

**READABILITY OF ENGLISH WRITTEN MATERIALS**  
(KETERBACAAN MATERI TERTULIS BERBAHASA INGGRIS)

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***Abstract***

*Cara terbaik untuk memastikan keterbacaan isi buku adalah dengan melihat prinsip-prinsip dalam menulis. Dalam teori, ini berarti menghindari banyak kata yang panjang suku kata, kata-kata yang tidak biasa, atau kalimat yang panjang dan canggung. Studi ini menganalisis bagaimana keterbacaan materi tertulis bahasa Inggris yang digunakan oleh siswa SMA dan faktor-faktor apayang mempengaruhi keterbacaan materi. Untuk menjawab ini, penelitian deskriptif kuantitatif telah dilakukan dan materi tertulis bahasa Inggris diambil sebagai subjek. Hasil menunjukkan bahwa Fog Index memberikan pengaruh positif bagi banyak orang termasuk pendidik, pustakawan, penerbit, dan bahkan siswa dalam memahami materi tertulis bahasa Inggris. Yang paling penting, memungkinkan kita untuk membentuk dan mengedit tulisan kita untuk pembaca tertentu.*

***Kata Kunci:*** *Keterbacaan, materi tertulis, fog index*

**Abstract**

The best way to ensure readability of the content is by look out for principles in clear writing. In theory this means avoiding many long syllable words, unusual words, or long and awkward sentences. This study analyzed how readable is English written materials used for high school students and what factors do the readability of written language affect. To answer these, a descriptive quantitative research has been conducted and the English written materials taken as a subject. It is found that The Fog Index provides numerous benefits for many people include educators, librarians, publishers, and even students. Most importantly, it allows us to shape and edit our writing for a particular audience.

**Key words:** readability, written materials, the fog index

## A. Introduction

It is important for writer to know that one of the major ways to have clearness of our writing is to write in a style that the reader can understand. A good writing style can considerably improve our ability to communicate ideas; we should always try to express ourselves as clearly as possible. But how do we know that what we are writing is at the right reading level for our audience?

On the other hand, teachers have to ensure that learners, who do not speak English as their first language, will be able to read and easily understand the content of their textbooks or materials. Therefore, contributions need to be written concisely and clearly. In this case some educators try to ensure the text readability by writing content at a reading grade one level below the school grade.

The best way to ensure readability of the content is by look out for principles in clear writing. In theory this means avoiding many long syllable words, unusual words, or long and awkward sentences. But if we want to keep more specific information, a way of measuring the complexity of writing such as the Fog Index (looking for 'fog factor') have to be considered.

Since the late 1940s, reading specialists have created several objective measurements of readability. The two most widely used scales are the Flesch Reading Ease Scale (Flesch 1948) and the Gunning Fog Index (Gunning 1968). The Fog Index, the simpler of the two, found by Robert Gunning. He developed this

“readability formula” to measure how hard something is to read and to find out if documents are written at reading level for their targeted audience. His Fog Index in *The Technique of Clear Writing* (McGraw-Hill) is considered the most reliable formula for testing our writing. It provide a means of calculating the reading or educational level required to understand a particular passage. The fog index does not determine the writing is too basic or too advanced for a particular audience as well it is not an index of how **good** your writing is, but of how **easy** it is **to understand**. Good writing is another subject, but all writing must be clear before it can be good. Unclear or confusing writing is an accessibility barrier to all readers. In the end, nearly everyone benefits from clarity and simplicity.

Based on the explanation above, this fog index is a good starting point for writer to have all the advantages of clear writing, even though some factors dealing with reading disorder or cognitive abilities should be compromised.

## B. The Theory about Readability of a Text

1. Readability is defined as reading ease, especially as it results from a writing style. Extensive research has shown that easy-reading text improves comprehension, retention, reading speed, and reading persistence. Examinations of text readability provide information in comparing appropriateness of text content, both semantic and syntactic, for

specific audiences or grade levels. Ease-of-reading is the result of the interaction between the text and the reader. In the reader, those features affecting readability are a. prior knowledge, b. reading skill, c. interest, and d. motivation. In the text, those features are a. content, b. style, c. design, and d. structure. The design can include the medium, layout, illustrations, reading and navigation aids, [typeface](#), and [color](#). Correct use of type size, line spacing, column width, text-color-background contrast and white space make text easy to read. When writing a textbook, a work-sheet or an examination paper, an author is intent on transmitting information to the reader. How well the author succeeds will depend on the readability of the text. Among language experts, readability is a score produced by a [readability formula](#), which is usually calibrated against a more labor-intensive [readability survey](#). The formulas are widely used to match texts with the reading level of the audience (See [Wikipedia](#) for more details).

2. Readability is concerned with the problem of matching between reader and text. The term readability refers to all the factors that affect success in reading and understanding a text such as the interest and motivation of the reader, the legibility of the print (and of any illustrations), the complexity of words and sentences structure in relation to the reading

ability of the reader. Among language experts, readability is a score produced by a [readability formula](#). Several mathematical methods are used to assess complexity and the suitability of books for students at particular grade levels or ages and they are known as readability formulas or readability tests. They all seek to assess the “reading age” required to understand written material. Some researcher use the term “reading age” to indicate the chronological age of a reader who could just understand the text. In considering the suitability of a book or a work sheet for a class, it is desirable to determine the reading age of the text, to see how well it matches the reading ages of students. In this case, there are four main methods of objective assessment:

- a. Question and answer technique  
Students of different ages are given the text to read. They are then questioned to gauge the level of comprehension and hence determine the reading age. This is usually unrealistic for practicing teachers.
- b. Sentence completion/Cloze procedure (1953)  
It based on the deletion of every fifth word. These sentence completion exercises are then given to the students to test comprehension and gauge the reading age. In short, the reader's ability to

fill in the blanks becomes the measure of the text's readability. This method is time-consuming.

- c. Comparison of text with a standard word list

It has rules for difficult words. The percentage of words not included in the Dale word list is determined and the reading age calculated from this. Well-known examples are the Dale-Chall and Spache tests (1948). For some teacher, this method is tedious.

- d. Calculations involving the sentence length and number of syllables.

Objective measures of readability are now widely used. They are formulae (or graphs) which based on an enormous amount of research evidence.

- 3. Measuring readability in a mechanical and quantitative way is an attractive idea, even though everyone knows that the factors that determine how easily something can be read are many and complex and vary from person to person. But about 50 years ago, writers and educators began trying to come up with a mathematical formula to compute the readability of written text (see T.M georges in analytical writing for science and technology)
- 4. A readability formula predicts the reading level of the text. This is expressed as a chronological age and is accurate to about  $\pm$  one year.

The reading level (reading age) predicted indicates that an average reader of that age could just cope with the text. However, readability formulas cannot capture cohesion or coherence—how well the writer communicates.

Research consistently shows that readers have less difficulty with cohesive text—even if they have measure at a higher-grade level. Nevertheless, there is a place for readability measurement. William DuBay commented that by the 1980s, there were readability 200 formulas and over a thousand studies regarding their statistical and theoretical validity. Here are a few of the more common tests:

Flesch-Kincaid (1939): A US Department of Defense standard test  
Reading Ease assesses adult materials; Grade Level scores upper elementary and secondary materials.

Fry Graph (1988) : For elementary through college material

FORCAS T Formula : This was devised for assessing US army technical manuals. It is NOT suitable for primary age materials. Because it is the

only formula that does not need whole sentences, it is suitable for assessing notes and multiple-choice questions.

Fog Index (1952) : Widely used for general business publications; appropriate for secondary and older primary ages.

McLaughl in SMOG : (Simplified Measure of Gobbledygook-1969). It predicts grade level required to comprehend scored text.

Powers-Sumner-Kearl Formula : This is the only one of the formulae suitable for primary age books. This test is NOT suitable for secondary age books, and is most suitable for material in the 7 - 10 age range.

### C. The theory behind Fog Index in writing

1. *Fog Index* is an effective measurement for the reading level of a written (Rose, 1999: 139). It is proposed by Robert Gunning from Robert Gunning Clear Writing Institute in Santa Barbara, California. This tool aimed for journalist who wrote in English but essentially, it works in any other language. It can be applied to any written piece to determine the grade level that it takes to understand the piece. It gives the number of years of education that the reader hypothetically needs to understand the paragraph or text. The Gunning Fog index formula implies that short sentences written in plain English achieve a better score than long sentences written in complicated language.
2. Most academic writing, however, is just plain awful. It is dull, pedantic, full of jargon and unnecessarily complex words and phrases, generally painful to read. Therefore the linguists offer the way out of this problem by quantify how bad the writing it is. They provide several objective measures of readability. These include Fog Index, the Flesch Index, and the Flesch-Kincaid Index, which estimate “how easy it is to read and understand the text of a book (see Peter Klein, 2006)
3. The Fog Index has been applied to the writing in many school publications, and to know whether the level is too high for the audience. How, for example, does an urban school district expect to communicate with parents of

underprivileged children when it sends out a newsletter aimed at the twelfth-grade or Harper's level? "The Technique of Clear Writing," by Robert Gunning (see McGraw-Hill: 1952) is recommended because it gives a complete explanation of the Fog Index and excellent advice on how to improve our writing.

4. Professional editors often use readability formulas to gauge how well writers are meeting an audience's reading levels, and one of the most famous of readability formulas is Gunning's Fog Index. Its premise is that the bigger the words you use and the more complex your sentences, the more difficult your prose will be to read. It enables writers to do some good old-fashioned counting. Along the way, we will become more aware of the role of the important stylistic factors. (see Guilford College articles)

#### **D. Some Previous Related Research Findings**

1. Linsear Write was developed for the Air Force to help them calculate the readability of their technical manuals. She found that The Canadians have developed an index that zeroes in on "it," "this," "there," and the word, "and," all considered lazy words. Better ways need to be found to write sentences. The calculation of the index also concentrates on prepositions, such as of, from, with, and by. These prepositions tend to make the sentence too long.

Also, prepositions can destroy the rhythm of the sentence.

2. Flesch Kincaid (2004) found that using fog index in writing process can help students to simplify their writing style
3. Using the Fog Index, Li found that the average readability score of an annual report was 19.4, much higher than a score of 12, which represents the reading level of a high-school senior and is often used as the benchmark by which text is believed to be widely comprehended. Li also found the annual report readability score to be 15.2 as measured by the Kincaid Index, nearly double the optimal score of between 7 and 8. Firms with more complicated annual reports have a lower persistence of earnings over the subsequent one to four years, even when they are profitable in the pertinent reporting year, according to Li's findings.
4. Substantial empirical researchers found that people have a 'preferred reading level' influenced by interest (in the subject matter), readability of the type (font size, color, etc.), sentence length and redundancy, format (spacing, illustrations, etc.), and conceptual density.

The research finding above showed that some practitioners were focused on how well the function of strategy or procedures used for measuring the readability of English written texts matched for identifying the students' reading level by grade. In this sense, the researcher wants to

investigate both of them. I wanted to see whether people (i.e., educators, librarians, publishers, students) know the importance of clarity of writing language. Writing in plain English does not mean we cannot share complex ideas. People are able to grasp complex science, as long as they make it relevant to their lives and use words they know or metaphors they can relate to. It helps to know target audience, how they live and what matters most to them (Marina Joubert).

People are more likely to understand the written text if the writers take the time to organize their thoughts and write them in the clearest, simplest form possible, taking into account the particular audience. I wanted to see if it was possible for students to be able to improve the conciseness of their writing so that theirs have greater impact. I was wondering this research able to give weight that bringing the students become independent appraiser of their own written work. There are various ways to measure the clarity of our writing, and in this thesis there will be a discussion about how to evaluate how clear the written materials are. By analyzing written texts, people are doing more than just making sure that those passages are easy to understand. People are also developing a better understanding of which aspects of written materials we need to be alert to. In order to maximize understandability for people with cognitive disabilities, people should lead their writing to the principles of clear statement proposed by Robert Gunning.

## **E. Methodology**

This paper presents a crucial test of the unintelligibility and illiteracy of written English. Such a test requires the use of readability formulas which have been familiar to many language experts. These techniques, however, have been employed for a variety of purposes. In educational research, readability measures have been used to assess the difficulty of textbooks intended for primary and secondary school students, while media researchers have employed them to ensure that television programs do not exceed certain minimal standards of comprehensibility (i.e., that programs requiring more than a sixth grade education for comprehension are automatically cancelled).

There is a long history of concern for the clarity of textual materials or of other technical writing. The earliest attempt at an operational definition of "readability" was apparently Lively and Pressey's (1923) "weighted median index number" which combined "vocabulary range," "index of difficulty," and "zero-valued words" into a single readability formula. Since that time, there has been a proliferation of alternative measurements, all of which have in common the intent to provide "quantitative, objective estimates of the style difficulty of writing" (Klare, 1963:3). These instruments all map the same theoretical territory, so researcher have chosen to employ the Gunning "fog index" because the fog index has become something of a standard tool

for analyzing textbooks and technical writing (Mullins, 1977).

#### **F. Subjects**

The subjects employed are pieces of passages on either the textbooks, work sheets for class or other technical writing (e.g., students' composition, etc.).

#### **G. Instruments**

There are many factors which affect any reader's comprehension of what people write. Various means of measuring readability have been developed. These are not 'quality measures' but related to the 'reading age' of the text. To collect data, the researcher used the Gunning fog index to analyze whether the English written materials are readable or not.

#### **H. Design**

To be a reference for control the research, it needs to decide a research design. The design accord with the type of research, variable of research and technique of data analysis that has been employed. This study analyzed how readable is English written materials used for high school students and what factors do the readability of written language affect. To answer these, a descriptive quantitative research has been conducted and the English written materials taken as a subject.

#### **I. Procedures**

- a. Pick a continuous piece of writing of approximately 100 words. It could be from a

textbook, or other technical writing

- b. Do readability test using fog index formula
- c. Assess the difficulty level of the written texts to know whether it addressing to the right target age

#### **J. Data Organization**

Researcher has employed a descriptive quantitative study into several English written materials of English and Literature Department. Textbooks or other written English sources has been analyzed for its readability standards. Actual readability was measured with the Fog Index, which assigns a score on the basis of the minimal grade level required to read and understand English text (range, 0 to 12). Data on the level of reading grade were obtained from typical scale of Fog Index.

#### **K. Statistical or Analytical Procedures**

Robert Gunning, a pioneering consultant in readability, established a business in the 1940s to improve the readability of newsprint. His mission was to make newspapers as widely accessible as possible, bringing them down from a college senior reading level to the 11th grade level which is the most commonly applied standard today. Gunning (1968) developed the fog index as a measure of grade level required for understanding textual material or other technical writing. The index is computed in the following manner:

1. Select Written Sample



A continuous piece of writing of approximately 100 words picked. The samples were usually be taken from one manuscript.

**2. Determine Average Sentence Length**

Count the number of words and sentences in the sample. Divide the total number of words (N) by the number of sentences (S) to obtain average sentence length:

$$N / S = ASL$$

**3. Determine the Number of Hard Words**

Gunning defined a "hard" word as one with three or more syllables.

- Count a hard word only once if it appears multiple times in your sample. If a hard word appears in various forms (-s, -es, -ed or -ing) count it only once.
- Count four (or more) syllable compound words like undercover or anybody.
- Do not count proper names or initials (Kathy E. Gill is two words but nothing is counted); acronyms (USDA is ignored also); or abbreviations (WA), alpha-numeric strings (1600 Pennsylvania Ave.) or common symbols.
- Do not count three-syllable compound words like bookkeeper or afternoon.
- Do not count two-syllable words that end with -s, -es, -er, -ly, -ier, -ily.

**4. Calculate the Percentage of Hard Words**

Use this formula and round off the answer to the nearest tenth:

$$100 \times H / N = PH$$

where H = number of hard words

where N = total number of words

where PH = percentage of hard words

**5. Find the Gunning's Fog Index**  
**Gunning's final formula:**

$$0.4 (PH + ASL) = \text{Gunning's Fog Index}$$

The result was translated into fog index level as an indication of the number of years of formal education that a person requires in order to easily understand a particular paragraph or text of English writing on the first reading. It is the reader's *reading level*" (the grade level of readership). Different types of writing calls for different scores. The "ideal" score is 7 or 8; and above 12 is too hard for most people to read. It assumes that the bigger words we use and the more complex our sentences written in plain English, the more difficult document will be to read.

**The readability scale**

- 0 to 13 = very easy
- 13 to 20 = easy
- 20 to 29 = fairly easy
- 29 to 36 = standard
- 36 to 43 = fairly difficult
- 43 to 52 = difficult
- 52 and above = unreadable

Scale	Reading Level by Grade
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<10	This is the level people should aim for when writing for most online publications (6= Sixth grade, 7= Seventh grade, 8= Eight grade, 9= High school freshman)
10	The average 15-year-old should be able to understand this level of writing (High school sophomore)
11-13	This writing can be understood by the top 20% of 16-year-olds (11= High school junior, 12= High school senior, 13= College freshman)
14-16	A first year college student should be able to understand this level of readability (14= College sophomore, 15= College junior, 16= College senior)
17-20 (+)	This writing requires a university graduate standard of comprehension. (College graduate)

Philip Chalmers of [Benefit from IT](#) provided the following typical Fog Index scores, to help ascertain the readability of documents.

### Typical Fog Index Scores

Fog Index	Resources
6	TV guides, The Bible, Mark Twain
8	Reader's Digest
8-10	Most popular novels
10	Time, Newsweek
11	Wall Street Journal
14	The Times, The Guardian
15-20	Academic papers
Over 20	Only government sites can get away with this, because you can't ignore them.
Over 30	The government is covering something up

### A. Results

The Fog Index provides numerous benefits for many people include educators, librarians, publishers, and even students. Most importantly, it allows us to shape and edit our writing for a particular audience.

- (1) Allow the learners to serve the fog index as an early warning system so they know that their writing is too dense. This formula can give a quick, on-the-spot assessment. It has been described as "screening devices" to eliminate dense drafts and give rise to revisions or substitutions on plain writing process.
- (2) Enrich the teacher's knowledge that readability tests in some organizational settings with the appropriate model of Fog Index, are considered useful to show measurable improvement in written documents. They provide a quantifiable measure of improvement or simplification as well it applicable in identifying readability of English written materials.
- (3) For general purposes, readability test using Fog Index can at least provide some basic feedback and give authors a general idea of how readable their documents are. The tests were also intended to help educators, librarians and publishers make decisions about purchase and sale of books. They were also meant to save time because before the formula was used those

decisions were made on recommendations of educators and librarians who read the books. These people were taking books already written and figuring out who were the appropriate reading groups

### **M. Limitations**

- a. Low writing styles can result from a slavish use of readability indexes—a monotonous succession of short sentences and simple words can make your writing dull and uninteresting to read.
- b. Regarding the exceptions for words with three syllables or more, there are some sources that claim that compound words (closed and hyphenated) should also be excluded. Of course, this would apply only to compound words that are three or more syllables after being joined. If one of the words alone already exceeds three syllables, presumably the rule would not apply.
- c. Indexes frequently give conflicting results. The Fog Index rating supposedly indicates the number of years of formal education required to read a piece of writing. In theory, the higher the Fog Index rating, the more difficult a passage is to read. However, it is important to remember that a passage with a lower Fog Index will not only appeal to less educated readers. A Fog Index of between 7–8 is probably the most accessible to the widest audience. A passage may be more or less readable depending on how well written it is, *regardless of the Fog Index*. In other words, sometimes a passage with a higher Fog Index rating is more readable than a passage with a lower Fog Index rating.
- d. Obviously, readability formulas cannot measure features like interest and enjoyment. Readability formulas cannot measure how comprehensible a text is, whether a text is suitable for particular readers needs. They cannot take into account the variety of resources available to different readers. They cannot measure the circumstances in which the reader will be using the text or form - both the psychological and the physical situations. Readability formulas are considered to be predictions of reading ease but not the only method for determining readability. And they do not help us evaluate how well the reader will understand the ideas in the text.
- e. Researchers have emphasized that readability tests can only measure the surface characteristics of text. Qualitative factors like vocabulary difficulty, composition, sentence structure, concreteness and abstractness, obscurity and incoherence cannot be measured mathematically. They have pointed out that material which receives a low-grade level score may be incomprehensible to the target audience. As an example, they suggest that you consider what happens if you scramble the words

in a sentence, or on a larger scale, randomly rearranged the sentences in a whole text. The readability score could be low, but comprehension would be lacking.

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