GRADE-LEVEL READABILITY OF MUNICIPAL WEBSITES: ARE THEY CREATING DIGITAL INEQUALITIES OF OPPORTUNITIES THAT PERPETUATE THE DIGITAL DIVIDE?

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GRADE-LEVEL READABILITY OF MUNICIPAL WEBSITES: ARE THEY CREATING DIGITAL INEQUALITIES OF OPPORTUNITIES THAT PERPETUATE THE DIGITAL DIVIDE?

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Dissertation

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ABSTRACT

The adoption of information technologies as a platform for disseminating government information has influenced traditional roles of public service delivery and citizen participation. There is concern whether the readability of government websites where public information found is creating digital inequalities of opportunities that perpetuate the digital divide. This study aimed to access the readability level of a sample of municipal websites in the U.S. to determine if municipal websites are being written at too high of a level for citizens to comprehend. The research utilized population data from the 2010 U.S. Census of municipalities to create a data set for analyzing readability of websites.

This dissertation sought to answer six research questions. What is the readability ease score and grade level of a sample of municipalities' websites with population greater than 5,000 citizens? Are the states' mean Flesch-Kincaid reading grade levels different from the national average reading grade level Do municipal websites' main pages read at the targeted state's standard reading grade level? Is the mean Flesch-Kincaid reading grade level of the city webpages within the state equal to the targeted state's standard reading grade level? Is there difference between the FKGL score mean difference among cities (small, medium, and large)? Do city websites offer audio or visual portals? Implementing new writing strategies that focus on high readability of text and issues of

communication with the audience can assist in guiding decisions that improves effectiveness of municipal websites' online instructions and text.

The findings revealed that municipal web pages are being written at levels greater than the national average reading grade level. In addition, the majority of municipal websites are absent of audio visual alternatives to text. This can impose a significant challenged to (all) citizens trying to access important information that can influence their lives economically, socially, and politically. Today, being able to access information from e-government websites is more important than ever, given the world we live in. Identifying high readability of text and issues of communication can assist in guiding decisions that improves effectiveness of municipal websites' online instructions and text.

DEDICATION

This study is dedicated to my mother, a strong and diligent woman, who inspired this study for those who have gotten caught within the boundaries of the digital divide. Thank you for teaching me that faith, hard work, and perseverance are the keys to success.

IN MEMORY

In memory of the late Dr. Ralph Hummel, who was a beacon of inspiration and encouragement that was so needed when I was preparing for comprehensive exams. Words cannot express my gratitude for the sharing of his time, his energy, his intellect, and of course, his many anecdotes that never got boring no matter how many times he shared them. He will be missed.

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CHAPTER I

INTRODUCTION

We are living in a flux of technological transformation in which computerization is causing drastic changes in government and society. A component compelling major changes in the form and functions of government is information technology (Thomas & Streib, 2003). The adoption of information technologies as a platform for disseminating government information has influenced traditional roles of public service delivery and citizen participation. There is concern whether the readability of government websites where public information found is creating digital inequalities of opportunities that perpetuate the digital divide, a social problem affecting various population groups from accessing information and services that can improve their lives (Choemprayong, 2006; Lazarus & Mora, 2000; NTIA, 1999; Smith, 2010).

Background of the Study

The medium in which we communicate has become as important as how the World Wide Web and the Internet have become a means to an end for the governments endless pursuit towards efficiency, responsiveness and transparency of administrative functions. All levels of government are utilizing websites and web base technologies to funnel government information about programs and services to citizens; however, citizens cannot access this information because the instructions on the webpages, portals,

or links are prone to problems of readability. All across the country governments have embraced electronic government. Many, if not all, have invested public dollars in developing websites that utilize new technologies that allow citizens to retrieve practical information at a given point in time or as a one-stop shop where citizens jump from one link to another in search of information on various programs; to interact with bureaucrats concerning programs and services; or to conduct online transactions such as paying a bill, filling out an application, enrolling in a government program, or voting (Digital Towpath Cooperative, 2010; Gillies, 2008; Thiele, 2011; Tyksinski, 2009).

Today, being able to access information from e-government websites is more important than ever, given the world we live in. For instance, from August 23, 2005 through August 30, 2005, one of the most deadly hurricanes hit the Gulf Coast, creating widespread devastation. According to the Nation Oceanic & Atmospheric Administration (NOAA) (2007), the National Climate Data Center (2005), CNN (2008), Dateline (2006), and Fox News (2005), Hurricane Katrina disrupted and displaced over 15 million people. The majority of which consisted of individuals with similar social and economic makeups. In particular, low income, less educated, and rural and urban dwellers. These groups of people fit the United States Departments of Commerce and the National Telecommunications and Information Administration's (1999) definition of at risk groups that are "digitally divided". The DOC and NTIA define the "digital divide" as, "The divide between those with access to new technologies and those without" (NTIA, 1998). Efforts were initiated on the federal level to utilize federal, state, and local government agencies to collaborate and to utilize technologies and e-government web portals to funnel information about evacuations, shelter, food, money and safe

drinking water. A special report on Katrina prepared by the Committee on Homeland Security and Government Affairs (2006) for the U.S. Senate writes that the national government "committed $88 billion to the response, recovery, and rebuilding efforts for Katrina. Unfortunately, not all of this money has been wisely spent; precious taxpayer dollars have been lost to fraud, waste, and abuse" (p. 577).

Thousands of supplies were sent and thousands of the Federal Emergency Management Administration trailers were available for displaced victims of Hurricane Katrina. However, conditions for getting into a trailer required a long intense process that sent applicants through a maze of questionnaires and other online requirements. This was a frustrating process to those in need of immediate assistance. Months after the disaster, hundreds of these FEMA trailers were unoccupied in a fenced in lot.

The Federal Government's approach to issues of readability included legislation in Plain Writing, such as the Plain Writing Act of 2010. Before then, other federal mandates and executive orders were given by various Presidents (Federal Plain Writing Mandates, n.d.; Greer, 2012). Since the Plain Writing Act, many of the Federal Executive Agencies have failed to implement the statue, so much of the written material disseminated by the government is still too difficult to read and comprehend. In addition, The Plain Writing Act has some inherent defects, and the implementation of plain writing guidelines in state and municipal governments is very limited.

After an extensive research was conducted on state governments' use of electronic government and readability, only one continuous study was found that measured readability. Annual studies by Darrell West of the Brookings Institute on electronic government features discovered that the readability level of federal and state

websites is being written at reading levels too advance for American adults to understand. An additional search on local governments' use of electronic government and readability produced only one study, a dissertation study; however, the study did not measure readability.

With 40 million Americans functionally illiterate and reading at or below an eighth grade education level, e-governments must include appropriate content and readable text that will allow every citizen the opportunity to access this pertinent information that can enhance their quantity and quality of life (Lazarus & Mora, 2000).

Problems with text difficulty have been addressed since the early 20th century. Nonetheless, municipal governments are utilizing technology and websites to encourage electronic governance. However, the process with government information being disseminated through web-based technologies is getting lost in translation. There are users of these technologies who are unable to understand the instructions that are designed to navigate them to resources, services, programs, and much more. A majority of text-based instructions (prose) that guide the users to find information found on municipal websites is written at levels beyond citizens' understanding (West & Miller, 2006). Governments' use of websites to communicate to online users is predicated on the belief that the users understand the instructions necessary to navigate between pages and have the necessary reading ability to read and comprehend technical communication.

The Digital Divide

The more society becomes computerized, the more society is dependent on computer/Internet technologies as tools of immediate communication, transaction,

interaction and information sharing (Hummel, personal communication, 2006). Furthermore, the more private and public institutions utilize information and communication technologies (ICT) to advance information on programs and services, policies, benefits, opportunities and much more, individuals who cannot access or without access to personal hardware and software, Internet skills and broadband will be left out of economic, social, and political benefits leaving such individuals/groups victims of the digital divide (NITA, 1995, 1999).

Since the inauguration of the term "Digital Divide" (in the mid-1990s), America has experienced an explosive growth in information technology and telecommunications, specifically, the Internet. The Internet has reshaped and redefined many industries: government, commerce, communication, education and entertainment. This new technology offered greater freedom and flexibility with regards to cost, time, space, location, and access to information. In theory, the Internet hosts greater amounts of information for people to utilize and not having access to a wealth of information via the Internet would affect every aspect of peoples' lives: economic, cultural, social, and political (Hummel, 2006; Lazarus & Mora, 2000; Thiele, 2011).

An international debate ensues between political official, scholars and professionals as to what the digital divide is and who is at determent. Political advocates of this new medium start to engage in political assumptions that the Internet carries a lot of political benefits. Meanwhile, scholars and professionals postulate that anyone who lacks access to these technological tools is at a tremendous disadvantage of being divided from information. Much of the survey literature on the digital divide has been done by the Department of Commerce in conjunction with the National Telecommunication and

Information Administration (NTIA). NTIA conducted a series of studies on the digital divide, *Falling Through the Net: A Survey of the "Have Nots" in Rural and Urban America* (July 1995), Falling *Through the Net II: New Data on the Digital Divide* (July 1998), *Falling Through the Net: Defining the Digital Divide* and *Falling Through the Net: Toward Digital Inclusion* to better understand, measure, and explain how the revolution of Information Technology is seemingly separating people into groups of haves and have-nots of information. It is assessed that a number of social determinates increase many disparities that avert low-income and minority citizens from gaining online access. The United States government builds on the assumption that full participation in a digital economy can only be gain through the access of technological tools and skills. The government's goal is to provide universal service to all its citizens because a lack of technological tools and Internet access to information by certain groups create a "digital divide" (NITA, 1995).

Previous studies revealed public policies that were geared to close the access gap between haves and have nots did not necessarily meet their goals. Researchers such as Kvasny (2002a) expounded on this position that technological access problems do not remove a have not to necessarily being a have. Kvasny inferred that, "this position often overshadows scrutiny of social, cultural, and institutional structures and practices that might serve to inhibit technology design, acquisition, access, and use." Compaine (2001) saw the Internet as creating gaps between those fortunate to access information and the latest technologies to those less fortunate to accessing such information through the Internet. Compaine's studies of the digital divide suggested that the divide has moving boundaries. If the digital divide centers on the latest information technologies as

suggested by Compaine, then Songphan Choemprayong (2004) brought up an interesting argument on whether the digital divide is a question of "obtaining latest technologies or a sufficient sub set of recent technologies" (Compaine, 2004, para 2). Compaine identified latest technologies as shifting from personal computers and software to access to broadband. And recent technologies include the use of web base technologies. Choemprayong (2004) went on to ask if such technologies are in the best interest of the public. One thing is certain, the digital divide isn't shrinking (West, 2008). Despite the fact, the overall goal of the Department of Commerce and NTIA is to provide universal access to information (NTIA, 1995, Summary, p. x).

Shifting Boundaries of the Digital Divide

Previous studies on the digital divide have always posited the digital divide as one of access: access to hardware and software, to the Internet, to broadband, and to skills. According to Thiele (2011), the digital divide should move beyond its dichotomous view that centers on access to a view that centers on digital inequalities (Choemprayong, 2004; Compaine, 2004; Lazarus & Mora, 2000; National Performance Review, 1993; Thiele, 2010; West, 2008). And as the Internet becomes a conduit for citizens and governments to interact through the use of web base technologies, content-related barriers are shifting the boundaries of the digital divide (Lazarus & Mora, 2000; Vice President Gore's National Partnership for Reinventing Government (n.d.). Since additional studies by West (2003, 2005, and 2008), studies conducted by Lazarus & Mora (2000, 2002) for the Children's Partnership and NTIA (1995, 1999) clearly show how e-government creates new barriers (content and readability) to access information. The Children's Partnership,

a national child advocacy organization that conducts research in areas of health care and technology, "to ensure that all children have the health care they need and that the opportunities afforded by computing devices and the Internet benefit all children and families." The Children's Partnership conducted a five year audit on the digital divide and underprivileged groups of society. The study concluded that a new problem other than access was contributing to the digital divide, a content divide (Lazarus & Mora, 2000). The term *Content* refers to information that is disseminated through many mediums of transmission. Technological advances in communication have permitted the transmission of content in many forms: telegraph, radio, telephone (voice), newspaper, television, Internet, websites, CDs, and other methods of transmission (Grulke, 2008; West, 2003). Daws, Bloniartz, Kelley, and Fletcher (1999), Dawes, Gregg and Agouris (2004), and Dawes and Helbig (2007) suggested that the government's use of digital technologies should be for the improvement and strengthening of public initiatives throughout the community (as cited in Grulke, 2008, p. 8).

When Content is distributed through mediums such as the Internet or a website, the term content can then refer to information (materials, text, documents), tools, or features (i.e., instructions) located on a website that a visitor finds beneficial to his or her search. Lazarus and Mora (2000) in The Children's Partnership audit defines useful content as "needed employment, education, and other information; reading levels that can be clearly understood by limited-literacy users; multiple languages; and ways for the underserved to create content and interact with it so that it is culturally appropriate" (p. 12).

As more citizens venture online to conduct business, they are also engaging in some form of interaction with their government (Children Partnership, 2002). Therefore, the content disseminated via the Internet should be useful and viable to servicing the needs of underserved communities (Lazarus & Mora, 2000). The creation of useful content offers a plethora of opportunities: education, job training, government programs and services, civic engagement and political participation and much more. The audit, however, points out that online content that is not understood by limited-literacy users creates a content-related barrier for users (p. 8). In particular, readability obstacles are created by designers or writers when content is written for those population groups that have additional income and education to decipher such complex information (Lazarus & Mora, 2000). The Children's Partnership (2000) approximated there are 44 million American adults who are functionally incapable of understanding useful, online content. If citizens cannot understand the level of content that is being disseminated though the website, how can they access the information needed to fulfill a quality of life?

The digital divide as an issue of access also becomes an issue of content and usability. One cannot use information that one cannot read and comprehend. Many of the federal and state government websites have a readability level of the 12th grade (West, 2008). The Department of Commerce identified education as one socioeconomic factor that prevents online access, and educational experts believe it takes a ninth and tenth grade competence level to understand basic instructions on a federal tax form. In 2003, The US Department of Education and National Center for Education Statistics conducted a followed up of the 1992 survey titled, *National Assessment of Adult Literacy*. The 2003 NAAL's survey concentrated on literacy skills of adults and adults incarcerated in federal

and state penitentiaries. Adult literacy measures were based on three literacy criteria: Prose, Document, and Quantitative. Findings reveal an extreme amount of adult urban residents in America were functionally and marginally illiterate and live under the government's official poverty line. Many could not read above an eighth grade level, nor did they possess the skill set needed to operate within a modern society (Greenberg & Jin, 2007; Maatta, 2003).

Electronic Government

As more and more opportunities are tied to the Internet, Americans of different races, socioeconomics, and ages are logging on hoping to take advantages opportunities that are linked to education, income, jobs, health and much more. Government agencies at all levels are trying to capitalize on this phenomenon (the Internet) to bring their services online. Since the passage of E-government Act of 2002, an act design to make government more accountable, efficient, and accessible to the citizens, the World Wide Web as an application of the Internet has empowered all levels of government to become content creators—allowing digital government and electronic governance to grow at unprecedented levels while transforming and reinventing itself through the use of the Internet (Baird, Zelin, & Booker, 2012; Grulke, 2008; Maatta, 2003).

Public Service Practices

Electronic governance has changed the traditional public service practices. No longer do citizens have to engage directly with the street-level bureaucratic. This new method of disseminating mass amounts of government information, programs and services, and democratic engagement allow governments to be cost effective, efficient,

accountable, responsive, and transparent to its citizens, at least in theory (Lazarus & Mora, 2000; Thiele, 2011). According to the research found by the Children's Partnership, underserved Americans are seeking the Internet for local opportunities offered through the local government (Children Partnerships, 2002; Lazarus, Lipper, & Roberts, 2003). A number of electronic government studies show that many Americans are going online to conduct business transactions, do social networking, and seek government information that may enhance their quality of life (Lazarus & Mora, 2000; Smith, 2010; Thiele, 2011). Consequently, certain population groups lag behind because they lack the necessary hardware and software, the appropriate Internet skill-set pertinent to online access, and now the lack of comprehension skills to decipher information. Those who cannot read, write, and understand information are severely impeded from participation in a complex, network society, and without access to the information necessary to make an intelligent decisions for the best interest of their wellbeing, they experience the reality of the "digital divide" (Hummel, 2006; Lazarus & Mora, 2000; Choemprayong, 2000; NITA, 1995, 1999, 2002, 2005).

Significance of the Problem

The adoption of e-government to facilitate government information to the public has been brought to The Office of Management and Budget's (OMB) attention that new barriers are now averting universal access to information, content, and readability. President Obama stressed in a 2009, Memorandum on Transparency and Open Government, the importance of a transparent, participatory, and collaborative government that can only be achieved through clear communication (White House, 2009). In 1990,

Glanz and Rudd wrote an article on how content that instructed consumers, patients, and workers on what to do were written at incomprehensible levels.

In recent years, a slow progressive movement, The Plain Language Movement, has picked up speed as a solution to bring about Universal Access to everyone as well as transparent, interactive government. The passage of the *Plain Writing Act of 2010* and the *Plain Regulations Act of 2012* are the federal governments' acknowledgements for plain language in their rulemaking and in their communications with the public. The goal of the Plain Writing Act of 2010, "to enhance citizen access to Government information and services by establishing that Government documents issued to the public must be written clearly, and for other purposes…the purpose of this Act is to improve the effectiveness and accountability of Federal agencies to the public by promoting clear Government communication that the public can understand and use" (H.R. 946--111th Congress, 2010, 124 STAT. 2861). However, The 2010 Act does not mandate states or municipalities to encourage compliance among state, local or county agencies to use this model language guidelines—which are committed to writing documents in clear, concise, well-structured and in plain language that is construed by all who encounters that information or instructions (H.R. 946--111th Congress, 2010, 124 STAT. 2861).

Plain Language Action and Information Network prepared a 2012 report card of the 12 federal agencies implementation of the Federal Plain Language Guidelines, only three agencies received a B and one agency received an A. All other agencies received an average score or an F for implementing basic requirements of plain language (Plain Language Report Card, 2012). Of the 50 states in the Union, only 32 states voluntarily have a plain language program. However, of these 32 states and their many agencies, one

agency offers a plain language website or plain language guidelines. Local plain language programs do exist in the larger municipalities such as Los Angeles and New York City. These larger cities are more than equipped financially to use plain language approaches to communication. Even though there is a strong push federally to get agencies to adopt plain language approaches, the normal practice for most state and local agencies' writers/designers are process strategies that focus on text-based approaches to writing and communicating with audiences. This is prevalent among state and municipal websites that still have high readability issues (Children Partnership, 2002; Lazarus et al., 2003; Lazarus & Mora, 2000; West, 2008). Writers and designers are more text-oriented than reader-oriented when developing their websites, instructions, organization, and documents. Meanwhile, government information on programs and services is continually being funnel through e-government websites; and there is a great possibility citizens going to theses webpages, portals, or links that navigate them to vial information are prone to problems of readability.

Purpose of the Study

The purpose of this study was to contribute to the understanding and knowledge concerning readability and government websites. This study aimed to fill a gap in the academic literature by examining the grade-level readability of a sample of municipal websites in the U.S. This understanding will assist politicians, government agencies, and public administrators in identifying practices that maybe contributing to issues of readability of text. Implementing new writing strategies that focus on high readability of

text and issues of communication with the audience can assist in guiding decisions that improves effectiveness of municipal websites' online instructions and text.

Research Questions

This dissertation focused on six research questions. The first was to analyze the reading ease and grade-level readability of a sample of municipal websites to determine if government information being disseminated is written at too high of a level for citizens to comprehend. In turn, this addressed the study's first research question: What is the readability level of official municipal websites with populations greater than 5,000 citizens?

The second question of this dissertation research was to measure the state's mean reading grade level against the national adult literacy grade level? Doing so addressed the study's second research question: Are the states' mean Flesch-Kincaid reading grade levels different from the national average adult reading level?

The third question of this dissertation research was to take the grade-level readability scores of these sample websites and compare them to the educational attainment levels established by each state. Doing so addressed the study's third research question: Do municipal websites readability grade scores differ from state average academic attainment levels of citizens?

The fourth question of this dissertation research looked at the relationship between individual webpages in the state to their state's standard reading grade level. Doing so addressed the study's fourth research question: Is the mean Flesch-Kincaid

reading grade level of the city webpages within the state equal to the state's standard reading grade level?

The fifth question of this dissertation research was to compare the FKGL scores of city sizes (small, medium, and large) to determine if a difference exists. Doing so addressed the study's fifth research question: Are there differences between FKGL score and city sizes category (small, medium, and large)?

A sixth question of this dissertation research was to take an inventory of how many of the sample municipal websites offer portals that present government documents through asynchronous web-base tools such as one way audio or video feeds. This addressed the study's sixth research question: Do municipal websites offer portals that will facilitate the same text message in an audio or video format?

Assumptions

There were some assumptions that needed to be addressed in this study. There was an assumption that government information is being written at too high of a grade level for citizens to understand. There was another assumption that the instructions on municipal websites that guide citizens to government information are also written at high levels of comprehension. There was an assumption that readability formulas can measure any text. There was an assumption that readability formulas are good indicators of text that are written at too high of a grade level.

Definitions

The Department of Commerce Census Bureau identified five forms of local government that are classified under two purposes of governments, general-purposes (i.e.,

counties, municipalities, townships) and special purposes of government (i.e., special districts and school districts) (Census, 2010). The Census Bureau's definition of government is (2010) "An organized entity that, in addition to having governmental character, has sufficient discretion in the management of its own affairs to distinguish it as separate from the administrative structure of any other governmental unit" (U.S. Census Bureau, 2012). The Census Bureau (2010, 2012) defines the term municipal as, "Organized local governments authorized in state constitutions and statutes and established to provide general government for a defined area; includes those governments designated as cities, boroughs (except in Alaska), towns (except in the six New England states, Minnesota, New York, and Wisconsin), and villages. Municipal governments are distinguished from township governments primarily by the historical circumstances surrounding their incorporation."

The concept of readability is explored to determine if the text (i.e. instructions, prose, or documentation writing) found on municipal websites are issues of readability. Readability has overlapping definitions that centers on elements of passage that can either contribute to reader ease and understanding or reading difficulty such as vocabulary difficulty, style, organization, design, and cognitive processes (Chall, 1988; DuBay, 2004a; Hallenbeck, 1935; Oakland & Lane, 2004; Zakaluk & Samuels, 1988a; Zakuluk & Samuels, 1988b). The Flesch-Kincaid Readability Formula is a test that determines readability of a given passage, prose, document, or instructions. West and Miller (2006) appeared to define readability and literacy synonymous. "Readability. Literacy is the ability to read and understand information from text and other written formats" (p. 656). Plain Language as defined by Greer (2012), "Public sector agencies, business, and legal

communities use the terms plain language, plain writing, and plain English interchangeably to represent improved communication from organizations to the public…clear and effective communication" (p. 137). OCEDiLibrary defines Educational Attainment Level as, "The highest level of education completed by each person, shown as a percentage of all persons in that age group.

Limitations of Study

The limitation of a formula is inherent in the selection of variables used to determined text difficulty. The algorithms in computer software programs will calculate scores differently because various formulas utilize other factors (sentence length, syllabic intensity, multiple syllable words, prefixes, number of prepositions, personal pronouns, and other correlating factors) to predict readability, which according to Kern (1979) can generate different scores and different grades for the same text. Even though, the differences are slight, it is enough for critiques of readability formulas to contest their findings. Another limitation of the formula is its inability to distinguish order of content. A readability formula will measure a sentence the same if it is written in a different order. For instance, a sentence written as, the dog barked for two hours, will generate the same score if written, two hours the dog barked. There are also the problems of generating an inaccurate score due to other factors other than semantic and syntactic variables influencing comprehension such as design, organization of content and writing style. There is also the factor of website incompletely developed, meaning not enough text or more illustration directing an online user.

Analytical Lens

The key element in which readability was examined was from the lens of quantitative research. This lens helped guide the methods that were used in pursuing answers to the questions established in the dissertation. A random sampling procedure was incorporated to obtain a probability sample of the population. This study used the Flesch-Kincaid Readability Formula in assessing data obtained the unit of analysis (municipal websites' front page). Three statistical techniques, descriptive statistics, t-test, and ANOVA were used to address all research questions.

Significance of the Study

A study by The Children's Partnership (2000) performed a series of audits over a five-year period on the digital divide. The audit identified a new dimension that is contributing to the digital divide; online content. Their comprehensive study looked at 1,000 websites to determine what content averted underprivileged Americans from acquiring information that could possible improve their current position. Content was considered a barrier that is so important when it comes to citizens moving forward in their search for information that it can possibly hinder their economic, social, and political opportunities.

As the Internet emerges as the new governing tool for all levels of government, it has become a way for governments to communicate cheaply to the masses. More government innovations, funding, and programs flow from the federal governments to state governments to local governments. And it is still at the local level of government

where the majority of communication between citizen and administrator occurs (Sandoval-Almazan & Gil-Garcia; 2012).

E-government allows citizens to engage in decision making; promotes new ways for the exchange of goods and services without the constraints of time and space; enables users the ability to communicate through inter or intra networks; and promotes new ways to deliver conventional education and information. Given the increase of responsibilities funneled down to the local levels of governments, it is important that the content (including instructions) is at readable levels for all to understand. If government documents and information are written at too high of a level for citizens to comprehend, then those who suffer will be left out of opportunities (jobs, programs and services, debating, etc.) and the ability to participate in the democratic process (voting and voicing one's opinion).

The current literature on readability in various industries and disciplines is immeasurable; however, a recent search under the search keywords "readability", "content" and "electronic government websites" yielded only a hand full of studies. These ongoing studies by Darrell West, from 2000 to present, inventory the content found on federal and state websites, content such as accessibility, privacy and security, online information, consistency, completeness, electronic services, readability, and access to foreign language and disability are catalog for purposes of state and federal consistency of what's being offered. Darrell West's (2008) study went so far as to compare federal and state websites and their content features. Websites with the better content features are considered to be more interactive in improving government service delivery. According to West and Miller (2006), these features can also become disparities

that excluded certain groups of the population from accessing important information. A national representative survey highlighting online access of various groups of people identified low income groups are not participating in the online revolution; yet still, government continues to funnel digital services through electronic mediums (West & Miller, 2006).

In *Dissertation Abstract*, a search using key words such as "readability", "content" and "municipal websites" yielded one study, a dissertation study by Levi Thiele (2011) that seemed to mirror Darrell West's (2008) study *of State and Federal Electronic Government in the United States*. Thiele's study examined the content and features of municipal websites. What was cataloged in West's study was pretty much inclusive in Thiel's study except for the omission of readability levels of municipal websites. Thiele, however, did offer benchmarks standard for e-governments. This examination was an understudied area of electronic government, especially of municipal websites, which lends credence to the necessity of this study.

This research filled a void in the academic literature on readability of municipal websites. Because the studies of municipal websites are limited in their research on levels of readability, this research lent practical usefulness to various stakeholders such as local public administrators, city officials, state and federal administrators, citizens, software developers, graphic designers, and technical designers of website text. Federal and state government programs that are designed to benefit low-income families can be accessed from local portals found on municipal websites. Local governments can customize their content for limited-literacy users. Software providers can create new applications that allow technical designers to create text that is more appropriate and

useful to all citizens. Not to mention, software producers can provide a simple interface system that allows an automatic default to more simple text for those citizens that suffer with limit literacy. Darrell West defined Literacy as, "the ability to read and understand written information."

When designing municipal websites, the content should meet the needs of its citizens. As aforementioned, the content of municipal websites is a piece that contributes to the whole. Each piece may have its designated duty that contributes to the overall website. Therefore, readability is indispensable to the overall content of websites. DuBay (2004a, p. 4) acknowledged that, "When the texts exceed the reading ability of readers, they usually stop reading." If the reader stops reading, they are left out of information that leads to opportunities disseminated through municipal websites. Equitable access has increased social and political pressures on elected officials and administrators to improve accessibility to electronic information. Darrell West and Edward Miller (2006) wrote that one of the industries that first came under scrutiny was the health industry. Legislation was passed. The Workforce Investment Act of 1998 required government agencies, "develop, procure, maintain, or use electronic and information technology to ensure that Federal employees and members of the public with disabilities have access to and use of information and data, comparable to that of the employees and members of the public without disabilities" (p. 655, para 2). Ironically, governments' use of websites improved their efficiency; however, West and Miller (2006) suggested that cynicism will decrease both efficiency and effectives of e-government.

Dissertation Organization

The framework guiding this dissertation is organized into five chapters. Chapter I provides the Introduction and its parts: Background of the study, digital divide, shifting boundaries of the digital divide, electronic government, significance of the problem, purpose of the study, research questions, analytical lens, significance of the study, and frame work for design.

There are two sides to explore when it comes to communication and documentation writing: From the perspective of the reader and the lens of the designer. Chapter II explores pertinent literature regarding the reading skills of the audience and the readability of the text. Both perspectives are important when trying to answer the research questions. The study also researched literature on state educational attainment levels so that comparisons can be made between readability levels of municipal websites and educational attainment levels of the states' citizens.

Chapter III presents the methodological framework for which to answer our research questions. This dissertation research utilized descriptive statistics and t-test to spot light the questions concerning readability of municipalities' and state educational attainment levels across the United States. Chapter IV presents the findings of results from the analysis of municipal websites' front page. These results were explored and compared against the means of state educational attainment levels. Chapter V incorporates the results from Chapter III and the comparative observations in Chapter IV in an effort to recommend future research that would build on the current studies already conducted on readability of websites.

CHAPTER II

REVIEW OF THE LITERATURE

Municipalities are utilizing websites and web-base technologies to funnel government information about benefits, programs and service to citizens; however, citizens cannot access this information because the instructions on the web pages, portals, or links are prone to problems of readability. This in turn can perpetuate the digital divide. Traditional ways of communication (face to face and ear to ear) are being abandoned for digital communication (computer to computer and networks to networks). The impact digital technologies have on communication is countless and requires a more advanced population that can digitally and cognitively process information from instructional text and documents. Digital technologies compel local governments to reinvent themselves and adopt new roles and structures if they wish to pursue efficiency, responsiveness and transparency of administrative functions in an information society. The once voiceless groups that were left out of the information revolution are possibly threatened again by the same technologies that supposedly gave them voice. However, the 'digital divide' has been spotlighted as an issue of access—those who do not have access to various hardware and software that lead to a plethora of information—issues of accessibility can also be averted by factors of readability, when trying to access information through websites (Hussain, Sohaib, & Ali, 2011). Lynda Harris (2010), director of White Limited, wrote, "For most of the organizations we deal with

information is the product and writing is the delivery mechanism. In this context, a poor document (failed delivery mechanism) means that an organization fails to connect and communicate" (p. 1). There is an assumption that citizens' ability to access information varies according to their reading capabilities and the readability of the text found on municipal websites.

As a result, readability has become a measuring criterion for web accessibility and has highlighted a new dimension to the 'digital divide', a content divide (Hussain et al., 2011; Lazarus & Mora, 2000). The focus of this discussion is on web readability of local electronic government websites. In order to explore this topic in detail, several topics need to be examined: municipal websites, plain language movement, readability studies, readability approach, critique of readability, and web readability guidelines.

Municipal Websites

Traditional methods of governing through bureaucratic structures have adopted information networks that transmit instant information, allow real-time communication, provide direct interaction, promote intra and inter collaboration, and facilitate citizens' democratic participation through electronic government websites (Kauhanen-Simanainen, 2005). Because of the Internet, the world has become smaller and governments have restructured and combined their efforts with other governmental and nongovernmental agencies to service the public in an efficient and effective manner (Morse, 2011).

Local governments too have adopted new methods for delivery the public good. Hunt (2007) posited municipalities have invested vast public resources into electronic government as an ideal medium to govern (Thiele, 2011). The use of the Internet to

promote electronic governing has allowed citizens to access practical and useful information about programs and services available to them. Although, local e-government websites are understudied, they are vastly becoming a critical part in the delivery of public service and programs that are connected to many parts. And many citizens are going online to retrieve government services than offline (Smith, 2010, pp. 21-27).

E-government websites have evolved from independent websites offering independent information and services into "one-stop" government websites that link private sector business with public sector agencies through one portal (Kauhanen-Simanainen, 2005; Thiele, 2011). Citizens can go to one place, one site and with the click of a button travel to other sites without the assistance of search engines. Morse (2011) argued, "There has been a shift towards collaborative governance…It is clear at all levels of government that collaborative governance is being embraced in practice" (p. 953). Kauhanen-Simanainen (2005) explained, "why collaborative information literacy is needed by government." According to Kauhanen-Simanainen, it will help improve the accountability of all governments and their use of websites to promote electronic transparency and responsiveness.

> In a democratic society preparation and decision-making relating to the issues at hand should be transparent. Both the realization of citizens' rights and accountability require that access to information is freely available. Information networks and e-government enable the transparency of the decision-making processes, the availability of documents and the possibility for citizens to influence the issues before they are finalized. In an open society the government has to actively disseminate information. Public information is a common capital and a resource for all. (p. 184)

This holds much importance for municipal websites because in a study by the Pew Internet and American Life Project (a Project of the Pew Research Center), Smith (2010, p. 19) sampled 1,375 online government users and found that the most frequent interaction between citizen and government was done on local e-government websites. Local governments interact with citizens on a daily basis rather than state governments or federal governments.

In 2009, The Pew Research Center's Internet & American Life Project identified that Internet use among American adults has grown to nearly 80% (Smith, 2010, p. 3). The Pew Research Center's Internet & American Life Project tracked over 2,000 adult users' use of the Internet. To have a true representation of internet usage among all American adults (from 18 and over), a random sample of telephone (hardline) and cellular users were measured (Pew Internet & American Life Project, 2012; Smith, 2010). The study found that research of government information on appropriations, legislation, agency operations and projects and programs has seen an increase since 2000 among online users who are highly educated with moderate to high income levels (Pew Internet & American Life Project, 2012; Smith, 2010). Specifically, of a population of 2,258 adults and a sample size of 1,676 internet users from 18 and over,

> Approximately, 82% of online users have connected to a government website, 48% of internet users have looked for information about a public policy, 46% have looked up what services a government agency provides…33% have renewed a driver's license or auto registration, 23% have gotten information about or applied for government benefits, and 19% have gotten information about how to apply for a government job and this type of information seeking is particularly common among African-American, the college graduates and those younger than 65. (Smith, 2010, p. 10)

Implementation of municipal websites relies on a number of factors such as public resources, administrative experience in new technologies, size of the city, and the attitudes of city council, public official or administrative officers to promote website development (Digital Towpath Cooperative, 2010; Tyksinski, 2009). The majority of larger cities' websites rely on formal networks, but smaller municipalities rely on informal networks, local employees' abilities to design the website, maintain the website, and update the content found on the website. Larger cities such as Oregon State, New York City and Los Angeles have implemented plain language guidelines that agencies and their departments must follow. According to Redish and Rosen (1991), writing guidelines are not for the professional writer (technical writer) to follow, but for practitioner or administrator or staff writer who see writing as a secondary responsibility to improving communication between the audience and its local government (Mazur, 2000).

Website development is crucial to the success of accomplishing whatever goals the city has attached to e-government. Traditional government activities are becoming on line features of some government websites; however, small cities with small budgets cannot afford to offer such interactive services for services, such as paying bills, filling out applications for permits, or retrieving information about government programs (Digital Towpath Cooperative, 2010, p. 2, 3). Coursey and Norris (2008, pp. 524-525) suggested there are several e-government models in which websites take on a linear development (as cited in Thiele, 2011). These various stages, according to e-government literature, are common among most e-government models (p. 13). A doctoral study by Levi Thiele's (2011) *Online Government*: *An Analysis of Municipal Websites* highlighted

basic information, customer service, interaction and transaction, and citizen participation as the four stages of development of e-government websites. The study examined municipal websites' accessibility, privacy and security and online features. If by any means, e-government websites have not progressed in their linear development to meet the demands of online government users; then the users will abandon the website. Citizens' trust is influenced through their ability to electronically participate in searching for information, acquiring information, delivering information (citizen feedback), and participating in an e-democratic process (Kim & Lee, 2012). However, Cassell and Hoornbeek (2010, pp. 311-312) and Scott (2006, p. 349) suggested that direct democracy is challenged when having to participate electronically (as cited in Thiele, 2011).

The Plain Language Movement

The practice of writing plain English has been around for centuries; however, the Plain Language Movement didn't occur until the 1960s. The movement commenced in the legal community. Lawyers who supported clear and understandable writings that are filled will simple words and short sentences are opposed to the pomposity, archaic, and redundant words that are composed of long sentences, that create clumsiness and vagueness, and that contribute to ambiguity for the writer and reader (Hathaway & Willard, n.d.; Orwell, 1950/2009). Out of concern for legalese writing birthed the Plain Language Movement. Traditional, writer-based style was being challenged for more of a reader-ease focus to writing, which utilized short sentences and unpretentious words. The emphasis of readability and information needs soon took center stage. The

movement grew and drew considerable attention from consumer groups which protested the technical language found in commercial and government documents (DuBay, 2004a).

A domino effect soon followed and compelled changes in other industries such as academia, government, law, and business. As the movement progressed, more domestic and international associations were created to eliminate showy and difficult writing that perpetuated the traditional writing style (Balmford, n.d; Federal Plain Writing Mandates, n.d.). Organizations such as Plain Language Association International (PLAIN) were founded in 1993 to make sure every audience around the world is able to read, understand, and use the information that is at their disposal. Clarity is an international organization made up lawyers and others to promote the use of plain language in various public and law domestically and globally (Siegel, 2011). There is also The Plain Language Information and Action Network, a collection of federal bureaucrats who are committed to improving the communication between government and its citizens (Plain Language Organizations, n.d.). The Center for Plain Language promotes the plain language movement by advocating legislation that promotes plain language. And one of the first organizations to promote research in the area of plain language was the Document Design Center of the American Institutes for Research (Mazur, 2000). Each of these organizations has led a diligent campaign in getting out the PL message, and showing how private, nonprofit, for profit, and public sectors benefit from its use. Because of their efforts, the Plain Language Movement has extended domestically and around the world (Balmford, n.d.; Siegel, 2011). Plain Language has not only crossed many borders, but its potential benefits have an impact on many professional industries: insurance, health, banking, education and government. Plain Language is being adopted

in religion, law, business, and government. The King James Version of the Bible has a plain language version call the NIV (English Version). Old scriptures are translated into everyday usable words and meaning. In the legal community, legal briefs are taking precedence over the old rudimentary, redundant language found in traditional briefs and legal documents. Stakeholders in banking, insurance, health and government are aware of the investment opportunities that plain language brings to their companies and agencies. Plain language in government and communications has helped to eliminate the jargon-filled documents that readers must endure when trying to understand compliance issues concerning regulations (Kimble, 1994, 1995). Dan Friedman (2008) in *Government Executive* predicted that plain language saves stakeholders (including citizens) time and energy which translates into monetary savings. The political, social, and economic benefits of plain language have been written about in international and domestic journals and advocated at national conferences on Plain Language such as Clarity (Balmford, n.d.; Clarity, 2010; Plain Language Organizations, n.d.)

Economically, plain language focuses on converting business and government decision-makers by showing them the benefits that come through the use of plain language, such as "improvements in efficiency, effectiveness, and customer satisfaction." Balmford (n.d.) was cited by Stephens (1999) in *Rapport*, a plain-language newsletter published between 1992-1999, that in the corporate arena, writing language in a plain style helps corporations save time and money in correcting problems associated with customer service and customer satisfaction (Stephens, 1999). No longer do companies have to spend x amount of dollars correcting customers' mistakes due to bad instructions and documentation writing. Literature on plain language shows that a failure to

effectively communicate can alienate a writer from their reader (DuBay, 2004a; Flammer 2010; Siegel, 2011). Layne and Lee (2001) and Moon (2002) recognized that e-government has become the medium in which an initiative such as a transparent government is able to effectively deliver services to citizens (Grimmelikhuijsen & Welch, 2012) and be seen positively, allowing e-participants to trust in governments abilities to do its business (Kim & Lee, 2012). Local e-governments have particularly become more efficient and effective with their scarce public resources (Grimmelikhuijsen & Welch, 2012; Kim & Lee, 2012).

Writing documents in relatively "plain English" eliminates the ambiguity that is hidden in government writings. Notable banks rewrote their loan applications to reduce customer service hours spent on correcting pretentious documents that were dominated with intimidating language and complicated sentences. Traditional applications that were rewritten into plain language saw a decrease in claim denial due to inaccurately filing. This saved the insurance companies money and restored their image (Mazur, 2000; Plain Language, n.d.). The Office and Management and Budget wrote that Joseph Kimble saw plain language not only as a time saver, but a cost saver as well (Mazur, 2000; Plain Language, n.d.; The Plain Language Regulations Act, 2012). Harris (2010) made a case for the use of plain language in business, that is, organizations which desire to communicate clearly will demonstrate the value of the organization and allow it to connect with the customers.

Politically, policy makers encouraging a transparent government through plain writing see an opportunity of "good governance" (Hood, 2006) because it ensures accountability among all the actors involved in the process (Grimmelikhuijsen & Welch,

2012; Meijer, 2009). Plain language provides elected officials with a way to promote e-democracy through plain writing. The political making process is seen to work easier among groups that are not familiar with policy making. Plain language allows citizens to participate in the decision-making process. Some proponents of plain Language believe that clear, concise writing is a precursor of human rights: to life, liberty and the pursuit of happiness, especially if fundamental rights are guaranteed through the acquiring of government information on programs and services that are written in traditional paper form or electronically (Cheek, 2008; Siegel, 2011). Plain language offers the ability to increase a government's responsiveness with citizens (Plain Language Government, n.d.). Citizens as voters called for widespread changes in how government did its business in the past. Today, the White House sought plain writing initiatives to decrease the cynicism among the general public (Vigoda, 2002). Plain writing supports collaborative governance between public and non-governmental agencies in their sharing of information, which will benefit the citizen. Overall, government means to promote collaboration with citizens improves with the continuous improvement of those governed (McGuire, 2006).

Social benefits of Plain Language are allowing citizens to make clear decisions dispersed through clear instructions that lead to understanding information that groups in society can use to improve their quality of opportunity via government programs and services (Balmford, n.d.). Kimble's (1994, 1995) writings on plain language suggested that businesses, social enterprises, charities, and public bodies benefit by writing documents in plain language (Mazur, 2000). A well-spirited citizen is encouraged to participate in government through voting, debating, and decision-making (Mazur, 2000).

Citizens become more well-informed and actively involved in government and society (Grimmelikhuijsen & Welch, 2012; Kim, 2012; Warner, 2001). Plain Language correlates with reducing other social ills such as incarceration rates and dependency on welfare (Smith, 2010).

What Is Plain Language?

What exactly is Plain Language? In much of the plain language literature, the general consensus of plain language was not having a "standard" or "universal" definition of plain language (Baldwin, 1999; Charrow & Charrow, 1979; Mazur, 2000; Penman, 1993). This could truly be the reason for so many varied definitions of plain language. Wikipedia, a free online encyclopedia, defines Plain Language as a more broader term of Plain English that emphasizes, "clarity, brevity, and the avoidance of technical language" as opposed to Wikipedia's broader definition of Plain Language as to be "clear, succinct writing…strives to be easy to read, understand, and use". Both definitions have overlapping characteristics. Therefore, for the purposes of this dissertation, the broader term "plain language" was used unless a cited work specifically refers to plain English. Additional explanations of plain language by professionals, experts, organizations and researchers go beyond the provincial boundaries that refer to the origin of plain "language" or plain "English." Kimble (2002), a law professor and advocate of plain language, defined it to be characteristics of guidelines and writing techniques to improve effective communication through clear writing. Kimble's definition focused on writing techniques that will bring about clarity and brevity of language through text-based writing. Brian (Bryan) Garner of Legal Writing defined plain language in *The Elements*

of Legal Style as, "the idiomatic and grammatical use of language that most effectively presents ideas to the reader" (Stephens, 1992, p. 3) and interesting, straightforward "plain English" that achieves is idea through simple words (The Plain Language Association International, 2009). Nick Wright of the Environmental Protection Agency writing course held that plain language is clear writing that utilizes short, concise sentences that translates clear expressions and comprehension of the writers' intent (Wright, n.d.). Professor Eagleson explained that "plain English" is direct and uses only what is needed to translate a clear meaning to the reader (Eagleson, n.d.). As cited in Steinberg (1991) is a definition of plain language: "Language that reflects the interests and needs of the reader and consumer rather than the legal, bureaucratic, or technological interest of the writer or of the organization that the writer represents" (Cheek, 2008; Mazur, 2000). Mazur identified the general non-layman audience as the focal point of writing. This is geared towards a reader-oriented approach to writing text. Legal experts and advocates of plain English claim that plain language goes beyond semantic and syntax expressions, that is, beyond word difficulty, word substitution, and sentence length (Balmford, n.d.; Garner, 2001; Strunk & White, 2009). Here the design and format takes precedent over the text-based style of writing.

Definition of plain language began to shift to include organization and techniques to accomplish plain language of writing. The Plain Writing Act (2010) defined plain language as "writing that is clear, concise, well-organized, and follows other best practices appropriate to the subject or field and intended audience." This is a comprehensive definition that focuses on collaborative style of writing. Janice Redish, a former Director of the Document Design Center of the American Institutes for Research

in Washington, D.C., (no longer in operation) defined it as a process. Brian Garner, in The Elements of Legal Style, defined plain language as language that is easier to translate into effective ideas. The Minister of Multiculturalism and Citizenship of Canada defined plain language as organizing language that conveys understanding to your audience (Plain Language, n.d.). Cheryl Stephens (1999), a plain language editor, asserted that plain language is a plethora of things that range from organizing, deigning and test if that understanding has been conveyed. DuBay (2004b) considered it a language that is designed to help writers write so that readers can read "instructions" that are fluent and well-organized. Hathaway and Willard (n.d.) offered a comprehensive definition that encloses all approaches to plain language. They wrote, "Plain English has always meant developing documents that meet the needs of the users, deciding what type of document is appropriate for the users and the situation, selecting guidelines for organization, style, layout, and graphics that are appropriate to the users and the situation, and testing iteratively with users, revising with users until we know that we have made good choices."

The numerous descriptions of plain language motivated Mazur (2000) to assert that there is a "common thread" amongst them. Plain language is to improve the readability of text (printed documents or electronically distributed documents) for the purpose of comprehensibility, accessibility and usability by their audience (Atkinson, 2003). Advocates of plain language proclaim that the different approaches and different perspectives allow plain language to reach its goals (Kimble, 2002; Stephens, 1999). And that is to make sure readers can…

Find what they need
Understand what they find; and
Use what they find to meet their needs (Plain Language, p. 1).

Critiques of Plain Language

Critics contest Plain Language's claims of producing clarity, understanding, and usefulness. Frankly, plain language approach to communication is useless, unbeneficial because it centers on language that consist of simplifying words and utilizing short sentences that dumb down the intended meaning of the text, documents or instructions (Kimble, 2002). Joseph Kimble's (1994, 1995) article "Answering the Critics" was the first to rebuttal such criticism, by separating old criticism and new criticism. The earlier (old) criticisms delved out by legal professionals, who saw plain language as a way to distort the writers' purpose and confuse readers. According to critics like Robyn Penman (1993), the harm of such a process would be lost of precision and clarity. Many of the old critics see plain language as lacking the intellectual capacity to transcended complex ideas to intended audiences. Kimble and other advocates of plain language refuted this by stating plain language is intellectual and literary.

The new criticism of plain language centers on its inability to improve comprehension among readers (Kimble, 2002; Mazur, 2000; Penman, 1993; Redish & Selzer, 1985). At the time, a number of plain language studies were utilizing readability formulas as a way to predict reading difficult of passages. According to Schriver (1997) and echoed by Cheryl Stephens (1999), a plain language advocate and legal writer, the issue with readability formulas was their value to predict comprehension or to determine what value the reader received from the content (Mazur, 2000; Stephens, 1999). In order

to improve comprehension, critics assert that plain language would have to take a reader-oriented approach to communication that actually does document testing on readers, not the use of readability formulas to determine comprehension (Mazur 2000). Stephens (1999) explains there is some salvage value of the data generated by readability test. According to Stephens, once the document has been tested and rewritten, administrators can use the readability test to highlight any additional difficulty of the text.

Opponents added to their argument by proclaiming plain language as a text-based approach to communication because its definition is supported by text-based principles, which are the foundation of the plain language movement (Kimble, 2002; Penman, 1993). Kimble (2002) addressed Penman's (1993) position of incomprehensibility as a misinterpretation of the definition of plain language. Baldwin (1999, p. 17) asked, "But what are they criticizing? There is no single, world-standard definition" (Mazur, 2000). Plain Language brings a new dynamic to document writing by making sure content is straight forward (through word selection and sentence length), but also comprehensive (through testing documents on its intended audiences). However, there are multiple studies on plain language in areas such as a juror's ability to understand instructions; the ability to comprehend medical content; education studies; and studies on proposed legislation (Kimble, 2002). Another reproach of plain language is its unbreakable connection to the Consumer Relations Movement—whereby, plain language imposes the burden on the government, business, or professional entity to improve customer satisfaction (Balmford, n.d.). Christopher Balmford (n.d.), Director of Cleardocs Limited, contended it is this type of thinking by critics and plain-language practitioners that hinder any "adoption and implementation of plain language" (p. 4).

Nonetheless, the arguments between advocates and proponents of plain language appear to be inherent in or not in having a "standard" definition. While the definition of plain language has a moving boundary to communication, its opponents are only interested in accepting it as a text-based approach to communication—keeping plain language in a very confined space (boxed-in) of what it can and cannot do. Plain language supporters believe there is no one approach, perspective or technique when it comes to communication since audiences have different informational needs, reading abilities, and uses (Hathaway & Willard, n.d.). This is opposite of the traditional style of writing that adhered to a writer-based approach, which focuses on creating documents that encompass long, drawn-out sentences, confused nouns and antecedent agreements, trailing modifiers, and polysyllabic vocabulary (Kimble, 2002; Myers, 2011). For the purpose of this dissertation, approaches to the writing process are discussed in the Readability section of this study.

Federal Government's Campaign to Addressing Issues of Readability

Dan Friedman (2008), a government executive, noted, "Campaigns for clear writing have occurred before, with limited and temporary success. Regardless of the laws on the books, only a sustain push by advocates within agencies can overcome a cultural preference for bureaucratic mush" (Plain Language News, n.d., p. 2). If the legal community was the match that gave life to the Plain Language Movement, then the government agencies writing practices is the fuel that kept the movement alive. Government writing has had a long history of technical language that is unclear for the general public. Annetta Cheek (2008), "a chairwoman of the Center for Plain Language"

exclaimed that government information is written above levels of understanding. Cheek provides an example of this level of difficulty by supplying a sample of a government notice on expense reimbursement.

> The amount of expenses reimbursed to a claimant shall be reduced by any amount that the claimant receives form a collateral source. In cases in which a claimant receives reimbursement under this provision for expenses that also will or may be reimbursed from another source, the claimant shall subrogate the United States to the claim for payment from the collateral source up to the amount for which the claimant was reimbursed under this provision. (p. 3)

Cheek asked, "And what does all this mean? Simply, that if money is being received from some other agency, the government will give only the difference of what is owed to you."

Cheek (2008) inferred it is these types of poor government writing practices, composed of convoluted sentences with jargon-filled, polysyllabic words that confuse the reader, the writers' intent and readers' course of actions. Consequently, this creates cynicism among the public as it sees not a transparent government, but an opaque government with something to hide (Grimmelikhuijsen & Welch, 2012). This had led customer advocates to continually push for plain language legislation in government. Thus, a steady number of mandates on plain writing have been adopted in various agencies and have kept the movement moving forward (Plain Language News, n.d.).

Stages of the Plain Language

The Plain Language Movement in the federal government went through two stages: The first, pre-Internet, from 1970 to the earlier 1990s and the second, post-Internet, from the mid-1990s to the present. Before the mainstream revolution of the Internet and Communication Technologies, the plain language movement sought changes

in print material. After the Internet explosion, the Internet became a depot of information. Also, websites are the delivery mechanism for many consumers, consumer advocacy groups, professional industries, and government and government stakeholders (administration, agencies, and bureaucrats). This has drawn the attention of many plain language advocates and organizations to push the movement into legislation that mandates executive agencies adhere to plain language best practice (Locke, 2004; Plain Language, n.d.; Plain Language Network, 1992). In the 1970s, reader-friendly regulations were encouraged over the bureaucratic muddle through writing that existed at the time (Mazur, 2000; Stephens, 1999, #21). Plain Language in government documents was advocated for and pushed through by decrees, executive orders and memorandums of four presidents. President Nixon, "decreed that the Federal Register be written in layman's terms" (PLAIN, n.d.). Since 1977, the Federal Communications Commission placed an initiative that plain "English" (short sentences, pronoun agreement, and clear language) be used to write the guidelines for Citizens Band Radio (Federal Plain Writing Mandates, n.d.; Plain Writing Laws in the United States, n.d.). By 1978, the Plain Language Movement received momentum when President Carter issued Executive Orders to be written in artless, direct language, and for government regulations to be written so they are "cost-effective and easy-to-understand by those who are required to comply with them." In 1981, the plain writing initiative slowed under the direction of President Regan, who concedes the decision-making regarding plain language utilization and implementation to be left voluntarily to the agencies (Federal Plain Writing Mandates, n.d.; Greer, 2012; Locke, 2004; PLAIN, n.d.). Schriver (1997) wrote that plain language studies went under tremendous scrutiny for using methods that did not

predict comprehension (as cited in Mazur 2000). Various independent agencies as the Social Security Administration (SSA), Federal Communications Commission (FCC), and the US Nuclear Regulatory Commission (NRC) elected to use their own writing guidelines for plain writing (Locke, 2004; Plain Writing Laws in the U.S., n.d.). By 1982 Martin Cutts (1995), research director of the Plain Language Commission in Great Britain, wrote that the Plain Language Movement had gone abroad. And the British Parliament has taken on the task of revising their methods of organization and writing (Mazur, 2000). Although the Plain Language Movement slowed in the U.S. Federal Government from the 80s to the mid-90s, it did not come to a halt. In 1993, the Clinton and Gore Administration focused on "reinventing government." They stated the intention of the National Performance Review (renamed the National Partnership for Reinventing Government in 1998) was to concentrate on citizens and employees by providing excellence service to customers while giving more power to employees to foster efficiency and effectiveness in government (Plain Language Government, n.d.; Vice President Gore's National Partnership for Reinventing Government, n.d.). The idea was to foster trust among the people, so to create a government that would be "responsive, accessible, and understandable in its communications with the public" (Clinton, 1998). The Clinton-Gore Administration commitment to reinventing government was the precursor to the second half of the Plain Language Movement from the late 1990s until present. In 1998, Clinton issued a federal memorandum to all bureaucrats and anyone else who composes documents on services, benefits, and regulations that they must be written in plain language (Clinton, 1998; Mazur, 2000; Plain Language Government, n.d.).

By 2008, plain language was being utilized by a number of government agencies, but not all federal agencies are willing to give up its long standing "gobbledygook" even though studies show a significant difference when documentations are written in original form compared to plain language form (Greer, 2012). For instance, past studies on plain language in areas of health show that proper implementation of writing guidelines improves readability and comprehensibility of text. A study by American Institutes for Research and reported in Redish, Felker, and Rose (1981) on Federal Communication regulations compared two groups of users (experienced and non experienced users) and their ability to read regulations in their traditional form versus the new plain language form. The two groups were measured on three criteria. First, readability and how long it took them to find information after reading the regulation. Second, comprehensibility and how accurate was the users in answering questions relating to the text. Third, usability and how easy were the rules to use. The findings of the study identified that when regulations were written in plain language, experienced and inexperienced users found them faster, a high percentage of questions were answered correctly, and rules were found to be easier (Benefits of Plain Language, n.d.).

Kimble's (1996, 1997) citation of a plain language study of an original benefit letter by the U.S. Department of Veteran Affairs was rewritten for clarity and comprehension. The findings revealed that the original letter generated 1,100 call backs and 200 call backs as a result of the plain language letter (as cited in Mazur, 2000). Another study by Cutts (1998) measured comprehension of law students after reading an original draft to a plain language draft. Again, the respondents scored higher on the plain language document than on the original (Mazur, 2000). The challenge for the federal

government has been to create language that is meaningful, comprehending, and accessible. This means getting away from writer-base prose that is concerned with complex vocabularies that enforce power over its readers by using drawn out sentence structures (Mazur, 2000; Plain Language, n.d.). It is easier for bureaucracies to use this approach since they are writing to other bureaucrats who understand their language (Mazur, 2000; The Plain Regulations Act, 2012).

The Plain Writing Initiative

In 2010, the federal government chose to address readability with a plain "writing" initiative. Baldwin (1999) cited a list by Williams (1999) for reasons why plain language is effective,

- Readers understand documents better
- Readers prefer plain language
- Readers locate information faster
- Documents are easier to update
- It is easier to train people
- Documents are more cost-effective (Mazur 2000).

This approach supported the White House's belief in a rapport built on the foundation of an open government through a collective effort to promote transparency, participation, and collaboration increases accountability, trust, and democracy amongst the general public (Whitehouse.gov). President Obama's normative description of an effective and efficiency government is,

> **Government should be transparent**. Transparency promotes accountability and provides information for citizens about what their Government is doing. Information maintained by the Federal Government is a national asset. My Administration will take appropriate action, consistent with law and policy, to disclose information rapidly in forms that the public can readily find and use. Executive departments and agencies should harness new technologies to put information about their operations and decisions online and readily available to

> the public. Executive departments and agencies should also solicit public feedback to identify information of greatest use the public. (p. 1)
>
> **Government should be participatory.** Public engagement enhances the Government's effectiveness and improves the quality of its decisions. Knowledge is widely dispersed in society, and public officials benefit from having access to that dispersed knowledge. Executive departments and agencies should offer Americans increased opportunities to participate in policymaking and to provide their Government with the benefits of their collective expertise and information. Executive departments and agencies should also solicit public input on how we can increase and improve opportunities for public participation in Government. (p. 1)
>
> **Government should be collaborative.** Collaboration actively engages Americans in the work of their Government. Executive departments and agencies should use innovative, tools, methods, and systems to cooperate among themselves, across all levels of Government, and with nonprofit organizations, businesses, and individuals in the private sector. Executive departments and agencies should solicit public feedback to assess and improve their level of collaboration and to identify new opportunities for cooperation. (p. 1)

Transparency is the foundation to trustworthy and responsible government qualities that citizens hold sacred. When citizens believe the public trust has been manipulated through governments inappropriate, ineffective and inefficient activities, government will lose that trust (Grimmelikhuijsen & Welch, 2012). In 2008 and 2012, President Obama ran on a platform of an open and transparent government; since then, many government agencies' have been practicing and interacting with users seeking government information. In practice, various agencies websites have promulgated initiatives regarding federal objectives. Users logging onto the internet has had slow growth; however, information gathering has steadily inclined since 2000. The dominant use of the internet has been in activities such as entertainment, emailing, browsing, downloading music, playing games, and sports information (Pew Internet & American Life Project, 2012; Smith, 2010). There has been an increase in the demand for other

web usage activities like information retrieval in subject matters that deal with health, religion, government, job training and politics (Lenhart et al., 2003; Madden, 2003; Pew Internet & American Life Project, 2012; Smith, 2010; Zickuhr, 2012).

Research literature on Internet-use demonstrates low-level and low educated online users are more likely to use the Internet for entertainment than to research government business or participate in e-democracy. Some government agencies' creative use of social networks (Facebook, Twitter, My Space, Link In) as a platform for funneling government information and activities has been successful in alerting various groups, not committed to directly visiting government cites, to receive information concerning online government services (Madden, 2003; Pew Internet & American Life Project, 2012). Since 2000, e-governments have utilized synchronous and asynchronous tools and mobile real-time devices (Twitter) to encourage citizen interest and participation in the government decision-making processes. Online government users participating in these various decision-making e-debates are highly educated citizens with high incomes. Citizens with similar demographics, low-income, low-education and minorities are less likely to be involved in any electronic decision-making processes. Government's use of electronic mediums to promote the democratic process can ignore voices of underprivileged groups of society (Lenhart et al., 2003; Madden, 2003; Pew Internet & American Life Project, 2012; Smith, 2010; Zickuhr, 2010). The demographics of the heaviest online users of government information are white males between the ages of 39-49 with college degrees and making well over $75,000 annually (Smith, 2010, pp. 12, 18). This population group is what Mills referred to as the powerful elite (Warner, 2001). Since the creation of the American government, the powerful elite have always

afforded themselves opportunities as a result of status, education, wealth, gender and race (Stillman, 1999). The elite make decisions based on their interest that ultimately affects the majority. Immanuel Kant wrote about the active citizenship where the governed has a right to participate in the democratic process, especially when such decisions affects their well-being (Hillier, 2002). Informed decisions depend on the availability and accessibility of information. Access to that information plays a vital role in democratic participation. Citizens have the right not to be impeded by accessibility issues, unreadable and incomprehensible text that can exclude them from participating in traditional democracy and electronic democracy.

Vigoda (2002) agreed that government and modern public administration rest upon an open, collaborative, and responsive involvement in the needs and the demands of the general citizenry. Chi (1999), Rourke (1992), Stivers (1994) and Vigoda (2000) posited that citizens' needs and demands should be of value, and how agencies respond to those needs make it a valuable characteristic of bureaucratic agencies (Vigoda; 2002). Collaborative government, according to Moore (2004), "is becoming a dominate frame if not *the*, most dominant, frame for public administration today" (p. 953). The government in its structure is changing from a high bureaucratic structure with layered rules to unrecognizable networks (Warner, 2001) that share information instantaneously across boundaries (federal, state and local, regional and county boundaries) (Benton, 2002; Linden, 2010). Governments are becoming multidimensional and having to do business with many partners: interagency, private sector, and with non-profits and foundations. Inherent in the practice of collaboration is the public trust that weighs on all actors' ability to be successful in their sharing of information through electronic service delivery

(Moore, 2004). Page (2004) said collaboration offers the ability to increase government's responsiveness to diverse circumstances and changing conditions (p. 591). To better serve the general public and do government business efficiently and effectively, the White House adopted an open and transparent government that encourages a practice of collaborative governance.

The Plain Language Act of 2010

On October 13th of 2010, President Obama signed into law The Plain Writing Act. The policy is meant to improve the general public's communication with the federal government through documentation writing. According to the Act, a "covered document" can be in paper or electronic form. The term "covered document" "includes letters, forms, publications, notices and instructions" (OMB, 2011). The Plain Writing Act of 2010 mandates each executive agency to compose documents in what the Act defines as a "clear, concise, well-organized" writing style (Plain Language, n.d.). In the Act, the style of writing appears to be conditioned upon the audience in which it is addressing. The audience also appears to be the skilled bureaucratic or administrators of executive agencies. Moreover, even the executive agencies style of writing is addressing the most frequent online government users, who happen to be the highly educated, white males and females with moderate to extreme incomes.

The Office of Management and Budget (2011) offers preliminary and general guidance for executive agencies to following for implementing the Plain Writing Act as defined under 5 U.S.C. § 105.2 and before July 13, 2011. General guidelines state that each agency must:

- Designate one or more Senior Officials for Plain Writing who will be responsible for overseeing the agency's implementation of the Act and this guidance;
- Create a plain writing section of the agency website that is accessible from the homepage of the agency's website
- Communicate the Act's requirements to agency employees and train agency employees in plain writing;
- Establish a process by which the agency will oversee its ongoing compliance with the Act's requirements; and
- Publish an initial report, on the plain writing section of the agency's website that describes the agency's plan for implementing the Act's requirements.
- By October 13, 2011 (one year after enactment), agencies must write all new or substantially revised documents in plain writing. (124 STAT. 2862 and 2861)

And the Act is specific about the guidance for websites described under paragraph (1) (E) shall—

> Inform the public of agency compliance with the requirements of this Act; and
> Provide a mechanism for the agency to receive and respond to public input on—
> Agency implementation of this Act; and
> The agency reports required under section 5. (124 STAT. 2862)

The Act also specifies what actions need to be taken during the interim guidance period. The Director of OMB gives discretionary authority to the agencies in following plain language writing guidelines laid out by the Plain Language Action and Information Network or designate one or more senior officials for overseeing the implementation of the Act (Public Law 111–274, 124 STAT. 2862). On each executive agency website, the Act requires the posting of how it will comply with the Act (Public Law 111–274, 124 STAT. 2863).

The Substantive Issues With the Act

In 2012, the Plain Language Action and Information Network prepared a report card on the 12 federal executive agencies implementation of the Federal Plain Language

Guidelines. Sadly, the executive agencies report card mirrors something of that of a struggling student. Of the 12 agencies, only one agency received an A, and three agencies received a B. The other eight agencies received an average C score or an F for implementing basic requirements of plain language (Plain Language Report Card, 2012).

Does this study demonstrate that the executive agencies are failing in their efforts to implement a plain language initiative? If so, Pressman and Wildavsky (1984) examined problems of implementation that provoke questions as to why exactly are executive agencies failing in their implementation process of plain "writing" guidelines. This could be credit to the agencies' "lukewarm" definition of plain language and agencies' practices not to follow federal plain language guidelines. It has long been suggested that theory and research of clear writing move to practice and teaching. However, given the aforementioned report of the federal agencies, it is obvious that it is easier to slip into the old mold, where it is easier to not think than to think at all. Furthermore, writing requires thoughts that are clear: clear in its direction, meaning, and construction (Orwell, 1946). Cheek (2008) echoed similar thoughts as to why government continue with such obtuse writing, "it is easier. Writing clearly takes hard work. And it requires clear thinking…" (p. 4). The fact that plain language is still considered a movement can be another implementation issue. According to Balmford (n.d.), executive heads and others in positions of power are less likely to implement programs they think are here today and gone tomorrow. Or even that, traditional writing is part of the DNA of the federal government. America established itself on complex words, redundant phrases and convoluted legal language that compose sentences that go on and continue on. Today, all three branches of government are filled with attorneys

and many still believe in the old writer-based prose where precision and intent is important (Kimble, 1995, 1997). In all, it is hard to drop bad habits. And why should they, Joe Davidson (2010) of the Washington Post argued there is no judicial review or enforceable penalties against those that may violate the statue.

Another substantive issue with the Plain Writing Act (2010) is its legislative mandate only applies to federal executive agencies. Plain language initiatives on a state level are at the sole discretion of that state. Plain language statues in state governments do exist in some areas, requiring "readable" consumer agreements and insurance policies and agencies guidelines; however, of the 50 states in the Union, 38 have at least one state agency practicing in plain language writing (Battison & Goswami, 1981). That is very low considering all the bureaucratic agencies under the umbrella of state government.

Readability Studies

When researching the literature on readability, a pool of studies surfaced on readability in areas of medicine, education, corporate communication, business communication, journalism, policy, and government. When the search on readability is narrowed to website readability, the pool shrank to shallow findings. As the search narrowed even farther to include readability of municipal websites, less than a handful of studies were generated. After investigating a large number of the readability studies that utilize different measuring criterion (SMOG, Flesch Reading Ease, Flesch-Kincaid, Fog Grading Formulas), there seemed to be an occurring phenomenon in the online information and content that is passed to consumers (customers, clients, patients, citizens, students, and stockholders) and that is, the material is being written well above the

recommended intended audience of each study (King, 2007; Means, 1981; Schutten & McFarland, 2009; West, 2008; West & Miller, 2007). With the Internet becoming a popular tool to upload information, more readability issues are surfacing.

Literacy studies identify that over 40 million American adults are functional illiterates. King (2007) wrote "Approximately 40% of American adults were reading at 8th grade level—age 12 years" (p. 113). With more public funds going to transferring government services on line, Darrel West (2003, 2008), director of the Taubman Center for Public Policy at Brown University, conducted yearly studies that investigated the accessibility of government websites and their "interactive features" to the general public. In 2003, 1,663 state and federal websites were studied and in 2007, 1,537 state and federal websites were measured for readability. According to West, federal sites were rated by the same index. The study measures the front page text of state and federal websites on text difficulty. West utilized the Flesch-Kincaid Reading formula to test the material. The 2003 findings revealed that the average state and federal websites were written at the 11th grade reading level. The 2008 findings reveal only 36% of state and federal websites had material written below the 12th grade reading level. The American population are confronted with government material written at too high of a level for the general public to comprehend (West, 2008).

Thiele's (2011) dissertation on interactive features found on 50 municipal websites, measured similar variables found in West (200e) list of "interactive features", with few exceptions. A major difference in West's study is the exclusion of studying features of municipal websites and comparing those features a cross cities with similar populations, while Thiele's study did not explore readability as a documented feature of

municipal websites. This leaves a gap in the literature on readability of municipal websites. Thiele explored how accessible are the interactive features on e-government websites, but omitted readability as a featured variable that can hinder access to e-government information and services. Given the research literature on readability, and West's finding of high readability of state and federal websites, brings into question if municipal websites are facing the same issues of high readability.

A study by the Children's Partnership, a nonprofit organization based in Santa Monica, California, found alarming findings with online content. A study of 1,000 websites was analyzed for its useful content. The study defines useful content as "material and applications that serve the needs and interest of millions of underserved Internet users" (p. 8). An underserved user is someone who falls in the federal government's definition of poverty and who has a limited amount of education. What the study found is that nearly 45 million Americans adults are underserved by the content they interact with on a day-to-day basis on the web. Over 9 million are functional illiterate and without the necessary comprehension needed to complete Internet tasks. Over 30 million have language deficiencies in English. The study revealed that much of the content found on websites was written for advance audiences. Government or commercial content disseminate through electronic means only advances opportunities for the elite and digital inequalities for the underprivileged (Thiele, 2011). Of the 1,000 websites studied, only 10 had content written at a plain language reading level for adults. Without the necessary skill set and useful content to motivate an actor, then any involvement by the actor will eventually become stagnant. According to the study, barriers such as information, literacy, language and cultural diversity are averting

underserved audiences from accessing information and opportunities to self-sufficient through self-improvement (Hafner, 2000; Lazarus & Mora, 2000). The quality of information and the ability to access such information matters to those who are actively information searching. Pickard (2011) stated that without "morphological knowledge," it is difficult to interpret, evaluate, and make connections with words that can infer comprehension (p. 2).

The issue of readability goes beyond the United States; it has gone international. Readability studies concluded that over 45% of Great Britain had difficulty comprehending material written for a 15 year old. In 1993, a readability study by Audit Communication of patient information found that material was poorly written, poor quality, and full of poor content (King, 2007). These studies are very alarming given the number of e-government websites (federal, state, and local) that disseminate information electronically to its citizens. Kauhanen-Simanainen (2005) stated, "The conditions and the character of democracy require that the language used is understood by the citizens…In a democratic society the language used by the citizens, by the officials, and by the decision-makers should not differ much" (p. 185). Readability studies identify a need for readability formulas; however, Battison and Goswami (n.d.) wrote there has been a shift "from measuring the "readability" of a finished document to looking at how a document is created, how it functions in a communication system, and whether it achieves its purpose." Courtis (1987) supported an argument that is still held today by many proponents of readability formulas, and that is, readability formulas focus on the end product curtailing any effective communication. According to Courtis, (1987),

> Effective communication occurs if the messages intended by the sender are those actually interpreted by the receiver. One technique for predicting whether these messages or at least those conveyed in prose format, are capable of being comprehended by the intended audience is that of readability formulas. (p. 19)

Elements of Communication

Linguists refer to language as the *Art* of communication. According to Oakland and Lane (2004), "L*anguage* refers to all forms of communication through which thoughts and feelings are symbolized in ways that convey meaning to others…transmits culture, impacts all other cognitive abilities" (p. 240). DuBay (2004a), as it relates to communication, claims there are two substantive issues: "the reading skills of the audience and the readability of the text" (p. 2). Oakland and Lane (2004) echo similar thoughts about communication, but from the lens of language. They claimed, "Communication requires both the producer and recipient of a language-based message to share a common understanding of language symbols" (p. 240). Both definitions of communication are vital when it comes to audiences being able to comprehend the language (writing) that the author (developer) is sharing through common symbols (Oakland and Lane, 2004). The second substantive issue of communication, the readability of the text, will be discussed in the readability section of this study.

Reading Skills of the Audience

According to the literature on plain language and readability, the writer should identify the audience first when creating a document (DuBay, 2004b; Plain Language Federal Guidelines, 2011). Cheek (2008) writes, "Often, government writers don't think much about the most important aspect of communication—the audience" (p. 4). When

using various approaches to communicate with your audience, it is vital to determine the audience that is being addressed for the purpose of readability and comprehension. Having knowledge of your audience's reading skills, prior knowledge, and motivation are crucial when writing documents attempting to improve the readability of text (Oakland & Lane, 2004). The government must be aware of demographical makeup of the citizenry it serves when delivering information relating to benefits, programs, services, regulation, and much more (Atkinson, 2003). More importantly, an audience can be as different as the three levels of government that serves them. Furthermore, each group of people possesses an equally diverse level of reading and comprehension skills that will affect their level of communication.

Educational Attainment Level

In 2002, a survey by the National Adult Literacy Survey (NALS) found that over 40 million adults of the U.S. Government's audience are recognized as being functionally illiterate. Statistically, 32% of the adult audience reads at a 7th grade level, 27% reads at a 5th grade level, and 97% of the 40 plus million reads below the 12th grade level (National Center for Educational Statistics, 1993, 2002). Chall (2002) wrote that understanding, assessing, and inferring are literacy skills that are crucial to information deciphering (as cited in Pickard, 2011). The U.S. Census Bureau (2012) reported a national average, educational attainment level of adults Americans over 25 years of age. Finders were generated from both the 1990 and 2000 Census of Population and the 2009 American Community Survey findings. In 2009, 10.3% of the population acquired an advance degree, 27% of the population received a four year degree, and 85.3 %

completed high school (U.S. Census Bureau, 2012). Since 1990 and 2000, educational attainment among adult Americans (25 years or older) in all three categories have increased. However, The Alliance for Excellent Education contest that America's teenagers are reading well below proficient levels. The National Center for Educational Statistics (2003, 2005) wrote, "Only 31% of American's 8th grade students—and roughly the same percentage of 12th graders—meet the National Assessment of Educational Progress standard of reading 'proficiency" for their grade level" (Alliance for Excellent Education, 2006, Front page, Bullet 2). National Center for Educational Statistics (2005) wrote, "More than eight million students in grades 4-12 read below grade level" (Alliance for Excellent Education, 2006, Front page, Bullet 1). Balfanz, McPartland, and Shaw (2002) expounded on the aforementioned argument by stating that over 33% of ninth graders are a few years lagging in reading skills (Sclafani, 2006). Even in the state of Ohio, the Ohio Achievement reading proficiency test (a.k.a. The Ohio Graduation Test) to graduate is at a 10th grade level (Ohio.gov). The assumption is that even if a student graduates, they are possibly two years behind in reading skills.

The research literature on literacy identifies a strong correlation between education and reading, and reading and employment. Because more citizens are accessing government websites does not mean they are accessing the information on or linked to the websites (Society for Technical Communication, n.d.). One cannot act, if one does not understand what is being communicated (Hummel, n.d.). Smith (2010, pp. 3, 10) mentions there has been a surge in adult activity with contacting government agencies online (Smith, 2010; Thiele, 2011). In 2010, the U.S. Census Bureau reported that more than ¾ of North American households are connected to the Internet. Health

and government studies show that when searching for health and government-related information, many of the users did not understand the content written (Atkinson, 2003; Dy et al., 2012; Mueller, Reid, & Mueller, 2010; West, 2003, 2008). Even though more adults are going online, many are having difficulty understanding the language of the text (Oakland & Land 2004). In 1992, over 42 million American had less than a 12th grade education. The 2003 National Assessment of Adult Literacy (NAAL) added another component that was not measured in the NALS 1992 report. The Adult Literacy Supplemental Assessment (ALSA) studied low-literate adults' ability to "read and comprehend simple prose that are highly familiar and contextualized" (NAAL, 2003, p. 1.). In particular, ALSA studied NAAL's participants that took into account the adults' previous knowledge, current reading ability, and their ability to search and infer information related to literacy. According to ALSA, "Most participants cannot read connected text, which means they cannot read the question itself. Therefore, ALSA questions are composed of easier tasks and hands-on stimulus materials that are designed to facilitate the measurement of low-level literacy skills. Since least-literate adults tend to rely heavily upon context for comprehension" (NAAL, 2003, p. 1). The body of literature on readability and literacy research indicates that comprehension difficulty correlates with education (NAAL 2003; NALS, 1992). In 1992, a great percentage of American adults generated scores in the lowest levels (level 1) of proficiency in all three categories of literacy: prose literacy, document literacy, and quantitative literacy. West and Miller (2006) assessed the three types of literacy as

> Prose referring to the ability to search, comprehend, and use continuous texts (e.g., editorials, news stories, brochures); document literacy to the ability to search, comprehend, and use noncontinuous texts (e.g., job applications, maps,

> tables, labels); and quantitative literacy to the knowledge and skills required to perform quantitative tasks (e.g., computing a tip, completing an order form, balancing a checkbook). (p. 656)

The National Center for Education Statistics (2003) and the National Assessment of Adult Literacy (2003) reported that adult proficiency percentages got increasingly worse amongst American adults. Many average Americans struggle to complete basic tasks such as writing a check, reading a news paper, filling out an application and reading basic instructions. The 1992 and 2003 NALS's survey showed a correlation with improved prose and educational attainment; however, correlation among the two factors was not necessarily causality (Maatta, 2003).

The social and economic implications that poor literacy creates affects not only the individual but also communities, regions, a nation and the world. According to NALS (1992, 2003) and report by The National Institute for Literacy (2003), a population consisting of so many low-literate citizens has a negative economic impact on society: increased levels of poverty and high levels of unemployment, healthcare issues, increase welfare and criminal activity. The United Nations Literacy Decade (UNLD) reported that "literacy is a human right." The UNLD found that in poor countries, 40% of the adults suffer from literacy as opposed to higher income countries that have only 1% suffering from literacy (Education Portal, 2011). Adults suffering with literacy are more likely to experience poverty, low-wages, incarceration, and depend on government assistance (Educational Portal, 2011; Hamburg, 1994; Maatta, 2003). An unskilled labor force does not add value to a society that is moving towards knowledge based jobs that require technical skill set (DuBay, 2004b). Such technological opportunities will require

adults to apply information from text to task. Therefore, the material being written should pair with the reading skills of the audience. DuBay (2004b) posits that,

> Low and intermediate literacy skills are a big problem for large numbers of users of technical documents…the larger the audience, the more it will include the average reading habits and skills of the public as determined by the literacy surveys…the more critical the information is for safety and health, the greater is the need for increase readability. (p. 9)

If there is legislation directly affecting someone, then it should be written at a level of understanding. Poorly written material can create additional cost, issues of usability and increase cynicism amongst the general public (DuBay, 2004a; DuBay, 2004b). Edudemic (2012) reported that there are over 93 million American adults who suffer with limit literacy and 30 million American adults who suffer with basic reading task. The cost of documents not written in plain language increases customer service cost because more calls need to be answered to explain forms, instructions, and even alleviate cost associated with users' mistakes. Online users visit government websites in search of information that will benefit them in some way; however, they will not utilize sites that are not beneficial (Smith, 2010). The literature shows that when material is written in difficult text that audiences cannot read or understand the audience will not be motivated to keep reading the material. Ultimately, they will scan the material then eventually leave the website frustrated. Government information which is written at too high of levels for the citizens to comprehend is deterring citizens from accessing and using vital information that can contribute to their quantity and quality of life. In Darrel West's (2003) study on state and federal electronic government in the United States, the section on Readability commenced by saying,

> Literacy is the ability to read and understand written information. According to national statistics, about half of the American population reads at the eighth grade level or lower. A number of writers have evaluated text from health warning labels to government documents to see if they are written at a level that can be understood by citizens. The fear, of course, is that too many government documents and information sources are written at too high of a level for citizens to comprehend. (p. 4)

The Readability Approach to Comprehension and Text Difficulty

When Plain Language became a conscious movement, readability as a concept of reading ease had already been around and in practice since the 1920s (Crossley et al., 2007). Its definition has taken upon a metamorphosis of what it was to what it is today. DuBay (2004a) in his article, *The Principles of Readability*, cited several leading researchers' definition of readability. These perspectives offer some understanding of DuBay's (2004a) definition of readability, "of what makes text easier to read than others" (p. 3). Klare (1963) stated it is the *"style of writing"*; Hargis and colleagues at IBM (1998) marked it is the simple understanding of *"words and sentences"*; McLaughline (1969) proclaimed text is *"comprehensible"* given the interaction between it and a group of readers knowledge, skills, and abilities; Dale and Chall (1949) believed it is *"the sum total"* of all the characteristics of readability (DuBay, 2004a, p. 3). Zakaluk and Samuels (1988b), and echoed by Oakland and Lane (2004), said it is the ability to *cognitively process* information that influence comprehension. For the purpose of this study, the term *readability* is referred as the ease with which a reader can read and comprehend text.

In 1971, Herbert Simon called for a "new perspective" in determining reading comprehension, since several of the classical approaches befell heavy scrutiny (p. 338). Simon cited Thorndike's 1917 definition of reading comprehension:

> a very complex procedure, involving a weighing of each of many elements in a sentence, their organization in the proper relations to one another, the selection of certain of their connotations and the rejection of others, and the cooperation of many forces to produce the final response. (p. 323)

Simon (1971) criticized the readability approach for its inability to produce data that support the comprehension process, a process that goes beneath surface-level features (syntax and semantics) of text difficulty to include accurate characteristics of observations concerning structure (concrete experiences and inferences about abstract ideas) level features of the basic process of reading comprehension. Simon argued that having some basic knowledge as to the process can lead to behavioral criteria for improving text, instruction, or other printed materials (p. 340). Simon posited that readability research has done little to develop a standard criterion that is sound in its explanation of the reading comprehension process.

Readability has a distinct history in its approach to creating objective methods to measuring text difficulty and reading comprehension. Inherent in its construct in creating readability formulas is a tremendous amount of scrutiny concerning "validity and measuring error" (Report, 2011). This study gave an historical overview of readability from its formative years to new approaches of the readability process. *The Classic Readability Studies*, by William H. DuBay (2004b), posited there have been two major directions of readability studies: The first being the use of readability in education, and the second being the use of readability in general communication of adults with limited reading ability. Also discussed are compositions of readability formulas and their strengths and weaknesses in determining text difficulty.

Classical Approach to Readability of Text

The study of readability, according to Chall (1988) from the lens of language studies has been around since Greek philosophers, who philosophized over the emphasis of words connecting to their objects to influence meaning of sentences (Zakaluk & Samuels, 1988a, pp. 2-13). It was not until the mid-20th century that readability drew emphasis in the educational arena. Educational researchers and educational practitioners (librarians and teachers) sought methods for improving the reading skills of students (Pickard, 2011). As the physical appearance of America's public schools systems began to change in the mid-19th century from one room schools with children of all ages to multiple classrooms separated by children of like ages, so did public educators' methods of teaching children how to read. Much of the reading materials during the colonized communities until the 1820s were piety materials found in hornbooks, primers, and spelling text books with long multi-syllable words (vocabulary) that were hard to understand and offered no meaningful subject matter to children. These books introduced children to reading by focusing on the phonics of vocabulary and syllables of words.

By the 1920s, the Progressive Movement sought changes in child labor laws. These reforms changed the school dynamics to include first generation immigrants and migrants' children. New reading text books called "Basal Readers" offered a child more meaningful stories, however, considered to be demanding for a child's level of understanding (Monaghan & Barry, 1999; Zakaluk & Samuels, 1988a). Many of the children lacked sufficient "English" literacy skills, which became an impetus to reduce the vocabulary load of textbooks in order to increase learning and comprehension. This

led to an enormous amount of research to discover an objective approach to measuring comprehensibility of content of printed material. The introduction of vocabulary word lists as a method of learning to read and assessing word difficulty and comprehension drew considerable attention (DuBay, 2004a; Monaghan & Barry, 1999; Zakaluk & Samuels, 1988a). Instead of word decoding, a sight approach to learning was emphasized.

Readability Formulas in Education

Jeanne S. Chall cited in Zakaluk and Samuels (1988a) that readability in education focused on vocabulary control studies and readability studies that developed in tandem. The overall goal of both methods was to determine the reading difficulty of educational material (primary and secondary students) for purposes of learning and comprehension of educational material (Zakaluk & Samuels, 1988a). Before then, librarians and educators subjectively selected text to match students reading ability. Early predictors of readability built on the assumption that the more familiar a word to a reader, the more reading ease and understanding the reader had of the material (Hallenbeck, 1935). Word lists, such as that produced by Thorndike's *Teacher's Word Book* (1921), used an objective approach to determine the level of difficulty of textbooks. The method involved frequency of unfamiliar words and vocabulary variety, based on how many different words were found in the passage. This method assisted decision-makers with matching suitable text for students (DuBay, 2004a; Gray & Leary, 1935; Hallenbeck, 1935; Plain Language, n.d.; Stephens, 1999). The problem with wordlist was its lack of consistency of difficult words compared with other basal readers, its lack

to establish a standard word list, and lack of reliable evidence (empirical) that supported some of the vocabulary control studies. The popularity of readability measures grew out of a need and convenience for a more objective and reliable approach to evaluating text difficulty (DuBay, 2004a; Oakland & Lane, 2004; Zakaluk & Samuels, 1988a). Readability measures relied on correlations of factors that provided the best predictability of text difficulty. Although both methods were very popular, questions concerning the reliability and validity loomed (Report, 2011).

Readability in General Communication

By the 1930s, a majority of the readability studies started focusing on adults of limited reading ability. That is after literacy studies identified over 40 million adults had limited reading abilities that placed them on an average 8th grade reading level. It was also the period in which the U.S. government began to invest heavily in adult education. World War II was the impetus to find a statistical procedure that maximizes a legitimate transmission of information that would solicit civilians to finance the war, to build weapons and machinery for the war, and to fight the war. It was crucial that such documents and instructions were clear in content and intent if the government was to be successful in its efforts of recruitment in money and manpower. Readability researchers began a quest to know what literary interested adult readers and what averted adults from reading. An interesting finding by Lyman Bryson was limited education contributed to limited reading skills, not the stereotypical notions that adults with limited reading abilities lacked sufficient intelligence to understand words and material of text (DuBay, 2004). Some of the first major studies of adults were by Waples and Tyler (1931). They

found that reading interest of adults did not equate with their reading abilities (DuBay, 2004). Ralph Ojemann (1934) found that vocabulary list did provide a good basis for text difficult of quantitative factors, but not for qualitative variables such as "abstractness" and "concreteness" (DuBay, 2004a; Zakaluk & Samuels, 1988b). As for adults, qualitative factors were equally important as quantitative factors when determining comprehension difficulty (Oakland & Lane, 2004; Simon, 1971). According to DuBay (2004b), Dale and Tyler (1934) "published the first study on adult readability formulas" (p. 28). Other influential studies such as the Gray and Leary study (1935) created a readability formula for reading and comprehension of adults with limited reading ability. Gray and Leary identified 288 factors the contributed to readability difficulty. In most traditional readability formulas such factors are recognized as having a vital impact on what makes material easy to read (Gray & Leary, 1935).

Readability formulas were mathematical equations that tests quantifiable elements contributing to readability difficulty. Most readability researchers constructed readability formulas from correlation of factors that were best predictors of text difficulty. Gray and Leary (1935) grouped the 288 factors of text difficulty into four major categories: Content, Style, Structure, and Design. These four elements are consistent among most readability formulas.

Style as an Element of Text Difficulty

The typical pattern of most classical readability formulas consisted of stylistic variables that were used to promote comprehension and reading ease (DuBay, 2004a; Oakland & Lane, 2004; Report, 2011). Style variables were countable and other factors

such as content, format, and organization were not. According to the readability literature, readability formulas were designed to fit this mold and would continue this way for decades (Courtis, 1987; DuBay, 2004a; Oakland & Land, 2004; Selzer, 1981; Stephens, 1999). Entin and Klare (1978) wrote that style variables accounted for a large percentage of the variance found in readability formulas, in particular, semantic (meaning sentence) and syntactic (meaning vocabulary) factors (cited in Zakaluk & Samuels, 1988a). From 1920 to the 1980s, most readability formulas concentrated on these two factors as contributing to problems of text readability. Readability measurements were developed to assess the difficulty of content found in textbooks. They gained farther acceptance in the educational community when readability scores were referenced with student grade levels. One of the earlier readability formulas, the Winnetka Formula (1928), was interested in comprehension of text. Mabel Vogel and Carleton Washburne studied "structural characteristics" of passages. The formula used style variables such as prepositional and sentence range in its linear equation (DuBay, 2004a; Zakaluk & Samuels, 1988a).

Content as an Element of Text Difficulty

Courtis (1987), Selzer, (1981), and Oakland and Lane (2004) contested that any success of readability formulas have to look beyond measures of syntax and semantic elements. Factors included propositions, modifiers, personal pronouns, background of reader, prior knowledge, and other reader characteristics. Selzer (1981) and Redish and Selzer (1985) argued that readability formulas fail to include these factors because they

are not measurable. Organization and coherence of text are important to influence the interest of the text and motivation in the reader.

Structure as an Element of Text Difficulty

Organizational structures with expressive headings and subheadings increase the readability of the text, instructions, materials, paragraph and document (Irwin & Davis, 1980, p. 126). Layout of the text is important to context and comprehension of reader. ALSA (2003) identified that functional illiterates use the context of the text to help interpreted understanding of the text. How writers position chapter and headings of text along with navigation to and from various links are important elements of comprehension.

Design as an Element of Text Difficulty

Designing a website is a vital element to the success of a website. Written material should be designed in a way that it is legible and readable. Typography should be concerned with how the reader is drawn into the text without the text losing its meaning. Illustrations, size of text, type of text, positioning of text around illustration are all elements that can confuse the reader or web users when trying to interpret text and navigate around the site (Seubert, 2009). Learning how users interact with the website is equally important when designing and controlling for text difficulty (Bix, 2002; Friedman, 2008; Morville & Rosenfeld, 2008).

Readability Formulas

By the end of the 1970s, new formulas were utilizing measurements of cognitive factors. For the next 40 years, researchers of readability studies would come up with creative ways in designing the best formula for analyzing text and comprehension difficulty. A few of the major readability tests that had a major impact on reading ease in private and public sectors are the Dale and Chall Formula (1955); Flesch Reading Ease (1948); The Gunning Fox Index (Readability Graph by Fry (1968); Cloze Procedure (a reading test developed in 1953 but first used in 1963) and the Flesch-Kincaid Formula (1975). As mentioned by Klare (1988), the Dale and Chall Formula was one of the most accepted and utilized readability formulas in education (as cited in Zakaluk & Samuels, 1988a). Edgar Dale, once a notable professor at Ohio State University, and Jeanne Chall, once a director at the Harvard Reading Laboratory, used a simple approach to their formula that yield a correlation coefficient of over 90%. Consistency is very important when it comes to readability formulas, and the Dale-Chall was considered the most reliable and valid at the time. Critics complained that the linear equation formulas used did not account for the Pareto optimum effect, that is, when readability calculations based on surface features (style variables) leveled off at a particular grade level. Linear equations would continue and emphasize extended amounts of education needed to interpret text difficulty. Flesch Reading Ease Formula was designed to use two simple style variables (number of syllables and the number sentences in a given sample text). Also, the fact the formula took into account personal references (pronouns and names) separated it from other formulas. Furthermore, there was an interpretation table that included a reading ease score and grade level scale that account for the curvilinearity of

the equation. Its reading measure has a range from 0 to 100, zero being the very difficult and 100 being very easy to read. It made it widely accepted in other sectors outside of education such as commerce, military, and the government (DuBay, 2004a as cited in Zakaluk & Samuels, 1988a). It also introduced an old argument by Lyman Bryson that existing knowledge (qualitative factors) accounts for some portion of readers' comprehension of text. The Flesch Reading Ease formulas grew in popularity among the publishers because it had a 90% correlation coefficient that made it very reliable and valid.

Fry's (1968) readability graph accompanied some technological instruments that aided in its popularity: calculator and a computer program. Most of the aforementioned readability formulas criteria for development relied on passages such as McCall-Crabbs' *Standard Test Lessons in Reading*. However, according to Stevens (1980), this test underwent tremendous scrutiny for not being developed to serve such a purpose (Zakaluk & Samuels, 1988a). This opened the door for other procedures such as the Cloze procedure as a criterion for formula development. Cloze (meaning closure) acted as a predictor of text difficult and as a self-administered reading test; it predicted readers' abilities to replace every fifth word correctly in the passage. Many researchers saw this as a good indicator of comprehensibility (Zakaluk & Samuels, 1988b). Researchers have studied these formulas only to find that given the same variables, most of these readability measures differed no more than one or two grade levels (DuBay, 2004; Stephens, 1999; Zakaluk & Samuels, 1988a, 1988b).

Critiques of Readability Formulas

Critics of readability contend the problem with the earlier formulas was their deliberate exclusion of anything other than what George Klare (1988) referred to as style variables: personal pronouns, number of easy words, number of difficult words, unfamiliar words and average words in a sentence, and sentences length (Zakaluk & Samuels, 1988a). Critics warned that the manipulation of syntax and semantic factors to improve comprehension could possibly change the meaning of the entire text, without improving text difficulty (Oakland & Lane, 2004).

A major critique of classical readability measurement was its lack of validity that is inherent in its construct of selected variables that correlate with text difficulty (Dubay, 2004b; Oakland & Lane, 2004; Report, 2011; Simon, 1971; Zakluk & Samuels, 1988a). Earlier readability measurements were similar in their design thus predicting word difficulty and estimating comprehensibility of content of written material (Chall & Dale, 1995; DuBay, 2004b; Oakland & Land, 2004; Simon, 1971; Zakaluk & Samuels, 1988b). Present in most readability measurements are two distinct elements: "semantic variables and syntactic variables" (Report from Renaissance Learning, 2011, p. 2). Normal pattern is for researchers to consider many other factors that demonstrate a higher correlation in predicting readability of text.

Proponents of readability formulas agree their use is widespread in many arenas from government to health to education. They are simple to administer, cost effective to test for text difficulty, and simple. They have many inherent constraints that impeded their success: "conceptual background of the reader and conceptual load of the text is

absent" (Courts, 1987); interest of text and motivation reader is missing (Selzer, 1981); and other non measureable factors are missing in the formulas.

Simon attempted to explain why readability as an approach to reading comprehension fails to provide an explanation of the reading comprehension process. Simon (1971) suggested, "The inability of research to reveal the processes in comprehension is due to the research not being based on theory." The term theory, Simon explained, refer to a set of premises about a subject matter which meets a set of conditions:

- A theory must be falsifiable, i.e., it must be clear what kind of data will confirm or deny it.
- A theory must be perfectly explicit, i.e., all terms and relations must have explicit definitions.
- A theory must be comprehensive, i.e., it must include a description of the entire system it purports to explain.
- A theory must possess descript adequacy, i.e., it must describe all the facts accurately.
- A theory must be internally consistent, i.e., none of its parts may contradict one another.

Simon supported his argument by saying,

> It is important to distinguish between the products and processes of comprehension. The comprehension process is the mental operation which takes place in the readers head while he is reading…behaviors produce after comprehension has taken place…Since the comprehension process is inaccessible to direct observation, research design to shed light on it is limited to dealing with its products or behaviors. Therefore, any covert mental process such as comprehension is studied by looking at the behaviors associated with it and on the basis of these behaviors the characteristics of the process are inferred. (pp. 340-342).

Simon postulated that the readability approach is unsuccessful in its characteristics of the comprehension process because of unobservable cognitive experiences. This is contributed to using comprehensive measures (tests) that lack validity and reliability.

Simon cites Chall's (1958) four major factors that account for comprehension difficulty: 1. Vocabulary load, 2. Sentence structure, 3. Idea density, and 4. Human interest. However, Simon addresses these factors as counting for some comprehension difficulty. Gray and Leary listed these four comprehensive variables under their group heading called Style Variables and Content Variables. As mentioned throughout the readability literature, content variables were difficult to measure. Simon went on to infer that such variables were surface measures to a deeper comprehension process. Simon, however, did not mention what those underlying processes are. It could very well be the background, prior knowledge, and interest of the reader that he is referring.

Readability researchers began to shift attention to qualitative factors that were considered equally important in measuring comprehension difficulty of text. To emphasize concerns about formulas utilizing only surface elements to measure text difficulty, Jeanne Chall (as cited in Zakaluk & Samuels, 1988a) cites two excerpts, Huggins and Adams (1980, p. 91) and Ojemann (1994, p. 19).

> Although readability measures can be found that correlate fairly well with text difficulty…their main weakness is that the difficulty of a passage involves its comprehension, and surface structure descriptions capture only some of the syntactic variables necessary to comprehension. As an extreme example of the inadequacy of these [readability] formulas, most of them would yield the same readability index on a passage if the word order within each phrase, and the order of the phrases with n each sentence, were scramble.

And

> In similar studies that have been carried out for the most part with school children, qualitative factors have been overlooked in general. Their importance may be made clearer by considering an extreme example. If in a set of paragraphs the sentences, the vocabulary difficulty, etc., would remain constant, but there is considerable possibility that comprehension would be interfered with. (p. 19)

Researchers sought after readability formulas that took into account qualitative factors that associated words to their use, ideas, and experiences connected to the reader, not machine-driven formulas that were quantitatively connected to surface driven features that yield similar readability scores even after passages were rearranged. Critics see readability formulas as a way for writers and publisher to manipulate readability scores. Writing to formulas only contributes to incoherence of text, since many of the formulas varied in their approach, criteria of development, and different factors in predicting readability and comprehension level of text (Selzer, 1981; Zakaluk & Samuels, 1988a).

Still, many critics proclaim such formulas as a means to creating scores that corresponds to incorrect grade levels (Zakaluk & Samuels, 1988a). And the only way to truly determine comprehension of text is to test the reader. Klare (1976) warns that a readability formula acts as predictor of reading ease and not as producers of "readable writing" comprehensibility (Zakaluk & Samuels, 1988a).

Readable writing consists of more than just index variables (word difficulty, characters per words, number of syllables in a word or sentence, or characters in a sentence); it takes into account those qualitative variables that the writer assumes the readers has knowledge of (intuitive knowledge or background knowledge). In addition, critics contend that readability formulas will have writers of all sectors writing to the readability formulas.

New Approaches to Readability Formulas

New approaches to readability are born out of the inability of traditional readability formulas to measure qualitative factors, such as content, organization, and

coherence of the text. In the 1970s, Cognitive Theory rested on underlying variables that were more intrinsic to comprehension processing, to which Simon (1971) referred, a process that goes beneath surface-level features (syntax and semantics) of text difficulty to include accurate characteristics of observations concerning structure (concrete experiences and inferences about abstract ideas) level features of the basic process of reading comprehension. Cognitive theorists, Walker Kintsch and cohorts studied readability by measuring propositions and abstract ideas.

Today over 2,000 readability formulas exist. Each has its own creative approach to determining reading ease of text. Today, computerized readability formulas are designed and included in software programs that allow for the easy mathematical analysis of quantitative (syntactic and semantic factors and other style variables) and qualitative variables (concrete experiences, abstract ideas or obscure languages) that spit out a grade level or reading score of a text. Stephens (1999) mentioned that creators of formulas must be aware of what they are measuring when using computer software programs to conduct analysis. Stephens elaborated,

> For example, some programs treat a period, colon, or semi-colon as the sign of the end of a "sentence". This is in keeping with some research which concludes that the sentence is not the unit for measure. Rather the "sousphrase" which we might consider to be a clause represents the unit of thought for measure because it is the cognitive decoding unit. (p. 4)

Having some basic knowledge as to the process can lead to behavioral criteria for improving text, instruction, or other printed materials (p. 340). Simon posited that readability research has done little to develop a standard criterion that is sound in its explanation of the reading comprehension process.

Writing Approach and Readability

Gray and Leary's book *What Makes a Book Readable* (1935) was reviewed by Hallenbeck (1935), who concluded, "Clarity of thinking on part of the author, concepts within the experience of the reader, and precision and conviction in the presentation are essential to making materials readable" (p. 504).

Writer-based Approach

The traditional approaches to writing focuses on a writer based approach to document writing. The language of the text fits the needs of the writer. That is, the technical writer audience is someone of similar background, education, expertise or even an agency or administrator (Digital Towpath Cooperative, 2010). The technical writer normally has the same interest reading level of their audience. Any, who lack such a reading prowess, suffers at the words of the text.

According to the literature on plain language, documents should meet the needs of its readers (Hathaway & Willard, n.d.). When considering the reading ability of the audience, Hathaway and Willard (n.d.) stated that planning comes out of understanding what the organization wants to achieve, who the stakeholders are (inside and outside the organization), what is required of the users, the purpose of the document, and how it fits within the plan. When planning to write a document, a writer must choose the appropriate approach (or writing style). Each approach concentrates on various elements that can improve readability of the document. Failure to effectively communicate can alienate the writer's intent from the reader's need (Flammer, 2010). There are three approaches to creating documents: text-based approach, readers-oriented approach, and

collaborative approach. Each of these approaches is important and appears to be dependent on the audience and the purpose of the document.

Text-based Approach

With text-based writing the focus is not on the audience (per se), but on the syntax (vocabulary, sentence length or sentence structure) and semantics (understanding, as it relates to a word or a word association) that can help the readability of the text for the audience (Plain Language, n.d.).

Reader-oriented Approach

A reader-oriented approach tests the documents against the intended audience as a way to gauge readability and comprehensibility of the text. The text is then revisited for purpose of revision (Plain Language, n.d.).

Collaborative Approach

A collaborative approach focuses on the reader by engaging the reader in the process of creating the document. By holding focus groups, the readers' needs and language are taking into considering when rewriting the documents. The users are brought into the process to help create a "clear user-friendly" document (Hathaway & Willard, n.d.).

PLAIN introduces five major divisions of documentation writing that a writer should follow when approaching a document.

- Audience
- Organization
- Writing Principles and Principle for Writing for the Web

- Testing Techniques
- Revisions and Rewriting based on users input

Readability and Plain Language Guidelines

Technical writers and many others fail in their attempt to produce readable documents. DuBay (2004) suggested, "Writers are not familiar with the background and research of these guidelines" (p. 2). Experts of both plain language and readability have comprised standard rules on documentation writing. Both plain language and readability have their own set of guidelines designed to increase the readability of text (in paper or electronic). Redish and Rosen (1991) defined guidelines as "a suggestion that helps writers achieve the goal of communicating clearly with their reader" (Mazur, 2000). Mazur listed three vital criticisms of guidelines that are worth mentioning: The guidelines lack empirical findings; plain language practices do not mirror the principles; and the standard is not the rule. To show the similarities both set of leading guidelines from plain language and readability are listed below. The members of PLAIN created a set of Federal Plain Language Guidelines that would assist agencies of the federal government to better communicate with the general public.

Guidelines for Readability

- Use short, simple, familiar words
- Avoid jargon.
- Use culture-and-gender-neutral language.
- Use correct grammar, punctuation, and spelling.
- Use simple sentences, active voice, and present tense.
- Begin instructions in the imperative mode by starting sentences with an action verb.
- Use simple graphic elements such as bulleted lists and numbered steps to making information visually accessible. (Hackos & Stephens, 1997)

The Federal Plain Language Guidelines Revised May 1, 2011

- Verbs…Use active voice,
- Nouns and pronouns,
- Use short, simple, Omit unnecessary words,
- Avoid technical jargon
- Write short sentences
- Keep subject, verb, and object close together
- Avoid double negatives and exceptions to exceptions
- Place the main idea before exceptions and conditions
- Place words carefully

Write for the Web Guidelines

- How do people use the web?
- Write for your users
- Identify your users and their top tasks
- Write web content
- Repurpose print material for the web
- Avoid PDF overload
- Use plain-language techniques on the web
- Avoid meaningless formal language
- Write effective links

Testing Techniques (Testing the Audience)

- Paraphrase

  Testing(www.plainlanguage.gov/howto/guidelines/FederalPLGuideine...)

CHAPTER III

METHODS

Research Questions

In order to further explore official city website's readability and accessibility, the following research questions were framed:

- RQ1: What is the readability ease score and grade level of a sample of municipalities' websites with population greater than 5,000 citizens?
- RQ2: Are the states' mean Flesch-Kincaid reading grade levels different from the national adult reading grade level?
- RQ3: Do municipal websites' main page read at the targeted state's standard reading grade level?[1]
- RQ4: Is the mean Flesch-Kincaid reading grade level of the city webpages within the state equal to the targeted state's standard reading grade level?
- RQ5: Is there difference between the FKGL score mean difference among cities (small, medium, and large)
- RQ6: Do city websites offer audio or visual portals?

[1] Municipality to municipality was not conducted because available data for school district are often at the regional and county level and not the municipal level.

Research Design

The researcher's strategy of inquiry was associated with the quantitative approach to research. Creswell (2003) suggested that a quantitative approach seeks to identify variables that are associated with the purpose of the study. These purposes were addressed in the above research questions which were answered through empirical observations, measures, and statistical techniques and procedures. The readability levels of a sample of official municipalities' websites were analyzed by using the Flesch Reading Ease formula and the Flesch-Kincaid Grade Level Formula. The Flesch-Kincaid scores were compared to the expected (or targeted) educational attainment level of their respective states.

Descriptive and associational statistical methods were chosen to conduct the research and answer the research question. According to Teddlie and Tashakkori (2009), descriptive methods are, "[p]rocedures for summarizing data, with the intention of discovering trends and patterns, and summarizing results for ease of understanding and communication" (p. 257). The outcomes help connect the existing knowledge of readability of websites to current writing and designing practices.

The main objective of this dissertation was to examine the grade-level readability of official city websites, specifically the main page, usually termed "Welcome" page, or "History" page or "About Us" page. The unit of analysis, therefore, was the city's website main page as aforementioned.

Population of Interest and Sample

To begin the analyses, the researcher first searched for all cities within the United States. The researcher generated a list of 19,516 cities, towns, villages, boroughs, and counties in the United States based on a pre-populated data set found in the Department of Commerce Census Bureau: Population Estimates (Annual Estimates of the Resident Population for Incorporated Places: April 1, 2010 to July 1, 2011). The researcher reduced this populated list to contain only a data set with entries of cities with populations greater than 5,000. This new list generated a total of 4,636 municipalities. A further step was taken to exclude entries that were not considered municipalities (i.e., cities). The sample returned a new populated list of 3,718 localities. A random sample of 250 municipalities was generated from the list 3,718 localities to be analyzed in the study.

Data Collection

Secondary data were collected from a universal list of municipalities with populations greater than 5,000 as found in the Department of Commerce Census Bureau, 2010. In order to determine which municipalities had official websites, the United States Census list of municipalities was cross-matched with an online directory of official state, county, and city government websites at www.statelocalgov.net/state-al.cfm#toc. For municipalities that are not registered on the list, the Google search engine was used to locate and obtain municipal websites. The search terms included the *name of the city along with the state's name*. If an official website was still not located, those municipalities were removed from the sampling list, after which a new populated list was

derived and then put into alphabetical order for sampling purposes. The municipal websites were accessed between May 1, 2013, and July 7, 2013.

The researcher's sampling frame was the newly populated list of municipalities with official websites. A probability sampling method (simple random) was used in this study to allow each unit of the population to have an equal chance of being selected for the study (Trochim & Donnelly, 2008). A sample size of 250 municipal websites was drawn from the new sampling frame. Having a larger sample size ensured the study would have less sampling error while controlling for threats of internal and external validity (Babbie, 2001, 2012; Bryman, 2008; Trochim & Donnelly, 2008). A larger sampling size can reduce sampling error and ensure greater statistical power. The researchers utilized the SPSS 21.0 program to perform a computer random-number generator to select the sample population of the study.

Unit of Analysis

For the purpose of this study an official city website was defined as any valid and functioning electronic website that funneled information to viewers about the city, its government, and governance. In order for the researcher to assess the grade-level readability of a main readable page, it was necessary for the page to contain more than 100 characters. The main page utilized was usually the "Welcome," "About Us," "History," "Visitor," or the "Human Resources" page. With a simple selection and copy method the page was captured to analyze its reading ease and grade level of readability. The researcher's explanation for assessing the main page of each municipal websites rather than other pages was borrowed from West and Miller (2006) who stated that,

"Evaluating the home page of each website is a conservative examination of readability and disability access. Since the home page is the portal through which users reach all other information, we suppose that webmasters prioritize home page readability and access before other portions of their websites" (p. 660).

Readability

Readability as defined by George Klare (1963) is "the ease of understanding or comprehension due to the style of writing" (DuBay, 2004a, p. 3). According to DuBay (2004a), "This definition focuses on writing style as separate from issues such as content, coherence, and organization" (p. 3). To assess a city's webpage readability, the most utilized tools in assessing readability in many industries has been the Flesch-Kincaid Grade Level Readability Formula and the Flesch Reading Ease Formula. Trochim and Donnelly (2008) wrote that a good assessment is not only reliable but consistent in its findings.

Instruments

The Flesch-Kincaid method of assessing text is so recognized that it has been utilized by the Department of Defense, for academic social research and, not to mention, the Flesch Kincaid method has been successfully implemented in the Microsoft software packages. The Flesch Reading Ease Formula is so successful because of its use of two simple style variables (the average number of syllables per word and the average sentence length in a given sample text). Also, the fact the formula took into account personal references (pronouns and names) separated it from other formulas. Furthermore, there is an interpretation table that included a reading ease score and grade

level scale that account for the curvilinear of the equation. The Flesch Reading Ease Formula reading measure has a range from 0 to 100, zero being the very difficult to read and 100 being very easy to read (DuBay, 2004a; Flesch, 1948). An FRE score between 60 and 70 is considered to normal readability level. The reading ease score is then matched with grade readability of the text. This readability scale is easily performed with Microsoft computer calculations, which allows researchers to immediately assess readability levels of text.

The Flesch Kincaid Grade Level Readability Formula is modified to produce a grade-level score instead of a reading ease score. This is helpful to match the reader to the text. The formulas to calculate grade level is 39 (Total Words/Total Sentences) + 11.8 (Total Syllables/Total Words) - 15.59. The Flesch Kincaid scale signifies a reading grade level between 0 and 19.0, the lower the scale numbers the easier the written text being tested. For example, a text that generates a score of 10 indicates that the sample text is written at a reading level of 10^{th} grade. Table 1 gives a description of both the Flesch Kincaid Reading Ease Formula and the Flesch Kincaid Grade Level Readability Formula.

Table 1. The Flesch Reading Ease Score Matched With the Flesch Kincaid Grade Level

Reading Ease Score	Style Description	Estimated Reading Grade
0-30	Very Difficult	College Graduate
30-40	Difficult	13th -16th Grade
50-60	Fairly Difficult	10th -12th Grade
60-70	Standard	8th and 9th Grade
70-80	Fairly Easy	7th Grade
80-90	Easy	6th Grade
90-100	Very Easy	5th Grade

Source: The Principles of Readability (DuBay, 2004a, p. 22).

Reliability

The Flesch Reading Ease score has demonstrated high correlation with the ARI and the Fog Count scores (Kincaid, Fishburne, Rogers, & Chissom, 1975), which both aim to measure the understandability of a text. Flesch (1948), when developing the Reading Ease Formula, found that this formula is more easily understood when it is realized that the measurement of word length is indirectly a measurement of word complexity (r = .87) and that word complexity is indirectly a measurement of abstraction—affixes and abstract words had a strong correlation (r = .78). Additionally strong correlations have been found between the sentence length and sentence complexity (r = .78 see Gray & Leary, 1935; r = .72 see Sanford, 1941).

Table 2: Reliability of Instruments According to Different Sources

Researchers	Flesch Reading Ease	Flesch Kincaid Grade Level
Hayes, Jenkins, & Walker (1950)	>0.90	
England, Thomas, & Paterson cited in Klare (1963)	>0.90	
Kincaid, Fishburne, Rogers & Chissoms (1975)	>0.98	
Thomas, Hartley, & Kincaid (1975)	0.80	
Farr, Jenkins, & Paterson (1951)	>0.90	
Ley & Florio (1966)		>.91

Ley and Florio (1996) stated that the "correlation between the computer calculated score of the Flesch-Kincaid Grade Level and the manually computed score of Flesch-Kincaid Grade Level is excellent at .91." While the review of the literature at the moment this work was written was not successful at determining the validity of the instrument; however, a simple Google Scholar search on the citation for the development of the Flesch-Kincaid Grade Level Score stated that the article had been cited, and thus used, 605 times since 1975. See red circle in print screen figure below.

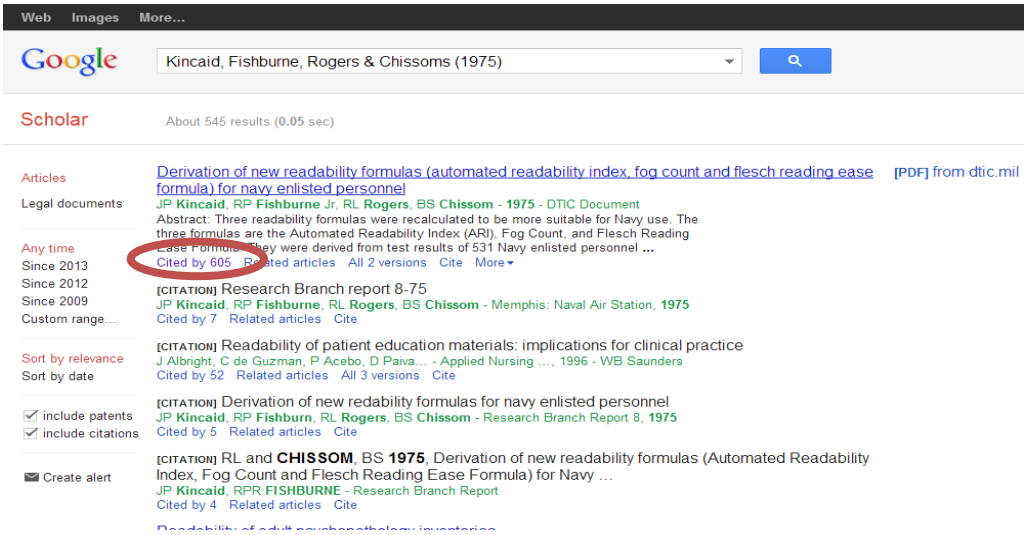


Figure 1. Google scholar search of Flesch-Kincaid grade level formula article.

Validity

To further explore the validity of the Flesch Kincaid Grade Level Formula, the researcher took a random sample of 10 municipalities' webpages from the 250 sample population. The selected webpage text of each city was run through a readability consensus calculator. The Test Readability Consensus Calculator took "a sample of the writing and calculate the number of sentences, words, syllables, and characters in your sample" (Readability Formulas, n.d., front page). The results were then plugged into both new and classical readability formulas to be analyzed. For each analysis, five readability scales were used: Coleman Liau Index, SMOG, Automated Readability Index (ARI), Linesar Write Readability, and the Flesch Kincaid Grade Level.

The requirement set by the calculator for a web page to be run was a minimum of 150 and 600 words. The 150 word criteria met some of the other formulas minimum criteria for a passage to be tested. The readability formula for the Coleman Liau Index is the following, "CLI = 0.0588L - .0296S - 15.8. L is the mean of letters per 100 characters/words. The SMOG grade = 3 + Square Root of Polysyllable Count. The SMOG counts sentences in the beginning, the middle, and the end of a passage and the number of syllables in each group of sentences to be rounded the nearest 10^{th}. The Automated Readability Index (ARI) took into account the number of letters per word and the number of words per sentence in the passage. The Formula for the ARI is 4.71 (characters/words) + 0.5 (words/sentences) -21.43. An automated number was generated that approximated an age appropriate number that was matched to a grade level scale. The Linear Write Readability Formula was developed by the U.S. military for mainly technical text. The Linear Write formula computed total sentences, and the number of

words, and multiple syllables. Each formula provided a score that indicated a reading grade level (Readability Formulas, n.d., front page). Table 3 shows the results of a validity test designed for this study. The test looked at four leading readability formulas and how the mean of each municipality compared to the Flesch-Kincaid score. The means demonstrated that the measuring scale was returning a similar value to the Flesch-Kincaid Grade level. A national mean was estimated from all the leading readability scores of all cities. These test results demonstrated that the Flesch Kincaid Grade level score was indeed measuring the grade level readability of the webpage according to four leading readability formulas.

Table 3. Comparison of Flesch-Kincaid Grade Level Formula Against Other Reading Formulas

Municipality	The Coleman-Liau Index (a)	SMOG Index (b)	Automatic Readability Index (c)	Linsear Write Formula (d)	Mean (a, b, c &d)	Standard Deviation (a, b, c &d)	Flesch-Kincaid
Alabaster, AL	12	10.3	9.9	9.4	10.4	1.128	10.8
Albert Lea, MN	7	6.5	5.1	6.5	6.27	0.818	6.1
Broadway Height, OH	11	10.8	12.6	14.6	12.2	1.762	12.1
Brownsville, TX	15	17.1	20.2	24.4	12.2	4.086	18.2
Fort Worth, TX	12	9.5	10.8	11.3	19.1	1.056	10.5
Boonville, MS	14	13.7	15.6	17.1	15.1	1.573	15.3
Dunwoody, GA	14	16.9	20.8	25.4	19.2	4.943	19.3
Farmington, MN	12	10.5	10.4	11.6	11.1	0.797	10.5
Fountain Inn, SC	10	9.6	11.9	14	11.3	2.017	10.9
Guymon, OK	9	8.7	7.4	8.6	8.4	0.704	8.5
Estimated National Mean from above cities	11.6	11.36	12.47	14.29	12.43	-	12.22
Estimated National Standard Deviation from above cities	2.46	3.47	5.09	6.38	-	-	4.17

Statistical Analysis and Procedures

The raw data generated by the Flesch Kincaid readability scores were entered into IBM Statistical Package for Social Sciences (SPSS 21) to run analysis. For research question 1, descriptive statistics allowed the researcher to take a large data set and summarize it. These sets of measurements (frequency distribution, central tendency, and dispersion) allowed the researcher to describe the sample. Descriptive statistics were the foundation of the quantitative analysis that was needed to answer research question 2. For research question 2, a one sample t test allowed the researcher to compare the states' mean Flesch-Kincaid reading grade levels to the national average reading grade level.

Various states have proficiency reading tests that students must pass before they can graduate. The targeted state standard reading grade level is the proficiency reading test that students must pass before they can graduate from high school. Any states receiving federal dollars for educational programs must adopt a standardized test in which students' level of proficiency is tested in the areas of reading, math, social studies, and science (Daggett, 2005; National Center for Educational Statistics, 2013; Perie, Grigg, & Donahue, 2005). This mandate was established under the "2001 No Child Left Behind Act that requires states to establish proficiency standards in order to assess whether states were making 'adequate yearly progress' on raising student achievement" (American Institutes for Research, 2013, front page). The Elementary and Secondary Education Act 2001 created the adequate yearly progress (AYP) standard which each state's Department of Education used as a guideline (National Center for Educations Statistics, 2013, front page).

According to the 2001 No Child Left Behind Act, the test could be designed and measured according to state proficiency levels. The National Assessment of Educational Progress (NAEP) is

> a continuing and nationally representative measure of trends in academic achievement of U.S. elementary and secondary students in various subjects. For nearly four decades, NAEP assessments have been conducted periodically in reading, mathematics, science, writing, U.S. history, civics, geography, and other subjects. By collecting and reporting information on student performance at the national, state, and local levels, NAEP is an integral part of our nation's evaluation of the condition and progress of education. (Reading Framework for 2011-National Assessment of Educational Progress, 2011)

The NAEP found that many of the states' proficiency scores were higher when the state standardized test was measured by the NAEP scale. The problem according to Willard R. Daggett (2005) was "Proficiency levels vary across states, subjects, and grades" (p. 2). Table 4 is an example of the proficiency levels and the reading grade-level equivalents matched with a literacy scoring range set by the NAEP.

Table 4. NAEP Proficiency Levels and the Reading-Grade Level Equivalents

NAEP Level	**Literacy Score**	**Grade Level**
I Rudimentary	150	1.5
II Basic	200	3.6
III Intermediate	250	7.2
IV Adept	300	12
V Advanced	350	16+

Source: The Principles of Readability, (DuBay, 2004a, p. 8).

During the study, the researcher found that many of the states utilized a literacy scoring scale similar to that used in the 1992 reported on Adult Literacy in America to determine levels of proficiency. The researcher learned that many of the cut scores that

separated the levels of proficiency were different from state to state. The researcher also discovered that states either published proficiency levels according to a scoring scale or some reading grade level equivalent to the scoring scale. On the high school level, the act mandated that schools must administer the test to students at least one time before the students' expected graduation date. States, however, could administer the proficiency test more than once. For the purpose of answering research question 3 and research question 4, the grade level in which the test was first administered acted as an indicator point of grade level proficiency. For instance, a school that required a student to take the proficiency test by year end of their ninth grade served as the targeted state's standard level of proficiency. In other words, the reading proficiency test year acts as an indicator of the reading level of the state. The researcher used the website Time 4 Learning to determine a state-by-state standardized testing (a targeted state standard reading grade level) for graduation (Standardized Testing, n.d.).

An assumption of the t test is having a sample size less than 50. Babbie (2010) stated it is useful to use a statistical method that will account for the sample size; however, as (n) approaches infinity, T = Z = F, it does not matter. A similar paired sample t test used in research question 3 that compared the FKGL of municipal websites to the mean state standard reading grade level (looks at city/municipality vs. the state), was also used for research question 4 that compared the average score of the state's Flesch-Kincaid reading grade level to the targeted state's standard reading grade level (looks at state vs. the state). Research question 5 employed a one-way ANOVA statistics to see if there was difference between the FKGL score mean difference among cities. Research question 6 employed descriptive statistics, but the measurement was recoded as

0 = No audio visual portal; 1 = Does have an audio visual portal. This allowed the researcher to determine which municipalities offer alternative methods for accessing information on their websites.

CHAPTER IV

RESULTS

Sample Population

A series of descriptive statistics such as measurements of central tendency, dispersion, and range were run to produce data that provided us with a description of the sample population. A total of 250 cities were randomly selected from the pool of all cities in the United States with populations over 5,000. The 250 cities were located in 44 different states. The sample population had a mean of 41,084.1, a median of 15,347, and the smallest mode was 5,008 (standard deviation = 83,600.2). The mean population for cities with a population over 5,000 is 43,567.73; the median is 15,903; and the mode is 7,218. The standard deviation for cities with population over 5,000 is 178,983.4; therefore, because the sample population mean falls within one standard deviation of the national population mean, it was determined that the sample population was representative of the national population (see Table 5).

Table 5. Population Statistics

Items	Sample Population	National Population
Mean	41,084.1	45,367.7
Median	15,347.0	15,903.0
Mode	5,008	7,218
Standard Deviation	83,600.2	178,983.4

As seen in Figure 2, the sample population was not normally distributed (skewness = 6.104). However, in Figure 3, when categorized by population size (small = 0-20,000; medium = 20,001-200,000; and large = >200,001) (European Foundation 1994 as cited in Kunzmann, 2009; Rivkin/Rivkin 1982; Rondonelli 1993), the sample population was normally distributed (skewness = .791; mean = 1.45). The distribution in the sample population mimics the distribution of readability of websites in the national population.

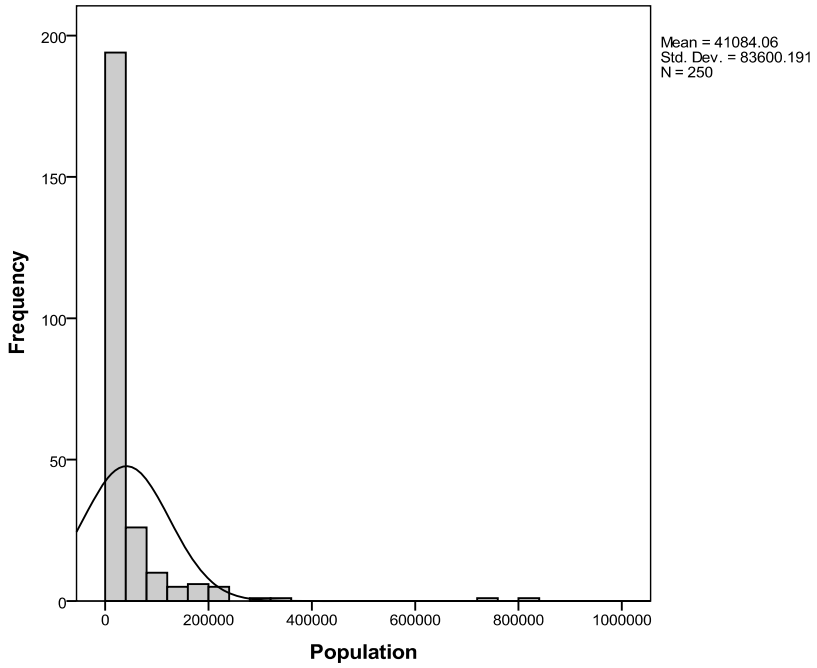


Figure 2. Population distribution.

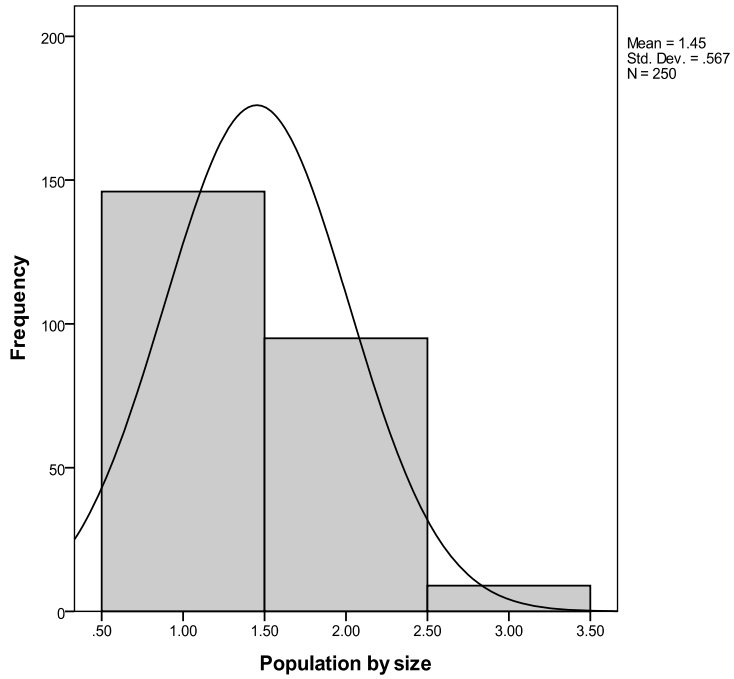


Figure 3. Distribution of population by city size.

City Websites

Descriptive statistics were conducted to learn more about the characteristics of the sample city websites. As previously described, the websites explored were those that the municipality deemed official. According to the research by West and Miller (2006) most users of websites will first interact with the front page. Generally, the front page has information on the community's History, About us, and Welcome message. A majority of the city websites offered these three categories as a cluster under About us or as separate links to that particular information. The researcher found that city websites also offered links to departments, city government, and services. When the home page of the website did not meet the requirements of at least 100 words to produce either a Flesch Readibility Ease score or a Flesch-Kincaid Grade level score, another page was analyzed (i.e., Human Resource Department page and Services and Program page). The Children's Partnership (2001) study of online content for low-income and underserved communities reported that the low-income and less privileged citizens logged online to retrieve information on employment or government assistance programs. As aforementioned, online users are first greeted by the front page that composes information of the community's History, About us, or Welcome message.

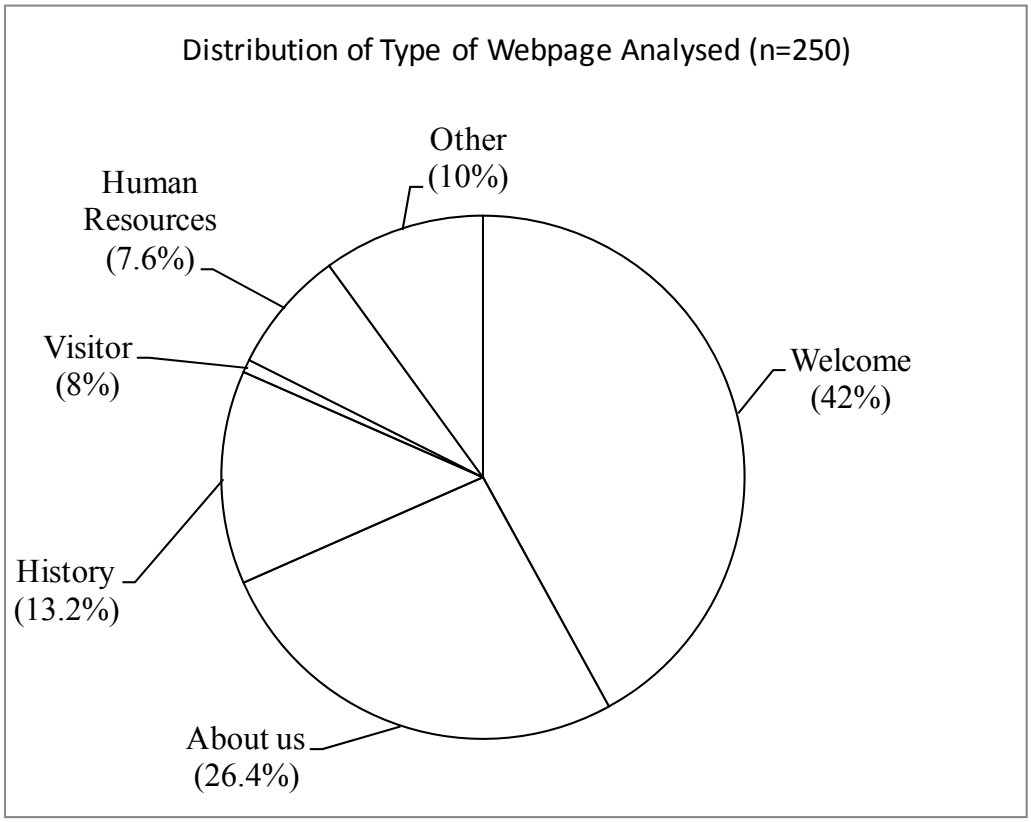


Figure 4. Distribution of the type of webpage analyzed.

The distribution of webpages visited can be seen in Figure 4. As shown in Figure 4 the majority (42%) of the webpages examined was the welcome page, followed by the about us page (26%).

Flesch Readability Ease Score and Flesch-Kincaid Grade Level

The first research question "What is the readability ease score and grade level of a sample of municipalities' websites with population greater than 5,000 citizens" was addressed using results from the descriptive statistics performed. The analysis produced by the Microsoft Office Word program returned the selected text's Flesch Readability

Ease score and the Flesch-Kincaid Grade Level score. The Flesch Readability Ease score ranged from 0 to 74. The scores were normally distributed (skewness = -.374) with a mean of 38.71, a median of 39.4, and a mode of 40—meaning that the readability ease of the sample population was difficult and the expected completed grade level to be able to read the material is between the 13th and the 16th grade level (see Figure 5).

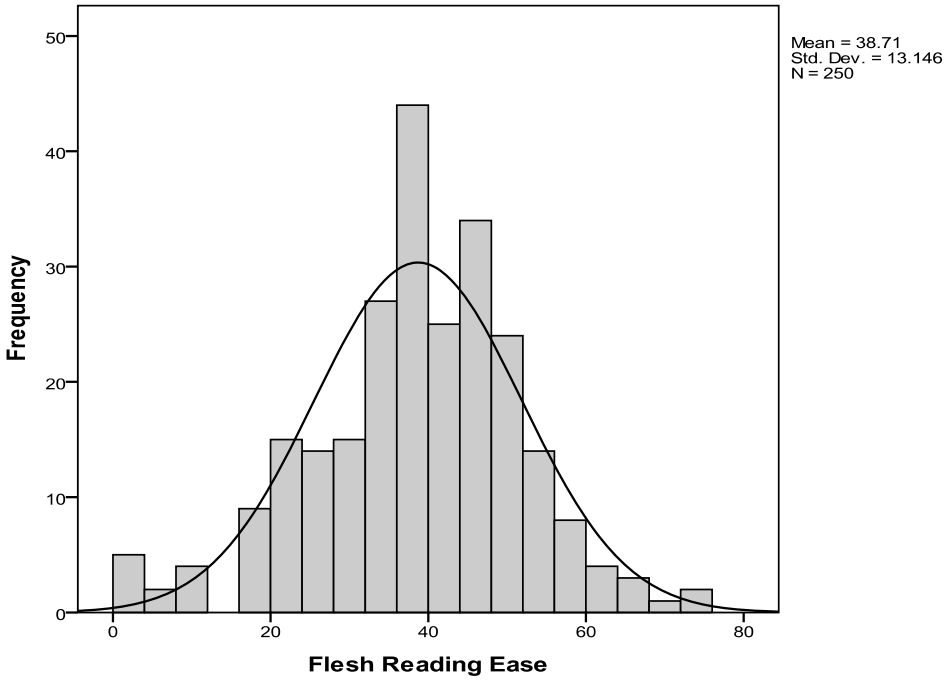


Figure 5. Distribution of Flesch reading ease scores.

Again, the Microsoft Office Word analyses also returned a Flesch-Kincaid Grade Level score. The Flesch-Kincaid Grade Level analyses of the webpages returned a mean of 12.7, a median of 12.5, and a mode of 13.3. The scores were normally distributed (skewness = .696) and ranged from 6.8 to 22.6 (see Appendix A). Thus, on average, city websites are showing a welcome page that requires at least 12 years of education (a high school diploma) in order to be able to understand the content. One city's webpage

required 22.6 years of education, and 4.8% of the cities required a post-graduate degree (FKGL>17.0) in order to comprehend their webpage's content (see Figure 6).

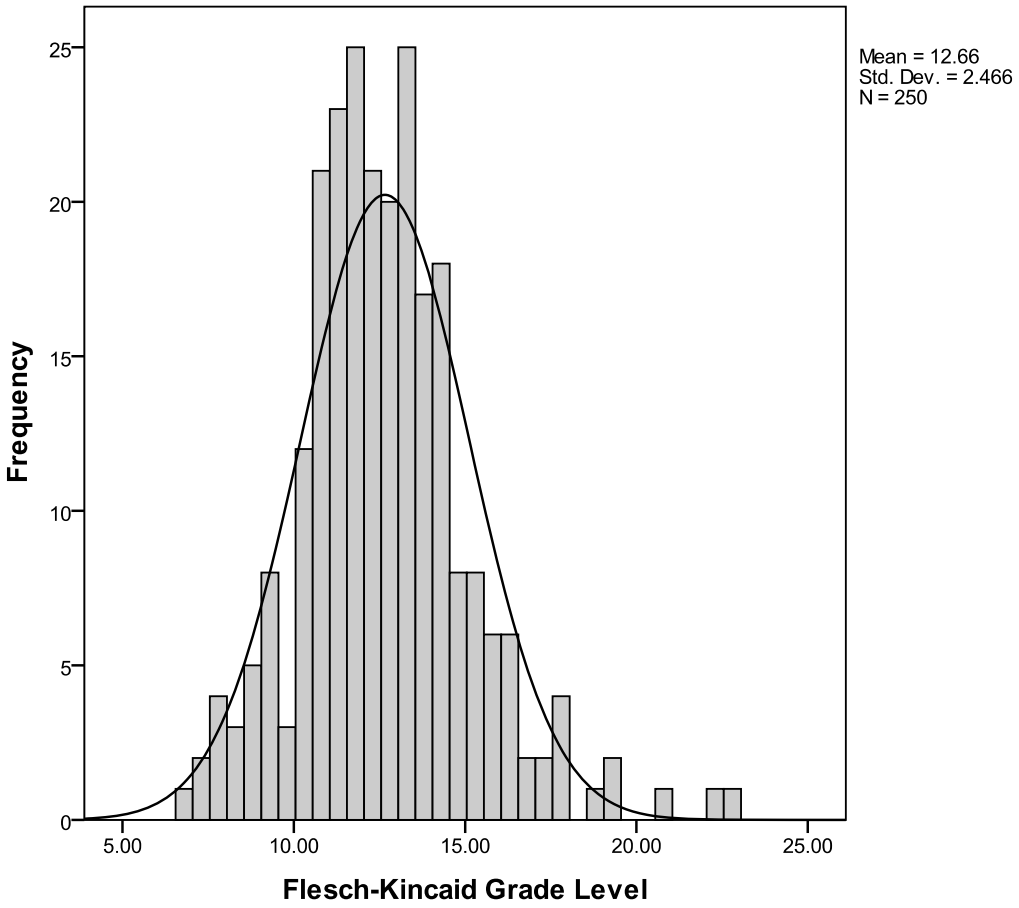


Figure 6. Distribution Flesch-Kincaid grade level scores.

In addressing the second research question, "Are the states' mean Flesch-Kincaid reading grade levels different from the national average reading grade level?" a one sample t test was executed. The t-test statistic shows that the mean difference (4.66) between the states' websites FKGL of the sample population and the national standard is statistically significant, $t = 29.88$, $p < .001$ (See Appendix B for one-sample t-test results

and Figure7 for visual comparison of state website's mean FLKG and the National Average Reading Grade Level).

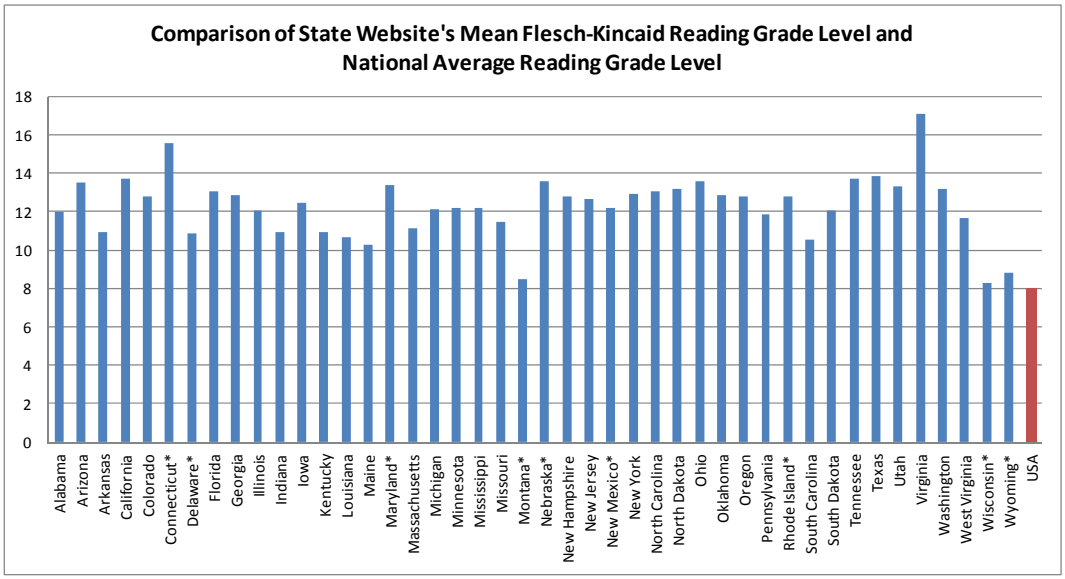


Figure 7. Comparison of state website's mean FLKG and the national average reading grade level.

For the third research question, "Do municipal websites' main page read at the targeted state's standard reading grade level?" a paired samples t test was conducted to test for differences between the mean state standard reading grade level and the FKGL of municipal websites. The paired samples statistics resulted in a statistically significant difference of 2.72, $p > .001$ (see Appendix C). This means that on average a municipal website is reading almost three grade levels higher than the targeted standard reading level of that state. Figure 8 also provides a visual of what each targeted state's standard score and actual website score look like.

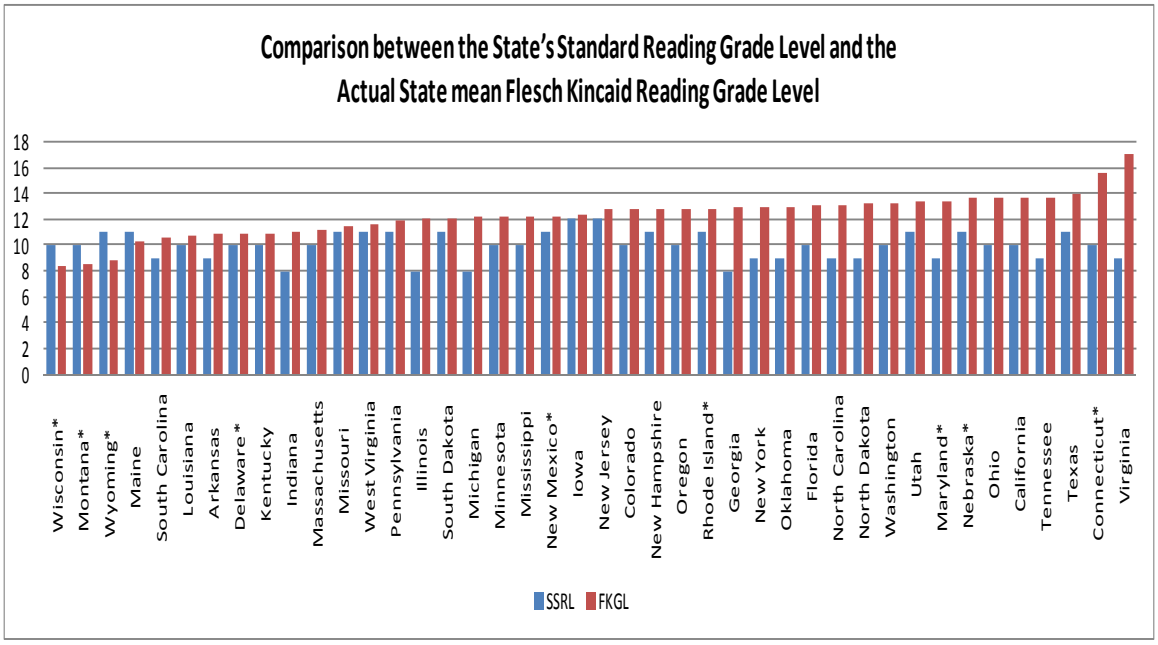


Figure 8. Comparison between the states' standard reading grade level and the actual states' mean Flesch Kincaid reading grade level.

For the fourth research question, "Is the mean Flesch-Kincaid reading grade level of the city webpages within the state's equal to the targeted state's standard reading grade level?" another paired samples t test was conducted. The results show that the city webpages within a state do not read at the targeted state's standard reading level (t = -7.658; $p < .001$). On average, websites in the state read at 2.3 levels higher than the targeted state standard (see Appendix D).

For the fifth research question, "Is there difference between FKGL score mean difference among cities (small, medium, and large)?" a one-way ANOVA statistics was carried out. From the results, it appears that the small cities have the lowest FKGL scores (12.2), with the medium sized cities having the highest FKGL (13.3) on their webpages.

The difference between the three groups is statistically significant ($F = 5.213$; $p = .006$), (see Table 6). A Bonferroni post-hoc statistics demonstrates that only groups that differ significantly from each other were the small and the medium sized cities ($p < .05$). See Appendix E for results of the ANOVA and the Multiple Comparison.

Table 6. One-way Analysis of Variance Summary Table Comparing FKGL Score on City Sizes Category (Small, Medium, and Large)

Source	*Df*	*SS*	*MS*	*F*	*P*
Years					
Between Groups	2	61.314	30.657	5.213	.006
Within Groups	247	1452.472	5.880		
Total	249	1513.786			

For the sixth research question, "Do city websites offer audio or visual portals?" the variable was dummy coded into 0 = No audio or visual portals and 1 = Yes audio or visual portals. Descriptive statistics were carried to show an overview of data. From the results, the majority of cities over 5,000, according to our sample, do not offer audio or visual portals. Out of the 250 cities' samples, only 10.8% (n = 27) offer an audio or visual portal as an alternative to the written content (see Appendix F).

In summary, chapter V deals with findings of the overall study. The overall research questions were addressed as follows: The first research question "What is the readability ease score and grade level of a sample of municipalities' websites with population greater than 5,000 citizens?" was addressed using results from the descriptive statistics performed. The results show that the readability ease of the sample population was difficult and the expected completed grade level to be able to read the material is

between the 13th and the 16th grade level. Additionally, when it comes to government website, the findings show that when it comes to reading website content, it takes more than 12 years of education.

The second research question "Are the states' mean Flesch-Kincaid reading grade levels different from the national average reading grade level?" was addressed using a one sample t test. The finding shows that there is a statistically significant difference between the FKGL (overall state website is my sample national average) of the sample population and the national average reading grade level). Thus, on the average state websites are reading almost five grade levels higher than the national average reading grade level (eighth grade reading level). In conclusion, this implies that an average American adult needs one year of college education to be able to read and understand the average state website.

The third research question, "Do municipal websites' main page read at the targeted state's standard reading grade level?" a paired samples t test was conducted to test for differences between the targeted mean state standard reading grade level and the FKGL of municipal websites. The results reveal a statistically significant difference between municipal websites and the targeted standard reading level of the state. The implication here is that on average a city website is reading almost three grade levels higher than the targeted standard reading level of that state. Thus, it will take on average an individual about three additional grade levels of education to be able to read their official city website.

The fourth research question "Is the mean Flesch-Kincaid reading grade level of the city webpages within the state equal to the targeted state's standard reading grade

level?" was addressed using paired samples t test. The results show that the city webpages within a state do not read at the targeted state's standard reading level (t = -7.658; p < .001). This implies that websites in the state are reading two grade levels higher than their targeted state standard reading levels.

The fifth research question, "Is there difference between FKGL score mean difference among cities (small, medium and large)?" was resolved using a one-way ANOVA statistics. The results show that there was significant difference in (small, medium, and large). However, using post hoc test demonstrates that the actual difference was between small and medium size cities only. This implies that when you have a small city to medium size city, the FKGL will be different. In other words, as cities get smaller in population, the readability gab gets larger.

The last research question "Do city websites offer audio or visual portals?" was measured using simple descriptive statistics after variable was dummy coded to fit the research study. The results show that the majority of municipal website lack another means of access to information or content. The implication here is that individuals who cannot read the website cannot access information that might be vital to their quantity and quality of life. The next chapter looks at policy implication, limitations, and future research.

CHAPTER V

IMPLICATIONS AND CONCLUSION

When local governments choose to engage in practices that involve the use of digital technologies (Internet and websites) to inform, to engage, and to encourage citizens, it is pertinent that in a democratic society all citizens have equal access to such opportunities. A number of conclusions were drawn from the analysis in chapter IV. The purpose of this chapter is to look at the implications relative to public administration as a means to encourage change in policies to implement better practices of governing citizens, disseminating information, and creating opportunities through digital tools (i.e., advanced technology).

Current literature suggests there are serious problems concerning readability and government websites. A series of studies by Darrel West (2003, 2004, 2005, 2006, 2007, 2008, 2010) postulated that there is a serious readability flaw in federal and state websites. By examining the readability of a sample of municipal websites across the United States, a number of concerns have highlighted the readability levels of municipal websites. Municipal websites are reading at higher grade levels, higher than the National Adult Reading Level. The average adult reads at an eighth grade level or below, while the average municipal website is reading at a 13th grade level. And there is also a statistical difference between the state's standard reading grade level and the sample population of the official city websites' main page, almost three grade levels higher than

the mean state standard reading grade level. The study also reveals that a city's webpage within a state does not read at the state's standard reading level. On average, websites in the state read at 2.3 levels higher than the state reading standard. Not-to-mention, the majority of the cities sampled do not offer audio or visual portals as an alternative to the written content. These findings have led to some practical implications that should be addressed in the future.

Limitations

The users of the Flesch Reading Ease and the Flesch Kincaid Formulas are able to manipulate the syntax and semantic factors to improve comprehension, which could possibly change the meaning of the entire text, without improving text difficulty (Oakland & Lane, 2004). A major limitation of the measurement has been its lack of validity that is inherent in its construct of selected variables that correlate with text difficulty (Dubay, 2004b; Oakland & Lane, 2004; Report, 2011; Simon, 1971; Zakluk & Samuels, 1988). The formula does not take into account the background of the reader, the interest of the reader, or the conceptual load of the text. Quantitative machine-driven formulas, like such, will yield similar readability scores even if the passage is written in no formal order of comprehension (Redish, 2000). Moreover, such formulas as the Flesch Reading Ease and the Flesch Kincaid Formulas have an inability to measure comprehension, account for the organization, design, or layout of the text and interpret difficulty of ideas. Flesch Reading Ease and the Flesch Kincaid Formulas are geared towards style difficulty of variables and sentences (p. 134). Klare (1976) suggested that a good score to be derived from a formula will depend on the passage selected (p. 134).

Gray and Leary (1935) wrote that there are many factors to consider when determining if a book or text is readable. Out of 288 factors, Gray and Leary mired it down to four dominate elements that must be given careful consideration when measuring readability of text. Figure 9 highlights these factors as Content, Style, Design and Structure. Many critics of readability would contest that content, design, or structure or a combination of all three would have been better at assessing the readability of text. Gray and Leary attempted to measure content but found there was no practical method for it; however, by the 1970s other theorists and linguists attempted to see meaning through interpretation and not in semantic and syntactic elements. According to DuBay (2004a), "They did not, however, come up with any practical method for measuring or adjusting them for different levels of readers" (p. 32).

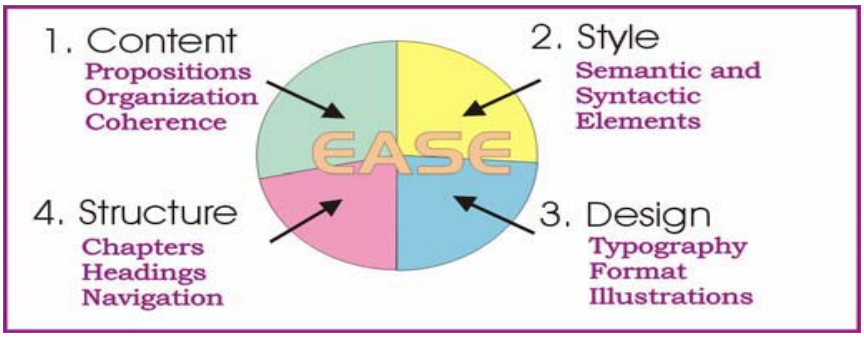


Figure 9. The four basic elements of reading ease.

Source: (DuBay, 2004a)

Content

Content factors focused on propositions of sentences that give different meaning and understanding to the reader. Propositions can help organize the sentences more clearly for conveying of ideas and cohesion. The content of the information must address

the audience that intends to engage the text. Text should not be wordy or full of polysyllabic words that convey multiple meanings. This can confuse the reader and the text's intended purpose and meaning. The organization of the information should be laid out in a manner that moves the reader along with consistent sentences and vocabulary that is clear. The content of the text should be written in active voice, which helps identify the subject of the sentence and its main idea (DuBay, 2004a; Gray & Leary, 1935; The Ohio State Medical Center, 2007).

Design

The design of the text works more like a catch phrase or hook; it is intended to spark the readers' interest through graphs, illustrations, and format of the text and depends on the layout of the text (positioning of chapters, placement of headings of titles, and the navigability of the page, the design can impose some difficulties on the readability of the text) (DuBay, 2004a; Gray & Leary, 1935). The Ohio State University Medical Center and AHEC Clear Health Communication Program (2007) identified a check list for easy to read material. This list identified several design factors that should be avoided when creating text. According to the article:

> The material looks uncluttered with ample white space, generous margins, and short line length of 2-5 inches. There should be balanced space between text and illustrations. Upper and lower case letters with a font size of 12-14 point for the text (serif faced preferred) are used. The font size of headings and important points should be larger or bolded to draw the reader's eyes to that area. Visual features like picture, charts, and sidebars to attract attention and aid in learning attention and aid in learning and retention are apparent. Color is also eye catching and should be utilized in moderation. Each illustration should convey a single idea and be properly labeled. Make certain that the material looks easy to read. If the text appears clustered and menacing, the reader is less likely to begin reading the material at all. (p. 12)

As a reminder, readability is about words and sentences. A fairly large city in Ohio has designed its website around bullets and illustrations. Though the front page of the website has very little semantic expressions, the website is still unreadable. Literacy is beyond decoding symbols. Thus, replacing a sentence with a bullet does not solve the problem of readability or increase access to information. More and more cities are utilizing bullets to fill in space, but bullets are no more readable than a drawn out sentence with polysyllabic words. Adding bullets to replace sentences is a design issue, not a style issue. And design issues do not address the issue of the digital divide.

Structure

The structure of text is equally important since it moves the reader from one part of the text to the other. Structure deals with how the designer will place information or text and how a webpage that has text is retrievable. The organization of ideas is essential to the reader stopping or continuing through the text or site. If the ideas or information are clustered under headings or links, that creates a long list of ongoing sub-links; thus, the reader will get frustrated. Also, the purpose of the text or information will get lost in its own translation. The Ohio State University and AHEC Clear Health Communication Program (2007) suggested utilizing transitional words to connect meaning and using few bullets (five to six bullets) to help organize the text or page.

Analysis of Other Factors of Readability

To justify the researcher's use of the style factor rather than Content, Design, and Structure, a random sample of 10 municipal websites was taken from the 250 sampling frame of municipal websites. Each site was put through a Web Accessibility Evaluation

Tool (the WAVE) that identifies various errors, alerts, feature, structural elements, HTML5 and ARIA, and Contrast Errors that are associated with each website's content, design, and format. The WAVE uses content analysis to compute these categorical errors. These errors would normally be compared to guidelines that make more web content available. The various guidelines are found in Section 508 of the Rehabilitation Act that requires executive agencies and their personnel to follow these guidelines so that information technology is available to people with disabilities (Section 508.gov, n.d.); the Web Content Accessibility Guidelines (WCAG) 2.0; Non-text Content Level A guidelines; Link Purpose (in Context) Level A guidelines, Info and Relationships Level A; and many other guidelines. DuBay (2004a) wrote that the difficulty in measuring content made style factor so much more vital as a measure of readability. The same can be said here: The style factor makes a more definitive claim as to what text is readable and what is not readable. The formula makes it clear as to what is being measured. The formula is inexpensive, simple, and time convenient. Newbold and Gillam (2010), suggested that the real difference between which factor is better at measuring readability lies in the definition of readability. The authors quoted Klare's (1963) definition of readability, "the ease of understanding or comprehension due to the style of writing" (p. 125). In this case, Newbold and Gillam, (2010) postulated that the "specific abilities of the reader are not important" (p. 125). The text (semantic and syntax factors) supersedes the characteristics of the reader, such as "background knowledge, language, motivation and engagement, and reading fluency" (p. 125). More importantly, content, design, and structure are concerned with the characteristics of the reader and what the reader brings to the text. In other words, it is concerned with the manufacturing process of the reader,

while style is concerned with the finished product of the text and determining to whom the product is more suitable (Redish & Selzer, 1985; Selzer, 1981).

In Table 7 each municipality except one (which had a no read error) produced multiple errors that are associated with categories.

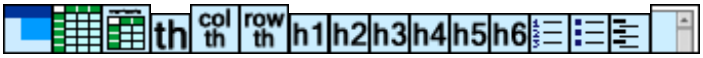
Table 7. A Reflection on Other Factors of Municipal Websites

Municipality	Errors	Alerts	Features	Structural Elements	HTML5 ARIA	Contrast Error	Total Errors
San Francisco CA	17	16	19	20	0	0	72
Edgewater CO	6	8	4	24	9	78	129
Baker LO	5	14	2	10	0	6	37
Monroe LO	23	71	46	19	0	13	172
Philadelphia MS	2	13	16	31	0	15	77
Jamestown ND	Error	Error	Error	Error	Error	Error	0
Laurens SC	2	12	29	10	1	14	68
Pierre SD	16	20	10	159	1	123	329
Price Utah	32	50	0	1	0	3	86
Maple Valley WA	2	3	19	29	0	28	81

When determining a set of best practice elements of reading ease, Gray and Leary (1935) took 288 factors and combined then into four major factors of readability. Researchers, theorists, and linguists have used these factors developing and attempting to develop readability formulas. Some of the formulas are good measures of readability and others not so effective in measuring readability (i.e., Content). Such is the case with these five categories of elements in Table 8. Table 8 illustrates a number of errors and

attached icons that create issues of accessibility. For the purpose of this narrative, only a few icons and their errors will be highlighted and defined within the table. The problem, however, is the definitions of the icons overlap and it is difficult to determine which error is associated with the websites' content, design, and structure. It is assumed that the reader brings certain amounts of knowledge to the text to understand content, design, and structure; however, The Department of Education through multiple studies has shown that people possess different levels of comprehension and reading abilities, again illustrating the difficulties associated with measuring content as a factor or readability.

Table 8. Identified Categories on Websites and the Icon Index

Errors: A link contains no text, error with labels, image without text, documentation missing. 
Alerts: Errors with alternative text, incorrect associated labels: 
Features: image with in link cannot be seen, alternative text is empty: 
Structural Elements: Unordered list of bullets, numbers, or symbols are present: 
HTML5 and ARIA: Errors associated with audio and video content and transcripts: 
Contrast Errors: Inadequate contrast in foreground and background: 1 possible explanation for Contrast error. 

Source: http://wave.webaim.org/report#/http%3A%2F%2Fwww.sfgov.org%2Findex.asp

Political Implications

Technology can no longer be seen as being neutral; the digital divide shows it has a political perspective that has led up to more pointed socio-political assumptions. There is the assumption that literacy is the problem of access to information, but another assumption is websites can be written at higher levels purposely to prevent accessibility.

To what extent is readability being used to establish power of the status quo? Or how is readability used to support the status quo? Governments can easily use readability as a tool to decrease access to programs and services that benefit various groups of society. If year-end budgets are not spent or used, governments can use this as a reason to decrease future budget allocation for those or similar programs and services.

Plain Language Implications

A practical implication of high readability websites is their contributing to the digital divide. As more and more opportunities are tied to the Internet, Americans of different backgrounds are going online to take advantage of opportunities that are linked to the Internet, opportunities such as an education, jobs and job training programs, health programs, civic engagement and political participation, and much more. Furthermore, local governments are trying to capitalize on this phenomenon (the Internet) to bring their services online. Since the passage of E-government Act of 2002, an act designed to make government more accountable, efficient, and accessible to the citizens, the World Wide Web as an application of the Internet has empowered all levels of government to become content creators—allowing digital government and electronic governance to grow at unprecedented levels while transforming and reinventing itself through the use of the Internet (Baird et al., 2012; Grulke, 2002).

When local governments are increasingly shifting governing responsibilities towards electronic means, these agencies should be aware that such information is readable and understood by all citizens. If not, then the implication is that local governments are creating barriers that avert citizens from accessing vital information that

can very well improve their quality of life (Lazarus & Mora, 2000). Over 90 million Americans are unable to understand the instructions that are designed to navigate them to resources, services, programs, and much more. A majority of text-based instructions (prose) that guide the users to find information found on municipal websites is written at levels beyond citizens' understanding (West & Miller, 2006). Governments' use of websites to communicate to online users is predicated on the belief that the users are capable of understanding and have the necessary reading ability to read and comprehend technical communication. For over two decades, the digital divide has been seen as an issue of access, whether to hardware, software, or Internet skills. The digital divide has seen its boundaries shift from an issue of access to lack of technological skills and content (Choemprayong, 2006; Compaine, 2004; Lazarus & Mora, 2000; National Performance Review, 1993; Thiele, 2010; West, 2008). In an effort to combat issues of access, the federal government has initiated public policies to close these gaps. In the meantime, new gaps are being created through the readability levels of websites. Unfortunately, the Plain Language Act of 2010 does not address the readability of state and local websites. Only on a federal level does it set forth guidelines that federal executive agencies must follow to produce Plain English that is understood by all users. New legislation concerning local government use of plain language must be enacted or the existing law of the 2010 Plain Language Act must be extended to mandate local municipalities to write documents on websites in plain language. This will allow the content/information disseminated through such electronic tools to be useful and viable for addressing the needs of all citizens/residents in the community, especially the less privileged, less educated population.

Creating legislation geared to mandating local governments, local government agencies and local administrators to focus on writing standards that will decrease the readability of a webpage would increase access opportunities for all citizens. Local governments, its agencies and its personnel need to do the following:

- Adhere to utilizing short sentences, familiar words that online users can understand.
- Write in terms of the audience: That is, use active voice, avoid PDF overload and the use of too many links and sub links. Be mindful to write clear and concise sentences and avoid over use of bullets and numbers to break down the text.
- Update the webpage on a regular basis to make sure text is readable and that links are not broken or have an empty page attached.
- Make sure information and services are accessible to the disabled. Add audio and video content to the site and check its upkeep frequently.
- Place text on white pages with black lettering to promote legibility and clarity.
- Establish a collaborative approach to writing, developing, and designing websites.

Literacy Implications

A study conducted by the Department of Commerce, the U.S. Department of Education and the National Center for Education Statistics (1992) identified education as a determinate to accessing information. According to the report, it takes a 9th and 10th grade competence level to understand basic instructions on many Internal Revenue

Forms. The National Assessment of Adult Literacy (1992, 2003) wrote that functionally and marginally illiterate citizens struggle with standard prose, documents, and quantitative tasks (Greenberg & Jin, 2007; Maatta, 2003). Approximately 44 million American adults are functionally incapable of understanding useful, online content. The National Adult Literacy (1992) reported that the average American adult reads on an eighth grade level (Children's Partnership, 2000). The National Assessment of Educational Progress (NAEP) reported the reading levels among high school students to have gotten worse in two decades. According to the study, students scored 212 points below the required reading comprehension standards of 500 points. Nearly 75% of high school seniors were classified below reading "proficient" levels (NAEP, n.d). According to the Alliance For Excellent Education (2013), "Graduation rates are a fundamental indicator of whether or not the nation's public school system is doing what it is intended to do: enroll, engage, and educate youth to be productive members of society" (p. 1). Meanwhile, students are dropping out of high school at alarming rates, a little over 7,000 students every school year. Not only this, but minority students seem to be at a major disadvantage when it comes to graduating (U.S. Census Bureau, Current Population Reports, 2011, p. 20). A significant barrier contributing to the increasing dropout rate is the inability to read and write above basic levels of comprehension. These dropouts add to the 90 million functional illiterates already in society and struggling to perform basic "fifth grade" level 1 and Level 2 tasks (filling out a check, an application for employment, or reading information concerning government services) (Alliance For Excellent Education, 2013; DuBay, 2004a). Over the decades, the federal government has attempted to address adult literacy by creating policies and programs such as:

"School to Work Opportunities Act (1994), Personal Responsibility and Work Opportunity Reconciliation Act (1996), Welfare-to-Work Program (1997), and the Adult Educational and Family Literacy Act (1998)" (Maatta, 2003, p. 3).

It is possible to see that online content that is not understood by limited-literacy users creates a content-related barrier for users (Lazarus & Mora, 2000). In particular, readability of web pages is creating obstacles for limited-literacy users. If local governments are going to engage in electronic resources to govern society or to funnel information through a website, then local governments should give at-risk, low-educated citizens the best chance at accessing that information.

Creating grassroots, adult educational programs offers adults with limited reading abilities the opportunity to develop their reading skills. A community-based educational program (informal educational programs or development and learning programs) is a program that is developed in collaboration with the local community and sometimes with universities and other nonprofit organizations. The program engages the adult citizen through an educational program that is geared to their learning deficiencies. Community educational programs strengthen a citizen's ability to read, identify task, process information, and engage in a democratic process. According to DuBay (2004a), "Workplace literacy programs are highly effective in producing, in a brief period, significant improvement in job-related reading" (p. 5). Communities/local governments need to create partnerships with universities, nonprofit organizations, and private companies to increase the reading ability of its citizens, which in turn, benefits those stakeholders greatly since the literature shows that poorly educated citizens socially and economically weigh on the community resources (NAAL, 2003). DuBay (2004a) wrote,

"Achieving high levels of literacy requires continued opportunities for life-long learning. Investments in adult literacy provide a unique and cost-effective strategy for improving the economy, the home, the community, the schools," (p. 6), and their students. An educated society and workforce increase the community's ability to draw outside companies and retain other companies.

Training Implications and Collaboration

Readability formulas address the need for websites to be written on levels that all can understand, but as the literature suggests, it cannot be the only factor used to improve the overall website. Currently there exist a number of plain language guidelines for writing text and web designing; however, literature reveals that technical writers choose not to follow such guidelines (DuBay, 2004a). The majority of the readers who go online are at best intermediate readers. Technical writers or bureaucrats who develop websites must be aware of writing on the level of the public in which it serves. Also, webpages should not be highly technical to navigate. Yet, most webpages are difficult to read, navigate, and understand.

Implementing training programs on readability and how to write to specific audiences will benefit both the writer and the reader. Technocrats write to those that understand technical jargon. Bureaucrats write material for other bureaucrats to read, even though the majority of those who interact with their material are average readers. In many cases, the reader is subjected to the bureaucrats' and technocrats' professional jargon, polysyllabic words, and long drawn out sentences. As Hummel (1994) wrote in

the "*Bureaucratic Experience,"* citizens are viewed as cases; therefore, it is easy for bureaucrats to ignore citizens and their needs.

There should be some collaborative approach to better address website issues of readability—a writer's approach to writing and readers' ability to process information make the content more readable (Hallenbeck, 1935). This can only be achieved if technical writers, bureaucrats, and citizens work together to better the site. Administrators and technical writers can work on the material and then create a focus group where citizens can come in and rate the website. This feedback will better prepare and help both the administrator and technical writer construct better webpages that fit the needs of its citizens. Tyksinski (2009) echoed that cities "adopting" e-government should have their web creators trained in areas that will improve their skill sets.

Performance Implications

When the digital divide first exploded on the scene, the federal government initiated federal programs and partnerships with federal and state agencies, the private sector, non-profits, and local governments to close the digital divide. One of the most advantageous programs created was Community Access Points (i.e., community centers and libraries), where at-risk citizens could access technology (hardware and software) that allow them to access information. Corporate foundations, public and private partnerships, and nonprofit agencies established community learning centers to train, educate and provide the necessary resources needed to help the underprivileged (Maatta, 2003). However, Maatta (2003) wrote, "Despite increased access to information, without the requisite conventional literacy skills it is unlikely that low-literate adults will be better

able to find and use necessary information through information access resources" (p. 9). Maatta questioned the effectiveness of such "community-based technology and learning centers" as resources for the underprivileged citizens (p. 4).

Of all of these access points, public libraries were more in abundance and able to reach the "digitally divided" citizen. Public libraries soon became the forerunner where poor, underprivileged citizens accessed public information online (Toward Equality of Access, 2003). Public libraries were not only a place where citizens could connect but learn how to connect. Citizens learned Internet skills needed to log online (pp. 3-4). When new government research on the digital divide announced the divide was closing as a result of such programs and initiatives as public and private support, free computer programs, and such programs as community access sites, the federal government began to cut funding in various areas. These cuts were premature because the definition of the digital divide broadens to include access and content. This study by Bill and Melinda Gates Foundation and in conjunction with other organizations reported that slightly over 20% of the larger urban areas are served by the library system. Consequently, these cuts were felt more in the at-risk, poor, urban communities across the country. "The current challenge for libraries is to sustain their ability to provide public access. This requires ongoing investment and support in five key areas: Hardware and software upgrades, Internet connectivity, keeping systems running, staff training, and keeping libraries open" (p. 5). Many of the urban libraries have fewer seats and too many citizens to fill them. To combat the problem, administration has put a time limit on how long a user can stayed logged on to the computer (normally 30 minutes). When websites are unreadable, citizens are spending more time trying to understand the web pages. As a result, citizens

do not have enough time to search for vital information to acquire a job, government assistance, or basic information. Library personnel need to have the readability skills necessary to help these individuals read and navigate through web pages to locate important information. Policies and programs like community access points, community learning centers, and the personnel involved are vital when it comes to citizens accessing information from municipal websites to improve the changes of moving from unemployment to employment (Maatta, 2003).

Audio Visual Implications

Municipal websites should offer video content with audio for those citizens who may have difficulties in reading and comprehending information. Another option is audio-only content for the visually impaired and text caption for the hearing impaired. For residents for whom English is not their first language, municipalities should not only provide video audio capability but also text caption in various languages. And all citizens (and those disabled) should have a means of accessing paper-base transcripts that provide a way for individual to get information on programs and services without surfing the entire website. A traditional resource of information such as printed documents is vital to functionally illiterate citizens. Citizens can acquire others (family and friends) to help decipher traditional text-based information that may not inconvenience a person or that may require a person to possess a technology skill set.

Municipalities can offer an interface system to help assist residents. A similar system to a phone automation system allows residents to use a prompt to by-pass a

particular section on the video audio service or go directly to a department or service without spending a lot of time trying to read unreadable materials.

Future Research

In order to improve effectiveness of electronic government at the municipal levels, efforts must be taken to improve the overall municipal website. The Internet is a private company that local governments are using to funnel pertinent information about government programs and services. Electronic governance rose out of a need to be cost efficient while improving citizens trust in government (Tolbert & Mossberger, 2006). This is nothing new since government has been reinventing itself for decades by utilizing different types of managing techniques (i.e., Public Choice, New Public Management, and Privatization) as a means to reduce operating budgets and serving its citizens. Outsourcing is nothing new to the federal, state, or local governments. Governments have been outsourcing public services to private companies to effectively deliver the public good (O'Looney, 1998). Today, governments are administering this old tool with a new twist to fulfilling their responsibility of electronic governance. According to the Institute for Public-Private Partnerships (PPP; 2009), "Employing PPP as a tool for meeting its obligations to citizens, governments have been able to avail themselves of state of the art technology and private sector expertise, while avoiding excessive strains on already limited budgets" (p. 3). In other words, governments are giving up their websites or allowing private entities to develop their websites to funnel government information about government programs and serves to the public. The report goes to

discuss the potential benefits to adopt e-governments and Information Communication Technologies,

> All levels of government require modernization, new technologies, better efficiency, and improved services for citizens and customers. However, many of the upgrades and modernization required is not only capital intensive and expensive, but is also complex to manage and outside of the scope and skill-set of most government agencies. By having the private sector perform an e-government or ICT service, *on behalf of*, the government, a potential "win-win" solution can be realized where the private sector financed and operates a system, the government is in a better position to "ensure" effective delivery of the service, and the customer/citizen is receiving a higher quality service and is engaged more constructively in customer interfaces with the public sector. Interface with stakeholders. An e-government system was conceptualized…the general public could access information regarding labor laws and regulations, and job seekers could access job listing databases to search for new employment. The system needed to be interactive, so that stakeholders could submit forms and information, in addition to receiving forms and information. (p. 5)

As the report claims this frees the government of any responsibilities to serve the citizen while still possessing an extreme amount of control over the private company that is delivering the public good. However, research has shown that outsourcing has not always been a "win-win" for the government, at least when delivering physical goods and services. It did not always produce efficiency, reduce cost, or transfer the risk to the private company. Citizens see only a government being delivered by who they think is the government. Normally, private companies' performance will be accessed by a performance-based measure to determine their effectiveness and efficiency. This is not so much the case when delivering goods (public information) electronically. Research as to whether or not government websites are meeting the needs of its citizens needs to be explored.

When municipal websites are constructed, formatted, organized, and illustrated in such a manner that makes the navigation an impossibility, then accessibility to readable

information will be a problem. Future research on other basic factors (Content, Design and Format) of readability must be explored and their effect on municipal websites' readability. Research, however, has shown that content is difficult to measure (DuBay, 2004a); therefore, creative means must be taken when looking at this as a variable. Further studies could be conducted to assess efforts being made by the municipal government to improve website readability such as navigating, web mapping, web development, web readability, web content, and feedback from citizens.

In addition, research on effective websites must take place to determine a consistent set of variables. These variables will not serve as best practices but as a guide in terms of how good quality practices can be replicated and applied to poorly developed municipal websites. Researcher literature shows that social capital improves through constant interaction (whether electronically or face to face).

The effects that high level readability of municipal websites have on citizens and social capital need to be explored. Today, more and more municipal websites are linking their site to social network sites as way to encourage social capital. Tolbert and Mossberger (May, 2006) wrote, "There is a statistically significant relationship between trust and use of a local government Web site, as well as other positive assessments of federal and local governments. The evidence suggests that e-government can increase process-based trust by improving interactions with citizens and perceptions of responsiveness." However, Kim and Lee (2012) wrote that trust is influenced through participation such as the ability to electronically participate in searching for information, acquiring information, delivering information (citizen feedback), and participating in an

e-democratic process. These assumptions can further a study on the effects web readability have on the level of citizen participation in the democratic process.

As a result of the study, a future study that uses a stratified random sample of populations to analyze heterogeneity and homogeneity should be conducted.

Conclusion

Readability is an element of the digital divide. And the digital divide shows that digital technology is no longer neutral, but creates digital inequalities for various groups of society from accessing important information that leads to social, economic, and political opportunities. As more and more municipalities are funneling government information on line, the readability of that information becomes vitally important to residents/citizens. This study has revealed that municipal web pages are being written at levels greater than the national average reading grade level. This can impose a significant challenge to citizens trying to access important information. The importance of this study was to fill a gap in the academic literature concerning readability and municipal web pages. Identifying high readability of text and issues of communication can assist in guiding decisions that improve effectiveness of municipal websites' online instructions and text. The style of writing can prove important in how citizens receive information and understand that information. Moreover, highlighting the problems of municipal web pages and their high level of readability offers opportunities for local governments to collaborate with citizens to improve electronic governance.

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APPENDICES

APPENDIX A

FREQUENCIES AND GRAPHICAL REPRESENTATION OF VARIABLES USED FOR STUDY

Statistics

		SSRL State Standard Reading Level	pop Population	rpop Population by size	F_readease Flesh Reading Ease	FK_gradelvl Flesh-Kincaid Grade Level
N	Valid	250	250	250	250	250
	Missing	0	0	0	0	0
Mean		9.94	41084.06	1.4520	38.71	12.6588
Median		10.00	15347.00	1.0000	39.40	12.4500
Mode		10	5008[a]	1.00	40	13.30
Std. Deviation		1.055	83600.191	.56655	13.146	2.46566
Skewness		-.384	6.104	.791	-.374	.696
Std. Error of Skewness		.154	.154	.154	.154	.154
Range		4	800227	2.00	74	15.80
Minimum		8	5008	1.00	0	6.80
Maximum		12	805235	3.00	74	22.60

a. Multiple modes exist. The smallest value is shown

FREQUENCIES FOR NATIONAL MEAN POPULATION OF CITIES WITH POPULATION

SSRL State Standard Reading Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	8	35	14.0	14.0	14.0
	9	30	12.0	12.0	26.0
	10	110	44.0	44.0	70.0
	11	64	25.6	25.6	95.6
	12	11	4.4	4.4	100.0
	Total	250	100.0	100.0	

rpop Population by size

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Small	146	58.4	58.4	58.4
	2.00 Medium	95	38.0	38.0	96.4
	3.00 Large	9	3.6	3.6	100.0
	Total	250	100.0	100.0	

FREQUENCIES FOR FLESCH READING EASE

Flesh Reading Ease

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	.8	.8	.8
	4	1	.4	.4	1.2
	4	1	.4	.4	1.6
	4	1	.4	.4	2.0
	7	1	.4	.4	2.4
	7	1	.4	.4	2.8
	9	1	.4	.4	3.2
	11	1	.4	.4	3.6
	11	1	.4	.4	4.0
	12	1	.4	.4	4.4
	16	1	.4	.4	4.8
	17	1	.4	.4	5.2
	17	1	.4	.4	5.6
	18	2	.8	.8	6.4
	19	1	.4	.4	6.8
	19	1	.4	.4	7.2
	19	1	.4	.4	7.6
	20	1	.4	.4	8.0
	20	1	.4	.4	8.4
	20	1	.4	.4	8.8
	21	1	.4	.4	9.2
	22	1	.4	.4	9.6
	22	1	.4	.4	10.0
	22	1	.4	.4	10.4
	22	1	.4	.4	10.8
	22	1	.4	.4	11.2
	23	1	.4	.4	11.6
	23	1	.4	.4	12.0
	23	1	.4	.4	12.4
	24	1	.4	.4	12.8
	24	2	.8	.8	13.6
	24	1	.4	.4	14.0
	24	1	.4	.4	14.4
	25	1	.4	.4	14.8
	25	1	.4	.4	15.2

Flesh Reading Ease

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25	1	.4	.4	15.6
	25	1	.4	.4	16.0
	25	1	.4	.4	16.4
	25	1	.4	.4	16.8
	26	1	.4	.4	17.2
	27	1	.4	.4	17.6
	27	1	.4	.4	18.0
	27	1	.4	.4	18.4
	27	1	.4	.4	18.8
	28	2	.8	.8	19.6
	28	1	.4	.4	20.0
	28	1	.4	.4	20.4
	29	1	.4	.4	20.8
	29	1	.4	.4	21.2
	29	1	.4	.4	21.6
	30	1	.4	.4	22.0
	30	1	.4	.4	22.4
	31	1	.4	.4	22.8
	31	1	.4	.4	23.2
	31	1	.4	.4	23.6
	32	1	.4	.4	24.0
	32	1	.4	.4	24.4
	32	1	.4	.4	24.8
	32	2	.8	.8	25.6
	32	2	.8	.8	26.4
	32	2	.8	.8	27.2
	33	1	.4	.4	27.6
	33	2	.8	.8	28.4
	33	2	.8	.8	29.2
	33	1	.4	.4	29.6
	34	2	.8	.8	30.4
	34	1	.4	.4	30.8
	34	2	.8	.8	31.6
	34	1	.4	.4	32.0
	34	1	.4	.4	32.4
	34	1	.4	.4	32.8
	35	3	1.2	1.2	34.0
	35	1	.4	.4	34.4
	35	1	.4	.4	34.8
	35	1	.4	.4	35.2
	36	1	.4	.4	35.6

Flesh Reading Ease

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	36	2	.8	.8	36.4
	36	2	.8	.8	37.2
	36	1	.4	.4	37.6
	36	1	.4	.4	38.0
	37	2	.8	.8	38.8
	37	2	.8	.8	39.6
	37	1	.4	.4	40.0
	37	1	.4	.4	40.4
	38	2	.8	.8	41.2
	38	2	.8	.8	42.0
	38	1	.4	.4	42.4
	38	2	.8	.8	43.2
	38	1	.4	.4	43.6
	38	2	.8	.8	44.4
	38	1	.4	.4	44.8
	39	1	.4	.4	45.2
	39	2	.8	.8	46.0
	39	1	.4	.4	46.4
	39	1	.4	.4	46.8
	39	1	.4	.4	47.2
	39	1	.4	.4	47.6
	39	1	.4	.4	48.0
	39	2	.8	.8	48.8
	39	2	.8	.8	49.6
	39	3	1.2	1.2	50.8
	40	4	1.6	1.6	52.4
	40	1	.4	.4	52.8
	40	2	.8	.8	53.6
	40	1	.4	.4	54.0
	41	2	.8	.8	54.8
	41	1	.4	.4	55.2
	41	3	1.2	1.2	56.4
	41	2	.8	.8	57.2
	42	1	.4	.4	57.6
	42	1	.4	.4	58.0
	42	1	.4	.4	58.4
	42	1	.4	.4	58.8
	42	2	.8	.8	59.6
	43	2	.8	.8	60.4
	43	2	.8	.8	61.2
	43	1	.4	.4	61.6

Flesh Reading Ease

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	43	1	.4	.4	62.0
	44	1	.4	.4	62.4
	44	1	.4	.4	62.8
	44	1	.4	.4	63.2
	44	2	.8	.8	64.0
	44	2	.8	.8	64.8
	44	1	.4	.4	65.2
	45	2	.8	.8	66.0
	45	2	.8	.8	66.8
	45	1	.4	.4	67.2
	45	2	.8	.8	68.0
	45	3	1.2	1.2	69.2
	45	2	.8	.8	70.0
	45	3	1.2	1.2	71.2
	46	1	.4	.4	71.6
	46	1	.4	.4	72.0
	46	1	.4	.4	72.4
	47	1	.4	.4	72.8
	47	1	.4	.4	73.2
	47	1	.4	.4	73.6
	47	2	.8	.8	74.4
	48	2	.8	.8	75.2
	48	1	.4	.4	75.6
	48	1	.4	.4	76.0
	48	1	.4	.4	76.4
	48	3	1.2	1.2	77.6
	48	1	.4	.4	78.0
	48	1	.4	.4	78.4
	49	1	.4	.4	78.8
	49	1	.4	.4	79.2
	49	1	.4	.4	79.6
	49	2	.8	.8	80.4
	49	1	.4	.4	80.8
	49	1	.4	.4	81.2
	49	1	.4	.4	81.6
	50	2	.8	.8	82.4
	50	1	.4	.4	82.8
	50	1	.4	.4	83.2
	50	1	.4	.4	83.6
	51	1	.4	.4	84.0
	51	1	.4	.4	84.4

Flesh Reading Ease

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	51	1	.4	.4	84.8
	51	1	.4	.4	85.2
	51	1	.4	.4	85.6
	51	1	.4	.4	86.0
	51	1	.4	.4	86.4
	52	1	.4	.4	86.8
	52	1	.4	.4	87.2
	52	1	.4	.4	87.6
	53	1	.4	.4	88.0
	53	1	.4	.4	88.4
	53	2	.8	.8	89.2
	54	1	.4	.4	89.6
	54	1	.4	.4	90.0
	55	1	.4	.4	90.4
	55	1	.4	.4	90.8
	55	1	.4	.4	91.2
	55	1	.4	.4	91.6
	55	2	.8	.8	92.4
	56	1	.4	.4	92.8
	56	1	.4	.4	93.2
	57	1	.4	.4	93.6
	57	1	.4	.4	94.0
	58	1	.4	.4	94.4
	58	1	.4	.4	94.8
	58	1	.4	.4	95.2
	59	1	.4	.4	95.6
	60	1	.4	.4	96.0
	60	1	.4	.4	96.4
	61	1	.4	.4	96.8
	62	2	.8	.8	97.6
	65	1	.4	.4	98.0
	65	1	.4	.4	98.4
	67	1	.4	.4	98.8
	69	1	.4	.4	99.2
	73	1	.4	.4	99.6
	74	1	.4	.4	100.0
	Total	250	100.0	100.0	

FREQUENCIES OF FLESCH-KINCALD GRADE LEVEL

Flesh-Kincaid Grade Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	17.10	1	.4	.4	95.6
	17.20	1	.4	.4	96.0
	17.60	1	.4	.4	96.4
	17.70	2	.8	.8	97.2
	17.80	1	.4	.4	97.6
	18.90	1	.4	.4	98.0
	19.20	1	.4	.4	98.4
	19.50	1	.4	.4	98.8
	20.60	1	.4	.4	99.2
	22.10	1	.4	.4	99.6
	22.60	1	.4	.4	100.0
	Total	250	100.0	100.0	

Flesh-Kincaid Grade Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6.80	1	.4	.4	.4
	7.10	1	.4	.4	.8
	7.40	1	.4	.4	1.2
	7.70	1	.4	.4	1.6
	7.90	3	1.2	1.2	2.8
	8.10	1	.4	.4	3.2
	8.30	1	.4	.4	3.6
	8.50	1	.4	.4	4.0
	8.60	2	.8	.8	4.8
	8.70	1	.4	.4	5.2
	8.80	1	.4	.4	5.6
	9.00	1	.4	.4	6.0
	9.10	3	1.2	1.2	7.2
	9.20	1	.4	.4	7.6
	9.30	1	.4	.4	8.0
	9.40	1	.4	.4	8.4
	9.50	2	.8	.8	9.2
	9.60	1	.4	.4	9.6
	9.70	1	.4	.4	10.0
	9.80	1	.4	.4	10.4
	10.10	2	.8	.8	11.2
	10.20	4	1.6	1.6	12.8
	10.30	2	.8	.8	13.6
	10.40	2	.8	.8	14.4
	10.50	2	.8	.8	15.2
	10.60	1	.4	.4	15.6
	10.70	4	1.6	1.6	17.2
	10.80	7	2.8	2.8	20.0
	10.90	4	1.6	1.6	21.6
	11.00	5	2.0	2.0	23.6
	11.10	4	1.6	1.6	25.2
	11.20	5	2.0	2.0	27.2
	11.30	6	2.4	2.4	29.6
	11.40	2	.8	.8	30.4
	11.50	6	2.4	2.4	32.8
	11.60	2	.8	.8	33.6
	11.70	4	1.6	1.6	35.2
	11.80	5	2.0	2.0	37.2
	11.90	8	3.2	3.2	40.4
	12.00	6	2.4	2.4	42.8
	12.10	7	2.8	2.8	45.6

Flesh-Kincaid Grade Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	12.20	6	2.4	2.4	48.0
	12.30	3	1.2	1.2	49.2
	12.40	2	.8	.8	50.0
	12.50	3	1.2	1.2	51.2
	12.60	3	1.2	1.2	52.4
	12.70	7	2.8	2.8	55.2
	12.80	4	1.6	1.6	56.8
	12.90	3	1.2	1.2	58.0
	13.00	3	1.2	1.2	59.2
	13.10	5	2.0	2.0	61.2
	13.20	4	1.6	1.6	62.8
	13.30	9	3.6	3.6	66.4
	13.40	1	.4	.4	66.8
	13.50	6	2.4	2.4	69.2
	13.60	3	1.2	1.2	70.4
	13.70	5	2.0	2.0	72.4
	13.80	4	1.6	1.6	74.0
	13.90	3	1.2	1.2	75.2
	14.00	2	.8	.8	76.0
	14.10	2	.8	.8	76.8
	14.20	3	1.2	1.2	78.0
	14.30	2	.8	.8	78.8
	14.40	7	2.8	2.8	81.6
	14.50	4	1.6	1.6	83.2
	14.60	2	.8	.8	84.0
	14.70	2	.8	.8	84.8
	14.90	2	.8	.8	85.6
	15.00	2	.8	.8	86.4
	15.10	2	.8	.8	87.2
	15.20	1	.4	.4	87.6
	15.40	4	1.6	1.6	89.2
	15.50	1	.4	.4	89.6
	15.60	2	.8	.8	90.4
	15.70	1	.4	.4	90.8
	15.80	1	.4	.4	91.2
	16.00	2	.8	.8	92.0
	16.20	2	.8	.8	92.8
	16.40	3	1.2	1.2	94.0
	16.50	1	.4	.4	94.4
	16.70	1	.4	.4	94.8
	17.00	1	.4	.4	95.2

FREQUENCIES OF WEBPAGES ANALYSED

Statistics

pagevstd_categories Categories of webpages analyzed		
N	Valid	250
	Missing	0
Mean		1.36
Median		1.00
Mode		0
Std. Deviation		1.659
Skewness		1.165
Std. Error of Skewness		.154
Range		5
Minimum		0
Maximum		5

pagevstd_categories Categories of webpages analyzed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 Welcome	105	42.0	42.0	42.0
	1 About us	66	26.4	26.4	68.4
	2 History	33	13.2	13.2	81.6
	3 Visitor	2	.8	.8	82.4
	4 Human Resources	19	7.6	7.6	90.0
	5 Other	25	10.0	10.0	100.0
	Total	250	100.0	100.0	

APPENDIX B

RESULTS FROM ONE-SAMPLE T-TEST RESEARCH QUESTION 2: (DOES A RELATIONSHIP EXIST BETWEEN THE NATIONAL AVERAGE READING GRADE LEVEL OF EIGHTH GRADE AND THE SAMPLE POPULATION MEAN FKGL?)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
FK_gradelvl Flesh-Kincaid Grade Level	250	12.6588	2.46566	.15594

One-Sample Test

	Test Value = 8					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
FK_gradelvl Flesh-Kincaid Grade Level	29.875	249	.000	4.65880	4.3517	4.9659

APPENDIX C

RESULTS FROM PAIRED SAMPLE T-TEST FOR RESEARCH QUESTION 3: (DO MUNICIPAL WEBSITES' MAIN PAGE READ AT THE TARGETED STATE'S STANDARD READING GRADE LEVEL?)

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	SSRL State Standard Reading Level	9.94	250	1.055	.067
	FK_gradelvl Flesh-Kincaid Grade Level	12.6588	250	2.46566	.15594

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	SSRL State Standard Reading Level & FK_gradelvl Flesh-Kincaid Grade Level	250	.026	.685

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	SSRL State Standard Reading Level - FK_gradelvl Flesh-Kincaid Grade Level	-2.71480	2.65678	.16803	-3.04574	-2.38386	-16.157	249	.000

APPENDIX D

RESULTS FROM PAIRED SAMPLE T-TEST FOR RESEARCH QUESTION 4: (IS THE MEAN FKGL READING GRADE LEVEL OF THE CITY WEBPAGES WITHIN THE STATE EQUAL TO THE TARGETED STATE'S STANDARD READING GRADE LEVEL?)

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	ssrl	9.9773	44	1.02273	.15418
	webFKGL	12.3000	44	1.63721	.24682

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	ssrl & webFKGL	44	-.096	.536

Paired Samples Test

		Paired Differences				
					95% Confidence Interval of the Difference	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper
Pair 1	ssrl - webFKGL	-2.32273	2.01181	.30329	-2.93437	-1.71108

Paired Samples Test

		t	df	Sig. (2-tailed)
Pair 1	ssrl - webFKGL	-7.658	43	.000

APPENDIX E

RESULTS FROM ONE-WAY ANOVA STATISTICS TO ADDRESS RESEARCH QUESTION "IS THERE DIFFERENCE BETWEEN FKGL SCORE MEAN DIFFERENCE AMONG CITIES (SMALL, MEDIUM AND LARGE)?"

Descriptives

Flesh-Kincaid Grade Level

					95% Confidence Interval for Mean	
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound
Small	146	12.2411	2.39864	.19851	11.8487	12.6334
Medium	95	13.2537	2.44635	.25099	12.7553	13.7520
Large	9	13.1556	2.63776	.87925	11.1280	15.1831
Total	250	12.6588	2.46566	.15594	12.3517	12.9659

Descriptives

Flesh-Kincaid Grade Level

					95% Confidence Interval for Mean	
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound
Small	146	12.2411	2.39864	.19851	11.8487	12.6334
Medium	95	13.2537	2.44635	.25099	12.7553	13.7520
Large	9	13.1556	2.63776	.87925	11.1280	15.1831
Total	250	12.6588	2.46566	.15594	12.3517	12.9659

Multiple Comparisons

Dependent Variable:Flesh-Kincaid Grade Level

	(I) Population by size	(J) Population by size	Mean Difference (I-J)	Std. Error	Sig.
Tukey HSD	Small	Medium	-1.01259	.31965	.005
		Large	-.91446	.83286	.516
	Medium	Small	1.01259*	.31965	.005
		Large	.09813	.84574	.993
	Large	Small	.91446	.83286	.516
		Medium	-.09813	.84574	.993
Bonferroni	Small	Medium	-1.01259*	.31965	.005
		Large	-.91446	.83286	.820
	Medium	Small	1.01259*	.31965	.005
		Large	.09813	.84574	1.000
	Large	Small	.91446	.83286	.820
		Medium	-.09813	.84574	1.000

*. The mean difference is significant at the 0.05 level.

Post Hoc Tests

Multiple Comparisons

Dependent Variable:Flesh-Kincaid Grade Level

	(I) Population by size	(J) Population by size	95% Confidence Interval	
			Lower Bound	Upper Bound
Tukey HSD	Small	Medium	-1.7663	-.2589
		Large	-2.8783	1.0494
	Medium	Small	.2589	1.7663
		Large	-1.8961	2.0923
	Large	Small	-1.0494	2.8783
		Medium	-2.0923	1.8961
Bonferroni	Small	Medium	-1.7831	-.2421
		Large	-2.9220	1.0931
	Medium	Small	.2421	1.7831
		Large	-1.9404	2.1367
	Large	Small	-1.0931	2.9220
		Medium	-2.1367	1.9404

Homogenous Subsets

Flesh-Kincaid Grade Level

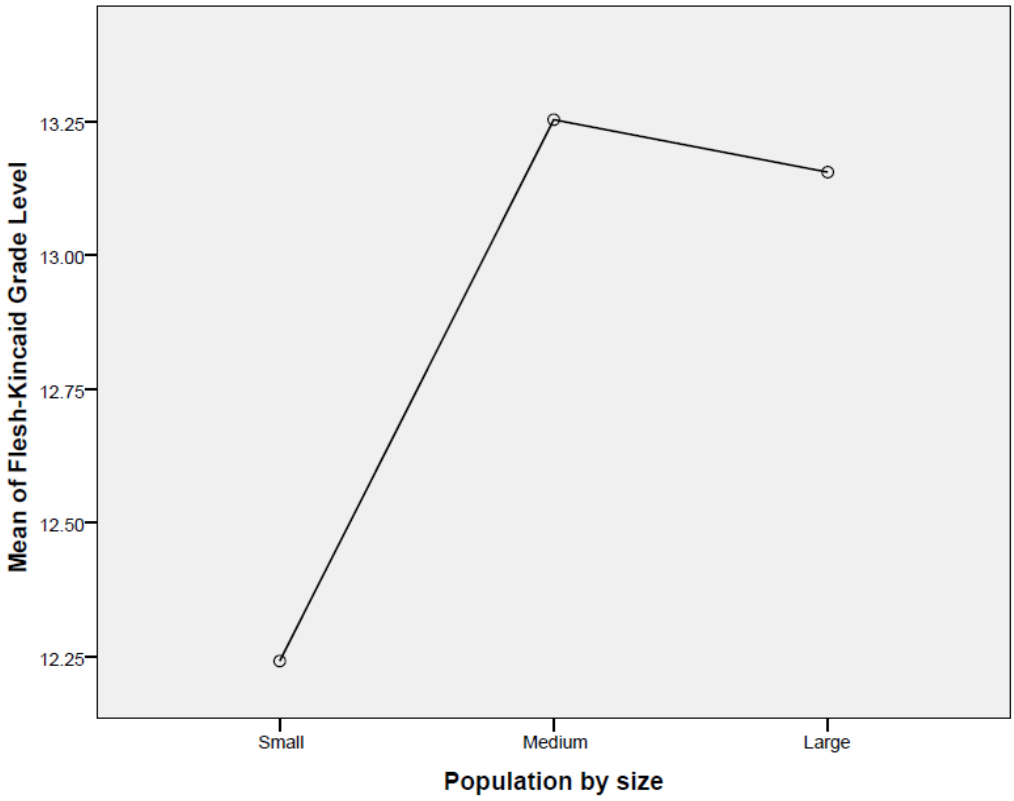
	Population by size	N	Subset for alpha = 0.05
			1
Tukey HSD[a,b]	Small	146	12.2411
	Large	9	13.1556
	Medium	95	13.2537
	Sig.		.329

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 23.349.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Means Plot


Mean of Flesh-Kincaid Grade Level
13.25
13.00
12.75
12.50
12.25
Small
Medium
Large
Population by size

APPENDIX F

RESULTS FROM DESCRIPTIVE STATISTICS TO ADDRESS RESEARCH QUESTION 6: DO CITY WEBSITES OFFER AUDIO OR VISUAL PORTALS?

Statistics

Website audio/visual portal

N	Valid	249
	Missing	1

Statistics

Website audio/visual portal

Mean	.11
Median	.00
Mode	0
Std. Deviation	.312
Skewness	2.517
Std. Error of Skewness	.154
Range	1
Minimum	0
Maximum	1

Website audio/visual portal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	221	88.4	88.8	88.8
	0	1	.4	.4	89.2
	1	27	10.8	10.8	100.0
	Total	249	99.6	100.0	
Missing	System	1	.4		
	Total	250	100.0		