The Development of Academic Vocabulary for Undergraduate Students in Writing an Undergraduate Thesis: A Corpus-Based Analysis

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Abstract:- This corpus-based research is aiming 1) to find out the word frequency which appears in the undergraduate thesis based on Coxhead's word selection criteria, 2) to find out the distribution of Coxhead's (2000) Academic Word List (AWL) in the undergraduate thesis in Indonesia particularly in Education field, and 3) to establish new academic words for undergraduate students in writing the undergraduate thesis. A 2.2-million-word corpus was compiled comprising 200 undergraduate theses deriving from 10 universities in Indonesia. The LancsBox 5.0 software was exerted to calculate the word frequency and percentage of the text by applying the quantitative method. By implementing Coxhead's word selection criteria, only 1-million words appear more than 63 times in the undergraduate theses and at least appear 5 times from 5 universities. The research indicates that Coxhead's AWL is as much as 8.95% and a new academic vocabulary is 4.46%. There are 268-word forms of AWL and 276 new academic vocabularies found in undergraduate theses. In sum, those words become an academic vocabulary for undergraduate students in writing an undergraduate thesis. Based on the findings of the results, it can be concluded that Coxhead's academic word distribution in undergraduate theses of English education is still low compared with the distribution of AWL in other fields. Meanwhile, the new academic vocabulary in this study needs to be considered. It is essential to confirm that the use of the high-frequency word does not imply the inclusion of an academic vocabulary in writing undergraduate theses. This is because students rarely used low-frequency words. After all, they are unfamiliar with the words. Sometimes low-frequency words are the words that have high frequency used by the experts in writing academic text. Therefore, the findings support the development of the new academic vocabulary by involving research articles and considering the unfamiliar words utilized by the students, but high frequency used by the native speakers or academicians in writing academic papers.

I. INTRODUCTION

The process of learning the words of a language is referred to as vocabulary acquisition. Because language is a complicated, changed, and subtle thing [1]. The acquisition of new vocabulary in a language plays a strategic role in bridging the learners to acquire new knowledge, especially foreign language learners. The ways in which English Foreign Language (EFL) students acquire the vocabulary of a native language differ from second language learners in acquiring the vocabulary of a second language [2] Since the acquisition of vocabulary knowledge affects proficiency in language learning, understanding vocabulary is considered as the crucial component in learning English as a foreign language [3].

Academic vocabulary is recognized as a foundation to ensure success in academic writing [4]. A substantial number of researchers agreed that academic vocabulary plays an important role for learners and educators at University as a guideline in writing academically and comprehending academic text [5][6]. However, academic Vocabulary is one of the most challenging aspects of making decisions in which words are worth teaching [7][8]. The teachers do not know the occurrences of the word and which words are genuinely representative in teaching new vocabulary [9].

The students in University should read and write academic text. However, insufficient vocabulary knowledge is the most problem of English as a Foreign Language (EFL) learners faced in learning academic discourses because it is rarely used in daily activities [10], [11]. Sometimes the students find them difficult to distinguish which words are academic and which words are general. The preliminary study reported that choosing the appropriate term is one of the challenges in writing undergraduate theses. Sometimes students also found it difficult in paraphrasing the idea and looking for the appropriate synonym of the word to avoid

plagiarism. The students also rarely used theses as references for academic Writing [12].

In Indonesia, some scholars also reported that the vocabulary and academic vocabulary knowledge of university students is relatively low [13] [14]. A recent account of tertiary learners' acquisition of vocabulary, for example, has informed that EFL learners despite years of their learning English as a foreign language have problems comprehending academic texts because they have limited possession of vocabulary [15].

To guide the present study, a collection of undergraduate theses in the field of English Education was established to address the following research questions: 1) Which are the words that frequently occur in undergraduate theses based on Coxhead's word selection criteria?, 2) What are the academic vocabularies in Coxhead's AWL that appear in undergraduate theses?, and 3) What are the new academic vocabularies found in the students' undergraduate theses based on Coxhead's word selection criteria?

II. SOME RELATED STUDIES

The development of the academic vocabulary list can be traced back to the Academic Word List (AWL) from Coxhead [6] as a widely used word list. Coxhead's AWL focus on word families and consists of 570-word families compiled from 3.5 million words of English Academic text by examining the range and frequency of words. It involves four disciplines: Arts, Science, Law, and Commerce. As a result, Coxhead [7] ensures that the new academic word list coverage 10% of total tokens in the academic corpus. The list did not involve the first 2,000 words in the General Service List (West, 1953). At present, Coxhead's AWL is widely used as a reference for building a new academic vocabulary list in English Academic Purposes or English Specific Purposes and as better sources for vocabulary learning in the English language. The effectiveness of Coxhead's (2000) Academic Word List has been discussed in some studies [8] [16]. However, providing academic vocabulary from the general field seems ineffective because some words which are frequent in one field may be absent in another field [17] and the students in different areas have different needs.

A review of the literature indicates that there is a good number of studies conducted on academic vocabulary in specific fields, subjects, and also across different fields. Quite a number of these researchers have developed new academic word lists in the field of Medical [18] [19], Science [5], Linguistics [6], Chemistry [20], Nursing [21]. Additionally, some researchers only identify the distribution of academic words in academic texts [8].

Pathan et al. [16] have investigated Academic Vocabulary Use in Doctoral thesis in Major Scientific Disciplinary Groups. Their study involves 200 doctoral theses from physical sciences, biological and health sciences, and covering 17 disciplines areas to investigate the frequency and coverage of academic vocabulary in scientific doctoral theses texts using AntConc version 3.4.4 software. The results

revealed that 550 world families (96.50%) among the total 570-word families of Coxhead's AWL are found to be frequently used in the doctoral theses of scientific disciplinary groups including Biological & Health science and Physical sciences. The coverage of AWL in Pakistani Doctoral Theses text is 8.76%. It is accurate to conclude that Coxhead's AWL is sufficient for writing doctoral theses.

The distribution of the Academic Word List has also been addressed in several research articles on various subjects. Chanasattru & Tangkiengsirisin [9] investigate the use of the Academic Word List (AWL) and New General Service List [22]. Sixty-four English were selected and loaded in *AntWordProfiler 1.4.0.* The result reported that the distribution of Academic Word in Social Science Research Articles is a good percentage covering 13.86% and the coverage of NGSL accounted for around 70%. The finding of this research revealed that AWL has an excellent contribution to vocabulary learning, particularly in preparing students for reading and writing social science research articles. In contrast, Mozaffari and Moini [10] also try to investigate the use of Academic Word List in the field of education entitled: " Academic Words in Education Research Articles: A Corpus Study". 239 Education research Articles were involved and loaded into WordSmith Tools software. The finding reported that word lists from the Education Research Articles corpus could be considered one of the efficient and best methods in language learning. However, the use of AWL in Education research articles is still low. The coverage of AWL word forms in the Education Research Articles Corpus was only 4.94%.

Khani and Tazik [6] tried to establish an academic wordlist specific to applied linguistics. This research contains 1,553,450 running words taken from 240 Applied Linguistic Research Articles from prestigious journals; there was an attempt to develop an academic word list for this field of study. The data was compiled by using the Range Program. By the predetermined word selection criteria plus exclusion of GSL words, 773-word types were finally selected as the academic words which appeared 193,989 times in the corpus. Similarly, the finding of this research showed that academic vocabulary is hugely influenced by pedagogical implications. They also argued that academic word is very crucial to be acquired by the students [23].

The previous studied showed that all of the scholars were interested to investigate the distribution of the Academic Word List from Coxhead. The results of all their research have an excellent contribution to the learning process but not in the education field. All of these studies have addressed the academic vocabulary from journal articles, meaning that they provide the academic vocabulary that the students are required to know receptively. Besides, Rahman et al [24] had argued that "productive use of vocabulary requires more knowledge than receptive; therefore, a pedagogical focus on productive vocabulary is at least as important as one of receptive vocabulary." In response to these issues, the researcher formulates that it is crucial also to know the productive use of vocabulary gathered from the undergraduate students' theses. Furthermore, the list of words from the undergraduate thesis

can be used as a reference to find out whether the words are meant for the students writing and need to be developed to improve vocabulary learning. To fill this gap, the current study focuses on the distribution of AWL from the undergraduate theses focus on English Education subject and provides a new thesis academic vocabulary for undergraduate students in writing an undergraduate thesis.

III. RESEARCH DESIGN

This study applied quantitative research by using a corpus-based approach. By considering representativeness, the corpus was compiled from 200 undergraduate theses from 10 universities in Indonesia containing 20 undergraduate theses for each university. The undergraduate theses soft files were collected from universities' e-library and selected randomly. The section of the undergraduate thesis included in this study are abstracts; Introduction; Literature Review; Research Method; Result and Discussion; Conclusion. Meanwhile, Numbers, acknowledgments, table of content, references, caption, chart, diagram, pictures, and appendices were excluded from the word count.

To determine the frequency and range of the words, *LancsBox* [25] was taken. The program helps to identify the words in the text. This tool works with the data from undergraduate theses and automatically analyzes the data's frequency and annotate data for part-of-speech. However, the software read all of the kind of text, such as numbers, the wrong word, and the others, therefore the result from *LansBox* was copied into Microsoft Excel to facilitate further data analysis. The word lists were investigated only the words that met selection criteria adopted Coxhead's word selection criteria based on the frequency and the range. The frequency of Coxhead's AWL appears at least 100 times in the whole corpus of 3.3 million running words. It is equal to approximately 28.6 times in every one million of the corpora. In the present study, the corpus was contained around 2.2 million running words. To follow Coxhead's AWL principle, the frequency criterion is that the word forms have to occur at least 63 times in the entire corpus (28.6 x 2.2 = 62.9). The range criterion is that the word forms have to occur at least five times in five universities. The rationale to select these rates of occurrence is based on Coxhead's (2000) selection of AWL words. Coxhead's corpus for the AWL was around 3.5 million words, and her selection criteria for the AWL word forms was that each word form in the AWL should occur at least 100 times in the entire corpus and at least 10 times in 15 or more of the 28 subject areas.

To explore the distribution of Coxhead's AWL, 570 of the academic word family was compared with the word selection in undergraduate theses. The new academic vocabulary was found by comparing the undergraduate these words and Browne and Philips' New General Service List (NGSL) in 2014. The NGSL contained 2801 words and the words that include NGSL were removed as the academic word.

IV. FINDINGS AND DISCUSSION

A. Findings

The current study involved the balanced corpora containing 200 undergraduate theses from 10 universities in Indonesia. From the software analysis, the 2,249,910-running word in undergraduate theses was created. However, only the words that met frequency and range word selection criteria were investigated. Among 2.2-million word, only 1-million word (1,030,954) that appear at least 63 times in the undergraduate theses and occur at least five times in five universities which coverage 45.82% of the total words and 1,680 lemmas. The proportion of words in undergraduate theses is presented in table 1.

Based on the data analysis, the most frequent word that appears in undergraduate theses is "student" which occurs 43,463 times and accounted for 1.93% of entire undergraduate theses. The top frequency words are the word related to the English education field, such as research, teach, learn, use, write, English, read, speak, and language. The list of the high-frequency word based on word selection criteria is displayed in the Appendix.

Table 1. The proportion of word in Undergraduate theses

	Tokens	%	Lemmas	Headwords
Selected Words	1030954	45.82%	1680	1192
AWL	201286	8.95%	389	268
New Academic Words	100318	4.46%	326	276

1) Frequency analysis of the AWL in Undergraduate theses

To elucidate the coverage of the words in undergraduate theses, the coverage is exhibited in table 1. The AWL coverage in undergraduate theses accounts for 8.95%, which appeared 201,286 times in the whole undergraduate theses. This percentage is much higher than the 4.94% of the AWL in Education research articles so far. Meanwhile, the coverage of the AWL in this corpus is lower than Coxhead's AWL that covered 9.3% of Arts sub-corpus in the field of education, history, linguistics, philosophy, politics, and sociology. Among the AWL's 570 words families, only 268 were found in undergraduate theses based on the selection criteria, which contained 389 lemmas. Those words appear at least 63 times in the whole undergraduate these and at least five times in the five universities.

In this study, the most frequently used word was research, which appeared 2,4191 times, and data which occur 7,730 times in entire universities. This word accounts for 12% and 3.84% of AWL an entire corpus. Other AWL such as process, analysis, and method also appear very frequently and occur in ten universities.

Table 2. Top 10 most frequently used AWL in the undergraduate theses.

Rank	Headwords	Frequency	Range	Coverage of AWL
1	Research	24,191	10	12%
2	Data	7,730	10	3,84%
3	Process	6,649	10	3,3%
4	Analyze	5,087	10	2,53%
5	Method	4,291	10	2,13%
6	Differ	3,642	10	1,81%
7	High	3,468	10	1,72%
8	Motivate	3,179	10	1,58%
9	Technique	3,068	10	1,52%
10	Conduct	2,787	10	1,38%

2) New academic vocabulary in undergraduate theses

The investigation of determining a new academic vocabulary had been explained above. The new academic word was developed by comparing selected words in undergraduate theses and Brownie and Philips' NGSL (2014). NGSL is a list that contains the general high-frequency word, therefore the words in NGSL that are included in undergraduate theses word are removed as a new academic word. Based on the investigation, among 1,680 lemmas only 326 lemmas were not included in NGSL which covers 4.46% of the total words in undergraduate theses (see table 1).

This study found some abbreviations that occur with high frequency such as SPSS, CLT, ELT, ESP, and EFL however this study only focuses on the words, therefore the abbreviations are removed from the list. Table 5 displays the ten most frequent non-AWL word types in undergraduate theses. The high-frequency word in the new academic word is the word vocabulary that occurs 5,509 times and covers 0.2% in the entire undergraduate thesis's corpus. The next words are strategy, learner, classroom, strategy, comprehend, post-test, implement, pre-test, competence and aspect also have a high frequency that found in the new academic word.

The focus of this study is to develop an academic vocabulary list for undergraduate students in writing an undergraduate thesis which is written by those undergraduates from Indonesian university before they graduate. Based on the word selection criteria, this study found 268 AWL and 276 new academic words.

Table 3. Top 10 most frequently used new academic vocabularies in undergraduate theses

Rank	Headwords	Frequency	Coverage
1	vocabulary	5,509	0.2%
2	strategy	3,635	0.16%
3	learner	3,352	0.15%
4	classroom	3,090	0.14%
5	comprehend	2,306	0.10%
6	post-test	2,009	0.09%
7	implement	1,987	0.09%
8	pre-test	1,969	0.09%
9	competence	1,800	0.08%
10	aspect	1,789	0.08%

B. Discussion

The corpus demonstrates a different proportion of academic vocabulary. As a corpus of academic text in undergraduate theses, the AWL percentage was 8.95%, in which 268 AWL word families were detected. It is close-related to the coverage of AWL in Pakistani Doctoral Thesis which contains 8.76% (Pathan et al., 2018). This coverage is not supported by Coxhead's (2000) research that the 570 words of AWL cover 10% of the academic corpus. It shows that the coverage of AWL in undergraduate theses is lower than the distribution of AWL in Applied Linguistics which cover 11.17% [8], 10.07% in Medical [18], 9.6% in Chemistry [20], and 13.86% in Social Science [9]. However, the coverage of AWL in undergraduate theses higher than the distribution of AWL in Education which covers only 4.94%. Some of the words ranked as high frequently utilized in Coxhead's AWL did not frequently appear in this study, and vice versa. For example, the word of differ, high, and motivate came in the top ten of AWL in undergraduate theses.

In undergraduate theses, one of the most frequent words utilized by the students in writing theses is used, which appears 20,395 times. The word use is not included as AWL. Interestingly, the synonym of this word is utilized with a low frequency, which occurs 123 times in the whole undergraduate theses. It means that some students are not familiar with the utilized word.

The finding of this study found that some of the words that closed-related to the English Education field are not included in AWL. Therefore, this high-frequency find out words new academic vocabulary exclude following Coxheads' AWL principles. Coxhead's AWL did not include West's GSL in her word list. It is because GSL was contained high-frequency general words, therefore they are excluded from the academic word list. GSL was found in 1953 and it is outdated. Therefore, this study did not use GSL in comparing the words in the undergraduate thesis but using Browne and Philps' New general Service List (NGSL) that was published in 2014.

There are 276-word that are not included in Browne and Philips' NGS which coverage 4.46%. The percentage closed-related with 5.82% the coverage of academic word in the Science Academic Word [5]. From the top 10 high-frequency words, only the word of comprehending, implement, and aspect that determines as Coxhead' AWL

As can be identified in Appendix, among 276 new academic words, some of them include specialized terms in the English education field, such as material, classroom, competence, curriculum, pronunciation, syllabus, and

pedagogy. This finding is similar to Vongpumivitch et al.[8] who found some field-specific words being used in applied linguistic. They also found the specialized terms related to the education field, such as the word of competence and classroom. The new academic word in undergraduate theses found some terms of research methodology that can be found in the academic research paper, such as, p-value, quasi-experimental, null, quantitative, t-test, variable, instrument, questionnaire, pre-test, and post-test. These terms are commonly found in quantitative research papers in the methods section. In sum, some of the words that close-related in the English education field are not detected as Coxhead's AWL. Meanwhile, those words are very crucial for students in learning academic writing and in writing academic text.

This study provides an academic vocabulary list for undergraduate students in writing undergraduate theses by considering word selection criteria. Finally, this study found 268 of AWL and 276 of new academic vocabulary can be used as a reference in writing undergraduate theses.

This study also proves that the high-frequency list of words in undergraduate theses is monotonous. Many of the words are known well by the students. It is essential to confirm that the use of the high-frequency word does not imply the inclusion of an academic vocabulary in writing undergraduate thesis. This is because students rarely used low-frequency words. After all, they are unfamiliar with the words. Meanwhile, sometimes low-frequency words are the words that have high frequency used by the experts in writing academic text. Therefore, the findings support the development of new academic vocabulary by involving research articles and consider the words that unfamiliar utilized by the students but always used by the native speakers in writing academic papers.

V. CONCLUSION

The present study is concerned with the distribution of Coxhead's AWL involving academic vocabulary for undergraduate students in writing an undergraduate thesis. It is apparent from the research findings that academic words are widely used in various disciplines and contexts of learning. The finding is to confirm that still little can be reported about previous studies that had investigated the academic word used in writing an undergraduate thesis. To this end, a 2.2 million-word corpus was compiled in an English Education Study consisting of 200 undergraduate theses in 10 universities during 2016-2020. Considering the set criteria, only 1-million word (1,030,954) that appear at least 63 times in the undergraduate theses and occur at least five times in five universities which coverage 45.82% of the total words and 1,680 lemmas. This study found that the distribution of AWL in undergraduate theses was 8.95%.

The finding concerns that a number of AWL frequently appearing in Coxhead [7] did not frequently occur in undergraduate theses corpus and vice versa. It is because the focus of their corpus is in general disciplines. Meanwhile, there are some of the words close-related to the English Education field but did not include academic vocabulary. The

role of the academic word in academic writing is very crucial. Therefore, develop a new academic word in the specific field is essential for teaching academic words. This study found 326 lemmas excluded in NGSL which covers 4.46% of the total words in undergraduate theses. The AWL words and New Academic Word found in undergraduate theses were selected as academic vocabulary lists for undergraduate students in writing the undergraduate thesis.

This study provides Academic Vocabulary for undergraduate students to write an undergraduate thesis that has an excellent pedagogical implication. This study's result should be a useful resource for learners and teachers in teaching and learning academic text, particularly in writing undergraduate theses, and a useful reference in syllabus design and developing teaching materials. In addition, the finding of this study presented which words that the teachers can teach in teaching academic writing.

At the same time, students need to have sufficient recognition of academic vocabulary to enable them to write and comprehend an academic text. Understanding the nature of vocabulary acquisition as well as the use of vocabulary in an appropriate context will enable the researcher to develop a new academic vocabulary in a specific English education that involves a massive number of academic texts, such as research articles, theses, and academic textbooks.

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