



# Exploring the Readability of Terms of Service of Social Networking Sites

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**Abstract**—Terms of service of social networking sites provides relevant information for end-users to make inform decision regarding their use of social networking site. The purpose of this paper was to evaluate the readability of the top five social networking sites namely Facebook, WhatsApp, Messenger, YouTube, and WeChat. Using Flesch reading ease and grade level indexes, the authors measured the readability of the selected terms of service. Measures of central tendencies, and one-way analysis of variance, with bootstrapping, were used to analyse the data. The results showed that the ToS were difficult to read when compared to the standard score of public documents. Moreover, the readability levels of the ToS required end users to have attained at least 13 years of formal education, which is equivalent to first year college student, in order for the users to find the ToS readable. In addition, no statistical difference existed among ToS of the five social networking sites meaning all the ToS of the five networks were unilaterally difficult for the average reader (end user). It is recommended that the ToS of these networks be revised to make them more readable since substantial number of their audience are young with low number of years of education.

**Keywords/Index Terms**— Readability, Readability Indexes, Terms of Service, Social Networking, Web Application

## 1. Introduction

Social networks are part of the main drivers for the growing global connections of businesses and

individuals (Bahera, Rath, Damasevicius & Maskeliunas, 2019). As global networks, social networking sites connect users of diverse cultural

backgrounds to interact and share information. The developers of social networking sites as part of the legal and ethical requirements add terms of service to the software packages of the networks that users are supposed to consent to before they can install and use the social networking site package. Terms of Service (ToS) refers to rules, conditions, and (or) stipulations that a user of any service must abide before services are rendered. Concerning social networking sites, terms of use defines the obligations and privileges of the end user as well as the service provider. It is a very important document that legally binds users to agree with developers specifications.

Due to its vital importance, ToS is found on the platforms of every online service provider. It is mostly a necessity for end users to agree to such ToS during account creation on the online platforms such as Social Networking Websites (SNW). Users who agree to ToS imply that they have consented to the terms and are legally bound to the agreement (Scott, 2007). In essence, agreeing to terms of use of social networking site is equivalent to signing a contract where the parties are legally bound to relate according to the articles contained in the contract, in this case terms of use.

Despite the contractual function of terms of use in social networking sites, there is a growing observation that many people consent to many ToSs without proper scrutiny when it comes to their digital activities (Gyasi & Bangmarigu, 2019). This is the case because consenting to ToS is simply by ticking a check box that says 'I agree' (Luger, Moran, & Rodden, 2013). So bad is the situation

such that earlier researchers have quantified that less than 1% of end users actually pause to read these ToS (Bakos, Marotta-Wurgler, & Trossen, 2009), and even those who should know better (educated ones) tend not to bother (Hillman, 2005).

A critical reflection on the importance of ToS as an agreement document that spells out the responsibilities of both developers and users with regards to the social networking sites connotes the need for users to do a thorough reading to comprehend the ToS before signing to it. Understanding Terms of Service is vital to ensure responsible use of the social networking sites. For instance, terms of use of social networking sites like Facebook prohibit pornographic content for legal and ethical reasons. Moreover, other social networking sites (Twitter and WhatsApp) states the number of characters that are allowed in composing a content in the site or the volume of data that is allowed to be sent to other users through the social networking site. When this kind of information is known to users, it is possible it could reduce irresponsible use of the social network sites to promote violence and other content that are abusive to other users of the network. In one study, Azeta, Omoregbe, Ayo, Raymond, Oroge and Misra (2014) discovered that university students resorted to social media as a platform to perpetrate cultism and violence acts in their institutions. Moreover, cases of people leaking nude videos on social media have been a potential threat to privacy of other users especially celebrities. The terms of service therefore, becomes a tool to educate and spell the legal implications

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of actions that are prohibited in the social networking sites. But if users do not read the ToS, how will they engage in responsible use of the social networking site?

The lack of readership of ToS has been discussed on many platforms, and has gained attention in academic circles. Studies have identified three major factors that account for the lack of reading of ToS. First, many users do not consider ToS as important document when they are signing to a social networking site. As Abascal et al. (2015) discovered with regards to ToS that many users read or skim through ToS when large sums of money are involved (e.g. buying a house), medical treatment is in question (e.g. before operation), and in other similar circumstances. In such cases, users consider ToS services as least important and without any repercussion to their decisions. Another reason that accounts for users' lack of readership of ToS is the lengthy nature of almost all ToS. Terms of Service are known to be very lengthy. It has been estimated that on the average, ToS contains about 2500 words (about 6 – 7 pages long; using 1 – 1.5 spacing) (McDonald & Cranor, 2008). Due to its length, many ToS are buried deep inside the website to improve the website's attractiveness such that users do not even get to see it before ticking "I agree" (Meiselwitz, 2013).

A third reason that accounts for the lack of readership of terms of service of Social Networking Websites (SNWs) is the readability of the ToS. Terms of Service of many websites have been indicated to be very poor in terms of readability. For example, a number of

authors have warned that the complexity of privacy policies, and terms and conditions hinders their readability and creates one of the key usability problems of website design (Fiesler & Brudcman, 2014; Luger et al., 2013; McDonald & Cranor, 2008). Luger et al., (2014) explicitly indicated that ToS are very unreadable, and feared that if not checked, it will result to a world of "digital under class without the capabilities to make meaningful consent choices to control their digital identities" (p. 2688). Such a situation will have a much profound effect on the masses if the ToS of a platform with large number of users, such as Social Networking Websites (SNWs), is not written at a readable grade.

Social Network Websites have become very useful and powerful means of disseminating information in this era. Humans are now able to 'connect' to others just by clicking on few buttons on websites. What makes social networking so powerful is the speed in which information can spread. With the click of a button, one can send a 'tweet' not only to one's followers (say 10,000) on Twitter, but potentially to the individuals in the network. The speed and exponential growth of information sharing is what makes social networking websites so powerful, and for which reason the use of SNWs has become deeply embedded in human society in this era. Access to social networking websites has increased due to the proliferation of internet devices such as mobile smart phones, iPads, tablets among others. As more and more users join these websites, there is a growing need to provide readable terms of service

content so that almost every user will understand what they are signing in for or to. The need to produce readable terms of use is even demanding when one consider the fact that users of social network websites have different educational, cultural, age and demographics backgrounds that affect how readable a text will be to them.

However by using readability formulas, developers can obtain reading ease scores that will help them predict the readability of their ToS as public document. For instance, the flesch reading ease formula recommended a score of 60-70 in its scale of 0-100 as standard score for public document. This implies that if Terms of service are measured by these readability formulas, readability scores will help them predict the reading ease of the content before attaching it for the end-users.

In recent study published by Gyasi and Bangmarigu (2019) on the readability of terms of service of software packages, the authors discovered that the terms of service of the software packages were difficult to read, and, therefore, require revision to make them readable to users. Though the readability of terms of service of social networking websites is relevant to improve readers' readership and comprehensibility of the ToS before signing to the ToS, there is limited empirical studies on the readability of terms of service of social networking sites. This study therefore seeks to fill the lacuna by exploring the readability of terms of service of selected social networking sites namely, Facebook, Twitter, Messenger, WhatsApp, YouTube and Wechat.

The specific objectives of this paper are to determine:

- 1.The readability of ToS of top five SNWs by using readability formulas.
- 2.The difference(s) in readability of ToS among these selected SNWs.

Terms of Service (ToS) of social networking sites is regarded as the contractual document in social networking websites; therefore, it is important for users of social networks to be able to read and understand the ToS of these websites. Moreover, it is the firm belief of the authors that users who read and understand terms of service will better understand the repercussion that comes with flouting the agreement signed in the terms of use. Moreover, certain warnings on the use of the sites are embedded in the terms of service and hence reading and understanding the terms of service will help readers to use the service responsibly related consequences

## 2. Review of Related Works

Bahera et al. (2019) asserted that social network analysis is essential in understanding the interactions and relationships among users as well as the patterns of online users' behavior. The social network analysis however, has been focused on understanding the nodes and edges that are involved in networks. The nodes refers to the individuals, groups and organisation that are involved in a social network. Edges, on the other hand, refers to the relationships, friendship, kinship and financial transaction among social network users (Olajde, Adeshakon, Misra & Ayo, 2016). The nodes and edges make up networks, and networks can be categorized into offline and online

networks. Offline networks involve interaction among nodes while online networks are in the form of online social networking websites like Facebook, Instagram and Twitter that allow users to interact and share information (Olajde et al. 2016). The online networks which are basically social networking websites involve more than examining the nodes and edges but also the terms of service that enjoin the developers and end users. In the context of social networking sites, terms of service refers to the agreement document between social network website developer and the end-user of the website. Almost all social networking websites have a terms of service package added to the software packages that is usually downloaded and used by end-users to access the service of the social network website. End-user predominantly cannot access the service of SNWs without first consenting to the terms of service of the SNWs. The terms of service usually covers important areas such as description of the social network website, licensing for users, restrictions of use, termination of use, limitation of liability, disclaimers of warranties, copyright infringement and contact information (Gyasi & Bangmarigu, 2019). The content is therefore lengthy in providing details as to what is permitted and what is prohibited as far as the developer/manufacturer and end-user are concerned.

Despite the overarching importance of the content of ToS to end-user, the evidence from previous studies showed that terms of use are less read by end users. Meiselwitz (2013) who studied the policies and procedures of social networking websites, thus Facebook and

Twitter, discovered that readers do not read terms of service because they found them too lengthy, inaccessible and their file format unappealing. The author also discovered that policies and procedures of the social networking websites are difficult to read and users do not usually notice mostly the changes to the policies because the files are placed at inaccessible location.

The consequences of end users not reading terms of service include users breaching the terms unknowingly, which can lead to their termination, or the users may try to use the website for unspecified function that the website does not support. It is also a legal flout to claim ownership of parts or blame damages of the site on developers when those claims and damages were specified as part of the terms of service. Therefore, if developers can compose readable and comprehensible terms of service for users, there is a great chance of promoting mutual beneficial use of the websites among all users and the developers. Moreover, users could avoid legal implications that could be because of their lack of knowledge of the terms of service. Finally, when users read and understand terms of service, they are better equipped to make informed decisions on which social networking websites to install on their devices. This is because as part of the terms of service, some social networking websites add promotional features such as sending automatic ads to the end user, which are sometimes having offensive content for some users. Noticing such added features, for example, through reading the terms of use could save users from making wrong installation that will affect

their devices negatively. Terms of service is therefore, a vital communication tool that provides relevant information from developers to end-users so that the end-users could make informed decision on whether to use or not to use the social networking websites.

Not only is readability of terms of service a gateway to improving the relationship and communication between developers and end-users of social networking websites, but generally, the quality of websites can be measured by several factors such as accessibility, usability, functionality, efficiency and readability (Niazi & Kamram, 2012; Ismail et al. 2016). According to Pawn et al (2018), the web has become a popular and important medium for transmitting information from one place to another. A web content can be considered accessible if it follows the web 2.0 guidelines. It is useful and functional if it provides the service at an optimum efficiency it promises to offer. While it is undoubtedly true that the social networking websites are accessible, usable and efficient communication tools for diverse users, the readability of the content of social networking websites has not received much attention. Social networking website's content is considered readable and understandable to a reader if it uses simple language. Polysyllabic words and lengthy sentence affect the readability of any text (DuBay, 2004).

Studies on the text variables of social networking websites have discovered that their content contain variables that pose difficulty to measuring their readability. For instance, Davenport and

DeLine (2014) argued that hashtags, acronyms, multilingual tweets and abbreviations render social networking websites content unreadable. In fact, same authors found that such variables make it difficult to use traditional readability formulas to measure the readability of social media user generated content. To compensate the limitation of traditional readability formulas efficiency to measure social media content, Pawn et al. (2015) identified some computational formulas that can help measure web content such as the GUI evaluator, age rank algorithm and many others that can help to measure web content readability by considering the non-traditional variables.

Moreover, social media content sometimes contain multilingual content. In terms of measuring the readability of multilingual content, Pawn et al. (2015) suggested language specific formulas such as fernandezhuetainde for Spanish text, Djoko formula for Indonesians text and lix for French text as alternative readability formulas that can be used to measure the readability of multilingual content of social networking websites. The advantage however, with terms of use of social networking websites is that there are predominantly written in the English language, and if not, there can be translated in the site. Also, the terms of service of social networking websites does not include the variables such as hashtags, pictures and others that affect effectiveness of readability formulas prediction. It is imperatively easier to determine the readability of terms of service of social networking websites than other content on social networking websites.

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Exploring the terms of services' readability is paramount since they are communication tool between developer and user of any social networking site. Besides, the terms of service of social networking websites specify the developer and user rights, their responsibilities and their claims. Also, as indicated earlier, the terms of service is one of the content that are written in specific language, especially English Language, with less web centered variables such as hashtags, acronyms among others. It therefore implies, terms of service readability can be predicted by traditional readability metrics because the content of terms of use has no special characters that will pose difficulty to measuring their readability using traditional readability formulas.

### **2.1 Empirical Studies on Social Networking Websites**

Social networking analysis has been a crucial aspect of studies on technology and its impact on society. Olajde, Adeshakon, Misra and Ayo (2016) studied social network analysis impact on e-commerce in south-west Nigeria. Based on their analysis of centrality of the social network sites, the authors discovered that social network analysis especially on the recommender system of e-commerce, has led to good customer satisfaction, effective product ranking and sales, high recommendation and purchasing and better understanding of customer preferences. The study of Olajde et al. (2016) provided evidence that social network interconnect people from diverse backgrounds and as such the importance of individuals of the community understanding the terms of service that regulate the producer and

end user is vital. Moreover, the benefits discovered by Olajde et al. (2016) on social networks provide a better reason to argue that enhancing such benefits will be by providing readable terms of service so that users of the network will use the networks more responsible to avoid conflict of interest.

Azeta et al. (2014) investigated how to reduce or curb the perpetration of cultism and terrorism on social networking sites among university students in Nigeria. The authors developed a software package that had the capacity to filter abusive language and channel it to the university administration for further scrutiny and investigation. The authors discovered that cultism behaviors on social media websites have led to vices such as violence, rapes and recalcitrant behaviors that are uncalled for in an intellectual and moral based university setting. While the application developed by the authors provided features to deal with the cultism on social networking websites, it is ultimately important to understand the place of terms of service of social networking sites as a yardstick to measuring the agreement between programmers and users. Improving terms of service of networking websites by adding terms that prohibit uncouth behaviors will also be a way of reducing foul language among users of social media sites. However, even with the inclusion of termination of user as part of the terms of service, end users do not usually know ToS because most of them do not read the terms of use.

Also, few previous studies on the terms of service of websites have produced insightful evidence of their difficulty for readers. First, Luger et al., (2013)

*William Kodom Gyasi & Manasseh Jonah Bangmarigu* evaluated the readability of ToS of six UK Energy services using SMOG readability formula. The researchers observed that ToSs were written at a level that was far beyond what a functionally literate adult could be expected to understand.

Similarly, Prichard and Hayden (2008) compared the readability of freeware end-user licensing agreements of 91 freeware programs frequently downloaded in 2003 and 100 freeware programs frequently downloaded in 2008. Seven different formulas (Dale – Chall, Coleman – Liau, ARI, Fog, SMOG, Flesch reading ease and Flesch – Kincaid Grade level) were used to evaluate the readability. They found that “anywhere from 55% to 97% of the 2003 agreements studied were either difficult or very difficult to read” and that “anywhere from 61% to 97% of the 2008 agreements were categorized as either difficult or very difficult” to read. On the average, the authors found that the readability grade level score for both 2003 and 2008 agreements were between 11.76 years (i.e., senior high school) and 14.5 years (2nd year college). None of these earlier works focused on the readability of online communication services platforms. Thus, this work seeks to fill the information gap.

In a recent study, Gyasi and Bangmarigu (2019) studied the readability of thirty-eight (38) terms of service of software packages. The researchers used readability formulas to objectively measure the comprehensibility of the terms of service documents in relations to how they achieve their intended purpose of communicating developer-user agreement. The authors argued that

determining the readability of terms of use of software packages is beneficial for both programmers and users. It helps programmers to communicate their intended rights and restrictions for users and it helps users to understand their rights and limitations in using the software package. Using Flesch reading ease and Flesch Kincaid grade level to measure the reading ease and grade level of the terms of service respectively, Gyasi and Bangmarigu (2019) discovered that majority of the terms of use were difficult to read and understand. The authors therefore recommended a revision of the terms of service to make them readable for users.

From these studies, it is evident that the terms of service of most websites have been found to be difficult to read. Meanwhile, terms of service of social networking sites contain vital information such as authorization for use of the social networking website as well as restrictions of users in terms of publishing certain information or using certain content. As part of terms of service, users can be terminated if they use the social networking websites wrongly. Copyright infringement, disclaimers of warranties and contact information of developers are all included in the terms of service (Gyasi & Bangmarigu, 1995). Based on the content of terms of service, it is obvious that the content is vital for programmers and users as far as ethical and legal issues may be concerned. The recent growing interest to control publication of obnoxious content on social media such as the use of foul language and use of false identities to defraud others has prompted the need to explore how

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readability of terms of use can help defend programmers and promote proper use of social networking websites. It is therefore, vital to examine the readability of social networking websites' terms of use in order to ascertain whether there are readable or difficult to read.

## **2.2 The Concept of Readability**

Readability is a crucial concept in language as far as reading and understanding of a text is concerned. Basically, readability refers to ease of reading a text (Ahmed, Zeeshan, Shaukat, & Islam, 2013). The study of readability is the study of those features of written text that aid or hinder the effective communication of ideas and information to a reader (Bailin & Grafstein, 2016). Readability of a text is largely determined by the writing style such as the choice of words and sentence length. Readability has been used as a proxy for predicting comprehension of a material (Richards & Van Staden, 2015), since direct measuring of comprehension is difficult.

Readability is usually measured by using readability formulas. A readability formula (index) is a mathematical tool used to quantify the ease of reading a text (Abascal et al., 2015). "Readability formulas are derived from regression analysis, and are based on semantic characteristics of written text (including sentence length, syllables, characters etc.) (Bailin & Grafstein, 2016). Readability formulas are based on the assumption that how difficult a text is to read is related to whether or not the words in the text are understood, and whether or not these words are put together in an easy-to-follow manner (Bailin & Grafstein, 2001)." Therefore,

readability formulas hang on vocabulary difficulty and syntactic complexity. Vocabulary difficulty refers to the degree to which a text contains words that are unfamiliar and/or difficult to understand. Similarly, syntactic complexity refers to the degree to which the sentences in a text have complicated grammatical structures. That is, the longer a sentence, the more difficult it is to comprehend.

Currently, there are hundreds of readability formulas in use (Benjamin, 2012). These include the Fry formula, SMOG, and Flesch tests (Flesch-Kincaid and Flesch Reading Ease). Though the formulas vary, they estimate difficulty based on what is easy to count at the level of individual words and sentences, such as the length of words and sentences (US Dept. of Health and Human Services, 2012). "The increasing number of indexes used to evaluate readability is a function of the inadequacies or flaws underlying classical readability indexes. For example, classical readability indexes do not take into account the meaningfulness of a text during evaluation. Relying on a grade level score can thus mislead an individual into thinking that the materials are clear and effective when they are not. Because of these inadequacies of existing readability indexes, newer indexes are designed frequently and are aimed at 'fixing' these flaws. Nevertheless, classical readability indexes are adjudged as good enough for assessing readability, and they are used not in a conclusive manner (DuBay, 2004). It helps to give a writer a fair idea of the readability of his written text.

Although there are many readability indexes, not all are fit for certain texts.

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For example, SMOG and Fry readability indexes have been identified to work well for almost all written text. Yet, it has been indicated that the SMOG index does not work well with low literacy texts. Therefore, in this work, the Flesch tests (Reading Ease and Grade Level) have been used since they are approved and noted in readability studies to be the most reliable metrics (DuBay, 2004; Benjamin, 2012).”

The Flesch Reading Ease (FRE) is one of the oldest and it is considered to be the most accurate of all the formulas. This formula is mostly used for academic text. It is largely used to assess the difficulty of a reading text written in English language. According to Owu- Ewie (2014) instead of using grade levels, this formula uses a scale from 0 to 100; whereby 0 corresponds to the 12th grade (Senior High School 3) and 100 is also equivalent to 4th grade (Primary 4). This simply means that the higher the score the easier the passage is to be read and the lower the score the more difficult the passage.

Flesch-Kincaid Grade Level (FKGL) Test is a related test, which translates the Flesch Reading Ease Test scores to grade level. Peter J. Kincaid and his team propounded the formula in 1975. It is mostly used in pedagogy. This formula is used to determine the readability level of a variety of educational materials especially books. This formula makes it easier for parents, teachers, and librarians to select suitable reading texts for their children/learners (Owu-Ewie, 2014). The combination of Flesch reading ease and Flesch-Kincaid grade level helps to predict the reading difficulty level of the text and the grade

level (formal education) readers require to find the terms of service (use) readable and understandable.

### 2.3 Theoretical Framework

A study of this sort requires a theory to guide the analysis. In this study, Ehri's theory of stages of reading development and fluency is adopted. According Ehri (1995), there are four stages of reading development and fluency which are pre-alphabetic stage, partial alphabetic stage, fully alphabetic stage and skilled reading level.

The pre-alphabetic stage is where readers lack understanding of alphabetic principle, which is letters and their sounds and hence have difficulty pronouncing words, except by doing association of letters based on their visual components. In addition, the partial alphabetic stage is a stage where readers learn the letters and their sounds but their knowledge of sounds are limited hence they can find it difficult to pronounce unfamiliar words. Fully alphabetic stage refers to readers having the ability to use pronunciation and hence can pronounce unfamiliar words based on the sounds combinations. They however, may not be fluent readers as in reading fast.

The skilled level is where readers develop the skill of knowing words by sight. At this stage, readers can read fast. According to Ehri (1998), the building blocks of fluency are graphophonic letter familiarity, phonemic awareness and knowledge of graphemes. To Ehri, the ability of readers to decode a text is dependent on reading fluency.

In using Ehri's theory, Gyasi and Bangmarigu (2019) asserted that Ehri's

(1998) theory provides an understanding of the foundation in language skills, which are syntax and lexis. The lexis (words) and syntax (sentence) are crucial for readability studies. This is because readability studies consider sentence and word length as the two most important predictors of text difficulty. In this current research, the researchers posit that Ehri's theory of stages of reading development is vital in understanding how different readers of diverse reading stages will face in reading the terms of use. Users of social networking sites range from young adults to the aged. It therefore means that the reading abilities of these readers may be at different levels further requiring low readability scores. Therefore, composers of terms of use of social networking sites should consider adopting a writing style, word choice and sentence structures, that appeal to the reading abilities of the mass users of social networking websites.

### 3.0 Research Design

Since the study sought to describe the readability of ToS, descriptive research approach was employed (Blessing & Chakrabarti, 2009). According to

Streubert and Carpenter (1999: 49), descriptive research involves direct exploration, analysis and description of the particular phenomena, as free as possible from unexplained presuppositions, aiming at maximum intuitive presentation. To Reinard (1994), 'descriptive empirical research is invited when a research problem's questions ask about current description of things and explore explanations that characterize things as they are now.' In this study, the researchers seeks to ascertain the readability levels of terms of service of social networking websites in order to ascertain whether there is the need to recommend revision of the content of terms of use.

### 3.1 Sample and Sampling Technique

Readability of Terms of Service of all social networks were the target population. Out of these, the ToS of the topmost five of the world's largest social networks ranked in terms of reported or estimated global Monthly Active Users or MAUs were purposively selected. That is, the sample size of ToS was five. A list of these networks is given in the Table 1.

Table 1- Top 5 Social Networks in the World (Ranking as of April 2017)

Name of Network	Estimated MAU	Rank
Facebook	1.9 Billion	1
WhatsApp	1.2 Billion	2
Messenger	1.2 Billion	3
YouTube	1 Billion	4
WeChat	889 Million	5

Source: Sparks, 2017

The ToSs of these SNWs were selected since they have a very large number of

users. As such, users failure to understand the ToS of these networks

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due to poor readability will affect a substantial number of individuals.

After selecting these five ToS, readability scores for the entire ToS of each SNW were calculated. The selection of texts in each ToS was done such that each subheading constituted one sample of text. This approach was used since different subheadings treated different legal requirements. Hence, different readability levels were expected across texts of different subheadings.

### **3.2 Data Collection**

Selected texts for which readability scores were to be calculated were first prepared by removing things (e.g. punctuation marks) that would have otherwise confused and mislead the computer in the calculation. This was done in line with the recommendations of earlier researchers (US Dept. of Health and Human Services, 2012). Since the computer interprets any period (full stop) as the end of a sentence, embedded punctuation such as periods that were used for abbreviations were first removed. In addition, texts that were not in full sentences, such as titles, headings, and bulleted points that are not full sentences were excluded.

This preparatory stage was important in order to achieve accurate readability scores since MS Word readability program tells the computer to sense the end of a sentence by looking for the type of punctuation that normally marks the end of a sentence, such as a period, question mark, or exclamation point. Because sometimes this punctuation falls within a sentence, rather than at the end, the computer cannot distinguish this, and thus result in errors in its

computations. Therefore, each selected text was prepared before measurement with the readability formulas.

Prepared texts were copied into Microsoft Word. Readability scores of the terms of service were subsequently calculated using the inbuilt Flesch readability calculator in MS Word.

Two readability indexes were used to calculate the readability of the ToS, namely, Flesch Readability Ease and Flesch – Kincaid Grade Level. The Flesch Reading Ease and Flesch – Kincaid Grade Level were employed because they are among the oldest readability indexes, are considered to be the most accurate of all the readability formulas.

### **3.3 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 the readability of the terms of use of the selected networks.

A one-way analysis of variance, using bootstrapping technique, was performed for samples of 1000 to ensure robust estimates of significance or p-value, standard errors and the confident intervals (IBM, 2013). To ensure robust confidence intervals, Bias corrected and accelerated (BCa) intervals were used since it ensures adjusted intervals that are more accurate (IBM, 2013). Mersenne Twister Random Number Generator was set to replicate a sequence of random numbers. This helped to preserve the original state of the random number generator and restore that state after the analysis was completed (Arbuckle, 2010). The

Simple method was used since it helps to resample with replacement from the original dataset. No post-hoc analysis was conducted because the results of the ANOVA was statistically insignificant.

#### 4.0 Results and Discussion

The main purpose of this study was to explore the readability of terms of service of social networking websites of top five social media websites. The readability of the terms of service of the selected social networking websites

were determined by using Flesch reading ease and Flesch Kincaid grade level readability formulas.

Table 2 presents descriptive statistics of the readability of ToS of the top five social networking websites. The table 2 also included the means and standard deviations of the readability scores of the terms of service for better interpretation the readability levels.

Table 1 -Descriptive Statistics showing readability scores of ToS of top 5 SNWs

Social Network		Min	Max	Mean	SD
Facebook	FRE	3.60	61.40	36.85	14.82
	FKGL	10.10	21.80	14.57	3.56
WhatsApp	FRE	10.40	62.60	39.19	14.10
	FKGL	8.60	19.60	13.83	3.20
Messenger	FRE	.00	55.20	30.52	25.33
	FKGL	9.00	36.20	18.67	12.37
YouTube	FRE	25.80	66.70	36.75	11.00
	FKGL	9.90	18.20	15.05	2.56
WeChat	FRE	16.10	48.10	35.24	10.04
	FKGL	11.70	18.60	15.16	2.04

According to Owu- Ewie (2014), Flesch reading ease predicts the level of reading difficulty of a text based on the higher the score the easier the text is to read and understand, and the lower the score the difficult the text is to read and understand. From that perspective, it is evident that the mean readability scores of the selected terms of service were Facebook (36.85), WhatsApp (39.19), Messenger (30.52), YouTube (36.75) and WeChat (35.24). From these scores, the researchers ascertain that the readability of the terms of service were generally difficult. To better understand the implication of these scores on readers, the researchers included the

Flesch Kincaid grade scores, which translated the Flesch scores to grade level scores. The grade level scores predicted the number years of formal education a reader should have attained before he/she could find the text readable and understandable. From the means scores of Flesch Kincaid grade level, a end-user requires at least 13 years of formal education, thus equivalent to college level, before there can find any of the terms of service readable.

It is succinct that the ToS of the top five SNWs were generally 'difficult to read' when measured in terms of the Flesch reading ease. The highest mean Flesch

reading ease score was recorded for the ToS of WhatsApp social network (FRE = 39.19, SD = 14.10). This implies that on the average, the easiest to read ToS was that of WhatsApp social network. Although WhatsApp's ToS emerged as the easiest to read on the average, the readability level was still 'difficult' to read when considered on the Flesch Kincaid grade level. One required over 13 years of education to be able to comprehend this ToS (FKGL = 13.83, SD = 3.20). In contrast, the most difficult to read ToS was that of Messenger ( = 30.52, SD = 25.33), requiring readers to attain nearly 19 years of formal education in order to be able to comprehend the terms of service (FKGL = 18.67, SD = 12.37). From the mean score of the ToS of Messenger social network (app), the readability of the ToS was 'very difficult' to read when measured in terms of the Flesch reading ease.

Generally, one major reason that accounts for end-user of networking websites avoiding reading of the terms of service of the sites is the readability of the terms of service. Meiselwitz (2013) discovered that placement of files of social media policies and procedures affected readers' access to the policies but then, the readability of the policies and procedures of the social networking websites were difficult to read. In the same lens, Prichard and Hayden (2008) concluded from their study that majority of end user agreements were difficult to read. Prichard and Hayden (2008) found grade level scores of end user agreement to be between 11.76 to 14.5 years. This implies the authors grade

level scores were slightly lower than the current study which recorded grade level scores between 13.83 to 18.67 years. Similar findings were also reported by Luger et al., (2013) with respect to ToS of Energy companies in the UK. In this study, the readability scores were high because the terms of service included complex syntactical and lexical items.

As Ehri indicated in the reading development and fluency theory that the graphophonic letter familiarity, phonemic awareness and knowledge of graphemes contributes to reading difficulty as well as fluency. As far as the readability scores are concerned, it is clear that the word choice and sentence structures of the selected terms of use were not written in a readable style, which therefore negatively affected the readability scores. From Ehri's theory, the authors glean that the unfamiliarity of the words, the phonemic difficulties and lack of knowledge of the graphemes will woefully affect readers' understanding of the terms. Worst of all is that as DuBay (2004) argued that when a text is difficult to read, readers are likely to get bored and therefore, avoid reading the text entirely. DuBay (2004) added that even when the readers persist to read, the reading difficulty of the text will divert their concentration as they grapple to find meaning of polysyllabic words or complex grammatical structures. From this point of view, it logical to agree with Gyasi and Bangmarigu (2019) that the readability of terms of use greatly affect the readership and comprehensibility of terms of use.

Meanwhile, considering that ToS outlines the legal requirements and privileges of end users of this medium of communication (social media), it is reasonable to assume that such information should be, at a minimum, written in such a way as to be understandable to a functionally literate individual. This assumption is met if texts are written at a plain language level (FRE score of 60 – 70; FKGL score of 7-8) since the reading level of majority of the masses is at best that of plain language level. Therefore, any ToS falling below plain language readability level will be practically difficult to read and understand by majority of users of these SNWs. Considering this study, none of the ToS scored a readability of a plain language level or below and this is suggesting that all the ToS are far difficult to comprehend by target audience.

If SNWs genuinely wish to communicate effectively with a wider proportion of their customer base, then it is expedient that the ToS are revised to grade level of 7 – 8. This is particularly important since people of varying educational backgrounds use SNWs. As has been suggested by Luger et al., (2013), individuals with poor literacy skills are (a) more literal in their interpretation of words, (b) ignore words unfamiliar to

them, (c) place over-emphasis upon the insignificant details within a text. Moreover, such readers: (d) read more slowly than those with higher literacy levels, (e) find difficulty in identifying the key concepts within a text, and (f) often do not consider the context of the narrative (Luger et al., 2013). Therefore, writing complex ToS will make it extra difficult for audience to interpret it as meant by the authors. Thus, SNW users would not be able to make informed choice about which network to use because the ToS are generally written above the recommended grade level for public documents.

### **Objective 2- Are there statistically significant differences in the readability of ToS of the five SNWs?**

While it is important to know the individual scores of each network terms of service, the authors examined the statistical difference among the network sites in terms of their readability scores. To achieve the objective two, the authors evaluated the relative difference of the readability scores of the top five social media sites using one-way analysis of variance (with bootstrapping). Preliminary analysis was conducted to ensure that the assumption of homogeneity of variance was not violated. The results from the ANOVA are presented in Table 3.

Table 3- Results of One-Way Analysis of Variance of FRE scores among the ToS of the top five SNWs.

FRE	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	268.521	4	67.130	.367	.831
Within Groups	11336.321	62	182.844		
Total	11604.842	66			

From Table 3, the results indicated no significant difference existed among the readability scores of ToS of the topmost five SNWs ( $F_{(62, 66)} = 0.367$ ;  $p = 0.831$ ). The results means that the readability scores of the terms of service of the top five social networking websites were apparently similar with no relative difference. Since there was no statistical difference among the readability scores, no posthoc analysis was conducted. The implication of this finding is that, the topmost five SNWs all have ToS of equal readability. Therefore, one cannot decide on which SNWs to choose based on this decision-making tool, the ToS, of any of these networks since they are all of equal readability.

From this finding therefore, any attempt to encourage SNWs to revise their ToS to make them readable should target all these five SNWs with the same amount of seriousness and attention. With respect to Ehri's theory of fluency, the authors of this study opine that the text will be difficult for most readers because of the unfamiliar words, complex sentence structures among others that are affecting the readability of the terms of service of social networking applications. It is therefore, the firm position of the researchers that

the terms of service of social networking sites be revised to meet the standard reading levels of most users of social networking sites.

### 5.0 Conclusion

In this study, the researchers examined the readability of ToS of the world's top five social networks. Using the readability formulas and descriptive statistics, the researchers measured the readability of the terms of use of the social networking sites and analysed the data respectively. The analysis revealed that the ToS of these social networks were generally difficult to comprehend. Amongst the five networks, the ToS of WhatsApp was found to be the easiest to read, requiring 13 years of education in order to comprehend. In contrast, ToS of Messenger social network platform was the most difficult to read, requiring users to have attained nearly 19 years of formal education to comprehend the text. In addition, the study showed that the readability level of ToS of all SNWs were similar with no significant statistical difference among them. This finding was not surprising since all ToS are typically written in legalistic format. The researchers firmly believe that revision of the terms of service of the social networking sites will improve

their communicative effectiveness as well as their usefulness to end-users who require the information in terms of use to make informed decision. Moreover, revising the content of the

terms of service to plain language will entice readers to read the terms rather than ignore as it is the usual practice of most end-users.

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