

THE EFFECTS OF LOGICAL THINKING AND VOCABULARY MASTERY TOWARDS STUDENTS' READING COMPREHENSION AT STATE SENIOR HIGH SCHOOL IN EAST JAKARTA

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Abstract

The aim of this research is to find out and analyze empirically the effects of logical thinking and vocabulary mastery towards students' reading comprehension. Research method used was survey. The sample was taken through simple random sampling. The data then was analyzed by using descriptive statistics, multiple correlation coefficient, and determination coefficient and regression analysis. The result of this research explained that there is significant effect of logical thinking and vocabulary mastery concurrently toward students' reading comprehension with the score of $F_{observed} = 122,732$, correlation coefficient 0,901 and determination coefficient 0,812 or 81,2%. Partially, there is significant effect of logical thinking towards students' reading comprehension. The result has shown the score of $t_{test} = 4,324$. Then, there is significant effect of vocabulary mastery towards students' reading comprehension. The result has shown the score of $t_{test} = 3,924$.

Keywords: Logical Thinking, Vocabulary, and Reading Comprehension

1. INTRODUCTION

Globalization has completely become a reality. The increasing uses of technologies in information, communication and transportation have made the 'global village' become familiar in daily conversation. This fact has made not only people but also all countries in the world connected each other. In this case, language as a systematic means of

communication is needed. As we know, English is an international language. It has played an important role in building relationship among countries for many years due to its influence on education, business, society, diplomacy and so on. Accordingly, the role of English as a means of international communication is important in the world's civilization.

As a matter of fact, learning English

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in Indonesia may differ from the English learning in Malaysia or Singapore in which people should learn English in the condition where the language is used for communication in their daily live. In Indonesia, English is not as a second language but as a foreign language where English is not spoken in the society. Not all people agree the distinction between second language and foreign language. Krashen (1982) as cited in Bambang (2006:21) states that second language acquisition includes learning a new language in a foreign language context as well as learning a new language in a host language environment. They use the term second language to refer to both foreign and host languages and the teaching methods apply to the acquisition of both. It implies that the way to teach English as a second language is not necessarily different from the way to teach English as a foreign language, and whether English is learned in Indonesia or in Malaysia, English is called the target language (TL).

There are basically four skills in learning a language, namely listening, speaking, reading and writing. Therefore, students who learn any foreign language especially English have to master four skills of language. Those skills can be divided into two groups, one group is called receptive skills and the other is

productive skills. Receptive skills involve listening and reading while productive skills cover speaking and writing. Apart from listening, speaking and writing, English reading skill seems to be the most crucial skill to master for the education in Indonesia. Reading is one of the priority skills of language taught to senior high school students (SMA). It is suitable with the objective of the curriculum itself that the students trained to be able to read the written text in English when they continue their study to higher education as well as to get the advantages of the knowledge transfer. Hence, teachers are supposed to give them the opportunity to develop their capability in reading comprehension. Every student should know that reading activity is more than word recognition but reading activity needs an ability to get the information from the written words. Robert (1988:38) supports this idea by stating, "Reading involve much more than word recognition. However, the ability to recognize written words is basic to the reading process". Based on his opinion, it can be known that the principle of reading is not only recognizing words but also meaning or message of the text. In other words, reading comprehension also ask students to be able to find the conclusion of the reading text.

In term of reading activity in the class, mostly students were lack of reading as they felt that reading was such a boring activity. In fact, they still had some difficulties to comprehend the reading text. They used to read word by word, got confused with unfamiliar words and the structure of the sentence. They were also difficult to answer the questions from the text because their vocabulary was inadequate. In order to comprehend the reading text successfully, students should do some efforts to support reading comprehension. One of them is the mastery of vocabulary. The mastery of vocabulary is one of the most important things that support one's productive (speaking and writing) and receptive (listening and reading) skills (Bambang & Widiati, 2008:1). It plays such an important role that it may influence students' ability to comprehend the reading text. To be able to comprehend the reading text, students need to have an adequate number of words and know how to use them accurately.

Savage and Mooney (1985:1) point out the definition of reading comprehension. They say, "Reading comprehension is a process of acquiring or deriving meaning and understanding of printed language; involves cognitive functioning related to what one

read". Whereas, Grellet (1994:3) states that reading comprehension is understanding written text means extracting the required information from it as efficiently as possible, further, locating the relevant advertisement on the board and understanding the new information contained in the article demonstrates the reading purpose in each has been successfully fulfilled. Beside those statements, Pamela (2004:3) points out the definition of reading comprehension. She says, "Reading comprehension is the process of understanding the message that the author is trying to convey. Very simply, it is making meaning from the text at hand".

Competence of reading or people call it with reading comprehension is an ability which students should have when they read a text. It is stated by Robert (1988:46), he notes, "reading with comprehension means that the children are able to get the meaning from what is being perceived in writing". It can be seen if reading comprehension is an activity of reading a text where the student should have the ability to get the meaning or information from the text.

Based on the definitions above, the writer firstly summarizes that reading comprehension is to understand a written text that contains information. It can be

also summarized that reading comprehension is the way of someone to get meaning of the text and to understand the message of the text deeply.

Reading comprehension, furthermore, is a complex intellectual process involving a number of abilities. The two major abilities word meanings and reasoning with verbal concepts (Rubin, 1982:107). This means that reading comprehension is a process of constructing meaning from a text and an active thinking process.

Pirozzolo and Wittrock (1986:231) state that reading comprehension involves different people and contexts, the psychological process involved in generating meaning by relating to the parts of the text to one another and store information such as rules, schemata and memories of events. Furthermore, Johnson and Pearson (1988:8) point out that reading comprehension seems to involve language, motivation, perception, concept, and development in the whole of experience itself.

As one of language aspects, vocabulary is the basis of language; it is the foremost important step to be mastered first in acquiring language. Vocabulary is also one of the language aspects which should be learnt. In reality, our everyday concept of vocabulary is

dominated by the dictionary. When we consider by what we mean with vocabulary, the first idea that probably exist in our mind is word.

According to Wilkins as stated in Thornbury (2002: 13), points out that without grammar very little can be conveyed, without vocabulary nothing can be conveyed. It means that the existence of vocabulary cannot be separated by the existence of a language.

There are definitions of vocabulary. According to Richard, Jack C. (2001:5), vocabulary is one of the most obvious components of language and one of the first thing applied linguists turned their attention to. A.S Hornby (2010:959) in Oxford Advanced Learner's Dictionary of Current English states that vocabulary is total number of words which with rules for combining them make up a language; range of words known to, or used by a person, in a trade, profession, etc.

Meanwhile, Read (2000:11) says a basic assumption that vocabulary is knowledge of word. A word is a microcosm of human consciousness. Vocabulary therefore has an important role to help the students understand the meaning of words.

Furthermore, Thornbury (2002:15) stated that it is importance of having an extensive vocabulary that knows lots of

words; knowing a word involves knowing its form and its meaning at the most basic level. Specifically about knowing a word, Read (2000:26) supported Thornburry's statement by including receptive and productive knowledge. Knowing a word as a receptive knowledge means we are able to recognize a word when we see or hear it, while knowing a word as a productive knowledge means we are able to use it in our own speech or writing.

In addition to vocabulary mastery, students have to realize that reading comprehension does not only use their eyes but also their brain. The process of reading comprehension actually takes place in the brain in which logical thinking operates systematically. In this case, logical thinking can help students to comprehend the reading text because the basis of logical thinking is sequential thought. Webster's Comprehensive Dictionary defines logic as the normative science which investigates the principles of valid reasoning and correct inference, either from the general to the particular (*deductive logic*) or from the particular to general (*inductive logic*). It means that logical thinking process systematically involves deductive reasoning and inductive reasoning which needed in the process of reading comprehension.

In the process of thinking, there are two sides of the human's brain namely the left hemisphere and the right hemisphere. According to Brown (1987:88), the left hemisphere is associated with logical, analytical thought, mathematical and linear processing of information. The right hemisphere perceives and remembers visual, tactile, and auditory images; it is more efficient in processing holistic, integrative, and emotional information. It means that thinking logically occurs in the left hemisphere.

It is necessary to understand about logic or logical itself before we explain logical thinking. Webster's Comprehensive Dictionary defines logic or logical as the normative science which investigates the principles of valid reasoning and correct inference either from the general to the particular or from the particular to the general.

In wikipedia, three kinds of logical thinking can be distinguished: deduction, induction, and abduction. Given a precondition, a conclusion, and a rule that the precondition implies the conclusion, they can be explained in the following ways:

- a. Deduction means determining the conclusion. It is using the rule and its precondition to make a conclusion.

Example: "when it rains, the grass

gets wet. It rained therefore, the grass is wet". Mathematicians are commonly associated with this style of reasoning.

- b. Induction means determining the rule. It is learning the rule after numerous examples of the conclusion following the precondition. Example: "the grass has been wet every time it has rained. Therefore, when it rains, the grass gets wet". Scientists are commonly associated with this style of reasoning.
- c. Abduction means determining the precondition. It is using the conclusion and the rule to support that the precondition could explain the conclusion. Example: "when it rains, the grass is wet. The grass is wet, therefore it may have rained". Diagnosticians and detectives are commonly associated with this style of reasoning.

It is quite the same as what have been brought by Sabari and friends (1993:47), They mentioned two methods of logical thinking, there are deductive and inductive. Further, Sutrisno S.J (2014) states that inductive is an approach that generalizes something based on the feeling of empathy to the certain case as an experience. In other words, inductive is born as an idea of which something

generalized based on someone's experiences. While, deductive is an approach that abstracts something derived from the result of some experiences.

As a result, there are some factors assumed contributing to the student's achievement in reading comprehension namely vocabulary mastery and logical thinking. Therefore, this research aims to know whether or not there are any effects of logical thinking and vocabulary mastery towards students' reading comprehension. Moreover, this research will hopefully be able to illustrate the relationship between logical thinking and vocabulary mastery in improving reading comprehension.

2. RESEARCH METHOD

This research is a quantitative research by using a survey, because it wants to give vivid description of what happens. Therefore, a survey research is suitable for this purpose. According to L.R Gay and Peter (2000: 275), a survey method is useful for investigating a variety of educational problems and issues. Typical survey researches are concerned with the assessment of attitudes, opinions, preferences, demographics, practices, and procedures.

The population of this research is all twelfth grade students of science class at SMA 88, SMA 98 and SMA 106 in East

Jakarta. The number of the students are 398 students. After that, 20 students in each selected school become samples. As a result, 60 twelfth grade students in the first semester of 2014/2015 academic year become samples in this survey research. For analyzing the result, the researcher used application SPSS (Statistical Packages for the Social Sciences) 20.0 version for windows to calculate the score.

The correlation analysis was used to find out the correlation coefficient of variable X1 ,variable X2 and variable Y. in this research, the writer used Application of SPSS version 20.0 for windows. The correlation coefficient was indicated by score of R. meanwhile, the determination coefficient was indicated by score of R2.

3. FINDING AND DISCUSSION

The score of reading comprehension that is acquired from the 60 respondents has the average of 79,75 within standard deviation of 10,018, median of 80,00, minimum score of 55 and maximum score of 95. According to the data above, the average score is in enough category. The score for standard deviation is 10,018 or quite the same as 12,5% from the average, it shows that the answers differentiations

between respondents are in the middle level. It also shows that reading comprehension of the respondents are quite various.

Next, the score of vocabulary mastery that is acquired from the 60 respondents has the average of 76,42 within standard deviation of 11,648, median of 77,50 minimum score of 55 and maximum score of 100. There are 20 statements brought up as the instrument for vocabulary mastery questions. According to the data above, the average score is in enough category. The score for standard deviation is 11,648 or quite the same as 16% from the average, it shows that the answers differentiation between respondents are in the middle level. It also shows that vocabulary mastery respondents are quite various.

Furthermore, the score of logical thinking that is acquired from the 60 respondents has the average of 71,58 within standard deviation of 10,716, median of 70,00, minimum score of 50 and maximum score of 95. There are 20 questions brought up as the instruments from logical thinking. There are 7 respondents who get score under 60 (12%). According to the data above, the average score is in enough categories. The score for standard deviation is 10,716 or quite the same as 15 % from the average,

it shows that the answers differentiation between respondents are in the middle level. It also shows that logical thinking of the respondents is quite various.

Table 1 The Correlation Coefficient and Determination Coefficient.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.901 ^a	.812	.805	4.425

a. Predictors: (Constant), Vocabulary Mastery, Logical Thinking

From table. 1, we can see that the effect of double correlation coefficient of independent variable logical thinking (X_1) and vocabulary mastery (X_2) towards students' reading comprehension is 0,901. The calculation of significant coefficient determination (*R Square*) is 0,812, it shows that quantity of the effect of logical thinking and vocabulary mastery towards students' reading comprehension is 81,2% and residue is 18,8% because of another factors.

Table 2 Anova Analysis

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig
Regression	4.805.379	2	2.402.689	122.732	.000
1 Residual	1.115.871	57	19.577		
Total	5.921.250	59			

a. Dependent Variable: Reading Comprehension

b. Predictors: (Constant), Vocabulary Mastery, Logical Thinking

From table 2, it can be seen that. the score of $Sig = 0,000$ and $F_{\text{observed}} = 122,732$ while $F_{\text{table}} = 3,16$.Because the score of $Sig < 0,05$ and $F_{\text{observed}} > F_{\text{table}}$ so it means that the coefficient regression is significant. In other word, there is a significant effect of independent variables of logical thinking (X_1) and vocabulary mastery (X_2) concurrently towards reading comprehension (Y).

Based on the test result of correlation and regression we can draw a conclusion that there is a significant effect of independent variables of logical thinking (X_1) and vocabulary mastery (X_2) concurrently towards students' reading comprehension (Y).

Table 3: Regression Analysis X_1, X_2 and Y Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
(Constant)	17.849	3.993		4.470	.000
1 Logical Thinking	.453	.107	.484	4.234	.000
Vocabulary Mastery	.386	.098	.449	3.924	.000

a. Dependent Variable: Reading Comprehension

From table 3, it can be seen that the score of $Sig = 0,000$ and $t_{\text{test}} = 4,234$

While $t_{table} = 2,00$. Because the score of $Sig < 0,05$ and $t_{test} > t_{table}$ so it means there is a significant effect of independent variable X_1 (logical thinking) towards dependent variable Y (reading comprehension).

Based on the result of correlation test, regression test or by seeing the line model, we may conclude that there is a significant effect of independent variable X_1 (logical thinking) towards dependent variable Y (reading comprehension).

From table 3, it can be seen that the score of $Sig = 0,000$ and $t_{test} = 3,924$ while $t_{table} = 2,00$, because the score of $Sig < 0,05$ and $t_{test} > t_{table}$ so it means there is a significant effect of independent variable X_2 (vocabulary mastery) towards dependent variable Y (reading comprehension).

Based on the result of correlation test, regression test or by seeing the line model, we may conclude that there is a significant effect of independent variable X_2 (vocabulary mastery) towards dependent variable Y (reading comprehension). Reading comprehension helps a reader to comprehend the text he / she read. In reading comprehension context, comprehension is a term which is directly related to the ability of the readers to understand a passage and it involves thinking. As a result, higher level

of comprehension would obviously include higher level of thinking (Rubin, 1982: 107). Beside that, Southgate (1972:102) makes a summary about comprehension. She summarizes that comprehension is based on the reader having an adequate decoding system. Comprehension includes that the book says (literal), what about the book really means (interpretive), how good the book is (evaluative), how the book makes him feel (reactive) and finally, what the book means on him (integrative). All of these relate to the students' logical thinking and vocabulary mastery.

The factors which affect reading comprehension are divided into two categories namely inside the head and outside the head. According to Johnson and Pearson (1988:9-10), the inside factors will be things like linguistic competence (what the reader knows about the language), interest (how much the reader cares about various topics that might be encountered), motivation (how much the reader cares about the task at hand as well as his or her general mood about reading and schooling) and accumulated reading ability (how well the reader can read).

The outside factors divided into two categories, namely the elements on the page and qualities of the reading

movement. The elements on the page are about textual characteristics which include some factors such as text readability (how hard the material is) and text organization (what kind of help is provided by headings, visual arrays and so on). The qualities of the reading environment include factors like the things the teacher does before, during or after to the task; and the general atmosphere in which the task is to be completed.

4. CONCLUSION

Based on the data description of the research and after doing an analysis, so it can be concluded that:

1. There are significant effects of logical thinking and vocabulary mastery jointly towards reading comprehension. In other words, there is a significant effect of independent variables of logical thinking and vocabulary mastery concurrently towards reading comprehension.
2. There is a significant effect of logical thinking towards student's reading comprehension. We may conclude that the better logical thinking the better of reading comprehension.
3. There is a significant effect of vocabulary mastery towards reading

comprehension. We may conclude that the better vocabulary mastery the better of reading comprehension.

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