Entry application software to identify the development of reading and writing vocabulary

F Inayatillah*, Kisyani², Mintowati³, and Mukhzamilah⁴

¹,²,³,⁴Faculty of Language and Arts, Universitas Negeri Surabaya

*fafiinayatillah@unesa.ac.id

Abstract The results of the reading literacy test for Indonesian children at national and international levels were low. Literacy tests are carried out by measuring aspects of understanding, using, and reflecting the results of reading in writing that contains vocabulary. Vocabulary is one of the important things that supports the development of student literacy. Thus, the vocabulary is important to study. This study identified the development of reading and writing vocabulary of junior and senior high school students. This research is descriptive quantitative. The data of this study were in the form of vocabulary derived from books of high school Indonesian students grade VII to grade XII based on the 2013 curriculum and the results of the writing of junior and high school students from grade VII to grade XII. Data were collected by entry application software. For data analysis, the linkage technique of comparing and contrasting was used. The results showed that the development of the number of Indonesian language entries in junior and high school student books was not good, tending to be stagnant. Compared with the results of similar studies in other countries, Indonesian language student books with the number of entries slightly less support literacy development include critical, creative, communicative, and collaborative thinking skills of junior and high school students. Conversely, the development of written vocabulary of middle school students has increased significantly.

1. Introduction
The 2013 curriculum will be applied thoroughly in Indonesia as a National Curriculum. Therefore, the accompanying teaching materials must also be accountable for their quality. The student book in the 2013 curriculum is a book that can be a quality standard for achieving student competence. In this case, the vocabulary contained in the student book is very important in any learning. Cunningham and Stanovich [1] estimated that grade 5 students who provide 10 minutes of reading time per day will have 622,000 more words each year than students who do not read.

Vocabulary should be introduced in stages, starting from the easiest / concrete and close to the lives of students to a more difficult / abstract level. Reading vocabulary (KB) is not always the same as listening vocabulary, speaking vocabulary, or writing vocabulary (KT). KB in this study refers to a collection of words in Indonesian language subjects that are used as book-students for junior and senior high school based on the 2013 curriculum. Mastery of reading vocabulary will determine one's success in life.
In terms of reading literacy through PISA (The Program for International Student Assessment), Indonesia is still left behind. In the 2012 PISA results, Indonesia ranked 2nd from the bottom especially for math, reading and science skills. The 2012 PISA data showed Indonesian students ranked 64th with a score of 396 (OECD average score 496) (OECD, 2013). There were 65 countries participating in PISA 2012. Trend in the International Mathematics and Science Study (TIMMS) had released results in 2011. The TIMMS data described the mathematical and scientific achievements of US students compared to students from other countries. TIMMS results for grade VIII students: Indonesian mathematics achievement was ranked 38th out of 42 countries with a score of 386, far below the standard 500. Science achievement was ranked 40th out of 42 with a score of 406 (Nces.ed.gov/TIMMS/result).

PIRLS, TIMMS, and PISA data, especially in reading comprehension skills, indicate that the competency of Indonesian students is low. In this case the literacy test is carried out by measuring aspects of understanding, using, and reflecting the reading results in written form. In the school literacy movement (GLS), literacy is defined as the ability to access, understand, and use information intelligently. In this case, the ability to read can be interpreted as the ability of students to access, understand, and use reading texts intelligently (one of which is proven by writing). Therefore, it is necessary to do research on the reading and writing vocabulary of junior and high school students.

To facilitate this research we development entry application software using golang technology, Microsoft Excel that was used to manage database and JSON to process data. For layouting, we used HTML and interface scitter.

2. Theoretical Framework

2.1 Reading and Writing Vocabulary

Vocabulary is a wealth of words owned by a person or a language [2]. In general, vocabulary means a set of words that are owned by someone who speaks. Mastery can be active or passive. Productive language mastery used for communication requires mastery of active vocabulary. The passive mastery is related to mastery for understanding, not for use. In this case, the vocabulary is a passive vocabulary.

The word occupies an important position in the language system. Therefore, mastery of one's vocabulary greatly determines success in communicating. Vocabulary learning aims to enrich students' vocabulary. Students do not have to memorize a number of words, but the important thing is to use them in sentences. Knowing and understanding the meaning of words is the main purpose of vocabulary learning.

Lado argued that a person is stated to have mastered the vocabulary of a language if he has mastered a number of words that are adequate, possess the necessary knowledge, and know the intricacies of vocabulary, speaking vocabulary, reading vocabulary and writing vocabulary [3]. According to him, the vocabulary of the second language can be divided into three levels: easy, medium, and difficult to learn. Vocabulary that is easy to learn is a vocabulary whose form and meaning are the same as the first language (B1); medium vocabulary includes contextual words: food, clothing, sport, city, village, discovery, geography, newspapers, education, and so on. The vocabulary which is difficult to learn is a vocabulary that is different from the first language, in terms of both form and meaning.

Research in America about the vocabulary of urban children showed that three quarters of them had approximately 1500 words in the middle of the first year of grade 1. Based on this research, the words mastered by first-grade children are: words that express taste, daily vocabulary, words that appear in almost every sentence, and words that mention things that have been experienced and lived by the child. According to the results of Dale's research, children ended grade 1 with a vocabulary mastery of 3000 words, adding 1,000 vocabulary each year. The average vocabulary for 12th grade students is around 14000 and for students around 18,000-29,000 words [4].

The rapid development of languages lately certainly affects the mastery of students' vocabulary. Therefore, research on vocabulary should be conducted periodically. Sarwadi et al research on vocabulary of elementary school students in grades 3 and 6 in Central Java and DIY showed that mastery of vocabulary for grade 6 of elementary school students was 4000 words. In addition, the research found words with a high frequency of occurrence based on the results of the essay's writing report on the predetermined theme [5].
Edgar Dale's research on the vocabulary of city children found three-quarters of city children having approximately 1,500 words in the middle of the first year of elementary school (grade 1) [6]. Words known to grade I children: (1) words that express taste; (2) vocabulary used daily; (3) words that appear in almost every sentence; and (4) words that mention things that have been experienced and lived by children (cf. en.wikipedia.org/wiki/edgar dale).

Harris Jacobson designed a vocabulary list based on computer analysis of all words in six elementary reading series and six reading textbooks for grades 1-6 [4]. This list consisted of a main list of words that appear three or more times in grade-based reading; Additional list of 1,699 words arranged by grade; Glossary of terms in four fields of study; The overall list was alphabetical; The form of inflection was presented according to the root.

Research in America about reading syllables was based on 1,045 samples taken from various kinds of reading for grades 3-9. This list contained 86,741 entries including each item that had been identified by the computer as a word different from the word that preceded or followed it, including: words, formulas, and so on. A total of 35,000 words only appeared once in a reading.

In Indonesia, based on the 1994 curriculum, junior high school graduates were expected to master 15,000 words, 21,000 for vocational high school graduates (Ministry of Education and Culture 1995). In a competency-based curriculum (MONE, 2000), senior high school students were only required to master a 12,000 words (less when compared to the previous curriculum). Zuchdi's research on Elementary School Reading Words found that the number of vocabulary words used in the sixth grade was fewer (3,244 words) than fifth grade (3,727 words) and fewer than grade IV (3,253 words). Research conducted by Supriadi (2000) showed that a large number of secondary school textbooks had a very low level of readability. One of the indications was the presence of foreign vocabularies for students [7].

Furthermore, it is believed that the development of sentences and vocabulary in textbooks will affect students' mastery of concepts and vocabulary meanings in textbooks. The vocabulary in the textbook develops according to the development of science and technology. This is in accordance with the approach used in the 2013 curriculum, namely the scientific approach. With this approach, the vocabulary used in textbooks automatically refers to the development of vocabulary as a science defender. Thus, students are expected to have the maximum knowledge and mastery of vocabulary used in the textbook. This is related to the vocabulary used which really must be in accordance with the 2013 curriculum used today. Knowing and understanding the meaning of words is the basic foundation of students to master a field. Unfortunately, special learning about the introduction or socialization of vocabulary seems to be less cared for at this time.

If reading is a receptive activity, writing is a productive activity. Therefore, mastery of vocabulary in writing activities is an active mastery related to mastery for use. In this case, the vocabulary is an active vocabulary.

3. Methods
This research is descriptive quantitative. The data source of this research is Bahasa Indonesia textbooks for junior and senior high schools based on 2013 Curriculum and books written by junior and senior high schools students. The data were analyzed using a computer tool in the form of entry application software http: //db.plansys.co.3000/compre that has been developed by researchers, in addition to manual analysis. In terms of reliability, repeated observations were carried out by researchers. To analyze the development of the vocabulary, the researchers used comparative and differentiating techniques [8].

4. Result and Discussion
a. Identification of Reading Vocabulary for Junior and Senior High School Students
The number of words used in junior and senior high school student books turned out to have ups and downs. In addition, the number of entries was the same thing. The following is a table of developments in words and entries contained in junior high school students (year I) and high school (year II). The development of reading vocabulary in junior high school student books is presented in the following Table 1 [9] and the development of reading vocabulary in senior high school student books is presented in Table 2 [10].
Table 1. Identification of Reading Vocabulary in Junior High School Students Book

| DESCRIPTION     | Grade VII | Grade VIII | Grade IX |
|-----------------|-----------|------------|----------|
| Number of words | 51.724    | 52.109     | 44.089   |
| Number of entries| 6.294     | 6.590      | 5.249    |

Table 2. Identification of Reading Vocabulary in Senior High School Students Book

| DESCRIPTION     | Grade X | Grade XI | Grade XII_1 | Grade XII_2 |
|-----------------|---------|----------|-------------|-------------|
| Number of pages | 296     | 312      | 208         | 248         |
| Number of words | 57064   | 58744    | 30408       | 70762       |
| Number of entries| 4980    | 5262     | 3052        | 4134        |

The percentage of the development of entries (the increase) from grade VII to grade VIII turned out to be small (5%). However, the decrease in entry from grade VIII to grade IX was actually quite large (20%). The largest entry is in grade VIII. The least number of words and number of entries is in grade VIII (less than grade VII).

For senior high school student books, based on the content and number of pages, grade XII books are split into two. Therefore, there are four books. Based on these four books, the number of words and entries from grade X to grade XI and continuing to grade XII appear to rise. The number of pages and words for grade XII can be added directly, but the number of entries cannot. The interesting notion is that the largest number of entries is in grade XI. For Grade XII, number of entries each semester is actually smaller than grade XI and grade X.

The results of this study compared with previous similar studies in the form of reading vocabulary for various levels. The results are presented in the following table 3.

Table 3. Comparison of Reading Vocabulary for Various Levels

| Grade | America | Zuhdi | Sarwadi | Research Result |
|-------|---------|-------|---------|----------------|
| 1     | 3000    |       |         |                |
| 3     | 86.741  |       |         | 6.294          |
| 4     | 3.253   |       |         | 6.590          |
| 5     | 3.727   |       |         | 5.249          |
| 6     | 3.244   |       | 4000    | 4.980          |
| 10    |         |       |         | 5.262          |
| 11    |         |       |         | 3.052          |
| 12-1  |         |       |         | 4.134          |
| 12-2  |         |       |         |                |

Based on Table 3, it appears that the development of entries in junior and senior high schools is not good enough, tends to be stagnant and even decline. Especially when compared with the entries developed in books in America (86.741). Research in America about reading vocabulary was based on 1,045 samples taken from various kinds of reading for grades 3-9. This list contained 86,741 entries [13].

With the highest figure of 6,590 for the junior high school level, it means that students were only introduced by exposing about 7%. When compared with the Indonesian language entries numbering 127,036 (KBBI edition V) [11], it means that only 5% of the entries were introduced to junior high school students. This is certainly concerning considering that in the 1994 curriculum junior high school students were expected to master 15,000 entries. This fact is possible with regard to our national (INAP) and international literacy achievements (PISA and PIRLS). This shows that books of junior school Indonesian students need to pay more attention and add the use of reading vocabulary and develop it.
More specifically, the development of the entries in senior high school decreased compared to the junior high school book entries. Especially when compared with the results of research by [4], [5], [9] and entries developed in books in America (86,741).

With the highest number of 5,262 (even tending to decrease), it means that senior high school students are only introduced by exposing around 29% if based on curriculum policy which mentions the number 18,000 (1994 curriculum) or around 44% of the competency-based curriculum policy which includes 12,000. When compared with the Indonesian language entry numbering 127,036 (KBBI edition V), it means that only about 4% of the entries are introduced to high school students. This shows that books of senior high school Indonesian students need to further add the use of reading vocabulary and develop it. What is worrying is that there are more junior high school entries than senior high school entries.

b. Writing Vocabulary of Junior and Senior High School Students

The number of the vocabulary used by junior and senior high school students in their writing has increased, as shown in table 4.

| Level | Entries | Word |
|-------|---------|------|
| SMP   | 2576    | 28704|
| SMA   | 6286    | 68561|

Based on Table 4, the development of the entries and vocabulary of junior and senior high school students has increased significantly. The entries and words in the writing of high school students rose 2.4 times from the junior high school level.

5. Conclusion

The finding of entry application software can be used to identify the development of reading and writing vocabulary. The development of the reading vocabulary of junior and senior high school students is not very good because it tends to be stagnant. Compared with the results of similar studies in other countries, Indonesian Language student books with a number of entries that slightly less support literacy development, including the ability of junior and high school students to think, create, and innovate. The number of Indonesian language entries in student books needs to be considered in relation to the gaps. The higher the grade, the more the number of entries should be.

On the contrary, the development of students’ writing vocabulary from junior high school to senior high school level has increased significantly. Thus, students’ writing vocabulary is more developed than their reading vocabulary. The results of this study are expected to be used as suggestion for the implementation of the school literacy movement and for the 2013 curriculum / national curriculum policy.

References
[1] Blachowicz, Camile L.Z. and Peter Fisher 2004 “Vocabulary Lessons”. Journal of Educational Leadership, March 2004, Vol. 6 (6).
[2] Kridalaksana, Harimurti 2008 Kamus Linguistik (Jakarta: Gramedia)
[3] Lado, Robert 1964 Language Teaching: A Scientific Approach (New York: McGraw-Hill)
[4] Zuchdi, Darmiyati 1997 KB Bahasa Indonesia untuk Sekolah Dasar di Indonesia (Yogyakarta: FPBS IKIP Yogyakarta)
[5] Sarwadi et al 1978 “Penelitian Penguasaan Kosakata Bahasa Indonesia Murid Kelas 6 Sekolah Dasar di Jawa Tengah dan Daerah Istimewa Yogyakarta” (Yogyakarta: Proyek Penelitian Bahasa dan sastra Indonesia dan Daerah)
[6] Supriadi, Dedi 2000 Anatomi Buku Sekolah di Indonesia (Yogyakarta: AdiCita)
[7] Edgar Dale (enwikipwdia.org/wiki/edgar_dale)
[8] Sudaryanto 2010 Metode Penelitian Linguistik (Yogyakarta)
[9] Kisyani, et al 2017 Kosakata Baca Kosakata Tulis Siswa SMP (Surabaya:Unesa)
Acknowledgments

We express our gratitude to Direktorat Riset dan Pengabdian Masyarakat Kemristekdikti for the research funding. Also, we thank Lembaga Penelitian dan Pengabdian Masyarakat Universitas Negeri Surabaya for fully supporting the researcher team.

[10] Kisyani, et al 2018 *Kosakata Baca Kosakata Tulis Siswa SMA* (Surabaya:Unesa)
[11] Carrol, Devies, and Richman 1971 “*The American Herritage Word Frequency Book*” (http://en.wikipedia.org/wiki/Word_lists_by_frequency)