Academic Vocabulary Used by High School Students in Essays and Its Relation to English Proficiency

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ABSTRACT

Among the high number of studies on vocabulary, little attention has been given to high school students, even though EFL students begin to learn and use vocabulary in academic settings more complex at a high school level in non-English speaking countries. To fill this gap, this study examined high school students' vocabulary use in English essay writing. The target words involved 70 among the most frequently occurring words in academic settings from the Academic Vocabulary List (AVL). The data set consisted of 233 essays collected in Thailand as part of an English proficiency test and analyzed using quantitative statistical analyses. The results of descriptive statistics disclosed the 48 words known and used by the high school students. The independent t-test and one-way ANOVA revealed the effects of gender and proficiency levels for certain words. Yet, students' academic vocabulary knowledge and use were found to be unrelated to their writing achievement, overall English proficiency, and specific English skills including reading, speaking, and writing. It was assumed that non-academic words might have played a more significant role in student essays than academic words did.

Keywords: Academic words; English proficiency; high school students; vocabulary

INTRODUCTION

Vocabulary is undeniably one of the most important components of English proficiency. Since the late 1980s, research has extensively explored diagnostic approaches to find out how many words are known by a foreign language learner recognized as vocabulary knowledge (Read, 1988). Various types of tests have been created to assess learners' vocabulary knowledge, ranging from the prominent Vocabulary Levels Test (VLT) created by Nation (1990) to the tests on receptive (Mochida & Harrington, 2006) and productive vocabulary knowledge (Fitzpatrick & Clenton, 2010). Over the past few decades, more and more revised versions of vocabulary knowledge tests have been published, implying the need for an assessment that is as precise as possible to provide accurate results of the number of words learners know. Beglar and Nation (2013) contend that vocabulary knowledge is a fundamental component of language proficiency as it is vital in the process of constructing receptive vocabulary knowledge and performing productive skills in the target language.

Vocabulary knowledge is multifaceted as it not only refers to the acquisition of words but also, how well those words and their derivatives are understood (Schmitt, 2014). Hence, the present study specifically focuses on academic vocabulary knowledge and its role in scaffolding English proficiency. The knowledge refers to students' familiarity with and understanding of words used in academic settings that may involve academic texts, conversations, writing, and listening (Schmitt, 2014). It has been reported that EFL learners often find it distinctly difficult to acquire academic English vocabulary because of the abstract and opaque nature of the words as well as the need to be particularly exposed to academic texts and discourses (Townsend & Collins, 2009). Academic words are tools of communication and

thinking concerning disciplinary contents (Nagy & Townsend, 2012). Existing research has indicated that knowledge of academic vocabulary can determine academic success for it is essentially required to gain new knowledge through academic reading and listening and perform it in speaking and writing (Schleppegrell, 2004).

Most studies measuring vocabulary knowledge focus on either a particular number of word families or the academic levels of the learners being assessed. Test scores have frequently been used to examine the relationships between vocabulary knowledge and the learners' receptive and productive skills (e.g., Choi, 2013). On the other hand, still little is known about which words learners know and use (Csomay, 2020) and how that relates to their academic achievement (Csomay & Prades, 2018). As well, the number of studies specifically focusing on high school students' academic vocabulary knowledge is still limited. Therefore, in recognition of such research gaps, the present study specifically investigates how much high school students know and use academic vocabulary in their essays and how this knowledge and word use affect their overall English proficiency as well as their English proficiency in specific skills including reading, speaking, and listening, measured by an English proficiency test. The findings of this study can contribute to the understanding of vocabulary knowledge and use in a more specific application, such as in essay writing. English teachers can benefit by knowing which academic words are most frequently known and used by their students and which words seem to have more impact on students' writing achievement and improve English proficiency, especially in the contexts related to Thai EFL learners.

LITERATURE REVIEW

ACADEMIC VOCABULARY LIST (AVL)

Typically, one of the immediately raised questions when studying vocabulary is how many words learners need to know and acquire at a certain level of education. By their graduation, high school students should have acquired around 75,000 words in their first language (Snow & Kim, 2007). The importance of acquiring a certain number of academic vocabulary words not only lies in their functions for academic communication and thinking but also in their functions in improving academic achievement. Townsend et al. (2012), who examined the role of academic English in middle school students' academic achievement, found that knowledge of academic words could explain a sizable amount of variance in students' achievement; similarly, in a more recent study, Masrai and Milton (2018) observed that students' overall vocabulary size could predict their grade point average (GPA) scores. In high schools where students are more likely to study abroad and eventually seek employment at international companies, non-native English learners still need more support in their academic English learning (Martinsen et al., 2010; Ranta, 2010). Due to the subjects emphasized in national school-leaving examinations and graduation requirements, other subjects tend to crowd out English, and less additional help is given to students in English subject (Dong, 2013). Thus, considering the size of the vocabulary that students have to acquire as well as the contribution of increased vocabulary to academic achievement, pedagogical academic vocabulary lists were created to assist in establishing goals, creating assessments, and determining materials (Coxhead, 2000; Gardner & Davies, 2014).

In 2014, Gardner and Davies published Academic Vocabulary List (AVL) developed from a 120-million-word academic sub-corpus extracted from the 425-million-word Corpus of Contemporary American English (COCA). The publication was soon followed by a significant number of empirical studies utilizing AVL in a wide range of contexts. Examining university students' writing, it has been confirmed that the use of AVL is relatively high with minor and

major variations across text genres and disciplines, respectively (Durrant, 2016). Positive relationships were noted between academic vocabulary use and scores in response, comparative, and argumentative papers, yet non-significant for exploratory, rhetorical, and editorial types of tasks (Csomay & Prades, 2018). The AVL was adopted for researching what academic vocabulary students use frequently in their writing the research identified approximately 600 words more frequently used in academic writing than in non-academic writing and disclosed students' ability in differentiating academic and non-academic words (Malmström et al., 2018).

It is important for all English students to know and be able to use the general vocabulary needed for general conversation and everyday living. However, for students aspiring to continue their education in English or to function at a higher level in English, a much wider vocabulary is needed. These words on the AVL are used across 90% of university formal writing in English (Durrrant, 2016). Vocabulary lists such as AVL offer pedagogical usefulness for English teaching and learning; nonetheless, no one set of words has been established that will be useful to all EFL students since the needs of learners will most likely vary by proficiency level, cultural background, academic disciplines, contexts, and personal goals (Brezina & Gablasova, 2017). Nonetheless, despite all these aspects, how much high school students know and use academic vocabulary measured by using AVL is still insufficiently investigated. The Thai high school students chosen for the current study were in their final year of school-level English study. The majority of these students aspire to continue their education at a university where English is the medium of instruction. As a result, it is critical to conduct research on the extent to which these high school students understand and use academic vocabulary as measured by the AVL.

IMPACT OF L2 HIGH SCHOOL STUDENTS' ACADEMIC VOCABULARY ON READING COMPREHENSION

L2 high school students' academic vocabulary knowledge has not received much attention, as most existing research has focused on university students. From among the relatively few studies that have specifically addressed academic word knowledge among L2 high school students, most of the exploration has focused on the effect of academic vocabulary knowledge on students' reading comprehension and the findings indicate positive correlations. For instance, among L2 Korean high school students, Choi (2013) observed positive interplay between vocabulary knowledge and vocabulary depth and reading comprehension; it was also found that vocabulary knowledge was a significant predictor of students' reading comprehension. Kim's (2014) study with other Korean high school students obtained similar results; the study administered a Vocabulary Levels Test (VLT), a Productive Vocabulary Levels Test (PVLT), a Word Associates Test (WAT), and a Reading Comprehension Test (RCT) to 10th grade students and analyzed the results using correlation and regression analyses. In the case of Israeli high school students, vocabulary knowledge was not only noticed to be a significant predictor of reading comprehension, but also had a strong correlation with students' lexical inferencing abilities (Prior et al., 2014). A mixed-method study that compared Malaysian high school students' vocabulary test and reading comprehension scores both in L1 and L2 also discovered that the students' level of vocabulary knowledge significantly affected their reading comprehension performance (Sidek & Rahim, 2015). Apart from reading comprehension, previous studies have also disclosed that vocabulary knowledge was associated with reading speed (Joo, 2014) and prior word knowledge and that it affected students' vocabulary learning progress in an extensive reading program (Webb & Chang, 2015). Inconsistent results were obtained from a study on vocabulary knowledge development by gender differences (Llach & Gallego, 2012).

ACADEMIC VOCABULARY KNOWLEDGE AND ENGLISH PROFICIENCY

Research into academic vocabulary knowledge has drawn lines to students' English proficiency in overall and specific skills. Miralpeix and Muñoz (2018), for instance, identified that vocabulary knowledge explained a large number of variances in English proficiency, but not as much as among low proficiency learners. According to this study, vocabulary knowledge of students with high levels of English proficiency was positively related to writing, reading, speaking, and listening. Often, measured by using the Vocabulary Levels Test (VLT), more proficient students had a larger vocabulary repertoire, and vice versa (Nasir et al., 2017). In the case of a standardized test, a weak, negative correlation was noted (Paribakht & Webb, 2016). The total of academic words included in a proficiency test could significantly influence the results of students' vocabulary knowledge level, yet some other factors were suspected to exist. This was recently clarified when González-Fernández and Schmitt (2019) uncovered that students' vocabulary knowledge could rely on their ability to recognize and recall the four-word knowledge components, such as the form-meaning links, derivatives, multiple meanings, and collocations. Obviously, when students were unable to recognize the most frequent words in English, their proficiency development was significantly affected (Stæhr, 2008).

The role of vocabulary knowledge in students' proficiency in the four English skills has also been examined. Concerning receptive skills, students' vocabulary knowledge showed a stronger correlation with listening (Cheng & Matthews, 2018). In each skill, Matthews (2018), who explored the contribution of aural (listening) vocabulary knowledge to listening comprehension, recognized a significant correlation, noting that L2 students who can recognize only the most commonly used words had lower proficiency in listening comprehension. Conversely, better recognition of the less frequently used words predicted higher listening comprehension proficiency. Among the two types of vocabulary knowledge (vocabulary size and depth), depth of vocabulary knowledge was a better predictor of students' listening proficiency (Vafaee, 2020). Yet, although students' pre-existing vocabulary knowledge played a significant role in listening, it could also work the other way around where listening activities were created to enhance vocabulary knowledge (Zhang & Graham, 2020). Meanwhile, given the nature of the skill, higher reading comprehension has extensively been associated with higher vocabulary knowledge (Hacking & Tschirner, 2017; Masrai, 2019).

For productive skills, Kilic's study (2019) discovered that vocabulary knowledge could explain 26% of variances observed in writing and 17% of those observed in speaking test scores. Vocabulary knowledge also significantly contributed to students' writing and speaking development, but the extent relied on students' proficiency levels (Waluyo, 2018) and receptive vocabulary size (Uchihara & Clenton, 2018). Meanwhile, productive vocabulary knowledge was observed to be useful in spontaneous speech production without any effects on comprehensibility and accentedness (Uchihara & Saito, 2019). Of the word levels, students had better oral performance when they had the knowledge of 2000-3000-word levels (Alharthi, 2020). Nonetheless, high school students seemed to lack the knowledge of words in such levels that consequently affected their listening, reading, writing performances (Stæhr, 2008).

THE STUDY

The brief review of the literature indicates two major points. First, much of the research has extensively been concentrated on university students' vocabulary knowledge, while little is known about the extent high school students know and use academic vocabulary. Secondly, most of the studies utilize Vocabulary Levels Tests (VLT) in examining students' vocabulary knowledge, whereas the details of which academic words that students actually know, and use are still insufficiently presented. Normally, once students start their English learning in high school, they are beginning to explore and acquire academic vocabulary. The absence of

information on how students' vocabulary knowledge is built at various school levels decreases our understanding of how students develop their academic vocabulary knowledge. Sato's study (2017) suggests the improvement of vocabulary tests used to measure high school students' vocabulary knowledge. In recognition of such research gaps, the present study aims to explore high school students' academic vocabulary knowledge by exploring the following research questions:

1. Of the 70 words chosen from the most frequently occurring academic words used in academic settings listed in the Academic Vocabulary List (AVL), which words are used by high school students in their essays, signifying explicit knowledge of the words?
2. Does high school students' use of these academic words differ across gender and proficiency level?
3. How does the frequency of using these academic words correlate with and predict writing achievement?
4. How does the frequency of using these academic words contribute to students' overall proficiency and in specific skills including reading, speaking, and listening as measured by an English proficiency test?

METHOD

PARTICIPANTS

This study involved 233 (male 43.8%, female 56.2%) high school students from one of the oldest and largest public schools in the South of Thailand. The school was considered as one of the prestigious public schools, in which some of the students had the experience of travelling abroad and having a short summer English course in the United Kingdom or Australia. Most of the school graduates continued their studies to prominent universities in Thailand such as Chulalongkorn University, Mahidol University, and Thammasat University. The school employed foreign English teachers and designed a specific curriculum that required students to practice English every day. Assessed by using the Walailak University Test of English Proficiency (WUTEP), students' proficiency levels ranged from A1 to B2 in the Common European Framework of Reference for Languages (CEFR). Table 1 below provides the details of their proficiency in overall and in each English skill.

TABLE 1. Students' proficiency levels ($N = 233$)

Levels	Listening	Reading	Speaking	Writing	Overall Proficiency
C1	1	1	0	0	0
B2	124	152	42	4	10
B1	98	75	94	39	129
A2	9	5	72	103	92
A1	1	0	25	87	2

TARGET WORDS

The first 70 of 500 most frequently used academic words from Academic Vocabulary List (AVL) by Gardner and Davies (2014) were selected to measure students' academic vocabulary knowledge. Gardner and Davies (2014) claimed that AVL was derived from the analyses of the 425-million-word Corpus of Contemporary American English (COCA). AVL was intentionally created to facilitate learning focused on academic English words. In this study, the word list was employed to guide the word count and analysis on high school students'

knowledge and use in academic English. The first 70 words were chosen because Gardner and Davies (2014) found that these words are generally the most frequently occurring in academic settings. Because these are the most frequently occurring academic words, students will encounter them more often. Based on the principle that frequent exposure facilitates acquisition (Rott, 1999), it is reasonable to believe that students should not only recognize these words in their reading but would be able to apply them in their writing. Table 2 provides the detailed list.

TABLE 2. The first 70 most occurring words in academic settings (Gardner & Davies, 2014)

1. study.n	2. group.n	3. system.n	4. social.j	5. provide.v
6. however.r	7. research.n	8. level.n	9. result.n	10. include.v
11. important.j	12. process.n	13. use.n	14. development.n	15. data.n
16. information.n	17. effect.n	18. change.n	19. table.n	20. policy.n
21. university.n	22. model.n	23. experience.n	24. activity.n	25. human.j
26. history.n	27. develop.v	28. suggest.v	29. economic.j	30. low.j
31. relationship.n	32. both.r	33. value.n	34. require.v	35. role.n
36. difference.n	37. analysis.n	38. practice.n	39. society.n	40. thus.r
41. control.n	42. form.n	43. report.v	44. rate.n	45. significant.j
46. figure.n	47. factor.n	48. interest.n	49. culture.n	50. need.n
51. base.v	52. population.n	53. international.j	54. technology.n	55. individual.n
56. type.n	57. describe.v	58. indicate.v	59. image.n	60. subject.n
61. science.n	62. material.n	63. produce.v	64. condition.n	65. identify.v
66. knowledge.n	67. support.n	68. performance.n	69. project.n	70. response.n

Note. n = noun; v = verb; j = adjective; r = adverb.

MATERIALS

The present study used a standardized test named "WUTEP (Walailak University Test of English Proficiency)" as the instrument to collect students' academic vocabulary knowledge and use in prompted essay writing as well as to measure students' English proficiency. WUTEP assessed students' proficiency in the four main English skills encompassing listening, reading, writing, and speaking. The whole test lasted about 2 hours 45 minutes. Both the assessors of the essays and interviewers of the speaking tests involved approximately 20 foreign English lecturers (native and non-native speakers) from the U.S.A, Iran, Indonesia, Philippines, Vietnam, India, China, and Ghana. WUTEP has been used to assess the proficiency levels of around 4,000 non-native English speaker students every year. The scores can be mapped to other standardized tests including IELTS, TOEFL, and TOEIC. The tests of reading and listening proficiency utilized multiple-choice questions, while reading and writing were assessed by using standardized assessment rubrics (Waluyo, 2019). This English test has been used by recent studies as a measure of English proficiency of Thai EFL students (Koad & Waluyo, 2021; Rofiah & Waluyo, 2020), signifying the validity of the instrument.

ESSAY WRITING

Students were given 40 minutes to write a prompted essay. The prompts involved the topics of the importance of homework and personalities. Students wrote at least 150 words. The assessment rubric looked at task achievement, grammar, vocabulary, logics, and mechanics (spelling and punctuation). The scores ranged from 0 to 10, in which 0-4 means A1, 5 means A2, 6 means B1, 7 means B2, 8 means C1, and 9-10 means C2 in the Common European Framework of Reference (CEFR). Students' scores from this writing test were referred as writing achievements in this study.
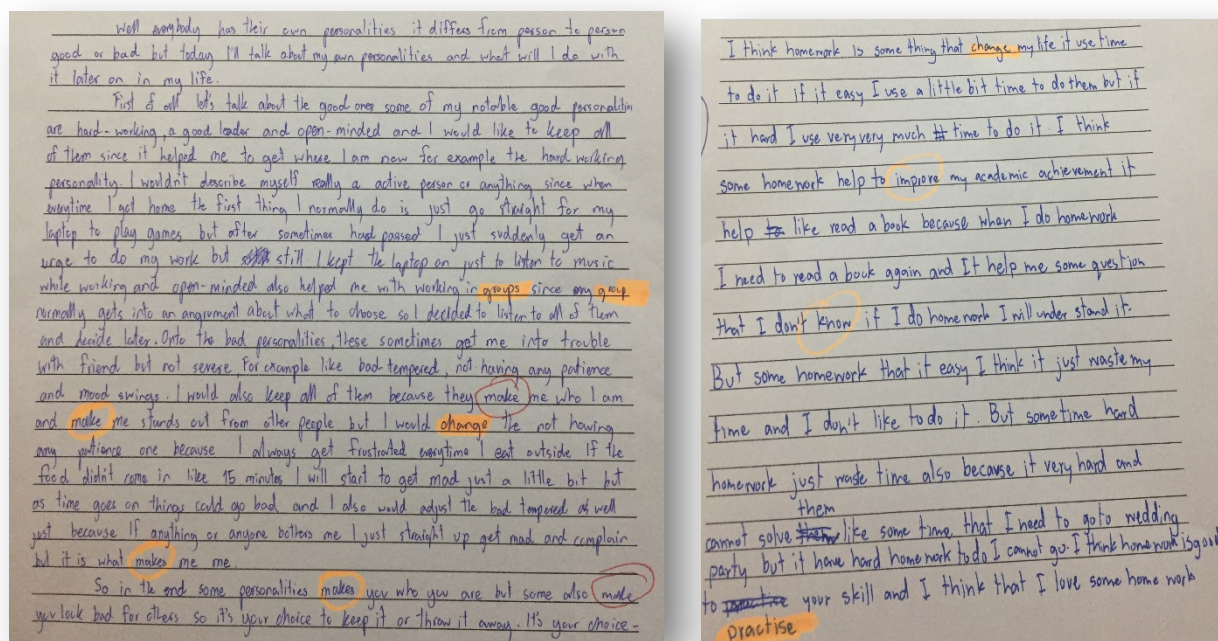
FIGURE 1. Samples of the students' prompted essay writings

LISTENING

The listening test consisted of four parts: Part 1: Statements and pictures, Part 2: Statements and responses, Part 3: Conversations, and Part 4: Talks. It lasted 40 minutes. The whole test used fifty multiple-choice questions. The audio was only played once.

READING

Following on from the listening test, the reading test was divided into three parts: Part 5: Sentence completion, Part 6: An e-mail completion, and Part 7: Reading comprehension: single passage and double passages. With fifty multiple-choice questions, the test lasted 60 minutes.

SPEAKING

The speaking test involved a discussion with a foreign lecturer involving self-introduction, speaking about two topics, and questions-answers for 10 minutes. The assessment rubric emphasized fluency and coherence, lexical resource, grammatical range and accuracy, and pronunciation. The scores ranged from 0-2 (Pre-A1), 3 (A1), 4 (A2), 5 (B1), 6 (B2), 7-8 (C1), and 9-10 (C2) in the CEFR levels.

RESEARCH PROCEDURES

As illustrated in Figure 2, the research was conducted in three stages:

STAGE 1

Students took WUTEP on February 8, 2020 at Walailak University, Nakhon Si Thammarat, Thailand. The results of the speaking test were directly obtained during the day of the test.

STAGE 2

Students' reading and listening answer sheets went through answer sheet checkers. The results were obtained after a few days. At the same time, students' writings were graded by foreign English teachers. The grading procedure involved two assessors for each paper. The results of stage 1 and 2 showed students' overall proficiency levels and in each skill.

STAGE 3

Researchers collected the essays and analyzed students' writing one by one. The analysis was focused on the use of the first 70 most frequently occurring words in academic settings by each student. These words were counted manually every time they appeared in an essay and recorded in an Excel file. Apart from collecting the 70 most frequently used academic words, researchers also collected words that were most frequently used by students to serve as additional information.

STAGE 4

The results from stage 1, 2, and 3 were students' proficiency scores and levels and frequency of the first 70 most frequently used academic words utilized by students in their writing. The data were, then, computed into SPSS for further analysis.

DATA ANALYSIS

The data analyses employed several statistical techniques which followed the raised research questions. Since the results of a standardized paper-based test were used to find the information, the researchers had to manually find the frequency with which each of these 70 words was used. Descriptive statistics were next used to discover the most frequently used academic words. Then, independent t-test and one-way ANOVA were run to disclose differences across gender and proficiency level. Afterwards, bivariate correlation and linear regression were conducted to reveal correlational and predictive roles. Lastly, multiple-linear regression was performed to see the contribution of students' academic vocabulary knowledge to their English proficiency. The detailed results are elaborated in the following section.
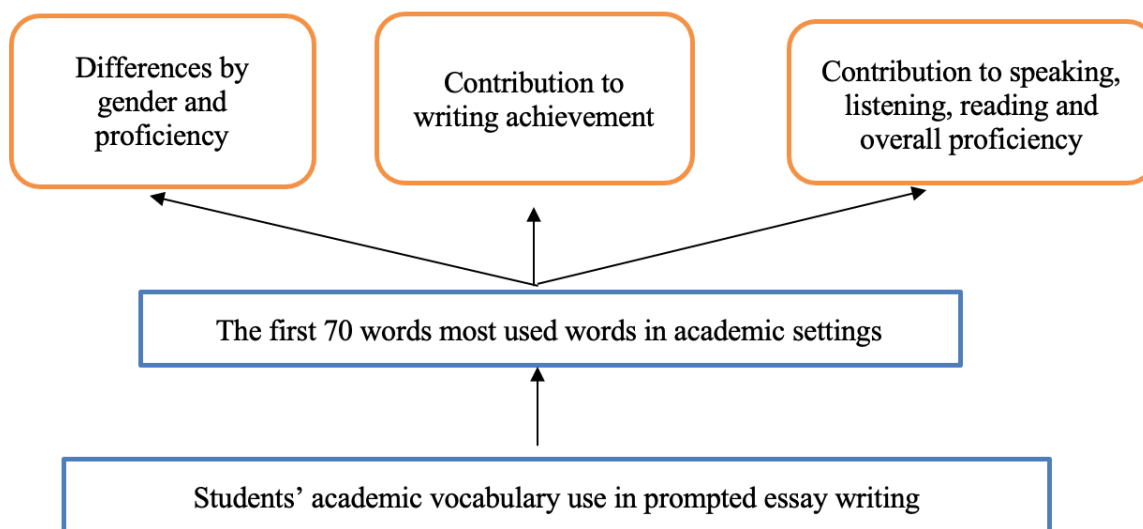
FIGURE 2. An illustration of the research model

RESULTS

ACADEMIC WORDS USED BY HIGH SCHOOL STUDENTS IN PROMPTED ESSAY WRITINGS

After analyzing 233 students' writings, it was found that of the first 70 most frequently occurring words in academic settings, 48 appeared, while the rest of the words did not. The most frequently used word was "Important(adjective)" with 119 appearances ($M = 1.74$, $SD =$ .97), followed by the words "Change (noun)" ($N = 86$, $M = 2.16$, $SD = 1.31$), "Study (noun)" ($N = 65$, $M = 2.09$, $SD = 1.34$), "Practice (noun)" ($N = 58$, $M = 2.29$, $SD = 1.43$), "Knowledge (noun)" ($N = 56$, $M = 1.77$, $SD = 1.06$), "Subject (noun)" ($N = 42$, $M = 1.40$, $SD = .94$), "Need (noun)" ($N = 36$, $M = 1.36$, $SD = .96$), "Include (verb)" ($N = 27$, $M = 1.63$, $SD = 1.08$), "Use (noun)" ($N = 25$, $M = 1.52$, $SD = .77$), and "Effect(noun)" ($N = 22$, $M = 1.59$, $SD = .22$). The frequency of word uses by these high school students differed from the overall frequency of use indicated by the AVL. This might be an indication of the differences between high school and university level ESL students; however, much wider research would be needed to know if this were actually the case. For instance, Study was the most frequently occurring word of all in the AVL, but it only appeared 65 times in these students' 233 essays, lower than the words "Important" and "Change" which were put 11th and 18th in the AVL. Further, two of the top ten academic words in the AVL, i.e. "However" and "Level", were not used at all by students. Table 3 presents the words explicitly known and used by students in their writings, excluding those that did not appear.

TABLE 3. Descriptive Statistics of Word Appearance in Students' Writings

Word rank from AVL	Word	N	M	SD
11	Important	119	1.74	0.97
18	Change	86	2.16	1.31
1	Study	65	2.09	1.34
38	Practice	58	2.29	1.43
66	Knowledge	56	1.77	1.06
60	Subject	42	1.40	0.94
50	Need	36	1.36	0.96
10	Include	27	1.63	1.08
13	Use	25	1.52	0.77
17	Effect	2	1.59	1.22
4	Social	16	2.00	1.79
59	Image	13	1.85	1.28
27	Develop	10	1.20	0.42
65	Identify	9	2.22	1.20
69	Project	9	1.33	0.50
70	Response	9	1.89	0.93
2	Group	8	1.88	1.13
16	Informative	8	2.00	2.45
23	Experience	8	1.00	0.00
37	Analysis	8	2.75	2.19
3	System	6	1.17	0.41
25	Human	5	1.00	0.00
39	Society	5	1.00	0.00
49	Culture	4	1.00	0.00
61	Science	4	1.75	0.50

5	Provide	3	1.33	0.58
7	Research	3	1.33	0.58
12	Process	3	1.33	0.58
21	University	3	1.00	0.00
24	Activity		3	1.67	0.58
43	Report	3	1	0
67	Support	3	1	0
36	Difference	2	1	0
41	Control	2	2	1.414214
51	Base	2	1	
57	Describe	2	1	0
9	Result	1		
14	Development	1	1	
15	Data	1	2	
28	Suggest	1	1	
32	Both	1	1	
33	Value	1	1	
35	Role	1	2	
40	Thus	1	1	
47	Factor	1	1	
52	Population	1	1	
54	Technology	1	1	
68	Performance	1	1	

Apart from the 48 words, there were three words that made frequent appearances in student writing, including "Make" *(N = 121, M = 2.45, SD = 1.57)*, "Improve" *(N = 103, M = 1.98, SD = 1.33)*, and "Know" *(N = 44, M = 1.84, SD = 1.46)*.

DIFFERENCES ACROSS GENDER AND PROFICIENCY LEVEL

Independent t-tests were performed to see if male and female students had significant differences in the use of the 48 words that made appearances. A significant difference was only observed on the word "Social" ($t (2,14) = -2.43$, $p = .03$), in which female students used the words ($M = 3.40$, $SD = 2.70$) more often than their male counterparts ($M = 1.36$, $SD = .67$). No other words showed statistically significant differences between the two sexes. Afterwards, one-way ANOVA was run to find out if students' use of the 48 words that made appearances significantly differed by proficiency levels. There was only one significant difference between groups on the word "Effect" ($F (1,21) = 4.81$, $p = .04$), while no significant differences were noted for other academic words. It revealed that the word "Effect" was only used by students with a higher proficiency level. On the other hand, the other academic words were known and used by the students, regardless of their proficiency levels.

CORRELATION AND PREDICTION

The next analysis examined whether the frequency of using the academic words in writing correlated with and predicted writing achievements. The normality of the data was first checked by looking at the *Skewness* and *Kurtosis*. Values between -2 and +2 are considered normal (George & Mallery, 2003). The results displayed a normal distribution of the data with the values < 2. The sample size was considered big as it involved more than 200 subjects. Since the assumptions had been met, bivariate correlations were performed between each word

frequency and students' writing scores; the results indicated no correlations. Then, multiple-linear regression was conducted for the words most frequently used by students including "Important, Change, Study, Practice, Knowledge, Subject, Need, Include, Use, and Effect" as the parameters as well as predictors of student writing achievement in prompted essay writing. The results did not suggest any predictive roles, as displayed in Table 4 below.

TABLE 4. Results of Multiple-Linear Regression

Word	R^2		F	Sig.
Important		001	.067	.796
Change		017	1.487	.226
Study		029	1.853	.178
Practice		000	.003	.960
Knowledge		002	.093	.761
Subject		007	.298	.588
Need		040	1.414	.243
Include		029	.736	.399
Use		000	.011	.918
Effect	010		.210	.652

Note. Only top 10 most occurring words from students' essays displayed

CONTRIBUTION TO PROFICIENCY

The last analysis explored whether the frequency of using the academic words contributed to the students' overall proficiency and in specific skills including reading, speaking, and listening. The results did not reflect significant contributions for all the regression models, as depicted in Table 5.

TABLE 5. Results of the Regression models

| Word	Speaking			Reading			Listening			Overall Proficiency		
	R^2	F	Sig.	R^2	F	Sig.	R^2	F	Sig.	R^2	F	Sig.
Important	0	0.03	0.87	0	0.1	0.75	0.03	3.77	0.06	0.01	1.4	0.24
Change	0.02	1.45	0.23	0.01	0.7	0.41	0.01	0.65	0.42	0	0.03	0.87
Study	0	0.14	0.71	0.01	0.46	0.5	0.01	0.67	0.42	0.01	0.66	0.42
Practice	0	0.11	0.74	0	0.05	0.85	0.01	0.71	0.4	0.01	0.4	0.53
Knowledge	0	0.09	0.77	0	0.06	0.81	0.01	0.7	0.41	0	0.07	0.8
Subject	0.04	1.46	0.23	0	0.08	0.78	0.03	1.41	0.24	0.02	0.67	0.42
Need	0.01	0.3	0.59	0.06	2.27	0.14	0.03	1.03	0.38	0.05	1.72	0.2
Include	0	0.02	0.88	0	0.08	0.78	0.08	2.2	0.15	0.03	0.64	0.43
Use	0.01	0.22	0.64	0.01	0.21	0.65	0.02	0.34	0.56	0.01	0.22	0.64
Effect	0.02	0.47	0.5	0	0.01	0.94	0.03	0.71	0.41	0.01	0.25	0.62

Note. Only top 10 most occurring words from students' essays displayed

DISCUSSION

The main objective of this study was to explore high school students' use of academic vocabulary in prompted essay writings and their contributions to English proficiency. In summary, there were four key findings revealed. Firstly, high school students used 48 words from the 70 most frequently occurring words in academic settings listed in AVL. This first finding indicates that students had knowledge of the words and used them correctly in their sentences, therefore, they understood and could utilize the terms well in sentences. Schmitt (2014) criticizes that often vocabulary knowledge tests only describe the number of words

known by students, but do not provide the details of what the words are and the degree of depth of vocabulary knowledge it represents. At this point, this study had provided the list of academic words used by high school students. Despite the reports of the difficulties of acquiring academic English vocabulary (Townsend & Collins, 2009), high school students seemingly possessed the ability to use the 48 words as their tools of communication and thinking concerning disciplinary contents (Nagy &Townsend, 2012). They must have learned the words from reading or listening. Below are extracts from student essays.

Sample 1. The words: Important and Subject
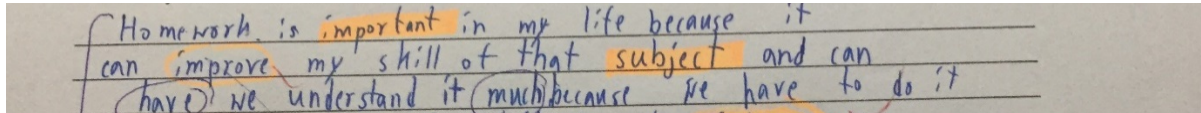

Sample 2. The words: Change and Practice
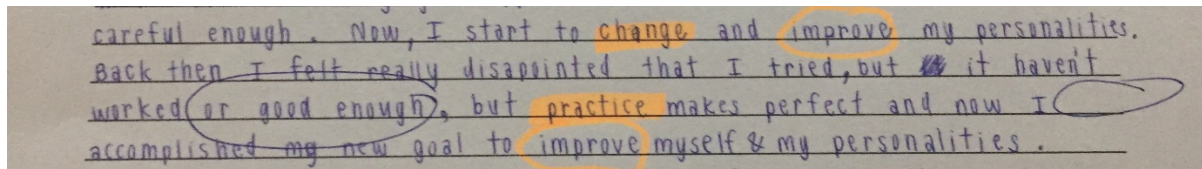
Another point was that students did not necessarily use all of the most frequently occurring words in academic settings listed in AVL in their essays. In addition, students used the words Make, Improve, and Know frequently, which were not included in the 70 most frequently occurring words. As Schleppegrell (2004) stated "… the patterns of language chosen by students to express and share their understanding are of major importance in presenting themselves as knowers and sharers of knowledge" (p.2). Previous studies utilizing AVL were mostly conducted on university students which had found variations across text genres and disciplines (Durrant, 2016) and disclosed the students' ability in distinguishing academic and non-academic words (Malmström et al., 2018). A study from Brezina and Gablasova (2017) argues that students' vocabulary needs, and knowledge can vary by proficiency levels, cultural backgrounds, academic disciplines, contexts, and personal goals. However, the second finding of this study did not fully support such an argument. A significant difference by gender was only observed on the word "Social" and a significant difference by proficiency level was only observed on the word "Effect", implying that high school students' need and knowledge of academic vocabulary might be homogenous, unlike those at university level. However, the words employed would also vary with the topic given. The finding sustains inconsistent results on vocabulary knowledge development by gender differences (e.g., Llach & Gallego, 2012). The samples of students' use of the words "Social" and "Effects" can be seen below.

Sample 3. The word: Social
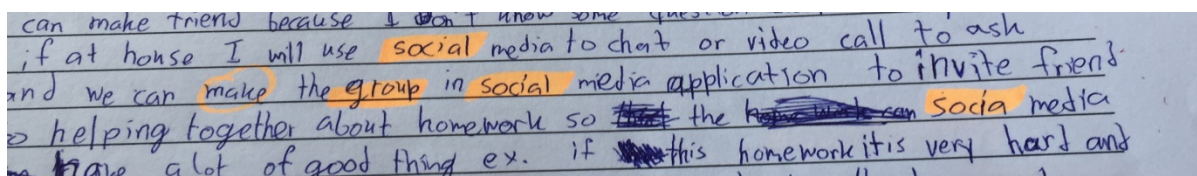
Sample 4. The word: Effect
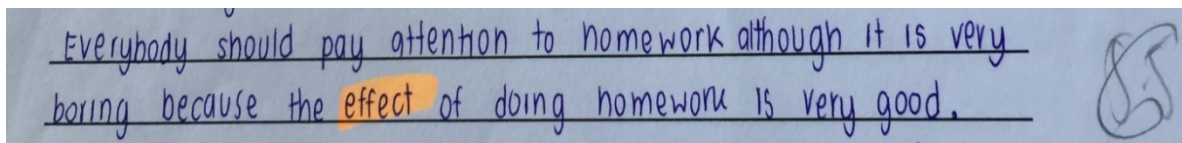
The third finding shows no correlations between the frequency of using the most frequently occurring academic words in academic settings and writing achievement; it also did not hint any predictive roles between these two variables of interest. It was assumed that non-academic words might have played a more significant role in student essays than academic words did. High school students had been suggested to lack the knowledge of most frequently used academic words (Stæhr, 2008). Another assumption was that the frequency of using the target academic words was inadequate to affect students' overall achievement in writing. Among university students, it had been found that level of vocabulary knowledge significantly affected writing performance (Kilic, 2019; Waluyo, 2018). In contrast, the present study did not observe significant effects of academic word use on writing achievement among high school students. This third finding was also enhanced by the last finding of this study, disclosing that the frequency of using the academic words did not contribute significantly to students' overall proficiency and in specific skills including reading, speaking, and listening. It did not follow the findings from previous studies that observed significant contributions (e.g., Cheng & Matthews, 2018; Matthews, 2018; Miralpeix & Muñoz, 2018; Vafaee, 2020). Nevertheless, the latest study analyzing publications around this area of interests from Zhang and Zhang (2020) discovered that previous studies were not consistent in their findings on the influence of vocabulary knowledge on overall English skills. This study, hence, recommends that more research be conducted at high school levels to ensure the consistency of the results.

IMPLICATIONS OF THE FINDINGS

The findings of this study have several pedagogical implications for both research and English teaching and learning. For research, the findings indicate that not all of the most frequently occurring academic words listed in AVL are used by students in their writing. This indication can lead to the question of whether the prominent vocabulary lists really represent the contextual academic vocabulary commonly known and frequently used by students from countries that consider English as a foreign language. Two prominent vocabulary lists provided in the body of the literature, such as AVL from Gardner and Davies (2014) and AWL from Coxhead (2000), were built from corpora collected from sources published in English speaking countries, e.g., USA, UK, and Australia. The most widely used measure of L2 lexical knowledge, Vocabulary Levels Test (Nation, 1990), also involved native speakers as the parameters of the test validity (Schmitt et al., 2001). The fact that students' academic vocabulary use was unrelated to their writing achievement might imply the inadequacy of academic vocabulary lists in covering what words are generally known and how they are used in their academic writing is also self-evident. It has been reported that there is no one set of words that will be useful to all EFL students due to differences in needs, proficiency levels, cultural backgrounds, and academic disciplines (Brezina & Gablasova, 2017; Waluyo & Bakoko, 2021). It is reasonable to assume that educated native English speakers will have a larger English vocabulary than L2 speaker, therefore, research should be conducted on the academic vocabulary knowledge and use of L2 English students and scholars. One of the

findings in this study provides the list of words commonly used by high school students in their essay writing which should serve as the basis for such investigation.

The effect of vocabulary knowledge in academic achievement has been identified by previous studies (Townsend et al., 2012; Masrai & Milton, 2018). EFL learners in non-English speaking countries are only starting their English learning when they enter at the high school level. Most of the time, their English learning is driven by the need to pass examinations and fulfill graduation requirements. Nevertheless, it is also important to perceive high school as the beginning level where students start to recognize and make use of academic English words in their study assignments and tests. Students' success in acquiring academic words at high school may determine their English advancement at the university level. Most of the previous studies have confirmed that university students' vocabulary knowledge is closely associated with proficiency level (Miralpeix & Muñoz, 2018; Nasir et al., 2017; Waluyo & Bucol, 2021).

LIMITATION

One of the main objectives of research around vocabulary knowledge is to measure the exact words known and used by high school students. This objective also underscores the present study. However, measuring vocabulary knowledge can be challenging, especially considering the fact that one word can be used in different forms. Students may be able to recognize a word and have enough ideas of a meaning to do well on a multiple-choice vocabulary test, however, they may not be able to use that word in writing and speaking. This study simply counts the words written by students in the part of speech as they are listed in AVL, meaning that they could remember and employ these words. Hence, the outcomes of this study should not be confused with those utilizing vocabulary tests as a measure of vocabulary knowledge. In addition, the context may affect the outcomes of this study. It involves high school students who are considered to have a good level of proficiency in English in Thailand, so the outcomes can be different from a study conducted in another context. This study was quantitative and should be interpreted in a way that is not mixed with studies employing other types of research methods. In addition, this study utilized information from a standardized paper-based test, therefore result had to be analyzed manually and verified that the word usage was the same as listed on the AVL. Consequently, only the used of the 70 most frequently used words could be analyzed not the entire 500 words on the AVL. The analysis also did not involve the accuracy of word usage, which means that the words might be found in the students' writing, but they might not be accurately used. Furthermore, according to WUTEP test results, participants represented a wide range of proficiency levels (B2-A1). This may be one of the study's limitations, as the use or absence of academic words in their writing may be due to their English proficiency. Despite these limitations, it is essential to note that more attention should be paid to high school students' academic vocabulary use in the context of non-English speaking countries as the amount of research is limited.

CONCLUSION

To sum up, this study has explored high school students' academic vocabulary use in one of the prominent schools in the South of Thailand. The results disclosed the use of 48 words from the 70 most frequently occurring academic words listed in the AVL. Small differences by gender and proficiency levels were observed, but the evidence seemed to be insufficient to establish whether there are significant differences in academic word use between genders, so further research is recommended. Despite the importance of academic vocabulary knowledge, this study did not confirm correlations and predictive roles that it played. This study also did

not analyze the words that were least frequently used, i.e., those appeared 5 or less times, to determine if they were more predictive of overall performance level. The findings of this study add to the knowledge of what words high school students know and use in their prompt essay writings. Future research can further investigate the applications of high school students' vocabulary knowledge and use in speaking performance. The integration of qualitative research analysis is also strongly urged.

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