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## TEXT READABILITY

Print is one of the most popular and effective means of communication. The extent to which printed material has the potential for effective communication between author and reader may be referred to as its readability. Newspapers, books, leaflets, technical reports, etc are all used to communicate information, ideas and opinions. The extent to which the authors of these printed materials communicate to their readers depends on two groups of factors, namely, the reader factor and the print factor. Learning how to evaluate printed material for its readability, that is, its ability to communicate is important. For example, newspaper editors and others in the journalism profession need to recognise the difference between articles which convey ideas, and those which merely confuse the reader. Educators may need to select textbooks for schools, and will need to evaluate them, not only for content, but also for their ability to communicate information to readers.

## **FACTORS AFFECTING READABILITY**

### **Reader Factors**

The first important reader factor is background knowledge. That is the familiarity of the topic to the reader. Another important aspect of background knowledge is the reader's facility in the language of communication. For example, legal documents are very difficult to comprehend by readers outside the legal profession, as the terminology and language structure used are not familiar.

The reader's purpose for reading is also an important factor in readability. The reader's purpose for reading affects his motivation, which is his willingness to persevere even when the reading task may be difficult. When a reader has a clearly defined purpose for reading he is more likely to direct his focus towards gaining specific information. For maximum comprehension, a reader's purpose for reading must be to use the information gained for something personally meaningful.

One other important element in readability is reader interest. It is common knowledge that we do quite well at getting information from materials on a topic we are especially interested in. A strong interest often compensates for a lack of reading ability or for text difficulty.

A final but critical reader factor is the reader's own concept of the reading process itself. If reading is perceived as the act of pronouncing words to somebody, or to oneself, then comprehension may suffer. Since in such a situation, the reader is not

looking for ideas he is not likely to find any. On the other hand; a reader who understands reading to be an active interaction between the author and himself is more likely to comprehend effectively.

### **Print Factors**

Print factors which affect readability include physical characteristics of the text such as size and quality of print, number of illustration and diagrams, etc. Overcrowding of words on a page tends to inhibit readability. On the other hand, wide margins and frequent use of bold print titles and subtitles, attractive lay out and use of colours improves the readability of the material. Margin notes, indicating main points, also improve the readability of difficult textbook material.

Probably the most important print factors, however, are the responsibility of the writer. Two key factors, which are controlled by the author, are vocabulary load and grammatical complexity. Readability is impaired when a high proportion of the vocabulary in a text is likely to be unfamiliar to a reader.

The second print factor, which is largely controlled by the author, is grammatical complexity. Long and complex sentences increase the reader's processing load. Sentence length. Easy materials generally contain short, simple, sentence with few prepositional phrases and clauses.

## TEXT DIFFICULTY IN NIGERIA

A number of studies have been carried out to compare text difficulty with reading levels of various ability to comprehend secondary school textbooks. Oyetunde (1987) investigated the ability of Junior Secondary School students to read a selection from a science textbook meant for their class level. Sixty form Two students were given a cloze version of a passage taken from their class Two Integrated Science Text. Analysis of the test, was based on Bormuth's (1968) criteria, which assigns students' percentage scores to three performance levels. The results revealed that for 75% of the pupils, the passage was on the lowest of the three performance levels, the frustration level. For 21% of the students the text was on instructional level, and for only 5% it was on independent level. This means that only 5% of the students could be expected to read the text profitably on their own. Twenty one percent would need teacher's assistance to profit from the passage. But for the 75% for whom the text was on frustration level, the students would not be able to make sense of the text at all.

A similar study was carried out by Ijezie (1985) using four different history textbooks with 160 form four and five students in Niger State. She found that there was a significant difference in the difficulty levels of the various textbooks based on student performance on cloze versions of passages drawn from the books. For example, she found that only 7.5% of the students were able to read the most difficult

textbook at independent level. On the other hand, another text, which covered the same content, was on independent level of 40% of the students. Students' ability to read history textbooks was also investigated by Okpanachi (1982) who used oral and written tests with 400 forms four and five students in Jos schools. The tests showed that the students had difficulty following the texts meaningfully. The author suggested that students' vocabulary knowledge and command of English syntax did not seem to match the demands of the texts.

The studies reviewed above would seem to lend credence to the general belief by secondary school teachers that some texts used in schools are not at the appropriate readability level of the target population.

Readability formula measures the two print factors. These two factors are vocabulary load and grammatical complexity. There are a number of different readability formulas used with the English language. They each use slightly different techniques for measuring these two variables.

Vocabulary load as usually measured in one of two ways. The first is by determining how many words in the sampled text are not on a list of high frequency words. The rationale here is that words common, encountered by a reader are easier to read than words which do not occur frequently. The Spache Formula (1983) is an example of a formula that uses a word list. The second way to assess vocabulary load is by measuring word length. This is done either by counting the number of syllables in a

word, as in the Fog Index (1952/68) or by counting the number of letters in a word, as in the RIDE Scale (Carver, 1974).

In English, there is a high correlation between word length and word frequency. Therefore, measuring word length eliminates the need to use a high-frequency word list.

Grammatical complexity is usually measured by sentence length. However, more sophisticated measures may involve counting phrases within sentences such as with the syntactic complexity formula (Botel & Granowsley, 1972).

The readability formula which should be of interest to the Nigerian teacher is the Fry Readability Formula (1977) which was specifically designed for use in English speaking African countries. Like most other readability formulas, it expresses readability levels in class levels, indicating approximately which level of schooling is required by the reader in order to comprehend the material easily. However, most readability formulas use American or British class levels which may not be applicable in African countries where the vast majority of children first learn English in school. The Fry Formula, on the other hand, uses both American class levels and also textbook levels as reference points. Using this formula it is possible to compare sampled text material with the level of difficulty of each of the *Oxford English Readers for Africa*. Fry cautions, however, that his formula should be considered an estimate. He

suggests other formulas for those who are interested in greater precision.

Readability formulas are most useful in comparing the relative difficulty of one book, or other written material, with another. For example, a textbook with a mean readability level of 5 should be much easier to read than one with a mean readability of 10. If the two books contain basically the same content, the book with the lower readability level would be preferred since it would be suitable for more students.

It is important to recognise that readability formulas cannot be used to match textbooks, or other reading materials with a specific group of readers unless the reading ability of those readers is also known. A Form One teacher, for instance, should not assume that all materials with a readability of class 7 (Form One) is appropriate for the students in his class.

On the other hand, if a form one General Science teacher, for example, has observed that three-quarters of his students can read a particular science textbook comfortably he can use the formula to find out the readability level of that particular book. He can then apply the same formula to any other reading material he is considering using with those same students. If he finds material with the same readability level as his textbook, he can be confident that three – quarters of his students will also be able to read that. If he finds that some material has a lower readability

level than the textbook, he can be fairly sure it would be suitable for even more students.

In Nigeria, readability formula has been used more for research than for practical application. The research that has been done has demonstrated the effectiveness of the use of the formulas for a variety of purposes. A few examples will now be presented.

Odejide (1986) used the Flesh Reading Ease Formula in her study of the readability of Nigerian Newspaper articles. She found that the editorials of the *Daily Times* of Nigeria tend to require a higher level of education of their reader than those of the *New Nigerian*. Based on the Flesh Formula, which incorporates a human interest element along with measurement of sentence length and vocabulary load, she found that 82% of the *Daily Times* Editorials and 70% of the *New Nigerian editorials* required a post primary education to be read. Odejide expressed concern over the level of difficulty of editorials in government-financed newspapers.

Readability formulas have been applied most often to textbooks as part of educational research. Etim and Umolu (1983) used three different formulas to determine the readability levels of four different secondary English textbooks. They found that, according to the formulas, the books are of about the right level of difficulty for the classes in which they were used. However, when students were tested on their ability to read selections from these textbooks, it was found that the passages were on the frustration level for at least 30% of the students. The authors did



not interpret this finding as a need to reject readability formula. Rather, they point out the importance of considering the second language factor in interpreting readability levels for use in Nigerian schools. Their findings suggest that the first year of serious English language teaching should be counted as the equivalent of readability level of 1. In some cases, then, a readability level of 1 may better correspond with primary 4, when, children first begin to learn to read in English.

Oyetunde (1985) used three different formulas to analyse the readability levels of three primary school English courses – books. Among other findings, he observed, “What seems to be a lack of graduation in the difficulty levels of the three texts analysed.” (p.33). For example, he found that passages in Book four of one series range in readability from class 4-7 while Book Six of the same series ranges from 3-6. He recommends the use of readability formulas by teachers in order to identify potentially difficulty textbooks.

The readability of locally developed science materials has been a concern of a number of researchers. Jegede (1985) reviewed his own work and that of others who applied various readability tests to primary and secondary level science textbooks. He concludes, “The trend of results emerging from these studies of readability of science curriculum materials developed in Nigeria seems to suggest that our science materials cannot be satisfactorily read by the majority of the students they are meant for.” (p.265).

Readability formulas have also been employed in the preparation of materials for remediation of reading difficulties. Umolu (1985) used the Fog Readability Index to match readability levels of passages in *Straight for English* with both oral and cloze reading passages written for use in her *Informal Reading Inventory*. This matching of readability levels has made it possible to use the inventory to determine which book level of *Straight for English* is appropriate for individual children.

## **READABILITY FORMULAS**

Readability formulas are means of identifying the factors that make materials difficult to read. Most readability formulas measure two variables, namely sentence complexity and vocabulary load. The scores given by readability formulas are estimates of text difficulty, and not absolute levels; for there are many factors that can make a text easy or difficult to read.

Among the best known readability formulas available for teachers' use are Fry Readability Graph (1968), Gunning's Fog Index (1968), and SMOG Grading Index. Let's now discuss how to use these three formulas for estimating text difficulty.

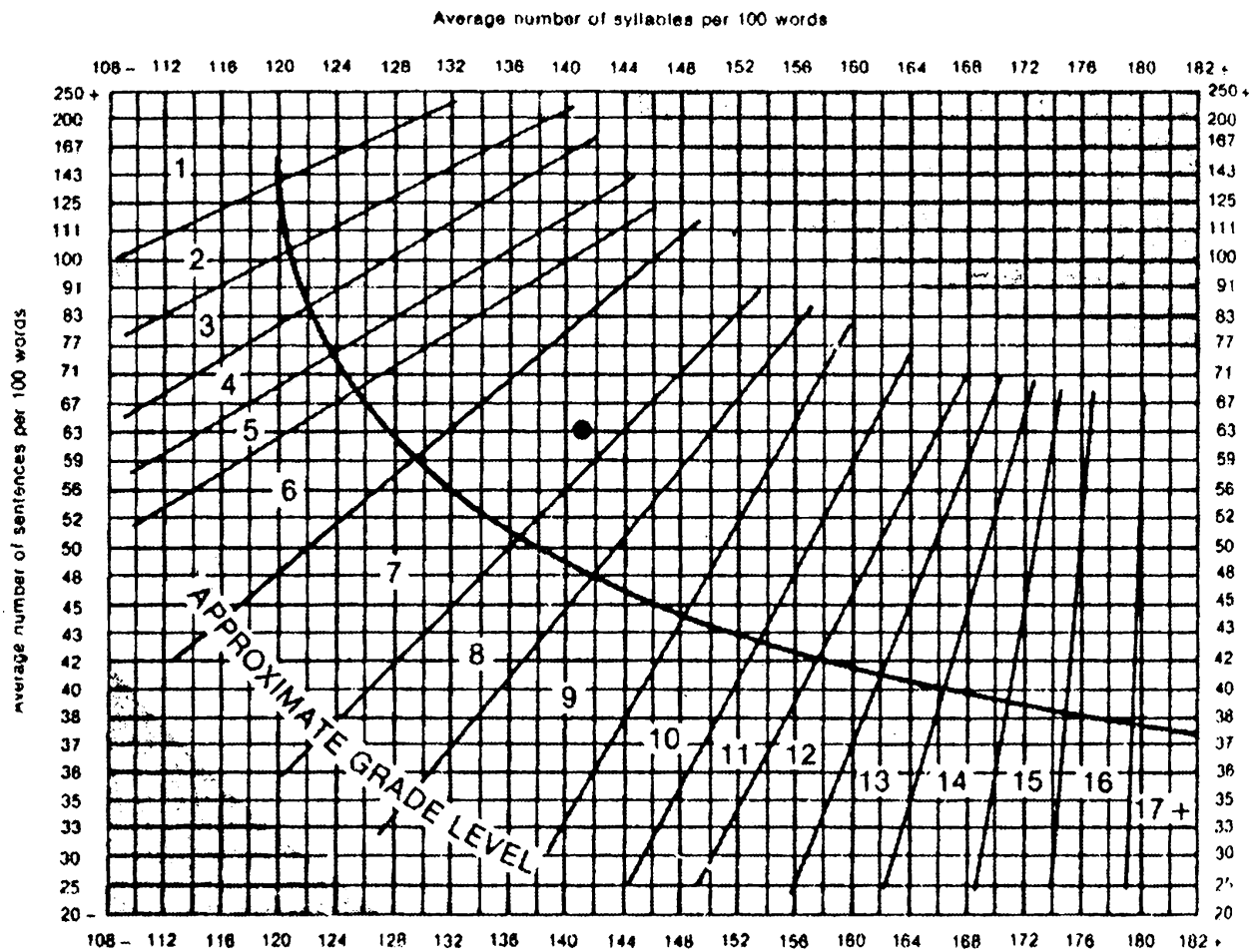
### **The Fry Readability Graph**

The following steps, according to Vacca and Vacca (1989, p.52), are involved in using the Fry Readability Graph. (See a sample of Fry's graph at the end of this section.)

1. Randomly select three (3) sample passages and count out exactly 100 words each, beginning with the beginning of a sentence. Do not count proper nouns, initializations, and numerals.
2. Count the number of sentences in the hundred words, estimating length of the fraction of the last sentence to the nearest one-tenth.
3. Count the total number of syllables in the 100-word passage. If you don't have a hand counter available, an easy way is to simply put a mark above every syllable over one in each word, then when you get to the end of the passage, count the number of marks and add 100. Small calculators can also be used as counters by pushing numeral 1 then push the + sign for each word or syllable.
4. Enter graph with *average* sentence length and *average* number of syllables; plot dot where the two lines intersect. Area where dot is plotted will give you the approximate grade level.
5. If a great deal of variability is found in syllable count or sentence count, putting more samples into the average is desirable.
6. A word is defined as a group of symbols with a space on either side; thus, 1945, is one word.
7. A syllable is defined as a phonetic syllable. Generally, there are as many syllables as

vowel sounds. For example, *stopped* is one syllable and *wanted* is two syllables. When counting syllables for numerals and initializations, count one syllable for each symbol. For example, 1945, is four syllables.

## Fry Readability Graph



## The Fog Readability Index

In using the Fog Readability Index, take the following steps:

1. Take 3 100-word passages, one from the beginning, one from the middle, and one from the end of the text.
2. Count the number of words in each passage that is polysyllabic. Do not count proper names, compound words or verb forms that become three syllables by adding “-ed” or “-es”.
3. Determine the average sentence length of each passage. For a partial sentence, estimate the percentage that is included in the 100-word passage.
4. Total factors 2 and 3 (i.e. the number of polysyllabic words and the average sentence length), and multiply the sum by 0.4. The result is the Fog Index for that passage. The score (Fog Index) represents the approximate level of education needed to read the passage.

The Fog Index formula is summarized thus

Number of difficult words: \_\_\_\_\_

Average sentence length: \_\_\_\_\_

Multiply by 0.4.

Level of difficulty according to index” \_\_\_\_\_

### **The SMOG Grading Index**

The following are the steps to take in using the SMOG Grading Index:

- a. Select 30 sentences (10 at the beginning, 10 at the middle and 10 at the end of the text).
- b. Count each word that is polysyllabic.

- c. Extract the square root of the total number of the polysyllabic words.
- d. Add the number 3 to the figure obtained in (c).

### **The Cloze Procedure**

The cloze procedure is not a readability formula, but it has been found to be a very useful tool for assessing text readability. This procedure, which was originated by Taylor in 1953, “determines how well students can read a particular text or reading selection as a result of their interaction with the material” (Vacca & Vacca, 1989, p.51). This cloze procedure should be seen as an alternative to a readability formula because it gives an indication of how students will actually perform with course materials (Vacca & Vacca, 1989, p.54). Vacca and Vacca highlight what the cloze procedure involves and its value as follows:

...a method by which you systematically delete words from a text passage and then evaluate students' ability to accurately supply the words that were deleted. An encounter with a cloze passage should reveal the interplay between the prior knowledge that students bring to the reading task and their language competence. Knowing the extent of this interplay will be helpful in selecting materials and planning instructional procedures. (p.51)

The following steps are given by Vacca and Vacca for constructing, administering, scoring, and interpreting a cloze test.

### 1. **Construction**

- a. Select a reading passage of approximately 275 words from material that students have not yet read, but you plan to assign.
- b. Leave the first sentence intact. Starting with the second sentence, select at random one of the first five words. delete every fifty word thereafter, until you have a total of 50 words for deletion. Retain the remaining sentence of the last deletion word. Type one more sentence intact. For children below grade four, deletion of every tenth word is often recommended.
- c. Leave an underlined blank fifteen spaces long for each deleted word as you type the passage on a ditto master.

### 2. **Administration**

- a. Inform students that they are not to use their textbooks or work together in completing the cloze passage.
- b. Explain the task that students are to perform. Show how the cloze procedure works by providing several examples on the board.
- c. Allow students the time they need to complete the cloze passage.

### 3. **Scoring**

- a. Count as correct every exact word students apply. Do not count synonyms even though they may appear to be satisfactory. Counting synonyms will not change the scores appreciably, but it will cause unnecessary hassles and haggling with students. Accepting synonyms also affects the reliability of the performance criteria since they were established on exact word replacements.
- b. Multiply the total number of exact word replacements by two in order to determine the student's cloze percentage score.
- c. Record the cloze scores on a sheet of paper for each class. For each class you now have one to three instructional groups that can form the basis for differentiated assignments.

### 4. **Interpretation**

- a. A score of 40 – 60% indicates that the passage can be read with some competence by students. The material will challenge students if they are given some form of reading guidance.
- b. A score of 60% or above indicates that the passage can be read with a great deal of competence by students. They may be able to read the



material on their own without reading guidance.

- c. A score below 40% indicates that the passage will probably be too difficult for students. They will need either a great deal of reading guidance to benefit from the material or more suitable material.