Investigating Indonesian Textbooks Readability Using Fry Graph Formula

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Article History:
Received: April 11th, 2021
Revised: May 2nd, 2021
Accepted: June 9th, 2021
Published: June 29th, 2021

Abstract: Learning the Indonesian language cannot be separated from the use of textbooks. In using textbooks, teachers must consider several aspects, especially text readability. This study aims to measure text readability in Indonesian textbooks using the Fry Graph Formula and determine the suitability of the text used in the book with the student's school level. The present study applied the descriptive analysis and quantitative approach method to count and analyze texts in several Indonesian language textbooks readability using the Fry graph formula. Three Indonesian language textbooks with 45 measured text in 11th grade were analyzed. This study found that 25 texts showed the results "Not Appropriate", 16 texts showed the results "Appropriate", and four texts showed the results "Invalid". Based on the analysis, the number of readabilities of text in Indonesian language textbooks was easy for textbooks at 11th grade. The findings in this study can help the teacher adjust and choose the suitable teaching materials in Indonesian language textbook to improve teaching and learning quality. Before selecting a leading textbook as a learning source, we suggest teachers analyze text readability to improve learning efficiency and quality.

INTRODUCTION

A language is a tool used to communicate and interact with other people. Language becomes a tool of unifying the nation and means of communication. In addition, language, which is tied to people's lives, is changing (not fixed), which results in language changing according to life in society, so language is also said to have a dynamic character. The language changes occur at all language levels, including phonemes, morphemes, syntax, semantics and lexicons (Anderson & Cheng, 2004; Byram & Wagner, 2018).

As part of society, education is closely related to language (Wang et al., 2019). In language learning, we recognize language skills. Language skills consist of four language skills: listening skills, speaking skills, reading skills, and writing skills (Gilakjani, 2017). Reading is an activity to understand the content of textbooks which is part of language skills. Reading contributes to the achievement of language learning outcomes and the success of other skills. Good reading skills make students more creative and communicative in understanding knowledge, identifying and solving problems in a learning activity (Pebriana, 2021; Penick & Harris, 2006). Therefore, reading is one of the essential aspects of learning a language and other disciplines.

In learning the Indonesian language, the teacher must be concerned with
reading material that students can read (Kasule, 2011). Reading material is important enough for the teacher to select as long as it can improve students' ability to understand the material (Hidayat, 2016). Language textbooks used in learning activities can help students to understand the fabric properly. The ability to determine the right textbook is an essential skill possessed by teachers (Puspita, 2019). In Indonesia, there is a selection of textbooks available under the guidelines for the National Curriculum Standards (Curriculum 2013) (Gunawan, 2017). Teachers and students in teaching widely use the electronic version of Indonesian textbooks because the material is more following the indicators to be achieved. As a language educator or teacher, the readability of the textbooks they recommend for use in the class they teach is essential. Therefore, it is necessary to recognize that textbooks have a higher role in the teaching and learning process in many resource-deficient classrooms as they may be the only teaching resource on which teachers explain their explanations. In Western and European countries, the government has decided the leading textbook for learning activity at school, so the teaching and learning quality is better than Asian countries such as Indonesia (Carvalho et al., 2011). Therefore textbook readability investigation is necessary to be conducted. This situation places high responsibility on the quality of the textbook itself in meeting appropriate criteria regarding the age of the student, educational and cultural background, and linguistic proficiency. Textbook writers need to be guided by these requirements. Therefore, the teacher's ability to determine and analyze the level of textbook readability is required for effective teaching and learning (Chen & Meurers, 2018; Kasule, 2011). Thus, the readability of textbooks is an exciting research focus, especially on Indonesian language textbooks.

In measuring the readability of reading material, various formulas for readability are usually used. The procedures used to measure readability which refers to the factors that affect readability, are formulas based on Fry Graphs (Fry, 1977). Fry graph is a formula that can be used to measure the readability of a text. The name of the fry chart comes from the name of the person who studied it named Edward Fry, which became known as the fry chart (Misra et al., 2013). The Fry graph measures readability based on two factors, namely the length of the word and the difficulty of the word, which is indicated by the number of syllables that make up each word in the textbook (Fitzgerald, 1981; Misra et al., 2013). The Fry graph formula is intended to measure the readability of English text. However, for Indonesian language textbooks researcher has to add a step to determine the readability of a text.

Many textbooks are used in the learning process, both those issued by the Government and other publishers. The majority of these books have been assessed for the quality of textbooks at the Book Center. One of the criteria for determining the quality of textbooks is readability assessment (Soh, 2019). The process of testing the readability of text in textbooks conducted by the Book Center focuses on the reader's understanding of the text being read concerning the suitability of meaning, moral values and learning objectives (Sulistyanto & Wiyono, 2008). In other words, the assessment of textbook readability by the Book Center has not focused on the number of syllables and sentences used in the text used in learning. This condition inspires the researcher to test the readability of the text in the textbook by focusing the test on counting the number of syllables and sentences.

Textbooks have benefits as a support in the learning process in schools are now available everywhere, there are
various kinds of publishers and writers who print textbooks for use in the learning process. As prospective teachers or even teachers, we must consider teaching materials such as textbooks to be used in the learning process in the classroom. Students can easily understand what is being said and learned based on textbooks. However, there is a limited study comparing textbook readability, especially in Indonesian language major in Indonesia. Some researchers (e.g., Kusuma, 2018; Pramuwibowo, 2015; Soh, 2019) just analyze the readability content for one specific book while no comparisons are obtainable as options. Therefore, this study aims to determine the readability of the text contained in three different Indonesian language textbooks using the Fry graph formula and to determine the suitability of the text used in the book with the student's school level.

THEORETICAL SUPPORT

This section is a theoretical support section explaining some related knowledge about textbook readability and related recent studies. We construct this section into four subsections: textbook and reading skills, readability, readability using Fry graph formula, and recent studies of textbook readability.

Textbook and Reading

The textbook is also a reference book used by schools containing learning material to improve knowledge mastery skills based on educational standards and the curriculum (Hernawan et al., 2017). In a Textbook, there is a text which is part of the textbook. Text is defined as a language unit used to express a social activity both orally and in writing with a complete thinking structure (West, 2019). Learning Indonesian is always related to the text; even in textbooks, there are lots of texts. There are various types of text: anecdotal text, exposition text, observation report text, procedure text, negotiation text, short story text, description text, explanatory text, review text, news, and novels (Isodarus, 2017).

Reading is a process carried out and used by readers to get messages, which the writer wants to convey through the media of words or written language (Henry, 2008). Reading activities are usually carried out intentionally or unintentionally to get messages or information from what is read. Likewise, writers make reading material because it is to provide information to readers. From a linguistic point of view, reading is encoding and decoding (a recording and decoding process), in contrast to speaking and writing, which involve encoding. An aspect of decoding is connecting written words with the oral language meaning, which includes converting the written/printed words into meaningful sounds (Henry, 2008; Mackey et al., 2006; West, 2019). We can assume that reading is a receptive activity that receives all information in the form of a decoding process. While writing and speaking are productive, namely producing written and oral communication. In addition, reading can also be interpreted as a method that we use to communicate with ourselves and sometimes with other people, namely communicating the meaning contained or implied in written symbols. Some writers seem to think that “reading” is the ability to see written symbols and change written symbols through phonics (phonics = a method of teaching reading, speech, spelling based on phonetic interpretation of ordinary spelling) being to oral reading. Reading can also be considered a process of understanding between the lines, seeing the thoughts contained in written words (Anderson & Cheng, 2004).

The Readability

Readability can be defined as whether a particular reading material is read or not by the reader. Readability questions the level of difficulty and
convenience of particular reading material for a certain reader rating (Himala, 2016; Pramuwibowo, 2015). We can conclude that readability is whether or not a text is readable, which is influenced by the readability and difficulty of reading material to be understood by readers. This relates to the reader's ability to understand the content of the reading. Readability can also be interpreted as the level of ease of the text to read and understand. People who read what is written don't want to be forced or tortured to understand what is written (Mulyadi, 2015). Therefore, the writer must try to make the reading easy to understand so that understanding can be resolved. With readability, it can help every reader read reading material according to their level of understanding to not feel forced to understand a reading material.

Widyaningsih and Zuchdi (2015) stated that the level of readability must be following the level of the reader's ability. So that we can conclude that the harmony between the readability level and the readability level of the reader will greatly affect the reader's understanding of the text they read (Xia et al., 2019). If the readability level is equal to the reader's ability level, the reader will find it easier to understand their text. If the readability level is limited while the readability level is high, the reader will certainly have difficulty understanding the text. Concerning readability and book preparation, some signs must be considered (Crossley et al., 2017; Mackey et al., 2006). There are several guidelines for compiling a textbook: (1) the frequency distribution of vocabulary that elementary school students can absorb; (2) range: the measured range, how far the words in the textbook are used; (3) availability: how far is the use of vocabulary, sentence structure, and other forms of language in supporting the contents of the book; (4) learn ability: a measure of the level of difficulty: words, sentences learned by students.

In this study, researchers chose to use the fry graph formula as the formula used to measure the readability of the text, because according to the literature review, the fry chart is a relevant graphic used to test text readability. When compared with other readability formulas, the fry graph can measure the readability of the text before teaching and learning activities begin, meaning that the text can be tested without involving the reader. Meanwhile, other formulas always involve the reader in measuring the readability of the text.

Measuring Readability Using Fry Graph Formula

Measuring readability involves several pivotal factors. The four factors influence readability, namely: style (including semantic and syntactic elements), content (including propositions, organization, coherence), structure (including chapters, headings, and navigation), design (including typography, format, and illustrations) (Crossley et al., 2017; DuBay, 2015). Reading activity is an interactive process implying text-based, reader-based, and writer-based factors regarding readability. Some factors can be measured using readability analysis because there are factors related to communicating and meaning, such as print readability, clarity and relevance of illustrations, and conceptual difficulties. On the other hand, there are several factors closely related to the subject of the reader, such as faulty top-down and bottom-up processing; lack of motivation; excessive motivation; familiarity with the topic; linguistic skills; and questions that are misleading or unfocused, so a test or formula is needed to measure the level of readability (Bensoussan, 1998; Cho & Ma, 2020). Therefore, tests that measure the suitability of the readability level provide a more reliable assessment of the readability of items at a specific level.

To analyze the readability of a textbook, a measuring instrument or
A formula is needed that can measure readability properly and precisely. Fry's graph formula is a measuring tool that can assess readability and is easy to use. Graph Fry's formula is taken from the name of the creator, Edward Fry. This formula began to be published in 1977 in the Journal of Reading (Fry, 1977). Fry's readability formula takes a hundred words in discourse as a sample regardless of the length. So, no matter how thick the number of pages of a book is or the length of any reading, the measurement of readability, if you use this formula, someone only uses 100 words (Pebriana, 2021). After calculating the Fry formula parameters, researchers can place suitability of the representative text based on student-level into Fry Graph (see Figure 1). The benefit of using the Fry graph formula is to measure the readability of a text to find out a person's ability to make discourse according to the level of readability. After it is known the percentage of student success in making discourse following the level of readability, measurable and well-programmed improvements can be made, which make students' skills in making discourse increase.

Recent Studies of Textbook Readability

Measuring text readability is a pivotal topic in learning a language. Chen & Meurers (2018) conducted a study to measure the readability of text from a frequency lexical perspective, which showed that the effective use of word frequency for assessing text readability must consider the various characteristics of the distribution of the number of words to categorize text readability. Recent research related to readability assessors was also carried out by Pebriana (2021) on thematic books at the elementary level using Fry Graph, which showed that the level of readability of thematic books in 4th grade was suitable according to students' abilities. Fry graph formula is still a measurement tool that is considered appropriate and easy to use even though recent studies related to the development of text readability measurements (Soh, 2019; Wang et al., 2019).

Pramuwibowo (2015) examined the use of the Fry graph in measuring the text readability in Indonesian language textbooks based on the 2013 curriculum by the ministry of education. This study found that the readability level is relatively easy (88 %) based on the characteristics of effective sentences, the level of text readability is classified as difficult (15 %) based on the reader's initial knowledge, and the level of readability of the text in the book fits the 7th grader students. Similarly, Fadilah (2016) found that the readability of Indonesian language textbooks at 7th grade and 11th grade published by the ministry of education was not suitable for students. Isabel (2013) also found that the electronic version of Indonesian textbooks in 7th grade published by the ministry of education was not suitable based on the Fry Graph analysis. Therefore, the present study is focused on analyzing the readability of text in Indonesian language textbooks published by the ministry of education. However, to expand and enrich the findings, a comparison of the readability of the text in Indonesian language textbooks published by Yrama Widya (YW) and Erlangga (E) was also carried out.

METHOD

Research Design

The quantitative descriptive method was applied in research using the Fry graph formula and expert judgment to assess the validity of the selected text. In quantitative research methods, the philosophy used is post-positivism, which examines the research results, which focuses on the variable to be studied in this study, the readability of the text (Creswell, 2002; Sugiyono, 2017). Three experts in Indonesian language and literature consisting of two language
lecturers and a senior teacher assessed the completeness of the text. When 45 texts were selected from three different textbooks whereby 15 texts from each book were selected as a representative sample in this study, the calculation used the Fry Graph formula to categorise texts into Appropriate, Not appropriate, and Invalid category. We can also assess the level of the text based on the Fry Graph. Figure 1 illustrates a simple workflow for assessing readability and suitability in this study.

![Flowchart](image)

**Figure 1. The Procedure Workflow.**

**Materials, Instrument, and Procedures of Data Collection**

The research materials used in this study were texts from three types of Indonesian language textbooks at the 11th grade level at senior high school. The textbooks are the Indonesian Language Textbook published by Yrama Widya, the Indonesian Language Textbook published by the Ministry of Education, and the Indonesian Language Textbook published by Erlangga. The three books were selected based on the number of representative texts needed in this study, and those books were used in teaching activity by teachers. The texts selected as the research data were 15 texts from each textbook. In addition, the text to be used is the text that has a minimum number of 100 words because the measurement using the Fry chart formula only requires 100 words or more.

**Table 1. Representative Text Selected based on Three Indonesian Language Books.**

| No. | Yrama Widya (YW) | Ministry of Education (ME) | Erlangga (E) |
|-----|------------------|----------------------------|--------------|
| 1   | Making an Android Smartphone into a Laptop Modem Via USB | Job Interview Tips | Interpreting Poetry |
| 2   | Online SIM Service | Four Tips to Not Envy Other People | Snowfall |
| 3   | The occurrence of floods | Relieves irritation on Monday | Earthquake |
| 4   | Landslide | Mass Demonstrations | Tsunami |
| 5   | Poverty | Aceh earthquake | The occurrence of a rainbow |
| 6   | Unemployment | Lecture Text | Lecture Text |
| 7   | Earthquake | Lecture Text | Lecture Text |
| 8   | Moral Decline in Youth Today | About Japan | Make Obstacles Become Bridges |
| 9   | Moral Decadence | Sandal Steal Case | Review Text |
When selecting the texts, the suitability of the text was validated with a triangulation instrument by three experts to determine the categories, and a readability calculation was performed using the Fry Graph Formula (Fry, 1977). The complete description of representative text based on the type of books is presented in Table 1.

**RESULT AND DISCUSSION**

In Table 1 we calculated all elements needed to categorize all text samples. The final category obtained from the calculation result readability and comparing with Fry Graph (see Figure 1).

Table 2 shows the calculated data from 45 analyzed texts. The results show the readability level of each text contained in the three books assessed. Then, the researcher categorized the readability level at the level of readability based on category showed that "Not appropriate" (25 texts), "Appropriate" (16 texts) and "invalid" (4 texts). The unsuitable level category is intended for a text that indicates an unsuitable class from a predetermined class, namely 11th grade, the appropriate level category is intended for a text that shows grade results according to 11th grade. The invalid level category is intended for the text that is in the shaded area (see Figure 2). 55% of the analysis results show that the text is not suitable for the class level and is below the 11th grade level, so the readability of the text is relatively easy for the student at 11th grade.
Table 2. Results of Calculation of Text Readability.

| No. | Title / Text Type                  | P Parameter | SK | KU | S | JKKA | X | KU | X | SK | Category |
|-----|-----------------------------------|-------------|----|----|---|------|---|----|---|----|----------|
| 1   | Making an Android Smartphone into a Laptop Modem Via USB | YW | 256 | 5 | 3 | 9 | 5.3 | 154 | Appropriate |
| 2   | Online SIM Service               | YW | 256 | 4 | 43 | 46 | 5.0 | 154 | Appropriate |
| 3   | The occurrence of floods         | YW | 254 | 7 | 15 | 18 | 5.5 | 152 | Not Appropriate |
| 4   | Landslide                        | YW | 264 | 1 | 25 | 7.0 | 159 | Appropriate |
| 5   | Poverty                          | YW | 273 | 9 | 11 | 7.9 | 164 | Appropriate |
| 6   | Unemployment                     | YW | 280 | 3 | 16 | 6.5 | 168 | Appropriate |
| 7   | Earthquake                       | YW | 238 | 6 | 2 | 14 | 6.1 | 143 | Not Appropriate |
| 8   | Moral Decline in Youth Today     | YW | 261 | 5 | 5 | 17 | 5.3 | 157 | Appropriate |
| 9   | Moral Decadence                  | YW | 277 | 5 | 11 | 13 | 5.9 | 166 | Appropriate |
| 10  | The Importance of Character Education | YW | 264 | 7 | 3 | 13 | 7.2 | 158 | Appropriate |
| 11  | The rise of promiscuity in society | YW | 241 | 6 | 15 | 17 | 6.9 | 145 | Not Appropriate |
| 12  | Our Environment                  | YW | 248 | 7 | 2 | 17 | 7.2 | 149 | Not Appropriate |
| 13  | Character                        | YW | 282 | 9 | 9 | 12 | 9.8 | 169 | Not Appropriate |
| 14  | Communicate Fluently by Binding Meanings | YW | 258 | 4 | 11 | 14 | 4.8 | 155 | Appropriate |
| 15  | Be the Winner of Your Future     | YW | 246 | 6 | 21 | 27 | 6.8 | 148 | Not Appropriate |
| 16  | Job Interview Tips               | ME | 252 | 6 | 14 | 15 | 6.9 | 151 | Not Appropriate |
| 17  | Four Tips to Not Envy Other People | ME | 260 | 6 | 2 | 14 | 6.1 | 156 | Appropriate |
| 18  | Relieves irritation on Monday    | ME | 253 | 7 | 9 | 15 | 7.6 | 152 | Not Appropriate |
| 19  | Mass Demonstrations              | ME | 274 | 7 | 9 | 19 | 7.3 | 164 | Appropriate |
| 20  | Aceh earthquake                  | ME | 264 | 7 | 16 | 23 | 7.7 | 158 | Not Appropriate |
| 21  | Lecture Text                     | ME | 288 | 6 | 14 | 19 | 6.8 | 173 | Not Appropriate |
| 22  | Lecture Text                     | ME | 249 | 6 | 5 | 10 | 6.5 | 149 | Not Appropriate |
| 23  | About Japan                      | ME | 259 | 9 | 5 | 17 | 9.3 | 155 | Not Appropriate |
| 24  | Sandal Steal Case                | ME | 272 | 6 | 2 | 13 | 6.1 | 163 | Appropriate |
| 25  | Review Text                      | ME | 253 | 6 | 15 | 19 | 6.7 | 152 | Not Appropriate |
| 26  | Review Text                      | ME | 251 | 6 | 15 | 23 | 6.6 | 151 | Not Appropriate |
| 27  | Review Text                      | ME | 283 | 6 | 8 | 18 | 6.4 | 170 | Not Appropriate |
| 28  | The Legend of Love Layla-Majnun | ME | 246 | 4 | 17 | 30 | 4.6 | 148 | Not Appropriate |
| 29  | Review Text                      | ME | 256 | 12 | 4 | 14 | 12.3 | 154 | Not Appropriate |
| 30  | Review Text                      | ME | 245 | 9 | 1 | 7 | 9.0 | 147 | Not Appropriate |
| 31  | Interpreting Poetry              | E  | 260 | 9 | 8 | 11 | 9.8 | 156 | Not Appropriate |
| 32  | Snowfall                         | E  | 239 | 8 | 4 | 28 | 8.0 | 143 | Not Appropriate |
| 33  | Earthquake                       | E  | 234 | 6 | 6 | 23 | 6.3 | 140 | Not Appropriate |
| 34  | Tsunami                          | E  | 246 | 8 | 0 | 17 | 8.0 | 148 | Not Appropriate |
| 35  | The occurrence of a rainbow      | E  | 257 | 8 | 9 | 11 | 8.9 | 154 | Not Appropriate |
| 36  | Lecture Text                     | E  | 278 | 8 | 18 | 32 | 8.6 | 167 | Invalid |
| 37  | Lecture Text                     | E  | 276 | 8 | 11 | 15 | 8.7 | 166 | Invalid |
| 38  | Make Obstacles Become Bridges    | E  | 262 | 7 | 14 | 42 | 7.3 | 157 | Not Appropriate |
| 39  | Review Text                      | E  | 275 | 7 | 5 | 24 | 7.2 | 165 | Appropriate |
| 40  | Review Text                      | E  | 266 | 5 | 13 | 25 | 5.5 | 160 | Appropriate |
| 41  | Review Text                      | E  | 249 | 8 | 16 | 17 | 9.0 | 149 | Not Appropriate |
| 42  | Review Text                      | E  | 269 | 8 | 6 | 19 | 8.3 | 161 | Appropriate |
| 43  | Review Text                      | E  | 258 | 10 | 2 | 16 | 10.0 | 155 | Not Appropriate |
| 44  | Review Text                      | E  | 279 | 7 | 14 | 26 | 7.6 | 167 | Appropriate |
| 45  | Review Text                      | E  | 259 | 6 | 10 | 19 | 6.6 | 155 | Not Appropriate |

Note: P: Publisher code, YW: Yrama Widya, ME: Ministry of Education, E: Erlangga, SK: the number of syllables per 100 words, KU: the number of complete sentences per 100 words, S: the number of words remaining in the last sentence per 100 words, JKKA: The number of words in the final sentence per 100 words, KU: the average number of whole sentences, SK: the average number of syllables.
Fry graph can specifically place the readability level of text based on class levels. Figure 2 shows Text 1(YW) sample analysis about "Making an Android Smartphone into a Laptop Modem Via USB" in the Fry graph. Text 1(YW) in the Fry graph shows that the text is suitable for 10th grade. To make the range more visible, the result of this determination must be added by subtracting and adding by one number. So, (10 - 1 = 9) and (10 + 1 = 11). The final result shows that this text is suitable for the 9th, 10th, and 11th-grade levels. Based on the results of class determination in this text, if it is included in a predetermined category. This text will fall into the "Appropriate" category because the class position is right at the appropriate class level, namely 11th grader students.

For discussion, the results highlighted important finding related to the text readability of Indonesian language textbooks in the 11th grade, as illustrated in Table 2 and Figure 1. The results of the text readability of the 45 texts show that 25 texts fall into the "Not Appropriate" category, 16 incoming texts in the "Appropriate" category, and four texts in the "Invalid" category. The interesting point is that Indonesian language textbooks published by the Ministry of Education (ME) have the highest unsuitability in the readability level. 12 out of 15 texts are in the "Not appropriate" category. This finding corresponds with the study by Isabela (Isabela, 2013) and Fadilah (Fadilah, 2016). They also found that Indonesian language textbooks published by the Ministry of Education (ME) were not suitable based on readability text even though the Ministry of Education (ME) was the main educational institution that became a pillar development of textbooks in various disciplines levels of school. This fact indicates that the readability analysis of a learning book needs to be done and adjusted based on learners' knowledge. Indonesian language textbooks published by Yrama Widya
(YW) and Erlangga (E) are more matchings with the 11th-grade level based on readability analysis.

Based on the level of readability of Indonesian textbooks at the publishers of the Ministry of Education (ME), Yrama Widya (YW) and Erlangga (E). No studies are comparing three sources of textbooks in measuring readability, especially in the language education field. The text readability in Indonesian textbooks is relatively easy because most text levels are below 11th grade. The result is also in line with a study by Pramuwibowo (Pramuwibowo, 2015), which showed the readability level of Indonesian textbooks based on the 2013 curriculum is relatively easy with a percentage of 88%. Similarly, Widyaningsih and Zuchdi (Widyaningsih & Zuchdi, 2015) also stated in their research that Indonesian language textbooks at the elementary school level were classified as easy to read.

This study may be the first studies that use several textbooks in comparing the readability level and illustrate how to use Fry Graph Formula properly. Understanding the suitability of the text readability in a textbook helps teachers to make good learning preparation. Thus, they can adjust and choose the right teaching materials. The fry graph formula is a readability measurement tool that is easy to use globally.

CONCLUSION

Text readability in Indonesian Language Textbooks at 11th grade using the Fry graph formula showed that the selected texts had been adjusted to the requirements for measuring readability using the Fry graph formula as representative texts. The results showed the readability of the text, which amounted to 45 texts from three Indonesian Textbooks, including to several categories, namely "Not Appropriate", "Appropriate", and "Invalid". The readability of the 45 texts showed that 25 texts fall into the "Not appropriate" category, 16 texts are included in the "Appropriate" category, and four texts fall into the "Invalid" category. However, the texts contained in all three textbooks were still relatively easy to read for students in the 11th grade.

We suggested this study could encourage other studies related to readability analysis using the Fry chart formula. Using the Fry chart formula as a measure of the readability level of the textbooks, the teacher will be better at preparing the learning process in the classroom. However, Researchers also suggest combining various formulas to measure readability in further studies so that further studies will be more comprehensive and complex.

REFERENCES

Anderson, N. J., & Cheng, X. (2004). Exploring second language reading: Issues and strategies. Foreign Language Teaching and Research Press.

Bensoussan, M. (1998). Schema effects in EFL reading comprehension. Journal of Research in Reading, 21(3), 213–227.

Byram, M., & Wagner, M. (2018). Making a difference: Language teaching for intercultural and international dialogue. Foreign Language Annals, 51(1), 140–151. https://doi.org/10.1111/flan.12319

Carvalho, G. S., Tracana, R. B., Skujiene, G., & Turcinaviciene, J. (2011). Trends in environmental education images of textbooks from Western and Eastern European countries and non-European countries. International Journal of Science Education, 33(18), 2587–2610.

Chen, X., & Meurers, D. (2018). Word frequency and readability: Predicting the text-level readability with a lexical-level attribute. Journal of Research in Reading, 41(3), 486–510. https://doi.org/10.1111/1467-
9817.12121
Cho, Y. A., & Ma, J. H. (2020). The effects of schema activation and reading strategy use on L2 reading comprehension. *English Teaching*, 75(3), 49–68.

Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative*. Prentice Hall Upper Saddle River, NJ.

Crossley, S. A., Skalicky, S., Dascalu, M., McNamara, D. S., Crossley, S. A., Skalicky, S., Dascalu, M., & McNamara, D. S. (2017). Predicting text comprehension, processing, and familiarity in adult readers: New approaches to readability formulas. *Discourse Processes*, 54(5–6), 340–359. https://doi.org/10.1080/01663853X.2017.1296264

DuBay, W. H. (2015). *The principles of readability*. Costa Mesa, CA: Impact Information; 2004.

Fadilah, R. (2016). Buku teks bahasa Indonesia SMP dan SMA kurikulum 2013 terbitan kementerian pendidikan dan kebudayaan 2014. *Jurnal Pena Indonesia*, 1(1), 26–49.

Fitzgerald, G. G. (1981). How many samples give a good readability estimate?: The fry graph. *Journal of Reading*, 24(5), 404–410.

Fry, E. (1977). Fry’s readability graph: Clarifications, validity, and extension to level 17. *Journal of Reading*, 21(3), 242–252.

Gilakjani, A. P. (2017). A review of the literature on the integration of technology into the learning and teaching of English language skills. *International Journal of English Linguistics*, 7(5), 95–106.

Gunawan, I. (2017). Indonesian Curriculum 2013: Instructional management, obstacles faced by teachers in implementation and the way forward. *3rd International Conference on Education and Training (ICET 2017)*, 56–63.

Henry, T. G. (2008). *Membaca sebagai suatu keterampilan berbahasa*. Angkasa.

Hernawan, A. H., Permasih, & Dewi, L. (2017). *Pengembangan bahan ajar tematik* (pp. 1–13).

Hidayat, R. (2016). The readability of reading texts on the english textbook. *Proceedings of International Conference: Role of International Languages toward Global Education System*.

Himala, S. P. T. (2016). Keterbacaan teks buku ajar berbasis aktivitas pada materi ruang lingkup biologi kelas X SMA. *Berkala Ilmiah Pendidikan Biologi*, 5(3).

Isabela, S. N. (2013). Analisis keterbacaan wacana buku sekolah elektronik bahasa Indonesia Jenjang SMP. *Bahtera Bahasa: Antologi Pendidikan Bahasa Dan Sastra Indonesia*, 1(1), 1–15.

Isodarus, P. B. (2017). Pembelajaran bahasa Indonesia berbasis teks. *Sintesis*, 1(1), 1–11.

Kasule, D. (2011). Textbook readability and ESL learners. *Reading an Writing*, 1(2).

Kusuma, D. (2018). Analisis keterbacaan buku teks Fisika SMK Kelas X. *Jurnal Pendidikan Fisika Dan Sains (JPFS)*, 1(1), 14–21.

Mackey, A., Gass, S. M., & Margolis, D. P. (2006). Second language research: Methodology and design. *The Korea Tesol Journal*, 9(1), 175.

Misra, P., Agarwal, N., Kasabwala, K., Hansberry, D. R., Setzen, M., & Eloy, J. A. (2013). Readability analysis of healthcare-oriented education resources from the american academy of facial plastic and reconstructive surgery. *The Laryngoscope*, 123(1), 90–96.

Mulyadi, M. (2015). Tingkat keterbacaan reading materials dalam mata kuliah telaah teks Bahasa Inggris STAIN Pamekasan. *NUANSA: Jurnal Penelitian Ilmu Sosial Dan
Keagamaan Islam, 12(1), 135–150.
Pebriana, P. H. (2021). Analisis keterbacaan buku teks siswa kelas IV pada tema I dengan menggunakan grafik fry. Jurnal Pendidikan Dan Konseling (JPDK), 3(1), 28–35.
Penick, J. E., & Harris, R. L. (2006). Teaching with purpose: Closing the research-practice Gap. NSTA press.
Pramuwibowo, A. B. (2015). Keterbacaan teks dalam buku “Bahasa Indonesia Wahana Pengetahuan.” Jurnal Pena Indonesia, 1(2), 240–259.
Puspita, L. (2019). Pengembangan modul berbasis keterampilan proses sains sebagai bahan ajar dalam pembelajaran biologi. Jurnal Inovasi Pendidikan IPA, 5(1), 79–88.
Soh, K. C. (2019). Readability formula for Chinese as a second language: An exploratory study. Frontiers of Education in China, 14(4), 551–574.
Sugiyono. (2017). Metode penelitian kuantitatif, kualitatif, dan RnD. Alfabet.
Sulistyanto, H., & Wiyono, E. (2008). Ilmu pengetahuan alam. In Jakarta: Pusat Perbukuan, Departemen Pendidikan.
Wang, Z., Zhao, X., Song, W., & Wang, A. (2019). Readability assessment of textbooks in low resource languages. Computers, Materials and Continua, 61(1), 213–225.
West, R. E. (2019). Developing an open textbook for learning and instructional design technology. TechTrends, 63(2), 226–235.
Widyaniingsih, N., & Zuchdi, D. (2015). Uji keterbacaan wacana pada buku teks bahasa Indonesia kelas V SD Negeri di Kecamatan Wonogiri. LingTera, 2(2), 144–155.
Xia, M., Kochmar, E., & Briscoe, T. (2019). Text readability assessment for second language learners. arXiv preprint.