

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the research questions, the design of the study, the data collection and data analysis that were applied in this study. The research questions section becomes the guidance of what problems that were investigated. The research design section elaborates on the paradigms and the design that were used in the study. The research design chosen enabled the researcher to administer the study effectively. The data collection section discusses about the sources of data and the process of obtaining the data. The last section of this chapter, which is the data analysis section, describes about how the data obtained were analyzed from the Systemic Functional Linguistics (SFL) perspective.

3.1 Research Questions

In order to reach the objectives of the study as stated in the first chapter, the following questions are addressed:

1. How does lexical density progress among and within the selected English textbooks?
2. How does lexical variation progress among and within the selected English textbooks?
3. How does grammatical intricacy progress among and within the selected English textbooks?
4. What is the pedagogical implication from the exploration of text complexity of the textbooks for textbook writing and teaching purposes?

In the process of answering those above questions, the design, data collection, and data analysis that were applied in this study are explained in the following subchapters and subheadings.

3.2 Research Design

The methodological approach applied in this study was mainly qualitative even though there were some quantitative measurements involved. The qualitative

methods were administered in determining the category of lexical and functional words or items and in determining the category of ranking clauses in the texts. Meanwhile, the quantitative methods were administered in the calculations based on the formulas mentioned in the previous chapter. All analyses were drawn on a systemic functional analysis of the texts mentioned above. The SFL analysis of the corpus comprised the following aspects: lexical density, lexical variation, and grammatical intricacy of the text.

3.3 Data Collection

This research focused on the analysis of three sequential senior high school textbooks used in Indonesian schools. The data that were analyzed were the written texts from those three textbooks. The textbooks selected for the study were issued by the Ministry of Education in 2014 to be used as school textbooks for Curriculum 2013. These textbooks are available online in electronic book format (e-book) and can be downloaded freely for classroom use. It's a series of textbooks by the same team of authors (Nurhasanah, Mahrukh Bashir, dan Sonya Sinyanyuri) published by the Centre of Curriculum and Bookmaking of the Ministry of Education (Pusat Kurikulum dan Perbukuan Kementerian Pendidikan dan Kebudayaan) in 2014. The parts of the textbooks that were analyzed for this research were a number of reading texts in the textbooks.

This study concentrated on the text complexity of the selected reading texts in the English textbooks of senior high school. It tried to describe about the text complexity of those reading texts from the perspectives of lexical density, lexical variation and grammatical intricacy. There were a total of 9 texts that were selected to be analyzed and became the sources of data analysis. Those nine texts were selected from the three different books and thus from three sequential grades with the following distribution, three texts from Grade 10 textbook (Textbook 1), three texts from grade 11 textbook (Textbook 2), and three texts from grade 12 textbook (Textbook 3). The selection was conducted that way in order to obtain a balance and representative data from each grade or textbook.

The three texts from each textbook were selected based on the chapters where the texts were situated. Three texts (Text 1, Text 4, and Text 7) were selected from the initial chapters of each textbook; another three texts (Text 2, Text 5, and Text 8) were selected from the middle chapters of each textbook; and the other three texts (Text 3, Text 6, and Text 9) were selected from the last chapters of each textbook. The selection was organized as mentioned above in order to investigate if there is an increase of text complexity of the texts among textbooks and also if there is an increase of text complexity within textbooks.

3.4 Data Analysis

The data obtained were analyzed by using Systemic Functional Linguistics proposed by Halliday (1994) that provides a powerful analytical tool and constitutes one of a variety of linguistic approaches that have been well developed in the area of education (Freebody, 2003 as cited in Emilia, 2005, p. 75). The selected texts from the three textbooks were analyzed in terms of their complexity which covered the lexical density, lexical variation, and grammatical intricacy.

Basically, each of the reading texts was marked and tabulated for its lexical items (content words), grammatical items (functional words), ranking clauses, and clause complexes. The content words or lexical items are verbs, nouns, adjectives, and adverbs. The noun determiners such as *the*, *some*, *this*, and *each* were not included and regarded as non-adjectives (an adjective has the feature of comparative degree). The phrasal verb was taken as one word or lexical item. The tense was also regarded as representing one verb. A clause consists of one predicate for the ratio in the determination of grammatical intricacy. The process of analyzing each of the aspects is presented in the following subheadings one by one for making a clear understanding of how the data were analyzed.

3.4.1 Lexical Density Analysis

The first analysis executed in the process of examining the complexity of the textbooks was the lexical density analysis. For this analysis, there were four steps that were administered. Those steps are presented as the following:

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1. The classification of lexical and functional words. Lexical words were manually tagged in the texts. Determining lexical or functional words was done qualitatively.
2. The identification of ranking clauses. The identification of the ranking clauses was done qualitatively based on Halliday's theory about clauses.
3. The calculation of the total number of lexical items and the total number of ranking clauses. The total number of lexical words was calculated by using MSWord. Meanwhile, the total number of ranking clauses was counted manually.
4. The application of the formula. After all the quantitative data had been obtained, the formula of calculating lexical density by Halliday was applied.

The results from the calculation of the lexical density formula of each set of data were presented in tables and charts. Then the interpretation and discussion of those results and findings are presented in the next chapter (Chapter 4).

3.4.2 Lexical Variation Analysis

The second analysis which is the analysis of lexical variation was performed automatically and manually. The automatic analysis was conducted by using AntConc 3.2.1w for Windows, a concordance program developed by Laurence Anthony (2007). This program was used to assist in identifying and calculating the lemmas (word families) that existed in the analyzed texts. The display of the concordance program can be seen from the following figure (Figure 3.1).

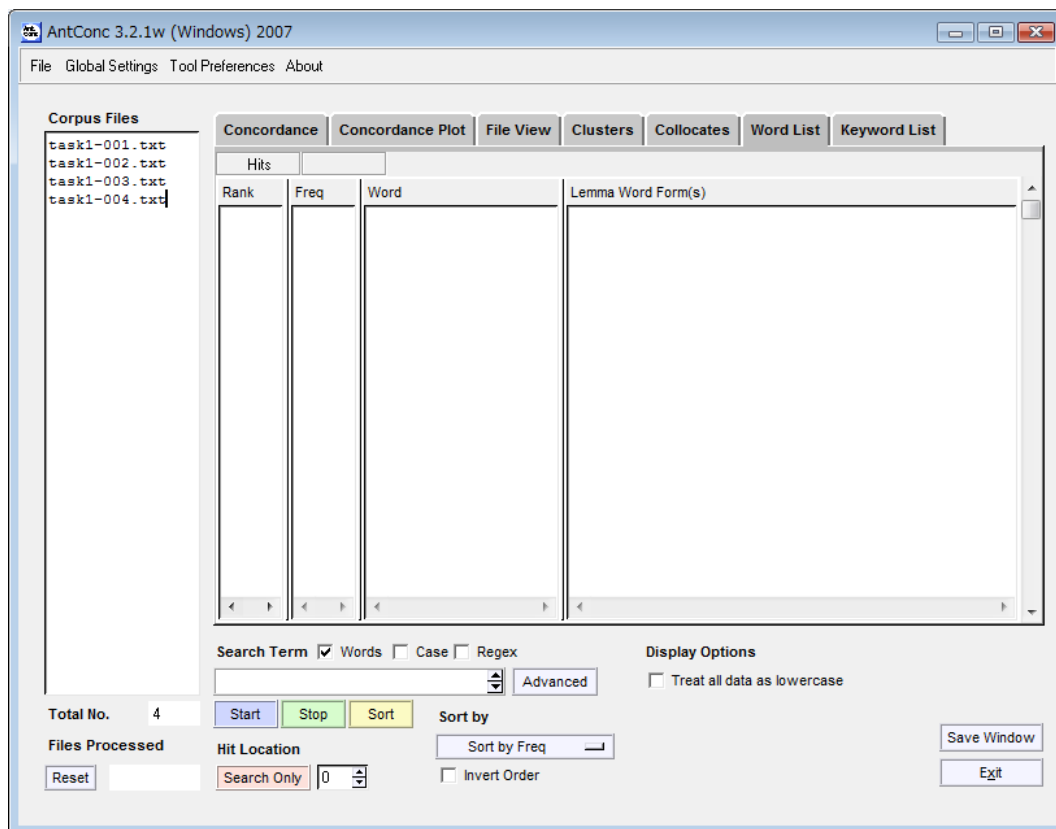


Figure 3.1 AntConc 3.2.1w for Windows

As it can be seen from the figure, there are five columns that are shown in the concordance program. The first column, which is labeled as “Corpus Files”, is where the text document files (.txt) are shown. The second column, which is labeled as “Rank”, is where the rank of each word from the corpus file is shown after the analysis of program is started. The third column, which is labeled as “Freq”, is where the frequency of each word is shown. The fourth column, which is labeled as “Word”, is where each word in the corpus file is shown. The fifth or the last column, which is labeled as “Lemma Word Form(s)”, is where each lemma in the corpus file is shown.

In the following, it is the presentation of some of the steps in using the concordance program for the analysis of lexical variation among and within textbooks and the process of analyzing the data after the automatic process. Those steps, among other things, can be described as follows:

1. All of the texts selected from the three textbooks were converted into the form of Text Document (.txt) files.

2. The English lemma list file (e_lemma.txt version 1) was loaded into the concordance program then the converted files were inserted after that. The lemma list used in this study is compiled by Yasumasa Someya (1998).
3. The results showed after being processed and read by the concordance program.
4. The results then were saved in the form of text document files (.txt) and all of the lemmas (word families) were shown in those files (functional and lexical word families).
5. The lemmas of lexical words were counted and tabulated manually from the result text document files. The identification of lexical and functional word families were done qualitatively to separate them.
6. All the data were then logged into the data set. The data set included the total number of words, the numbers of lexical words and grammatical words, and the numbers of lexical and functional lemmas.
7. The formula described in the previous sections was applied to calculate the percentage and index of lexical variation.

The results from the calculation of the lexical variation formula of each set of data were presented in tables and charts. Then the interpretation and discussion of those results are discussed in the next chapter (Chapter 4).

3.4.3 Grammatical Intricacy Analysis

Akin to the analysis of lexical density, there were also four steps administered for the analysis of grammatical intricacy. Those steps are described in the following steps:

1. Identification of ranking clauses. This identification was done qualitatively based on the theory from Halliday about clauses.
2. Identification of clause complexes. This also was done qualitatively based on the theory about clause complexes by Halliday.
3. Calculation of the total number of ranking clauses and clause complexes. After being identified, the total number of ranking clauses and the total

number of clause complexes were manually quantified from each group of text.

4. Application of grammatical intricacy formula. The formula of grammatical intricacy by Castello (2008) was implemented by inserting the numbers of ranking clauses and clause complexes to the formula.

The results from the calculation of the grammatical intricacy formula of each set of data were presented in tables and charts. Then the interpretation and discussion of those results are discussed in the next chapter (Chapter 4).

3.5 Concluding Remarks

This chapter has drawn a detailed methodological description of the study, including research questions, research design, data collection, and data analysis. This study employed qualitative and quantitative methods in conducting the study. The qualitative methods were administered in the process of identification of some categories of the texts while the quantitative methods were administered in the calculations using the formulas. Finally, the steps of each data analysis were presented one by one in details. The next chapter will put forward the findings and discussion of this present study.