**THE VOCABULARY OF ECONOMICS AND ACADEMIC ENGLISH**

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Abstract

Identifying the features of the text is useful in order to determine the most important aspects to teach especially for English for specific purposes. One possible way of doing this is by looking at the vocabulary needed by learners when reading a text. This research especially examines the vocabulary used in an economics text for the first year university students and compares it with another corpus of similar length. These two corpora have different features. The economics text is by one writer and is one general topic – Economics, and was written so that it forms a coherent continuous text. The general academic English corpus was made up 160 two-thousand-words texts by many different writers on diverse topics, across a wide range of academic disciplines.

The most striking difference between the two texts was the number of word-forms and word families each contained. The economics text consisted of 9,469 different words forming 5,438 word families. The academic English corpus, although roughly the same length as the economics corpus, consisted of over twice as many as word-forms and word families, namely 21,399 different word-forms and 12,744 word families.

In the economics text a few content words were extremely frequent. In the most frequent 100 words, there were 34 words like *price*, *cost*, *demand*, *firm*, *supply*, etc., which occurred with at least seven times the frequency of their occurrence in general academic English. The total difference in their frequency of occurrence accounted for 32,214 tokens which equaled 10.91% of the tokens in the economics text. This 10.91% coverage easily accounted for the coverage of the extra word types and families in the general academic corpus.

It was also found that 60.9% of the 5,438 word families in the economics text occurred in the general academic corpus. The remaining 2,124 words did not occur in the general academic English corpus. Only 5.4% of the non-overlapping words were technical words occurring in a dictionary of economics. It was possible to use frequency and range of occurrence as a statistical means of isolating technical words, but there were still problems with such an approach, particularly for low-frequency technical words.

It is apparent that continuous economics text was better for reading and vocabulary learning than the general academic corpus because the economics text had a smaller vocabulary and less very-low-frequency words.

***Key words: vocabulary. Economics corpus, academic English corpus, frequency of occurrences***

INTRODUCTION

Text analysis based on corpus study for the purpose of classroom teaching is relatively limited in Indonesia. One of the studies was done by Dwijatmoko (2011) dealing with the analysis of short story and Indonesian novel and focusing on the use of the words “saja”. Other corpus study was also done by Sutarsyah (1999) which investigated the collocation of the word “get”. However, some teachers of English are still unaware of the value of having their text books analyzed for their teaching. They just use them without any flexibility. This situation may lead to inefficient teaching. Text book analysis here means the analysis of language in use. It cannot be restricted to the description of linguistic forms independent of the purpose or function which those forms are designed to serve in human affairs (Brown and Yule, 1983). This involves studying the relationship between language and contexts in which it is used (McCarthy, 1991).

This present study attempts to investigate Economics vocabulary by analyzing a widely used Economics text book, Parkin’s *Microeconomics*, in terms of the vocabulary used. The study is based on computer corpus analysis including word frequency counts. There has been very little research similar to this where vocabulary in a text is analyzed and identified for the purpose of ESP teaching. This study seeks the answer to some questions; in what ways does the amount of vocabulary differ between a specialist text and a series of unrelated texts? In what ways does the distribution of vocabulary differ between a specialist text and a series of unrelated texts? What words in GSL do not occur or are of very low frequency in Economics text? What kinds of general words occur in both Economics text and general academic text? What are the distinct features of high and low frequency words in the economics texts and general academic texts?

**Vocabulary Counts**

Many word frequency counts and word lists especially by using a computer have been done previously. These basic techniques for processing texts by computer were developed some years ago in the investigation of vocabulary patterns (Jones an Sinclair, 1974). However, long before this, without the use of a computer, Thorndike and Lorge (1944) studied word frequency in a corpus from general reading, text books, the bible, and recent and popular magazines. Michael West’s General Service List of English Words (1953) which is partly derived from Thorndike and Lorge’s work became the standard for determining high and low frequency words for the purpose of teaching and learning English as a second or foreign language.

Some studies of word frequency were based on an assumption that learners should have a minimum learning burden with maximum learning outcome. Learning a language does not necessitate learning all the items in the system (Richards, 1974). It is also stated that this word selection is of benefit for simplification of teaching as opposed to the simplification of English language. Further, West (1953), when introducing his list, explained that ‘the chief values of the list are that it shows: (1) how heavy is the learning burden of the major words compared with all others, and how very much the learner’s task may be lightened by cutting out everything which is not really essential, especially in those heavy words; (2) how much less frequent and less important are minor items of words than one would have expected. Indeed, it may be taken as a general rule that anything which seems in the least degree unusual or doubtful should certainly be excluded from the teaching course’ (West, 1953: viii).

**English for Economics (ESP) and English for Academic Purposes (EAP)**

English for Economics is one of the disciplines in English for specific purposes (ESP) or more narrowly English for Academic Purposes (EAP). Ideally English is taught based on the learners’ basic needs for using English. Widdowson (1981) claims that the work that has been done in teaching ESP has generally been based on the following assumption: if a group of English learners’ needs can be accurately specified, then the specification can be used to determine the content of language program that will meet these needs. The implication of this assumption is that the specification should be made when teaching English to students of different study backgrounds. Thus, we can specify what students of Economics need to be able to do with English by analyzing their text books. ‘The process of deciding what to teach is based on consideration of what learners should most usefully be able to communicate in English. When this is established, we can decide what are the most appropriate forms for each type of communication.’ (Wilkins, 1976: 19)

*English for Academic Purposes*

General academic English in this research refers to English for Academic Purposes (EAP) and refers to the English used in a range of academic text books for university students. It may include many areas from different disciplines, such as Geography, Mathematics, Economics, and so on. EAP makes extensive use of authentic materials from text books for academic purposes (Hewings, 1990). In some cases, EAP is identical with English for Science and Technology (EST). Sometimes there is a distinction between EAP itself and English for Occupational Purposes (EOP).

*Lexical Items in EAP*

In general English vocabulary, words are usually classified into high and low frequency. The high frequency words are typically small in number but occur very frequently in a wide range of texts. The low frequency words are many in number and occur infrequently with a narrow range. For general purposes the words in the first 2,000 words of General Service List of English Words, called GSL (West, 1953), are considered as high frequency words. All other words are considered as low frequency words.

In EAP, low frequency words in general English may have a very high frequency in a specialized field, along with a special meaning. These may be termed technical vocabulary, although as we shall see later in this study, this group of words is not easy to define. Some researchers have shown that technical words do not usually cause great difficulty for second language learners (Ghadessy, 1979).

The problem for second language learners, according to Trimble (1985), lies in learning sub-technical vocabulary. Sub-technical vocabulary can be defined as context independent words which occur with high frequency across disciplines. This refers to those words that have one or more general English meanings and which in a technical context take on extended meanings.

It is assumed that university students are already familiar with the general service vocabulary since they have learned English for several years. However, they are likely to need words common to the academic texts used in universities. Based on this assumption Xue and Nation (1984) compiled a list of words called the University Word List—the vocabulary of university study. The list covered a range of disciplines from four different sources. It includes 737 word families. It assumes the knowledge of West’s General Service List of English Words (1953) and builds on that.

METHODOLOGY

The study had to decide which particular corpora would be used. After some consideration, a widely used introduction to Economics which is used as a textbook in many universities was chosen. It was *Microeconomics* by Michael Parkin. A corpus of a similar size from general academic vocabulary was made by selecting section J (written academic English) from the Lancaster-Oslo-Bergen (LOB) corpus and the Wellington corpus (VUW). The selection of section J, learned and scientific writing, was done to provide a sample of a wide range of the vocabulary of academic English.

**Parkin’s*Microeconomics***

The primary data of this research was taken from Parkin’s*Microeconomics*. This text is hereafter referred to as *Ecocorp*, which stands for Economics corpus. For this purpose, permission to use and scan the words from the book into a computer was gained from the publisher. The book is widely used and its writer is well respected in the field.

Section J of the LOB corpus was combined with section J of the VUW corpus. It was assumed that this combined data could represent general academic English to compare with the more specialized academic English of Economics.

The combination of section J of the LOB and VUW corpora formed a corpus of general academic English, called *Acacorp* (General Academic English Corpus) which is similar in size to Ecocorp. Acacorp consists of 311768 running words, compared to the 295294 of Ecocorp.

**Scanning**

This is the first part of data colleting process. Scanning is the process of transforming the words from the printed material, that is, Parkin’s Microeconomics, into computer. Some unnecessary parts are not included into the corpus, for example, titles, contents, etc..

**Editing**

Editing was done to ensure that all sentences and paragraphs matched those in the book. When the files were in the computer, the next step was to edit the files, removing all errors introduced by scanning and the original printed layout of the text. For example, hyphenated words, at line end and page breaks in the written text, had to be joined.

**Computer Software which was Used for Analyzing the Corpora**

The computer programs are called OCP and FVORDS. The information about the functions of these programs used in this research is briefly given below.

*OCP*

OCP (The Oxford Concordance Program) is a general purpose computer program that can be used to make concordances, indexes, and word lists from texts in a variety of languages and alphabets. OCP was used, in this research, to make frequency-ranked word lists and alphabetical lists. These lists show the number of running words in a text and the number of different words occurring in a text along with their frequency of occurrence. OCP can also be used to find collocations.

*FVORDS*

FVORDS compares all the word forms in an input text with three base word lists. It lists and counts the forms in the text according to what base word list they are in, in addition to listing those words that are not in any base word list. It also creates output lists according to forms and word families along with their frequency of occurrence of each item. In addition, it tabulates the proportion of the text covered by each list and by the words not in any list.

This program can also be used to help to make a lemmatized word list or a word family list from a text. Lemmatization is the process by which word forms occurring in text are linked with the paradigms to which they belong (Martin et al., 1983). So for example, conjugated verb forms are grouped together with the infinitive form, e.g. *tries*, *tried*, *trying*, are grouped under one word heading, *try*; noun inflections are grouped with the singular of the noun, e.g. *books* with *book*.

FVORDS can also be used to compare a vocabulary list against a text to see what words in the text are and are not in the lists and to see what percentage of the items in the text are covered by the lists. In other words, FVORDS classifies the words in the text into several categories based on three base words lists provided in FVORDS. These three word lists are called BASEWRD1., BASEWRD2. and BASEWRD3. The words in the text belonging to these lists will be grouped according to these three lists and those not in any of these lists will be grouped in a list called ‘the words not in any list’.

**Defining a Word**

Many researchers have defined a ‘word’ differently for different purposes. A word can be simply defined as a written or printed symbol as a unit of a language. Many definitions of the concept of a ‘word’ remain blurred. Are the items *interest*, *interests*, *interested*, *interesting*, and *interestingly* considered as one word or several? Another vagueness can be seen in the following phenomenon, as described by Lamb (1969). *Table* has two quite different meanings, as in *a book is on the table* and *a table is in the book*; are these two words—*table* 1 (a piece of furniture) and *table* 2 (a display of information)—or just one word? This phenomenon can be clarified by distinguishing the terms **morphological word**, **exical word**,and **semantic word** (Lamb, 1969). *Table* and *tables* are two different morphological words but they are two forms of the same lexical word. *Table* 1, as in *a book is on the table* and *table* 2, as in *a table is in the book*, are two different semantic words corresponding to a single lexical word (Lamb, 1969). They are homographs. They have the same form but quite different meanings. Knowing one meaning of *table* does not mean that minimal effort is needed to learn the other, so they would be regarded as two base words. This study does not differentiate between the meaning of these two words, as in *table* 1 and *table* 2. The word lists treat these two words as the same one word-form. Nation (1984) claimed that ‘decisions about what is included in a word family are important because they have significant effects on vocabulary size research, and learning goals and teaching procedures’.

**FINDINGS**

Economic corpus consists of one introductory textbook of Economics. It is thus the corpus derived from one writer, one general topic – Economics which is written so that it forms a coherent continuous text. The comparison of the two corpora canbe seen in the following table.

Table 1 Text Size and Vocabulary Size of Economic Crp and Academic Crp

|  |  |  |  |
| --- | --- | --- | --- |
| Texts | Total words | Word Forms | Word Families |
| Economic Crp | 295,294 | 9,469 | 5,438 (57.43%) |
| Academic Crp | 311,768 | 21,399 | 12,744 (59.55%) |

**The Features of the Most Frequent Words in the Economics Text Compared with General Academic English**

This section identifies the top 500 content words taken from the first 1,000 words of Ecocorp in terms of frequency rank order and compares them with the top 1,000 words of Acacorp. The purpose of this comparison is to show the influence of a single topic focus (Economics) on the occurrence of topic related words.

Comparing the rank order lists of both Ecocorp and Acacorp, it seems that they do not linearly match with each other. Some of the words in the rank order list have low ranks in Acacorp, some have high ranks.

The first 50 words of the content word list, however, are most striking. Most of the rank orders of the words in Ecocorp match with very low ranks in Acacorp, especially in the first 20 words of the list. The top words in Ecocorp, as mentioned above, *price*, *cost*, *demand*, *curve*, *firm*, *supply*, and so on, occur in the very low rank in Acacorp, that is , 479, 471, 411, 526, 991, etc. Some of the words are not in the first 1,000 words of Acacorp, such as *margin*, *revenue*, *profit*, *goods*, and *buy*. In fact, they are in the high rank order of Ecocorp and occur much less frequently in Acacorp.

Further investigation also shows that 125 words (25%) from Ecocorp in this 500 word rank order list are not in the first 1,000 words of Acacorp. And these words are scattered over this 500 word list. On the other hand, of these 500 words of Ecocorp, 18 words do not occur at all in Acacorp. Most of these words have a high frequency of occurrence in the text and therefore, they occupy the top rank order. This suggests that these words are very important in the Economics text.

Another comparison can be seen Table 2 in which two corpora were compared with the most frequent 2,000 words of GSL (West, 1953) and the University Word List (Xue and Nation, 1984). It shows that Academic corpus makes use of a large number word families at all word level including the first 1,000 words. In terms of coverage the major difference is at the first 1,000 word level.

**Table 2: The numbers of word families and coverage of economic corpus and academic corpus in the 2000 most frequent words of GSL (West, 1953) and University Word List (Xue and Nation, 1984)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Word Level | Families in  Economic Crp | Coverage of Economic Crp | Families in Academic Crp | Coverage of Academic Crp |
| 1st 1000 | 1,029 | 77.72% | 1,095 | 74.11% |
| 2nd 1000 | 548 | 4.78% | 796 | 4.32% |
| UWL | 636 | 8.74% | 811 | 8.40% |
| Others | 3,225 | 8.77% | 10,42 | 13.16% |
| Total | 5,438 |  | 12,744 |  |

**Words in the GSL do not Occur or are of Very Low Frequency in Economics Text**

As previously mentioned, the first and the second 1,000 words of the 2,000-word General Service List of English Words (GSL) by Michael West (1953) are very useful for a learner of English as a foreign language. The words in these two lists have a high frequency of occurrence in general English.

However, this group of words might have a less important role in a particular text, such as Economics, and therefore occur infrequently. In Ecocorp, we can find some words which have a very low frequency of occurrence, for instance 1 to 5 occurrences, but which can be found in these two lists (GSL). The data shows the number and percentage of words occurring 5 times or less from Ecocorp which appear in the first 1,000 words of GSL.

**Table 3. The Word Families in Ecocorp with a Frequency of 5 or Less Occurring in the 1st 1,000 and 2nd 1,000 of GSL**

|  |  |  |
| --- | --- | --- |
| Frequency | Number of words  1st 1,000 | Number of words  2nd 1,000 |
| 5  4  3  2  1 | 29 (2.82%)  32 (3.11%)  42 (4.08%)  39 (3.79%)  48 (4.66%) | 22 (4.01%)  38 (6.93%)  53 (9.67%)  67 (12.22%)  121 (22.08%) |
| Total | 190 (18.46%) | 301 (54.93%) |

We can also find some word families from the first 2,000 words of GSL which do not occur in Ecocorp. Of the 1181 word families in the first 1,000 words, 152 word families (12.87%) do not occur in Acacorp. In the second 1,000 words, 408 word families (42.68%) out of the 956 word families do not occur in Ecocorp. The following are examples of the words:

CONCLUSION

**How does Reading One Specialized Text Affect the Vocabulary Load Compared with Reading a Series of Separate Texts?**

Comparing the two corpora, Ecocorp is more favorable as a reading text than Acacorp in that it contains fewer unknown words. Table 4.1 provides clear evidence that Ecocorp has many less word families compared with Acacorp. Tables 4.2 and 4.3 show that Ecocorp has considerably less low frequency words and more high frequency words beginning from a frequency of 300. This is one indication that Ecocorp is better for reading.

If the words outside the first 2,000 words of the GSL are considered as unknown words, by looking at these words in both corpora, it is estimated that Ecocorp has 3,861 unknown word families (71% of the total word families), and Acacorp 10,853 word families (85.16%). Thus, Acacorp has many more unknown words than Ecocorp.

Some studies show (Goodman and Bird, 1984; Hwang and Nation, 1989) that a single-topic has a good effect on reducing the density of unknown word families. In addition, some of the unknown words may appear frequently enough in a long continuous text to be learned and many of them maintain semantic cohesion. The readers will learn their meaning from contextual clues.

**How does Reading One Specialized Text Affect Vocabulary Repetitions Compared with a Series of Unrelated Texts?**

Reading a text can result in vocabulary learning. This means that, besides strengthening the initial vocabulary knowledge, more new words would be acquired by reading the text. In order to achieve this, a text should contain new vocabulary with a reasonable number of repetitions.

Repetition of unknown words is important for vocabulary acquisition. A single encounter with an unknown word would seldom lead to a full knowledge of its meaning (Nagy, Herman and Anderson, 1985). Therefore, more repetition is important in order to have adequate learning.

Ecocorp being a text on one topic has a greater number of very high frequency words and a smaller number of low frequency words than the collection of texts that make up Acacorp. Table 4.2 shows that the number of words with a frequency of 5 or more in Acacorp is more than twice as many as those in Ecocorp. Table 4.3 shows that the figures still maintain this tendency up to a frequency of 300. Looking from this point of view, Acacorp is better in terms of vocabulary learning and also provides better coverage of the words in the base lists. The greater number of high frequency words in Ecocorp does not really help learners acquire new vocabulary as most of these words are in the General Service list and are thus commonly used in other texts. There is probably little extra effect after a word has been repeated 300 or more times.

We can identify which corpus is better for both reading and vocabulary learning. The assumption for this is that reasonable coverage and reasonable repetitions are needed. Despite its smaller size, Ecocorp still has a wider range of vocabulary. The number of words not in the base lists occurring 5 times or more in Ecocorp is larger enough, 679 words and the number of words with frequencies of 1 – 4 is 3306 words. Acacorp has 1930 words occurring 5 times or more and 6454 words occurring 1 – 4 times. Compared to Acacorp, Ecocorp has much smaller number of low frequency words of 1 – 4 occurrences. Based on these data Ecocorp is more favorable for reading and vocabulary learning in that it has a smaller number of low frequency words outside the GSL and UWL and it has good repetitions of vocabulary.

**The Most Frequent Words**

One way of identifying technical words is to use comparative frequency. This includes the very high frequency words which have a much higher frequency and those which have a higher rank in Ecocorp than in Acacorp.

Being a specialized text, Ecocorp has more very high frequency words than Acacorp. The 82 words with frequencies higher than 300 in Ecocorp that are not in Acacorp with a frequency higher than 300 account for 56,215 occurrences. This is 19.04% of the running words in Ecocorp. 46.34% (38 words) of these words occur in Parkin’s glossary and 62.5% (50 words) in a dictionary of Economics (Pearce, 1992). Typical words are *price*, *demand*, *produce*, *consume*, *capital*, *average*, etc., in the first 1,000 words of the GSL; *curve*, *firm*, *industry*, *govern*, *unit*, *slope*, *decrease*, *model*, etc., in the second 1,000. Another sub-group of words are those which also occur in the UWL including *margin*, *economy*, *income*, *labour*, *consume*, *vary*,*utility*, *factor*, *resource*, *maximum*, etc. These words have a much narrower meaning Economics than in general use.

*Demand* in Economics means the entire relationship between the quantity demanded of a good and its price (Parkin, 1990), but in general usage (West, 1953), it may mean *claim*, *commerce*, *needs* (nouns); and *claim*, *need*, *ask* (verbs). In Economics *demand* is mostly used in reduced clauses as in *quantity demanded* which occur very frequently in the corpus.

*Capital* has some common meanings in GSL. The highest semantic frequency is *town* or *city* as in *Paris is the capital of France*; the second is *money* and the third is *capital letter* (West, 1953). In Economics, *capital* refers to the real assets—equipment, buildings, tools, and other manufactured goods used in production—owned by a household , firm, or government (Parkin, 1990).

**The Frequent Words not in the GSL or UWL**

Another way of identifying technical words is to look at the words that are not in the GSL or UWL. Some of the very high frequency words in Ecocorp do not occur in the GSL and UWL. These words make up another group of what could be technical words in Economics. The number of words in Ecocorp but not in the GSL and UWL is 3,224 word families or 59.29% of the total 5,438 word families. By identifying a representative 558 word sample of the words not in the GSL and UWL, it was found that 11.47% occur in the dictionary of Economics (Pearce, 1992) and 3.76% in Parkin’s glossary.

**Non-overlapping Words**

A third way to identify technical words is to include the group of words occurring in Ecocorp but not in Acacorp. The number of words in Ecocorp but not in Acacorp is 2,124 word families (39.06% of the total word families in Ecocorp). 95.39% of these words (2,026 words) do not occur in either the GSL or UWL. When we compare a representative 369-word sample of these non-overlapping words with a dictionary of Economics and Parkin’s glossary, we find that 5.4% (approximately 114 words out of 2,124 non-overlapping words) are in the dictionary and 2.7% (approximately 57 words out of 2,124 non-overlapping words) are in Parkin’s glossary.

**The Value of Corpus Studies for ESP Course Design**

Many benefits can be identified. Firstly, by doing corpus research, we can more easily look at the many types of words occurring in the corpus and we can also compare them with those in another corpus to see the differences. We can find the number of the words in the text with their frequency to provide the view on the relative importance of the words. Corpus study can also give information about the behavior of lexical items in the text. The most frequent collocations and stylistic patterns can be identified by using concordances. In short, ‘the important thing computers can do for developing materials is to count things, to compare things, to sort things, and to find things’ (Carter, 1987: 181). The analysis based on frequency counts in this study has provided information on the most important Economics words in the text. The importance of these high frequency words is striking when their occurrence in specialized text is compared with their occurrence in general academic English. The results of this study can be of value in material design in ESP in that it helps provide teaching materials that will fit the specific subject are of particular learners.

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