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Readability and Comprehensibility Analysis of the English Language Comprehension Passages of the West African Senior School Certificate Examination in Ghana

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Abstract:

In recent years, students in the high schools in Ghana continue to perform poorly in English Language examinations, especially for students at the West African Senior School Certificate Examination (WASSCE). Various stakeholders in the education sector continue to deliberate to find answers to this unfortunate development. Some scholars have suggested that students' failure in the English Language examination is as a result of the readability and comprehensibility levels of the comprehension passages presented to students in their examinations. English language examination questions that cannot be read easily cannot be well understood. Determining the level of readability is of great importance if comprehension is aimed at. The authors made use of two Readability Indexes which include the Flesch-Kincaid Reading Ease and Gunning Fog Scale to carry out document analysis of the reading ease of seven comprehension passages presented to candidates from 2014 to 2020 in the WASSCE, to carry out the readability analysis and how that may have affected their Comprehensibility. The key findings from this study indicate that the readability of the comprehension passages analyzed between 2014 and 2020 was either very difficult or difficult for the students to comprehend. In conclusion, the researchers believe that the high level of readability of the comprehension passages has partly contributed to the low pass rate of the student in the English language at the WASSCE.

Keywords: Readability, comprehensibility, students, stakeholders, Ghana

1. Introduction

Readability entails linguistic characteristics of texts that are capable of influencing how a reader will successfully read and comprehend written information. There is a difference between readability and legibility. Legibility involves the actual ease through which a text can be read and understood. The readability level of a given text is a pointer towards the textual difficulty level of a text and the level of suitability of the text to the people of a given age or grade level who read it. For a given text, it is always fixed and does not change based on reader characteristics (Zamanian, & Heydari, 2012; Wissing, Blignaut, & Van den Berg, 2016; McLaughlin, 1969, p. 640).

During the text selection, readability is an important element in text selection because the ultimate goal of reading is understanding the written information. It is also very ideal for instructors to consider other personal and social factors in administering comprehension tests to students to get maximum feedback from the students. In a nutshell, the notion that "readability index analysis alone cannot determine readers' comprehension of a text" is rightly in place (Benjamin, 2012). While Wissing, Blignaut, & Van den Berg, (2016) see no difference in readability and understandability, researchers like Bansiong, & Wan, (2019); Smith and Taffler 1992: 85) bring out a clear difference between the two. According to the latter, there is a similarity between the two but they are intrinsically different in their own way. Accordingly, Smith and Taffler, (1992: 85) points out that it is not right to treat both readability and understandability as synonyms. This is because they have a marked difference that exists between the two concepts. On that note, Wray and Dahlia, (2013) add that readability is a characteristic of a text and understandability indicates the ability of the reader to pick a meaning out of a text. And even though a text has to be readable so as to be understandable, the level of comprehensibility is affected by both syntactical difficulty and the characteristic of a reader such as their background, prior knowledge about the issue, interest and reading ability (Jones, 1997, p. 106).

Besuglov, & Crasselt, (2020) argue that there is a considerable relationship that exists between text readability and academic achievement. According to them, readability can be used to foresee the kind of student who is likely to experience difficulty in terms of academics especially in technical subjects such as accounting. The objective of this study is analysis the readability levels of the comprehension passages of the West African Secondary School Certificate Examination (WASSCE) for School Candidates in Ghana between 2014 to 2020 and how the readability levels had affected their comprehensibility in the English language.

2. Literature Review

2.1. Readability Index Analysis

Readability indexes should not be considered as the only means of evaluating the level of comprehension difficulty of a text. Other factors are also extremely significant in defining the level of readability of the text (Crossley, Greenfield, & McNamara, 2008). Whereas some of these are text-centered, others are reader-centered. Some text-centered issues that determine the level of readability of a text include font type, font size, and legibility of print, diagrams, tables, charts, graphs, and several others. Reader-centered factors include issues such as the level of interest, motivation, and even area of study of the reader. Whereas readability analysis involves quantifying in mathematical terms the level of reading comprehension difficulty of a text, these other reader-centered and text-centered factors that influence readability cannot be quantified mathematically (Wray, & Dahlia, 2013). This therefore implies that readability is a prerequisite for understanding but not always the case. It is believed that "Comprehension is a complex concept which covers multiple behavioural and cognitive factors" (Gyasi, 2018; Wray, & Dahlia, 2013).

The difficulty and familiarity of words, together with the length of a sentence can be an essential indicator of reading difficulty. The level of difficulty of individual words which are used in a text is able to determine the ability of the reader to understand the text. In most cases, word difficulty is dependent on both the length and familiarity of a word. It is assumed that longer and less familiar words can be harder to read compared to shorter ones. However, there are some level of exceptions where technical words that may be shorter and unfamiliar. The familiarity of the word's ranking in word frequency lists. A relatively large proportion of English text is made up of a relatively small number of English words, meaning that these words are very familiar. Frequency of use varies between different nationalities and different age groups, which consequently reduces the value of word frequency as an indicator of word familiarity. In addition to these two factors, sentence difficulty also impacts readability. As a rule, longer sentences are harder to read than shorter ones. However, shorter sentences may contain concepts that are complex and difficult to understand, while longer sentences may provide more helpful clues to the meaning being conveyed. Cohesion and coherence within a text may aid readability for those readers with sufficient reading skills (Gablasova, D2015; Laufer, 1997, pp. 140-155; Wray and Dahlia, 2013, pp. 74-76).

The extent to which the writer shares meaning with the reader can be enhanced when the writer takes the lexical, textual, and background knowledge of the reader into consideration while composing the text (Allen, et al., 2014; Crossley, et al., 2017). However, this may be near impossible with texts published and prescribed globally. Therefore, the selection of the text must be conducted thoughtfully. At the same time, care should be taken not to oversimplify language in an attempt to improve readability. While shorter sentences and words with fewer syllables are considered easier to read, simple language might not foster the development of complexity in mental models where such complexity is necessary to deal with complex situations and course content.

The absence of sentence complexity in the prescribed texts read by students may also have a negative impact on students' the capability to bring out the complexities in their writing (Deane, 2018; Jagaiah, Olinghouse, & Kearns, 2020). Heilke, Joslyn, & Aguado, (2003) suggested that readability has to be one of the prime measures for the selection of a textbook. Though there exist other factors that influence the course of action, apart from readability, the level of academic performance as well as student retention capabilities goes down as textbooks become difficult to read. According to Redish, (2000) and Rush, (1985) readability formulae may not necessarily define the actual readability and therefore, should not be used unguardedly because actual readability is not just a simple function that can be objectively used to measure properties like a word or the length of a sentence. The length and grammatical complexities of a sentence (syntax) and the level of difficulty of words, measured in several syllables (semantics), in most cases, are used in calculating the level of indices of readability. However, the calculated indices of readability take no explanation of the various text aspects as well as the characteristics of the reader like skill, level of motivation, and experience (Redish, 2000; Rush, 1985; Bargate 2012).

Several objectives influence readability, for instance, "the explicitness of connection between clauses, the extra sentential, pragmatic factors of discourse and sentence topic and focus, the inference load placed on a reader, the epistemological status of statements, and finally, the appropriateness of vocabulary for a particular audience reading with limited background knowledge" According to Simpson, Wu, & Li, (2016); Ellert, (2013); Kodom, (2013) concept density, the nature of the complexity of ideas, abstraction level, the extent through which the ideas are armored and the effects of the writing style of the writer and the reader's interest including use of active voice, illustration as well as several other factors play a great role in influencing readability. Inappropriateness of the use of readability formulae, where understanding is based on whether or not readers are familiar with specific terminologies is also highlighted. Though all the criticisms are valid, it is important to note that the formulae are essential in predicting the understanding of the reader, oral reading errors as well as the willingness to proceed with the reading.

2.2. Readers Comprehensibility of Text

There is a major difference between readability and comprehensibility; however, they are interdependent in most cases. Gyasi, (2018); Jones, (1997) point out that readability refers to an attribute of text that has to be read while comprehensibility refers to the attribute of a reader. Readability mainly dwells on textual difficulty. On the other hand, comprehensibility mainly looks at the interaction in a text, the reader, the tasks involved, and the strategy variables. From a common viewpoint, it may seem obvious that besides sentence length and the complexity of the vocabularies, several factors contribute towards the degree of comprehensibility.

Readability may result in incomprehensibility but not necessarily (Gyasi, 2018). Bachman, (1990) on his part argues that issues such as personal characteristics, load of vocabularies, the complexity of syntactic as well as topic comprehension play a great role in the understanding of text. It means therefore that text comprehension could be affected, to a large extent, by individual characteristics such as fatigue, unexpected shift in mood which little can be done to accommodate. However, there are three different characteristics whose effects on text comprehensibility and the performance are understood that should be put into consideration when designing and developing the use of language test text. These individual characteristics include the following; Personal characteristics such as age, sex, and native language, Topical knowledge, and Affective schemata. Personal characteristics are the influence of the individual attributes one's ability to comprehend a text. Cohen, (1994) discusses these in the context of language testing and provides a list of test-taker characteristics that include age, foreign aptitude, socio-psychological factors, cognitive style, language use strategies, ethnolinguistic factors, and multilingual ability. He suggests that, in any test development project, the developer will need to develop a specific list of personal characteristics that to be considered in terms of their potential contribution to the comprehensibility of the test items. Topical knowledge in this sense is referred to as a person's prior knowledge or experience of the subject area. For example, a person who has no background knowledge of finance and economics will find it difficult to fully comprehend any document on this subject, especially when the document bothers on technicalities of the field. Even though such a document may be readable, the lack of background knowledge by the reader could impede his/her comprehensibility of the document. Affective schemata relate to the way an individual will respond or react to an emotional issue or topic. For example, if a teacher gives a comprehension passage on abortion, monogamy, or alcoholism to students who are predominantly Muslims, they are most like to get emotional and even forget that they are in an exam situation and that can affect their understanding of the content of the passage. In such a situation, the passage may be readable, but the affective schemata of the students in that particular circumstance can affect their comprehensibility of the text (Cohen, and Rence, 1994 Gyasi, 2018; Gyasi, 2013; Behnam, & Nahvi, 2013).

Cao, (2014) conclusively defines comprehensibility as "the listener's understanding of the level of difficulty one has to go through in comprehending and L2 speaker". According to Crossley, Salsbury, & Mcnamara, (2014), Cao (2014), comprehensibility is more "contextual" and often construed as listeners' ability to "interpret the meaning of messages" can be determined through answering comprehension questions finding a summary of the contents of the messages. Scholars have found it hard to conclude what linguistic variables contribute towards comprehensibility. They have attributed this to the various languages that are under study and the different methodologies that are used by the researchers. Cao, (2014) notes that researchers tend to believe that understandability is co-constructed by the person speaking or the one listening and this is based on the interaction that exists between the speaker, the listener, the prevailing social context as well as the environment (Abrahamsson, 2012).

The font size of a text and time allotted within which to complete a task on a text can also affect comprehensibility. In research by Fuchs, Heyer, & Langenhan, (2008) titled "Influence of Font Sizes on the Readability and Comprehensibility of Package Inserts", font sizes determine the readability comprehensibility and could greatly affect the way patients administer medications. For instant, the ability of a participant to locate and fully understand information that is printed in 9-12-point font sizes are higher and quicker compared to small or large versions. According to the findings, there were obvious in model package insert group compared to the original versions which were assumed to be significantly greater in locatability and understandability. This may have lowered the possible negative influences on the final results. On the other hand, the time allotted for a reading task can also greatly influence its comprehensibility. For instance, if the time allotted for a reading task is so short and demands speed to be able to accomplish the task, then certainly, comprehensibility will be compromised.

2.3. Readability Test through the Use of Two Readability Indexes

Flesch-Kincaid Reading Ease and Gunning Fog Scale were used to determine the ease of reading as well as the level of understandability of the information leaflets of medicine. Some sections of information leaflets were provided online to generate ease in reading as well as the level of difficulty of understanding every leaflet that was provided. Braught, (2003) points out that Flesch Reading Ease Index will subject a number between 0-10. Readability score of 90-100 can be easily read and comprehended by a 5th grader, on the other hand, the 8th and 9th graders will be able to understand documents that have scores of 60-70. A score of 0-30 can be understood by the university graduates (Braught, 2003). Based on the reading difficulty, Flesch Reading Ease score of 0-30 is termed very difficult, while those that are considered difficult are the ones that score between 30 and 50. A Flesch Kincaid reading of 50-60 is considered fairly difficult while 60-70 are for standard documents. A reading score of 70-80 and 90-100 is considered easy and very easy document respectively (Olliffe, et al., 2019; Rush 1985; Grundner, 1978). From the analysis above, writers are therefore encouraged to consider scores of between 60 and 70. The cores provide a rough measure regarding the number of years of schooling that someone would take to comprehend the content of reading material or the reading difficulty encountered while reading a text. Fog index of 1-8 is always meant for elementary school students. On the other hand, 9-12 is meant for high school students. A fog index of 13-16 is meant for students who have completed their secondary (post-secondary school students). From the analysis, it is evident that the lower the number, the more understandable it will be in terms of its content, the ideal score being a fog index of 7 or 8. Above 12 is considered too hard to be read by most people (Olliffe, et al., 2019; Rush, 1985; Grundner, 1978)

2.4. Readability formulas and Their Limitations

The study entailed an in-depth analysis of medicine information readability through the use of readability indexes known as Flesch-Kincaid and Gunning Fog. It is essential to note that given limitations are mainly linked with readability indexes. Redish, (2000) Klare, (1976, pp. 136-151), and DuBay, (2004) point out that the readers' motivation and familiarity with a number of vocabularies are not determined by readability formulas. In most cases, they overestimate the difficulty of the passage. Gyasi, (2018) argues that readability formulas provide an early warning system for the writer to understand that the writing is too dense. A quick assessment can be provided on the spot. In most cases, they are described as "screening devices". According to Klare, (1976, p. 8, 129-152), the aim is to eliminate dense drafts and give way to revisions and substitutions. In several organizational settings, readability tests are termed important as they indicate measurable improvement in written documents. They can give quantifiable measures of improvement (Benjamin, 2012; Gyasi, 2018). Therefore, the following major research question will guide this study:

2.5. Research Question (RQ)

- RQ1. What is the relationship between the readability levels of English Language Comprehension passages and student's comprehensibility?

3. Method and Materials

The study employed qualitative document analysis research methods. As Dornyei, (2007), and Sarantakos, (2005) stated, "Qualitative approach involves the combined use of qualitative methods with the hope of offering the best of both worlds". The qualitative method also contributed to gathering the data from documents, on student's readability levels of the English Language comprehension passages. According to Borge, and Galle, (1996, p29), "Documents are some of the most frequently used unobtrusive measures." This study made use of written documents (i.e., seven years past compression passages of the WASSCE from 2014 to 2020 to gain a deeper understanding of its readability levels. These past questions were selected purposively based on their importance as a judge by the researcher. To examine the student's readability levels of the English Language comprehension passages, the study used purposive sampling to select the past questions from 2014 to 2020 school candidates' comprehension passages. As Cohen, and Rence, (1994) and Creswell, (2003) noted, the sampling operations subjects itself to the application of a more rigorous controls, therefore ensuring an enhanced accuracy level. The data analysis and interpretation were done after the past questions for the study were collected. First, the author gathered the documents from the websites of the West African Examination council. Second, the past questions were re-typed and used MS Word readability software to carry out the analysis and compare it with the readability test index. Finally, the past questions were interpreted according to the readability index analysis of the Flesch-Kincaid Reading Ease and Gunning Fog Scale.

4. Findings

This section answers the two main research questions of the study:

- RQ1. *The relationship between the readability levels of English Language Comprehension passages and student's comprehensibility*

English Language Comprehension Passage	Gunning Fog	Flesch-Kincaid Reading Ease	Readability Consensus
2020	23.5	17.5	Very difficult to read
2019	35.2	15.4	Difficult to read
2018	22.3	14.8	Very difficult to read
2017	15.7	17.9	Very difficult to read
2016	11.2	18.5	Very difficult to read
2015	35.7	16.4	Difficult to read
2014	35.8	14.8	Difficult to read

Table 1: Readability Levels of English Language Comprehension Passages and Student's Comprehensibility Using the Gunning Fog and Flesch-Kincaid Reading Ease Readability Indexes

As indicated in Table 1, all the comprehension passages that were put under consideration are not easy to read. They have values that range from 14.8 to 17.5 for the Flesch Kincaid Reading Ease while Gunning Fog index is between 11.2 to 35.8. Therefore, in the case of the score for Flesche reading, a reader is required to be an undergraduate to be able to comprehend the information being communicated in the passage. As indicated in the table, the score given by the Gunning Fog goes beyond the grade-level expectation for the university graduate readers (13 to 16) (Gyasi, 2018; Grundner, 1978; Rush, 1985).

These results indicate that, because of the high readability levels of the compression passages under examination, it will be difficult for a student to comprehend or understand the passages. The consensus value of readability was 22.3, This was the outcome of the readability test and is based on the mean of the two readability indexes. In the website, readabilityformulas.com, there is an automated readability consensus value that has several indexes. It has a deviation of 3.64, ± 1.59 . When considered from the perspective of Flesch Reading Ease perspective, the text can be understood by someone who has adequate undergraduate knowledge. And when determined in terms of reading difficulty, the text can be difficult to comprehend (Gyasi, 2018; Grundner, 1978; Rush, 1985). The understandability of passages is quite above the

appropriate reading level among the people who are beyond graduate level (14-16). This is therefore quite difficult to comprehend.

The researchers also tested the comprehension passages for legibility and it was revealed that all comprehension passages representing 100% were written with font size 12. The effect is that the readability can be considered generally not readable when the readability of the comprehension is considered from the point of legibility of the print. From the results, all the 7 comprehension passages that represented 100% can be considered as non-glossy and have uncoated papers. Readability is, therefore, enhanced.

5. Discussions

As indicated in Table 1, readability consensus indicates that the West African Senior School Certificate Examination comprehension passages (2016, 2017, 2018, and 2020) are very difficult to read, while (2019, 2015, and 2014) are not easy to be read. The outcome indicates that the English language comprehension passages examination questions were very difficult to understand by the students who are aged between 14 and 16 years. Essentially, comprehension passages are aimed to test the student's ability to understand the passages presented to them. It is therefore important that they are made to be easily readable to facilitate easy understanding for senior high school students. Having readable comprehension passages will improve the students passing rate in the English Language Examinations. In connection with readability, (Crossley, Greenfield, & McNamara, 2008; Gyasi, 2018; Srisunakruea, & Chumworatayee, 2019) affirms that readable and comprehensible students improve the general passing rate of students in Examinations.

The high values attained during the study for both Flesch-Kincaid Reading Ease (14.8) and Gunning Fog (35.8), comes about as a result of the length of the sentence together with the use of complex grammar structures which contributed towards incomprehensibility of the. Such complex language in comprehension passages, according to (Crossley, Greenfield, & McNamara, 2008; Srisunakruea, & Chumworatayee, 2019) has been reported to be of concern. It is therefore important to note that when printing comprehension passages, the legibility of the printed material has to be put into consideration because it plays a great role in contributing to the readability of the comprehension pages. On the issue of paper use, it was discovered that 100% of the comprehension passages made use of the papers and did not reflect light. This made it easy to read (Gyasi, 2018; Crossley, Greenfield, & McNamara, 2008; Srisunakruea, & Chumworatayee, 2019).

6. Conclusions

The approach used in the study resulted in some findings that are related to comprehension passages. According to the findings, comprehension passages for the West African Senior School Certificate Examination which was done between the years 2014 and 2020 were considerably hard to understand by the students during the time as indicated in Table 1. The consensus of readability of the two indexes was 22.3. This therefore meant that comprehension passages were written beyond the proper readability levels even for the graduates in some instances. From the findings of the study and the conclusion arrived at, the researcher provided several recommendations. The study revealed that the comprehension passages were written beyond the comprehension level of the candidates. Because of this, the West African Examination Council and the Ghana Education Service in Ghana should comprehend passages that are at the reading level of the students through the use of plain language. The West African Examination Council should collaborate with the Ghana Education Service to make sure comprehension passages are less technical, functional, and readable.

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The authors have no conflict of interest to disclose

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