



When The Experts Write: A Readability Analysis Of Public Universities' Websites In Ghana

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ABSTRACT

Websites of institutions of higher learning provide valuable resources to students, professors, parents, and the general public. Since the websites have a wide range of audience, with different educational backgrounds, the contents on the websites must be readable in order to make them useful to the general public. This paper evaluated the readability of websites of seven public universities. Convenience sampling was employed to select 30 articles from each website ($n = 210$), and Flesch reading ease and grade level were employed to compute readability scores. The results revealed that contents on all the seven websites were very difficult to read, requiring 14 years of education to be able to comprehend, on the average. Only two of the websites (those of University of Development Studies, Tamale and University of Education, Winneba) differed statistically in their readability. It was recommended that webmasters re-evaluate the contents on their websites to make them more readable.

Keywords Readability, Websites, FRE, University, Readability Formulas

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Introduction

In this digital era (the age of the World Wide Web, www), the internet has become a very popular, perhaps even the most popular source of information for majority of people. The use of websites to access information has transformed the way communication has been carried out over many centuries because websites are available 24hr/day (Sorum et al., 2012). Websites have become vital for communication in that they are linked to social media platforms, making it possible for organizations to get connected to a lot of people and share information easily and rapidly. The use of internet resources, especially the use of websites, serves several additional functions aside communication. For example, in the field of business, websites can be used for e-commerce where people can do online shopping which is really convenient and efficient, pay bills, and search for commodities. Governments make use of the internet to run day to day services to the masses including the issuance of vital documentations such as passports. Similar uses could be listed for health purposes where patient health information is readily hosted on websites for ease of access. In essence therefore, the usefulness of the internet (www) can be summarized by the words of (Niazi & Kamran, 2016) that "internet has created a space without geographical, political, and temporal aspects, and has dramatically changed traditional ways of collecting, storing, evaluating, and disseminating information in organizations and information centres". It would be incomplete to discuss the benefits of internet resources on the "World Wide Web" without taking into account their application in the classroom. The World Wide Web (www) is becoming a crucial information resource for learning. Websites for universities and colleges offer information to parents of present and prospective students, alumni, and prospective students (both new and continuing). Websites are frequently the public face of the school's academic and athletic departments as well as the entrance to the intranet (Chapman, 2010). They frequently have to incorporate mountains of data in a format that facilitates finding it all.

Parents and kids would receive further information in the form of instructions and announcements. Universities benefit from the increased accessibility of

research and instructional materials provided via the web. The primary channel for disseminating information required by departments, teachers, and students nowadays is university websites. Due to the useful roles played by websites of institutions of higher learning, several studies have been conducted to evaluate the quality of websites of universities. For example, (Niazi & Kamran, 2016) evaluated the quality of Iranian state university web sites. Similarly, (Ismail et al., 2016) considered the readability, among other things, of government websites in India. Therefore, quality of websites of institutions of higher learning is very important to evaluate.

Several metrics could be used to measure the quality of websites (Arora & Arbor, 2016). These may include accessibility, usability, functionality, efficiency (Niazi & Kamran, 2016), and readability (Isamail et al., 2016). While each of the metrics on this list is significant, readability on a university website is especially crucial since data processing results in information, and information is only valuable when it can be understood. As a result, ensuring that web pages are readable has become crucial to ensuring that a wide range of consumers can readily consume the content (Ismail et al., 2016). To bolster this argument even more, website readability has been found to be one of the characteristics of successful user engagement (Arora & Arbor, 2016). Readability determines the quality of written text. It determines whether written texts on websites are either easy or difficult to read and understand. Its importance to the usefulness of a website has been demonstrated by using the readability of websites to rank the quality of websites (Isamail et al., 2016). University websites that scored high on readability tests (good readability) were ranked high while those with poor readability were ranked low.

The importance of readability to the assimilation of information on university websites is important in the Ghanaian context as well. As Ghana moves rapidly towards digitalization of information, universities have redefined their public face through active websites. Every university in Ghana has designed new websites in the past few years, and others have redesigned their old websites. The objective is summarized by the words of quoted by (Wilbanks,

2011, p.1)

...we live in a computer-centric world, and for those people looking for information about our school on the Internet, we must provide a website that easily and clearly directs prospective students or visitors to information they are looking for.... Good recruitment practices, which include good customer service, attract more students.... To put it bluntly, if we don't have students, we don't have anything. If we want to attract intelligent qualified students, it is our responsibility to practice good customer service by presenting what our school has to offer in a clear, easily accessible and user-friendly way.

In other words, the objective for owning websites for all Ghanaian universities is to present what the universities have in a visible, useful, clear, and readable manner. However, has the objective of readable websites been achieved by these Ghanaian universities? How readable are websites of public universities when measured in terms of readability indexes? This paper seeks to address these questions through the following research objectives:

1. to establish the readability of websites of seven public universities in Ghana
2. to determine whether there are statistically significant differences in the readability of websites of public universities in Ghana.

Literature Review

Readability measures the ease of reading, and by extension, understanding written texts (Cutts 2013). A readable text is considered to be one that has simple grammatical composition, and simple semantic structures. Written texts that have shorter sentences and minimal polysyllabic composition are assumed to be more readable than otherwise. To measure readability, mathematical formulas have been derived from regression analysis which incorporates semantic features that are presumed to affect readability (Bailin & Grafstein, 2016). Several of such indexes have been developed over the years. Examples include Dale-Chall formula, the Fog formula, the SMOG index, and the Cloze procedure (Stevens et al., 1992).

Amongst all readability formulas considered as reliable, the Flesch reading ease and Flesch – Kincaid grade level indexes have been said to be most reliable for general purpose usage (Olewinski, 2016). The Flesch reading ease formula was developed by Rudolf Flesch and was later modified with the help of an associated Peter Kincaid, and referred to as the Flesch-Kincaid grade level score. The US military even uses these two indexes, which are the most used readability metrics, to assess how readable their instructions are (Webpagefx, n.d.). A score between 0 and 100 represents the Flesch reading ease; the higher your score, the better. Text that is difficult to understand is indicated by low scores. A score of 65 is a decent goal for most business writing, while scores between 60 and 80 are typically understandable to readers aged 12 to 15. The Flesch-Kincaid grade level indicates how many school years you would need to have completed in order to understand the content on the page. The majority of your work should, on average, be understandable to seventh-graders.

The idea of text difficulty has been fundamental to communication and education for as long as people have used written language to create, communicate, and study ideas. Long before people started using the internet for everyday communication, linguistics researchers investigated the readability of text messages. These studies usually examine books or articles with a large number of pages and paragraphs. The majority of mainstream readability studies (Lively & Pressey, 1923; Manning, 1981; Vogel & Washburne, 1928) focus on lengthy articles, books, and documents and pay little attention to social networking sites or websites in general.

However, since the introduction of the World Wide Web and social networking sites, the concept of judging the readability of brief messages has expanded to include not only text messages, user manuals, and movie subtitles, but also social networking sites that mandate character limits for users to compose within. The character limit on social networking sites has not only made conversation flow more quickly, but it has also made it harder for users to read content because they are creating more content with hashtags, acronyms, and abbreviations to comply with the character limit (Davenport & Deline, 2014).

Likewise, readability of linguistic texts is no longer limited to content on books, articles and other hard copies but also content in websites of institutions, businesses, organizations, and individuals, among others. In evaluating the readability of websites, almost all of earlier works have focused on health. Majority of the results have indicated that such websites are generally much difficult for the average reader (e.g. Arora & Arbor, 2016; Mcinnes & Haglund, 2011; Raj et al., 2016). As of now, no extant literature is available which evaluates the readability of websites relating to educational setting such as higher education.

Numerous prior research studies have looked at how readable university websites are in various settings and nations. For instance, Akgül (2021) used a variety of online technologies to assess the readability, quality performance, accessibility, and usability of all Turkish governmental and private university websites. The findings demonstrated that the majority of the websites had low reading scores based on various readability formulas and did not comply with the WCAG 2.0 accessibility standards. Additionally, there was no discernible difference in readability between state and private institution websites, according to the survey. Kuppusamy and Balaji (2023) evaluated the usability of websites from the perspective of accessibility, adopting a variable magnitude technique to evaluate the accessibility of online pages for people with impairments. Ten of India's top-ranked websites for higher education were selected as data sources for the study. The results indicated that none of the websites achieved conformance level A according to WCAG 2.0 guidelines. The study also suggested some design modifications to make the websites more accessible for persons with disabilities.

Significance of the study

This study makes an important contribution by examining the readability of university websites, an area that has received little attention in previous research. Most prior research on website readability has focused on health contexts (Walsh & Volsko, 2008; Berland et al., 2001). University websites, however, provide a critical informational resource for a wide range of audiences including prospective and current students, professors, parents, and the general public. For these audiences to access and understand the

information, content must be readable and match their level of comprehension. Low readability acts as a barrier to accessing and understanding information (Fitzsimmons et al., 2010; Walters, 2009). In a study of health websites, Walsh and Volsko (2008) found poor readability inhibited users' ability to fully understand medical information and make informed decisions. Similarly, low readability scores on university websites may hinder audiences' ability to access key information like program requirements, financial aid opportunities, and institutional news. Scores showing content requires a college or higher reading level to comprehend would exclude parts of the target audience.

The readability challenges identified in this study are particularly problematic given Ghana's literacy context. While university enrolment is expanding rapidly in Ghana, functional literacy rates remain around 75% (UNESCO, 2016). Lower national literacy means university audiences are more likely to include those with lower reading and comprehension levels. University websites must accommodate this by emphasizing readability, clarity, and simplicity. This study provides evidence that public universities in Ghana are not currently meeting this need or effectively serving their range of audiences.

Addressing readability should be a key priority for institutions of higher education seeking to provide accessible resources and serve the informational needs of the public. By improving the readability of their websites, universities can enhance the user experience for all audiences, allowing them to locate and understand relevant information. The significant gaps in readability identified by this study suggest Ghanaian public universities and their websites have substantial room for improvement in providing widely accessible and usable information resources. Overall, this research contributes valuable insights into an important but understudied area of higher education communication in Ghana.

Methodology

The research was quantitative in nature and descriptive statistics was employed to assess the readability of the websites. The study was conducted between June and July 2017. Seven public universities in Ghana were

selected for the study (University of Cape Coast, Kwame Nkrumah University of Science and Technology, University of Ghana, University of Education, and the University of Development Studies, University of Mines and Technology and University of Health and Allied Sciences). These are the public universities in Ghana. Majority of would-be students therefore make use of the websites of these public universities much frequent than they do for private universities due to higher fees paid at private universities compared to the public ones. Hence, the public universities have higher audience than private university.

For each of the websites, 30 news items (total of 210 news items) published between June 2016 and June 2017 were selected at convenience from various hypertext links on the website for which readability analysis were calculated. News items for this time period was chosen because that represented the most current one-year news items. The use of data from 2016 and 2017 was backed by the fact that this period was marked by the need to increase enrolment figures in the public universities in order to stand the competition from the private universities (Statista, 2020). The data therefore, reflected what content public universities are providing to online users in order to persuade them to apply for programs in the public universities. Being mindful of the majority of university applicants being senior high school graduates, the authors expected the language on these websites to be plain enough for the students to understand.

3.1 Data Collection

The researcher collected data from the official websites of the selected universities. Since the study of readability is text-based content (Gyasi, 2013b), the researcher focused on written information displayed on the websites of the universities. The researcher collected three data types from each website, thus admission information, about institution and news article (announcement). Based on observation of the researcher, users, especially first time visitors of institutional website, usually seek after information from these three sections of the website. From each university, the researcher selected three samples and, in total, the researcher collected 21 samples for the

study.

The readability of each entire article was evaluated. This was done because several of the articles were short in length. Since Flesch readability index used in this study required at least sentence length of 100 words, whole articles were used. Selected texts were prepared per the descriptions of earlier authors (US Department of Health and Human Services, 2012). Readability scores were thereafter computed using Flesh reading ease and Flesch-Kincaid grade level indexes. These indexes were used because they are regarded as the most reliable. In addition, majority of earlier works that have evaluated readability of online materials have used the 9Flesch reading ease and its related index. Therefore, using same index allowed for comparison of results.

3.2 Data Analysis

With the help of IBM Statistical Products and Services Solutions (SPSS) version 24.0, frequencies, percentages, means, and standard deviations were used to describe readability, and the number of years to be able to read. Utilizing the Bias corrected and accelerated (BCa) technique, a one-way analysis of variance utilizing bootstrapping was carried out for samples of 1000 to ensure robust estimations of significance or p-value, standard errors, and the confident intervals (Davison & Hinkley, 2006). The Mersenne Twister Random Number Generator was configured to generate a random number sequence. This made it easier to maintain the random number generator's initial state and return it after the analysis was finished (Arbuckle, 2010). Since the Simple technique facilitates resampling using replacement data from the original dataset, it was employed.

In addition, Levene's test of homogeneity was significant [$t(4, 19) = 3.121; p = .039$]. Hence, Tamhane's Post-hoc comparisons were used to indicate the differences.

4. Results

4.1 Objective 1: Readability of websites of the seven public universities in Ghana

Table 1 presents descriptive statistics for the websites of each of the seven universities. From the table, KNUST's website recorded the highest mean Fleisch Reading Ease (FRE) ($\bar{x}=28.44$, $s=10.33$) The least mean FRE was recorded by UCC ($\bar{x} = 12.02$, $s = 3.76$). In addition, KNUST's website recorded the highest maximum score (46.90) while the UCC recorded the least minimum FRE score of 17.00. These results corroborate findings of majority of earlier works which have indicated that websites were generally difficult

for the average reader .

Considering the mean FRE scores for all seven websites, however, it can be concluded that information presented on all seven websites were generally *very difficult* to read, according to the benchmark for interpreting FRE score values. In addition, the University of Health and Allied Sciences recorded the highest minimum FRE score (25.7).

Table : Descriptive statistics of contents of seven public universities' websites in Ghana

| University | Fleisch Reading Ease | | | | Fleisch-Kincaid Grade Level | | | |
|------------|----------------------|-------|-------|-------|-----------------------------|-------|-------|------|
| | Min | Max | Mean | SD | Min | Max | Mean | SD |
| UCC | 6.40 | 17.00 | 12.02 | 3.76 | 15.10 | 18.70 | 17.02 | 1.48 |
| KNUST | 23.30 | 46.90 | 28.44 | 10.33 | 11.60 | 15.70 | 14.36 | 1.59 |
| UG | 18.60 | 33.60 | 27.62 | 6.28 | 13.20 | 19.10 | 15.68 | 2.19 |
| UEW | 3.40 | 32.50 | 20.53 | 13.96 | 15.80 | 20.40 | 17.88 | 2.37 |
| UDS | 16.50 | 32.70 | 26.24 | 7.16 | 12.80 | 15.30 | 14.00 | 1.05 |
| UMaT | 16.90 | 24.40 | 20.65 | 5.30 | 14.40 | 16.20 | 15.30 | 1.27 |
| Uhas | 25.70 | 31.90 | 28.34 | 2.47 | 13.70 | 14.70 | 14.26 | .52 |

4.2 Objective 2: Are there differences in readability of the three websites when measured in terms of Flesch reading ease?

A one-way between-groups analysis of variance was conducted to explore the differences in the mean number of school years (that is readability) required to be able to read and understand online information presented by the universities on their websites. The results showed that there was a statistically significant difference at $p < .05$ level in FKGL scores across the websites of the seven universities: $F(4, 19) = 4.088$, $p = .015$. The actual difference in mean scores between universities was large. The effect size, calculated using eta squared, was **0.46**. (Table 2)

Table - Analysis of Variance in FKGL scores of information on websites of seven universities in Ghana

| University | Fleisch-Kincaid Grade Level | |
|------------|-----------------------------|------|
| | Mean | SD |
| UCC | 17.02 | 1.48 |
| KNUST | 14.36 | 1.59 |
| UG | 15.68 | 2.19 |
| UEW | 17.88 ^b | 2.37 |
| UDS | 14.00 ^a | 1.05 |
| UMaT | 15.30 | 1.27 |
| Uhas | 14.26 | .52 |

Key: means having the same superscript do not differ (no significant difference).

In addition, Levene's test of homogeneity was significant [$t_{(4, 19)} = 1.210$; $p = .339$]. Hence, Tukey's HSD Post-hoc comparisons were used to indicate the

differences, in accord with recommendations of (Pallant, 2013). The test indicated that the mean score of information on the UEW website ($M = 17.88$; $SD = 2.37$) was significantly different (higher, denoting poorer readability) from UDS ($M = 14.00$; $SD = 1.05$). The FKGL score for information on all other universities did not differ significantly from one another.

5. Discussion

It is recommended that readability of information material which targets the general public should be of plain language level (readable to 7th and 8th graders) [7]. Contextualizing this recommendation for Ghana, it is reckoned here that the readability of such information for general public usage should target individuals of much lower grade levels than suggested by Cutts. This is the case because literacy rate in Ghana is much lower than for a developed country such as the US or the UK. Hence, information presented on the websites of the seven universities will better serve its citizenry if its readability scores were much higher. Considering the mean readability scores of the websites of all seven universities as presented above, it is realized that the goal of making website content readable to majority of users is not being achieved. Users of all websites will find it a challenge to comprehend what they read. This can have serious consequence on their decision making. For example, in articles describing the universities' requirement when filling online enrolment forms, prospective students could make wrong choices as a result of them not comprehending the requirements for filling of the forms. It is therefore important for all the public universities to revisit their content and make it readable.

That no significant difference in readability of contents on websites among the greater number of the seven websites indicates that the challenge of readability in Ghanaian literature is a prevalent and ongoing issue. It has been reflected in earlier studies that evaluated the readability of Ghanaian print texts that Ghanaian literature are generally very difficult to read. Hence, the findings of this work are consistent with the prevailing tendency of Ghanaian authors to write difficult to read text. Considering that the universities are making substantial efforts to redesign their websites to make them visible and more useful, it is important for the webmasters of these institutions to remember that

readable content on their websites will contribute to, and enhance the usefulness of these online resources.

6. Conclusion

The objective of this paper was to evaluate the readability of websites of seven public universities in Ghana. The idea was to provide 'rough' assessment of how easy it is for users of the websites to comprehend the contents on the websites when measured in terms of the Flesch reading ease and grade level formulas. The analysis revealed that the contents of all seven websites were *very difficult* to read, the easiest on the average requiring 14 years of education to comprehend. In addition, contents on the website of the University of Development Studies were relatively easier to read than those of the University of Education. All other comparisons showed no statistical difference.

If universities can achieve their objective of educating, providing information and directives to affiliates of their universities (being it students, prospective students etc.), they must communicate effectively by making the contents on their sites readable. It is therefore recommended that webmasters of all seven public universities in Ghana review the contents on their webpages with the objective of making them easy to read.

7. Limitations

The first limitation of this study is that the assessment is restricted to the scores of the readability formulae used in the study. This implies that manual analysis of the content of the websites was not done to corroborate the scores of the readability formulae.

Also, the present study depended largely on the available texts on the universities' websites. This means any readable content that were not available on the websites at the time of the study was not included in the study. The conclusions are basically based on the results of the test scores of the readability formulae rather than the audience or readers' feedback.

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