The Readability of Science: Student’s Book for Junior High School Year VIII Viewed From The Lexis and Grammatical Aspects (A Content Analysis of Science Lesson of Junior High Schools of Surakarta)

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Abstract

This research aims at finding out the readability of Science Student’s Book for Junior High School Year VIII of science lesson of Junior High Schools of Surakarta in 2011/2012 academic year through lexis and grammatical analysis.

This research applies a descriptive qualitative method specifically a content analysis. The primary data are the lexis and sentences used in Science Student’s Book for Junior High School Year VIII while the secondary data are test scores obtained with cloze test. The data were obtained by applying several methods, i.e. content analysis of the book, test, observation and interview. Data source and method triangulation were applied to obtain validity. Meanwhile to analyze the data, the ethnography technique proposed by Spreadly was employed.

The research findings show that in terms of the lexis used in Science: Student’s Book for Junior High School Year VIII specifically in chapter I, II, IV, and VI as the sample of the research, the total number is 13.908. This consists of 13.421 content words and 487 function words. Based on the questionnaire distributed to 151 respondents of SMPN I Surakarta, SMPN 4 Surakarta, SMP Kalam Kudus Surakarta, and SMP Al- Islam I Surakarta, 1634 words are considered new words and 833 words out of 2876 words are considered unknown. There are 1631 simple sentences or 63 % of the whole, 485 compound sentences or 90% and 413
complex sentences or 17 %. It is found that the complexity of the sentences is high approximately 14 words per sentence. Based on the research, the result of the cloze test done by the respondents and the computation using Flesch Reading Ease Formula show that the readability of Science Student’s Book for Junior High School Year VIII is low. The cloze test result shows that the readability gained from the respondents of SMPN I Surakarta is 31%, SMPN 4 Surakarta 28%, SMP Kalam Kudus 24% and SMP Al-Islam I 14%. It is concluded that the mean score of the readability is 24%. Whereas the readability obtained from Flesh Reading Ease Formula is 57.8%. Some factors causing the low readability of Science Student’s Book for Junior High School Year VIII are some of the students are not keen on reading English texts, some of them do not read English articles on Science very often outside the class which results in inadequate prior knowledge. Furthermore, the students have low intrinsic motivation in reading English text.

**Keywords:** Readability, Lexical, Grammatical
1. Introduction

Reading has been defined widely by many experts. Koswara (1998: 6) argues that reading is acquiring understanding of the words written by someone else and is the basis of early education. Furthermore, Aminudin (1987:6) argues that reading is reacting, which provides for the read a person's reaction to first carry out observations on the letter as a representation of speech sounds or signs other writing. Based on both opinions, the researcher concludes that the most important thing is that reading is the foundation of early education.

While readability is a term in the field of teaching reading that takes into account the level of difficulty of the material that is appropriate to read. Readability is a measurement of the suitability of a particular reading for readers to rank certain readers. (Harjasujana and Vismaia S. Damianti, (2003: 3)).

In school, good textbook contains material that is not only in accordance with the curriculum, but also must be written with a high level of legibility. Textbook discourse with a high level of legibility will support the achievement of quality education. Moreover, textbook providing the discourse with high reading level will also increase the ability of students in the learning process.

A research on textbook subjects of Science due to the teaching materials in science subjects are using narration, description and illustration in English language, so it is necessary to study the level of usage of the term, sentence complexity and its relation to the students' level of legibility by the program participants. Considering that RSBI (this school program was officially closed at 2012) schools use textbooks in the English language, it must use English language that can be readily accepted by the students or to support the program's success.

If the reading level of teaching materials in accordance with the conditions of the students , this will support the learning process to be carried out properly. Surakarta is a city residency supervises several surrounding counties that organized RSBI program in both public and private institutions. For this reason the researcher chose the town of Surakarta as a research setting.

1.1 Research Objectives

Generally, this study aims to seek and find out readability level of the textbook in teaching science. As for specifically, this study aims to provide empirical description of :

1) The Lexis used in the textbook “Science Student’s Book for Junior High School Year VIII” in Surakarta academic year 2011/2012.

2) The grammar used in the textbook “Science Student’s Book for Junior High School Year VIII” in Surakarta academic year 2011/2012

3) The Readability of the textbook “Science Student’s Book for Junior High School Year VIII” in the town of Surakarta academic year 2011/2012.
2. Underlying Theory

2.1 Textbook (textbook)

The term textbook, textbooks, or textbooks that are used as teaching materials by Henry Guntur Atarigan and Djago Terigan (1986:13) is:

"Textbooks are textbooks in the subjects of English language which the standard book, composed by experts in the field, equipped with the appropriate supporting infrastructure and easily understood by users in schools and colleges, so that it can support the achievement of instructional objectives and teaching program ".

2.2 About Lexis

What is meant by lexis in simply way is, the word used in the realization of the social process of verbal or text. Therefore, it is distinguished by the term lexis lexicon, which means that the list of words out of context, as found in the dictionary. To facilitate the discussion of terms and words used lexis together to refer words that are used to realize a text. As in the above levels, lexis is also a realization of the meaning of ideational (experiential reality and logical), interpersonal (social reality) and textual (reality symbol). (Santoso: 2002). Robins (1980/1992: 75) say that the term is used to refer to lexis lexical aspects of language and linguistics to study on this aspect. On another page (386), he say that in relation to systemic grammar, vocabulary lexis defined as a language consisting of separate lexical elements. Based on his opinion, it is concluded that Robins views lexis as dealing with the intricacies of lexical. He also argues lexis as the material covered in the study of language as well as the name of the study discussed. Meanwhile, in view of systemic grammar lexis considered tantamount to vocabulary.

2.3 Understanding Grammar

Grammar in English word can also refer to a set of principles or rules and knowledge, both social science and engineering fields. In the science literature, we may find such phrases grammar of music, grammar of mathematics, grammar of the theater and so on. In the Middle Ages grammar is defined as a set of rules, usually in the form of books (lesson) that regulate one true language usage. Then, in the traditional grammar rules, we see descriptive, which is preparing rules generally applicable and should be followed either in speech or oral.

2.4 Readability (readability)

Echols and Shadily (1982: 468) explains that “readability” or readable / ks / means “readable”. While in the Kamus Besar Bahasa Indonesia (Department of Education, 1988:62) legibility is “… about to read text quickly, easy to understand, understand, and easy to be remembered”. Furthermore Cowie (1989:1043), Chief Editor Oxford Advanced Learner’s Dictionary matching “legibility” is the term read-able / adj / and or read-ab-il-ity / n / which means “can be read easily and comfortably”.

In view of Podo and Sullivan (1989:79) readable term meaning “read”. Kridalaksana (1994) also interpret the level of legibility as whether or not a paper is read by people who have the
ability to read different.

3. Research Method

The research subject in this study is the textbook used in a secondary school in the town of Surakarta.

This research is a content analysis research in particular. It is A systematic analysis of the content rather than the structure of a communication, such as a written work, speech, or film, including the study of thematic and symbolic elements to determine the objective or meaning of the communication. In this research, there are two kind of data sources, they are:

a) Documents

Moleong (1992: 113) says that books, journals, memoirs books, and journals can be a source of data in qualitative research. Document used in this study is the textbook of Natural Science subjects at school entitled Science: Student’s Book for Junior High School Year VIII.

a) Informant.

Moleong (1988:90) argues that informant is a person in a research setting. More forcefully Moleong said that informant is a person who provides information about the situation and condition of background research. Thus, informants in this study are those that have a lot of experience on the research background. The Informants in this study were the teacher and student participants in school. The information will be extracted from the teachers and students on the level of readability of text books in the Science textbooks in the subjects of Science in Natural.

The Data collection techniques in this study were library research, test, interview and observation. Meanwhile, two kind of triangulation, the triangulation of data and triangulation methods, were employed

Based on the type of the data, data analysis used in this study were Etnography proposed by Spreadly. In this study the description of lexis description on the book Science : Students Book for Junior High School Year VIII per chapter includes general descriptions associated with the topic, a description of the type and the number of lexis which includes content word and function word including the part of speech as well as specific terms and general terms. Further more an illustration of new words and foreign words contained in the book and its relation to considered based on the cloze test and computation using Flesh Reading Ease Formula.

The research shows that there are new words found by students of SMP N 1 Surakarta, SMP N 4 Surakarta, SMP AL Islam Surakarta and SMP Kristen Kalam Kudus Surakarta. From the list of the new words by the respondents it can be seen content words dominate them. There is only one function word ‘ought’ considered new to them. In term of the content word found, there are two types of lexis: common word and technical terms. Technical terms found are as follows: gynchologist, electrolyte, Gallbladder, goiter, catayzes, amniotics. Common word
such as affect, extended, involved, advise, cut off, obstruct

4. Discussion of the Findings

This study focus on the readability of the aspects of linguistics, especially about lexis and grammar. Results of the data analysis are presented below:

a) New vocabulary and foreign vocabulary in lexis cause low reading

From the results of research in some schools the respondents found lexis which is considered a foreign word and a new word, words they have never been used before or foreign words outside the language used in the text. The new words in the study are divided into content word and function word. The result is similar to previous studies that have been done about readability in which foreign words (in this study referred to as the unfamiliar word) is one of the factors that affect the level of readability.

b) Grammatical complexity

Grammar study conducted on a book of Science, in the grammatical structure of the book is quite complex for junior high students in Indonesia. Long sentences contained in the text have an average length of 14 words per sentence. The sentence patterns found in the book are as follows:

1. Subject consists of Noun (phrase), Pronoun (phrase), infinitive (phrase), or noun clause.
   a. Most plants around you are vascular plants such as corn, cabbage, onion, and spinach.
   b. To answer this question, pay attention to this discussion and do the activities as suggested in this sub-chapter.
   c. Do it in groups
   d. When the metamorphosis is completed, the animals gains its adult shape.

2. Predicate consists only of one word and the work of more than one verb
   a. Metamorphosis is the change of an organism in one life cycle
   b. Buds are the start of a new growth and the points where the Appear are nodes of growth.

3. Object consists of a noun (phrase), Pronoun, Gerund (phrase), infinitive (phrases) or clause.
   a. Rickets cause the leg bones to develop into curved bones.
   b. You are now in this phase
   c. Later, early growth and development Accelerate the beginning of maturity, and discontinue at Decrease and Adulthood.
   d. Can you apply this pattern to the probability in the birth pattern of a family with five sons or daughters?

4. Complement consists of a noun (phrase), pronoun, Adjective (phrase), adverb, propositional phrase, or a gerund phrase.
   a. The growth and development of human beings undergo fast changes.
   b. It is located in the cavities of long bones.
   c. Wash all of the equipment that you have used and gives them back to your teacher.
   d. Record any skeletal and muscular systems that you can find on your observation table.
From the above description it can be seen that the grammatical structure used in the book is considered complex, due to the existence of complex phrases.

c) Low readability level

From the results of the study it is found that the readability of the textbooks is low. The findings in the field show several factors causing the low reading level of the students:

1) There are many foreign words and new words in the text so that students have difficulty in understanding the text, seen from the results of cloze tests conducted to the students, there are also new words or foreign words to the students, so that they cannot fill the word correctly.

2) Grammatical complexity in the text leads the students to have difficulty in understanding the text. Having computed using the formula of Ease Flesh Reading, it is found that the average length per sentence in the book is 14. According to Nababan (2003: 72), the average sentence length of 14 belongs to the category of quite easy. Here is an example of grammatical complexity in Science book, *When breathing, you will inhale mixed gases, called the water from your environment to your lung.* (272 / Student Book Grade VIII Chapter 4). *The core of this sentence is mixed you will inhale the ga.* Completely this sentence consists of 15 words, but with the complexity of a complex sentence structure for junior high students, because the sentence is composed of elements which are not simple, an adverb of time, like *When breathing,* and *called the air from your environment to your lung*). Research on readability in relation with the complexity of the sentence was made by measuring titled Amas Suryadi Book Readability Engineering Science with Klos. In the study, it is mentioned that the level of readability in Sain books science books used in physics, chemistry, biology, and mathematics-ITB TPB low level due to the density of the phrase that is used quite high.

3) Reading habit is also one of the factors of the low readability of the students who do not like reading English text, some like reading English text; Based on the results of interviews with the students it is found that information that some students do not like reading text in English, they read the English text on the external motivation, namely the necessity to understand the material in English in the subjects they take. Comprehension needed for teaching materials, teacher instruction and encouragement to practice and about the English language is a driving factor from outside the student to read the text in English. Such students tend to be less able to understand the text because of lack of internal motivation. While some students who love to read text in English language tend to be easier to understand and to fill cloze text more text than students who are less fond of reading English language text.

4) The students seldom read articles with topics outside of science subjects, so that the students are lack of prior knowledge; background knowledge about the topic being read is one of the factors that determine the level of students' comprehension. While students who do not like to read science texts tend to be less out of hours provision prior knowledge.
5) The students here less intrinsically motivated to read books in English include in Science books because the students tend to read the book Science as the task of the teacher. Based on the results of field interviews found that students lack the internal motivation to read the text in English, it is seen that students are not willing to read English text with their own outside lessons. With the lack of internal motivation of students led students do not like reading English text so that reading habits are less developed. This affects the vocabulary mastery and understanding the habits of English text.

6) Students are not accompanied by the specific dictionary so that science students encounter difficulties when the technical words in Science lessons.

From the samples taken in the book Science: Students Book For Grade VIII Junior High School are using the following grammar:

The total number of sentences in Chapter 1 System Of Human Body is 1114. Simple sentences totaled 782, consisting of 513 sentences affirmative, 23 negative sentences, 115 sentences interrogative and 13. That 241 compound sentence, which consists of 63 affirmative sentences, 10 sentences and 10 sentences interrogative command. Complex sentences is 91 sentences, which consists of 98 affirmative sentences, 10 sentences and 10 sentences interrogative command.

The total number of sentences in Chapter 2 Particles of Matter is 109. Simple sentences totaling 72 which consists of 55 sentences affirmative, 4 negative sentences, 10 interrogative sentence, and 4 command word. Compound sentences totaling 7 which consists of 4 affirmative sentences, 1 interrogative sentence and 1 command word. Complex sentences 30 sentences, which consists of 18 affirmative sentences, 3 interrogative sentence and 5 command word.

The total number of sentences in Chapter 4 System of Plant is 603 words. Simple sentences totaled 398, consisting of 244 sentences affirmative, 1 negative sentence, 101 interrogative sentences and 54 command sentences. Total of 87 sentences compound sentence, which consists of 63 affirmative sentences, 10 interrogative sentences and 10 command sentence. Complex sentence was 118 words, consisting of 98 affirmative sentences, 10 interrogative sentences and 10 command sentences.

The total number of sentences in Chapter 6 Chemical in Everday Life is 603 words. 279 Simple sentences consisting of 191 affirmative sentences, 1 negative sentence, 40 interrogative sentences and 47 commands sentences. 150 Compound sentences, consisting of 120 affirmative sentences, 1 negative sentence, 12 interrogative sentences and 9 commands sentences. 174 Complex sentences consisting of 159 affirmative sentences, 6 interrogative sentences and 9 command sentences.

In conclusion it can be seen that in Science book: Book For Students Year VIII Junior High School there in 1531 or 63% simple sentences, 485 or 19% compound sentence and 413 or 17% of the total sentence complex sentence 2429.

1. Readability: Students book for Junior High School Year VIII, published by the Ministry

Based on the results of research in the field by using cloze test and the Flesch reading-ease formula, it is shown that the readability level of the Science book: Students Book For Junior High School Grade VIII is low, SMP N I Surakarta (31%), SMP N 4 Surakarta (28%), SMP Kristen Kalam Kudus Surakarta (24%) and SMP AL Islam I Surakarta (14%), with the mean of readability level is 24%. While based on the flesh reading ease, the book readability level of the book is 57.8.

The lexis used contain many unfamiliar words and new ones for the students. Based on the result findings in the field the total number of new words is 56% or 1634 words and foreign words are 833 or 28% of the total number of words drawn as the sample of (2876). In terms of grammatical complexity of the sentence it is found that the complexities is quite high with an average sentence length of 14 words per sentence. Beside the lexis contains many foreign words and new words for students which influence the readability of textbook. The complexity of lexis and grammar in the book Science affects the students understanding although the students have a good enough background of English mastery.

While the results of the observation and interviews it is found some of the factors causing the low reading level of the students, namely: (1) that some students do not like reading English text, some like reading English texts; (2) students seldom read articles with topics outside Science after the class so the students knowledge does not improve; (3) tha students lack intrinsic motivation to read books in English including Science books because students tend to read the Science book as the task of the teacher and the students are not accompanied with a special dictionary of Science so that students encounter difficulties to find appropriate meaning of technical words in Science lessons.

In conclusion based on the results of the research is the Science book: Students book for Junior High School Year VIII levels is less appropriate for junior high school students. The level of complexity of the sentence in the book is suitable with the level of students, but the lexis used, foreign words and new words, cause the students difficulty in understanding the existing discourse in the book. Based on these findings in its use as teaching materials, this book is not recommended for the level of junior high school students. Moreover, it needs to be supported by the learning process and adequate facilities.

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References


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