Reading Comprehension Achievement: A Comparative Study between Science and Social Science Students

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Abstract
This study was aimed at finding different achievements in reading comprehension between the science and social science students at a senior high school in Banda Aceh. It was also aimed at finding factors that influenced their achievements by using a comparative study involving 40 second grade (year 11) students of the school. The instruments used for this study were a reading comprehension test and a questionnaire searching for answers about language attitude, intelligence and motivation of the students towards the English subject. The result from the t-test was 3.67 which were higher than t-table of 2.042 at the level of significance of 0.05. This indicated that the levels of students' achievement in reading comprehension in the two programs were quite different. The study also found and discussed the factors that made positive differences in achievement of these two groups of students in reading comprehension; they were positive attitudes toward the language, high motivation and higher intelligence.

Keywords: Reading comprehension, language attitude, motivation, intelligence.

1. INTRODUCTION

The Indonesian Department of Education has made a compulsory division amongst second grade (year 11) senior high students into three departments: science, social science, and languages. This prevails for all senior high schools across the nation, yet some senior high schools, especially those located in rural or remote areas cannot follow the rule because they lack facilities such as a language laboratory and lack teachers of foreign languages, too. Hence, most of them only have two departments of study, namely science and social science.

Moreover, the function of the student division into departments of study is to assist them in developing their interests and aptitude in subject matters they like the

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https://doi.org/10.24815/siele.v4i1.7007
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most so that they will be ready to choose a suitable department at the university later on. Procedures or requirements for the division into those departments must follow the KTSP (Kurikulum Tingkat Satuan Pendidikan) or the Curriculum Education Unit. The first requirement is that the students must pass the first grade (year 10). They also must pass the KKM (Kriteria Ketuntasan Minimal or Minimum Standard Score) for each subject. The KKM scores are regulated by each subject teacher. Finally, they must take the psychology test, as guidance for putting them into the department they will belong to. If the test shows higher scores in sciences, they will go into the science program and if the result is higher in social science or language, then they will be put into one of those programs.

SMAN (Sekolah Menengah Atas Negeri) or High School No. 12 Banda Aceh is one of the senior high schools that only has the science and social science programs as their two departments of study. There is no language program due to not enough foreign language teachers and no language laboratory. Science program students must study subjects such as biology, physics, chemistry, and mathematics. Meanwhile, students in the social science program are taught subjects such as economics, geography, sociology, history, and so on. As for English, it is a common compulsory subject. The students in both departments are taught and receive the same English materials for each skill under the same circumstances. For the reading comprehension skills, the indicators are the same although they are taught by different English teachers. And these indicators that must be accomplished by the English teachers are clearly stated in the curriculum.

Based on the high school curriculum for second grade as mentioned in the KTSP Model (Depdiknas, 2006) the standard of competency for reading comprehension is to understand the meaning of short functional texts and essays in the form of reports, narratives, spoofs and analytical and hortatory expositions of daily life contexts in attempts to search for knowledge and understanding.

Following the above, the researcher decided to look for differences in the students’ reading comprehension achievements in both programs. The researcher wanted to compare the English reading achievements of the science students with those of the social science students. She wanted to find out whether the students in the two programs had different achievements in it, and she also wanted to find out any factors that influenced such differences.

2. REVIEW OF LITERATURE

2.1 Definition of Reading Comprehension

Reading is a step by step process which includes reciting letter by letter, pronouncing, and then combining letters to form words which have meaning. Nunan (1999, p. 252) has said that reading is a process of “decoding written symbols into their aural equivalents in a linear fashion”. Thus, one first discriminates each letter as it is encountered, sounds it out, matches the written symbols with their aural equivalent, blends these together to form words, and in the end the words give us meaning.

On the other hand, comprehension means “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (RAND, 2002, p. 11). Comprehension understands both explicit and implicit
messages derived from a text or essay. It is a device or instrument to examine understanding about what has been read. In conclusion, reading comprehension is a process of making meaning from texts. It implies that readers do not make meaning from the printed words which are set directly in essays or paragraphs, but they build meaning from pieces of information, from whole sentences that are correlated to each other in those essays. Regarding to this elaboration, it is English teachers should teach their students on how to read properly so that they can absorb or digest hidden messages or meanings poured into a piece of English text.

In an attempt to develop the students’ ability in terms of reading comprehension, there are several ways to do it. First of all, every English teacher should be able to figure out their students’ prior ability in understanding reading texts. Second, teachers should train students simultaneously so their students will get accustomed to solving reading problems and will know how to solve those problems themselves after several good training sessions. Third, teachers themselves should pay attention to what kinds of texts they use to teach their students. This is also one of the essential elements of reading comprehension as the level of reading difficulty should be based on the grade at school, so teachers must select appropriate reading texts.

2.2 Most Common Reading Strategies

To facilitate the students to comprehend well when they have to answer a lot of questions about English reading comprehension, there are a few strategies which can be applied during the reading process; they are:

a. Scanning
   This is high speed reading. Mikulecky and Jeffries (1996) have claimed that when one scans, one question in one’s mind and does not have to read word by word, but just reads the words that can answer the question(s). Teachers should train their students to use this strategy by instructing them how to scan read and search only for words that can answer the questions, thus time to read is saved efficiently. This strategy also needs practice to strengthen the skill for scanning.

b. Finding the topic of a paragraph
   A paragraph is a group of sentences that were developed around one main idea. A topic is a general idea that reflects the whole idea of a passage. In an attempt to make it easier for students to find and to know the topic of a paragraph, the teachers ask them to look at the potential sentences where the author puts his or her topics in a text – i.e. usually in the first sentence of each paragraph (Mikulecky & Jeffries, 2007).

c. Finding the main idea
   Langan (2002) has claimed that the main idea of a paragraph is the author’s idea of the topic and is always in a complete sentence. The main idea is usually stated at the start, in the middle, and at the end of a paragraph. Understanding the main idea, the center point of the author’s ideas, is very important to teach since most of the reading text questions will be about it.

d. Guessing the meaning of unknown vocabulary
   The meaning of unknown vocabulary can often be guessed by its context and by its grammar function in a sentence (Prichard, 2008). Teachers must develop their students’ skills in guessing the meaning of unknown words/vocabulary, thus they
will not merely depend on a dictionary when they come to a word they do not know. They will make an effort to predict the meaning of the word based on the text.

e. Making inferences
Smith (1995) has stated that sometimes an author does not directly put the topic in the text and the best way to get the topic is by looking for clues and the reader can also make assumptions based on the clues and then draw conclusions.

f. Understanding questions about detail
This aims at checking out the student’s ability to understand implicit statements in the text. The answer to questions about detail can usually be found in the text (Carter, 2013).

g. Understanding questions about the purpose of a passage
The author usually does not state the purpose of a passage that he is writing in the text. To find the answer to questions about the purpose, one must look at the kind of text and then guess what the purpose of the text is (Carter, 2013).

These common strategies are important for teachers to teach to their students in order to help them figure out how to understand texts they are reading. By giving and facilitating them with these strategies, the students can be directed on what to expect from their reading.

2.3 Factors Influencing Reading Comprehension

All of the common strategies set out above are introduced to help students to get better understanding when reading texts in English. Although those techniques are quite advantageous, some students may still not get good results or perform well in the English reading tests. It is undeniable, for a fact, that it is not easy to master or comprehend reading skills in a second language. There might be some factors which cause the problem. The factors could come from the teachers and the learners themselves. Inappropriate selection of reading texts and boring teaching styles are factors from teachers. Factors coming from the learners themselves, called internal factors, can greatly influence their performance of language skills. These internal factors can be labeled as language attitude, motivation, and intelligence, leading each learner to achieve different results in reading comprehension achievement.

2.3.1 Language Attitude

Language attitude is a feeling that people have about their own language or the language of others (Crystal, 1992). It implies that the feelings which a student has while learning a language, particularly a second language, can be generalized into two; they are the feelings of like and of dislike. These feelings will have different effects on the ability of a student to learn a second or foreign language. The feeling of like, called favorability promptly drives the student into an atmosphere of interest in the language which is being learned and this feeling can be recognized by their positive attitudes and by their high motivation to learn the language. On the other hand, those who have an unfavorable feeling or dislike for a language will lack interest and have low motivation to learn the language. Accordingly, Oroujlo and Vahedi (2011, p. 997) have explained that:
Students’ attitude toward a language and to language learning will be strongly influenced by the situation itself. Attitudes develop within a frame of reference (language, teacher, book, class, and homework). A student who does not like learning and school, the teacher and the homework can walk into foreign language classroom and quickly generalize his dislike. Therefore, good attitudes and feelings are needed to raise the efficiency of the students in language learning classes. (Oroujlo & Vahedi, 2011, p. 997)

Regarding to the statement above, it can be concluded that students’ language attitudes are affected by several things. First, the situation of school: whether it can serve them in a good way, the character of the teachers, whether they have good knowledge and are enthusiastic while teaching, the book(s) given, whether it is interesting or not, and the homework assigned, and whether it is too difficult or not based on the previous learning. All of these things shape whether a student will have a positive or a negative attitude towards learning a second language.

2.3.2 Motivation

Motivation, in this sense, means a person’s strong desire to work, learn, and strive during learning a second or foreign language (Dörnyei, 1998). It is one of the most important factors which drive EFL students to be successful in mastering a second language. This is reasonable since a highly motivated student tries very hard to master a second language, while a lowly motivated student does not show enthusiasm to learn, so it marks him as a failed student in mastering a second language.

Moreover, Gilakjani, Leong, and Sabouri (2012) have claimed that a student can lack motivation to learn a second language due to several reasons. Firstly, they are not exposed to L2 input as much as possible in their daily lives, so they do not know much about the language. Not making opportunities to practice the second language, in this case English comes along as another reason. It is undeniable that the more frequently a student practices his English, the more proficient he will become. Thirdly, poor teachers do not make their students practice what they have learnt about the language. Lastly, some people still believe that there is no need to be good in English, so this idea ultimately makes some learners uneasy to learn their L2.

2.3.3 Intelligence

Intelligence, as a broad definition, means an ability to define something or to solve a problem accurately. Accordingly, Fernandez-Corugedo (1999) as cited in Chowdhury (2010, p. 9) says that “intelligence ... correlates with some skills associated with SLA, particularly those used in formal study of the language such as reading, writing, language analysis and vocabulary study”. Chowdhury (2010, p. 10) has also claimed that most researchers had positive agreement that results of tests on reading and language usage are strongly connected to level of intelligence which means that better performance in reading or language usage tests will indicate a higher level of intelligence. This implies that intelligence is tied up with formal learning, particularly in a school learning situation, and it is also positively correlated with results from tests of language competence such as reading, writing, vocabulary, and language analysis. All
of those language tests, of course, would show students’ proficiency in a second language.

Above all, reading comprehension is still considered difficult by most EFL students in Indonesia. Some issues with it have been studied by some researchers. Yusuf, Natsir, and Hanum (2014), Gani, Yusuf, and Susiani (2016), and Komariah, Ramadhona, and Silviyanti (2015) have said reading comprehension is still a problem for most Indonesian students in achieving good English. Similarly, Sinambela, Manik, and Pangaribuan (2015) have said that students’ proficiency in English reading comprehension was not good enough and this was due to inadequate vocabulary, poor reading techniques and boring teaching techniques used by their teachers. Similarly, Hamra and Syatriana (2010) also found that poor reading results was because students had many difficulties in reading and understanding English texts such as lack of vocabulary, grammar, pronunciation knowledge and motivation to learn English.

A number of studies have been conducted on comparing the reading comprehension achievement between science and social science students in Indonesia. Pusparia and Fakhrurozi (2008) tried to investigate the differences in motivation to learn English between science and social science students in senior high schools in Depok. The results showed that the science program students were more likely to have higher motivation, known as an intense desire, to be a success in something, compared to those in the social science program.

Likewise, a study by Hermawan (2009) in Lumajang also found that high school students majoring in science had interest and motivation to learn, and thus, this increase their achievement. Meanwhile, the students from the social science had poor learning achievement because they had less motivation in learning. Based on the results of t-test, the differences of interest, motivation and achievement were significant among students majoring in science and social science. Nevertheless, these published studies were conducted in other places in Indonesia, and this present study intends to fill in the research gap by conducting a similar research in Aceh.

3. METHODOLOGY

This research was designed as a descriptive quantitative study in which the researcher explained the phenomenon using numerical data (Sukamolson, 2007). The phenomenon was scientifically, formally, objectively, and systematically investigated by the researcher in order to get information about the existing situation.

A number of two classes from the second grade (year 11) at SMAN 12, Banda Aceh, were selected by simple random sampling as the sample for this research. The first was the science class, XI IA-1, with 20 students and the other was the social science class, XI IS-1, also with 20 students.

3.1 Procedure

To collect the data for this research, two instruments were involved: a test and a questionnaire. The test was conducted in two sessions based on the program. The first session was in the social science program and the second session was held in the science program. The instrument for the reading comprehension test had 10 multiple
choices and 10 true-false questions. The reading test used several texts followed by several questions based on each text.

Moreover, the questionnaire was developed by the researcher based on the Principles of Questionnaire, which is proposed by Slavin (1984). There were eight questions in the questionnaire for the students related to their language attitude, intelligence, and motivation.

3.2 Data Analysis for the Test

The result of the reading comprehension test of the students in both programs was calculated by using a formula from Sudjana (2002):

\[ SC = \frac{true}{n} \times 100 \]

Where:
- \( SC \) = the score
- \( n \) = the number of questions
- \( true \) = the number of correct answers
- 100 = the maximum score

Each question was scored 1 for a correct answer and 0 for a wrong answer, so the highest score was 20. In addition, after getting the final scores based on the above formula, the researcher then tabulated the obtained scores into several other formulas such as the mean score, standard deviation and the t-test. Additionally, the t-test is the core statistical formula employed to prove the hypothesis. It was used to explain whether there was a significant difference in achievements in reading comprehension between the students in the science program and those in the social science programs.

The t-test hypotheses for this research are as follows:
- \( H_0 \) : there is no significant difference in achievement in reading comprehension between the students in the science and those in the social science programs.
- \( H_a \) : there is a significant difference in achievement in reading comprehension between the students in the science and those in the social science programs.

According to Sundayana (2010), the criteria of the t-test with 5% level of significance (\( \alpha = 0.05 \)) are:
- If \( t_{obtain} < t_{table} \), \( H_0 \) is accepted
- If \( t_{obtain} > t_{table} \), \( H_0 \) is rejected and \( H_a \) is accepted.

3.3 Data Analysis for the Questionnaire

To obtain the differences in mastery of reading comprehension between the students in science and those in the social science programs, the researcher distributed the questionnaire to them. The answers were later tabulated and analyzed by using the formula for percentages as follows (Mardiana, 1999, p. 20):

\[ P = \frac{f}{n} \times 100\% \]

Where:
- \( P \) = percentage
- \( f \) = frequency of response
- \( n \) = the number of respondents answering the question
The percentages obtained from the questionnaire would show whether the students’ internal factors (language attitude, motivation, and intelligence) influence their mastery of reading comprehension.

4. RESULTS AND DISCUSSION

4.1 Results

After calculating all of the scores obtained by using several patterns or formulas, the researcher, then, summarized all in Table 1 overleaf.

Table 1. Summary of results from reading comprehension tests of the students in the science and in the social science programs.

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical symbols</th>
<th>Reading comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Science program students</td>
</tr>
<tr>
<td>1.</td>
<td>N (Number of sample)</td>
<td>20</td>
</tr>
<tr>
<td>2.</td>
<td>( \bar{x} ) (Mean score)</td>
<td>49</td>
</tr>
<tr>
<td>3.</td>
<td>( S^2 ) (Variance)</td>
<td>77</td>
</tr>
<tr>
<td>4.</td>
<td>S (Standard deviation)</td>
<td>8.7</td>
</tr>
<tr>
<td>5.</td>
<td>t-test</td>
<td>3.67</td>
</tr>
</tbody>
</table>

From Table 1, the mean score of the science students was 49, and that of the social science students was only 38. However, the scores of the two groups were not widely scattered. Next, the variance of the science program was 77, and the social science program was higher at 95. The standard deviation for the science program was 8.7, which was a little bit lower than that for the social science group at 9.7.

The \( t_{\text{test}} \) obtained was 3.67. The degree of freedom \( (df) \) at the level of significance \( (\alpha) 0.05 \) was \( (d.f) = N_1 + N_2 - 2 = 20 + 20 - 2 = 38 \) or 2.042. Hence, the \( t_{\text{test}} \) (3.67) was higher than the \( t_{\text{table}} \) (2.042), which means that the null hypothesis \( (H_0) \) was rejected and \( H_a \) was accepted. In other words, there was a significant positive difference in achievement or ability in reading comprehension skills between the students from the science program and those from the social science program.

Furthermore, the percentage results for each variable measured in the questionnaire are as shown in Table 2 that follows.

Table 2. Results for each variable measured in the questionnaire.

<table>
<thead>
<tr>
<th>No</th>
<th>Questions</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Science</td>
<td>Social Science</td>
</tr>
<tr>
<td>1.</td>
<td>Do you like English subject?</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>A. Yes, I do.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. No, I do not.</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>C. (Other) ...</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Do you have any problem in understanding reading materials?</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>A. Yes, I do.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. No, I do not.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>C. (Other) ...</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Based on the results presented above, it can be seen that the students in the science program had better language attitudes towards English, they had more motivation to learn English and higher intelligence compared to those in the social science program.

4.2 Discussion

Considering the results in Table 1, it was proved that there were some factors which influenced the difference in achievement in reading comprehension between the students of both programs. The students from the social science program were significantly poorer in reading comprehension than those from the science program. The factors that are further discussed in the following sections are language attitude, motivation, and intelligence.

4.2.1 Language Attitude

The first question indicates the language attitude of the students. The feelings of like and dislike can be classified as cognitive aspects of the language attitude. The data from the questionnaire showed that most of the social science program students did not like English. This is not good for them because when one does not like a language
which is being learned, it immediately drives them to be poor in it. This was proven by the students’ achievement in the reading comprehension test.

Accordingly, Tahaineh and Daana (2013), as cited in Alaga (2016, p. 4), has said that language attitudes vary in strength. It is crucial in language teaching and learning that students should possess a positive language attitude as it will bring students the ability to communicate effectively in English. On the contrary, a negative language attitude is about to lead them into failure in English competence.

4.2.2 Intelligence

Questions 2 and 3 reflected the intelligence side of the students. Most of the students from the social science program had not yet mastered vocabulary and grammar, which directly influenced their achievements in reading comprehension. As a result their scores were lower compared to those from the science program.

The reading comprehension test included several simple sentences plus compound sentences that tended to be long. The students with lesser intelligence could not understand the meaning of the long, compound sentences. Meanwhile, the students with higher intelligence, on the other hand, could easily recognize the meaning of these sentences. Shed (2010) says it is undeniable that intelligence plays a great part and takes part in someone’s proficiency in learning language. The more intelligence someone has, the easier he will understand and comprehend a language. This means that the science students could better comprehend the English reading text because they have better understanding on vocabulary, grammar, and other aspects of the text. Hence, this ability promptly guides them to have higher results in reading comprehension.

4.2.3 Motivation

Questions 5, 6, 7, and 8 all reflect students’ motivation. The students from the social science program did not exhibit much motivation to learn English, especially reading comprehension. They did not have enough motivation to enrich their reading comprehension skills by reading English books, newspapers, magazines, novels, etc. As a matter of fact, all of those could help them to improve their vocabulary and reading comprehension ability. Likewise, they did not have much willingness to train their reading comprehension by answering reading material exercises at home. In addition, they did not attend English Private Courses outside of the school. Consequently, Ushida (2005, p. 52) states the importance of motivation in language learning:

Motivation has three important roles. First, it mediates any relation between language attitude and language achievement. Second, it has a causal relationship with language anxiety. Third, it has a direct role in the informal learning context, showing the voluntary nature of the motivated learners’ participation in informal L2 learning contexts. (Ushida, 2005, p. 52)

Hence, pertaining to the explanation above, motivated students are those who eagerly learn a language and want to explore and expand their ability in it, and have a desire to endeavour to succeed in the activity.
5. CONCLUSIONS AND SUGGESTIONS

Based on the results and the discussion, the researcher draws some conclusions. This research shows that there was a difference in the level of achievement in reading comprehension between the students of the science program and those from the social science program. It was found that the students from the science program scored higher than those from the social science program in the reading comprehension test.

In addition, several factors have shown to influence the difference. First of all, the students in the two programs had different language attitudes during the English subject. The science program students showed their more positive attitude toward the subject, meanwhile those in the social science program did not; the latter tended to have a negative attitude or did not like English. This is assumed to cause them to not perform better in the reading comprehension test to test one of the English skills, which is reading. Second, most of the social science students seemed to lack motivation to learn English, while most of the science students showed high motivation to learn it. This influenced their proficiency as well in the reading comprehension test, in which they got better scores in the test compared to those in the social science program. Third, the differences in the level of intelligence also affected the difference in achievement in the reading tests. Hence, those students who had higher intelligence achieved higher scores.

Finally, the researcher has some suggestions in order to improve the students’ reading comprehension. First, students should expand their ability in reading comprehension by doing reading exercises, as many as possible, in order to train their ability in it. In addition, to doing such things, students should have high motivation to improve their reading comprehension skills by reading English books, novels, magazines, etc. Moreover, teachers should encourage their students to read more in English. To further attract the interest of their students, they must use interesting and effective strategies and techniques in the teaching and learning process of English reading comprehension.

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[Received 01 October 2016; revised 18 February 2017; accepted 25 February 2017]

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