution.

The third limitation was that among 131 participants who participated in this study only 45 of them provided their supervisor's (lecturer's) name to assess their actual ability in academic writing. Hence, getting 7 in IELTS writing which was agreed to be the boundary for being competent in academic writing by the lecturers may vary in another context with a higher number of lecturers' assessments. Moreover, reliance on lecturers' assessments to evaluate their students' academic writing competency based on brief descriptors seemed to be insufficient to assess the students' genuine academic writing ability.

Some ideas for future research were elicited from this study. First of all, as mentioned before the number of participants was not sufficient for each of the IELTS writing band scores. Therefore, future research could be carried out among different International Universities to include more participants with IELTS different band scores. However, it was not viable for the present study.

Second, future research may carry out the tests in different faculties separately. The underlying idea is that different faculties have different disciplines for academic writing. For example, in the Faculty of Education, language performance expectations are higher than in the Faculty of Engineering or Science.

Finally, using IELTS and lecturers' assessments as instruments to measure students' academic writing simply could be replaced by another tool such as free writing. Asking students to write could best measure their actual academic writing skills if there was a standard criterion for scoring. Thus, future studies may make use of free writing to measure students' academic writing skills. However, asking students to sit in a long session of writing is time-consuming and was not feasible in this study.

7. References

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