

## **An Analysis of the Readability of English Translation on Major City Governments' Websites in Korea**

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The objective of this study was to assess the readability and vocabulary size of the translated texts on the English websites of Seoul and five metropolitan city governments. This study evaluated the translated texts taken from the six cities with the use of four readability formulas including Flesch Reading Ease, Flesch-Kincaid Grade Level, SMOG, and Dale-Schall for measuring readability and RANGE for analyzing vocabulary size of the sampled texts. The readability measurement showed that the translation of the history sections of these six cities was too difficult for virtually all readers to comprehend the contents. The vocabulary size analysis yielded that around 80% of the words in the texts were covered by 3,000 word families, quite lower than 95% lexical coverage for adequate comprehension of a text, which can be interpreted as saying that the vocabulary demands are high for such public sectors' informational texts. The findings demonstrate that readability levels and vocabulary size of the sampled texts should be adjusted to help foreigners have a more comfortable and adequate understanding of the translated contents.

[readability/corpus/vocabulary size/lexical coverage/reading/translation/  
가독성/코퍼스/어휘크기/어휘의 텍스트 점유율/읽기/번역]

### **I. INTRODUCTION**

No one would doubt the status of English as an international language (EIL) in a global sense mainly because the English language is the most widely spoken and the most often studied language in the world. Thanks to the Internet and other technological advancement, the status of English can be also felt in the electronically connected media as English is used as if it were an official language of the Internet (M. Park, 2009). The English language is used not simply because of its linguistic beauty or superiority but because of its

practicality by which many people can function in the world (Svartvik & Leech, 2006) and it is more than true that using English has nothing to do with one's nationality. Such a trend is also found on the websites run by virtually all of the Korean local city governments across the country. In an ever-globalizing world, all of the major cities in Korea have created an English version of their official city government websites in an effort to prepare themselves for strengthening their international competitiveness and promoting foreign international investment in their cities.

Such translation of online materials can be part of the translation service in the public sector. As J. Shin (2007) claimed in a study on diagnosing the translation services in the public sector, the standards and quality of overall translation were found below par. It is also assumed that the translated government websites of major cities in Korea would be practically low in its translation quality. The local governments' efforts of running an English-version homepage deserve to be praised, but it would leave much room for improvement if they are just satisfied with the presence of the English translation. It would require much effort to come up with such translated information of their cities, yet if it fails to serve its purpose of helping make foreigners who come to visit their websites understand it, it is a big waste of time, money and efforts.

As the problem many writers face is how to increase the readability of their works, so is translation. In this regard, it is more than necessary to evaluate the readability of the translation on the websites run by major cities in Korea. Little research has ever examined such readability issues in relation to the quality of translation.

The purpose of the present study was to survey those translated materials on the websites of the major cities in Korea to answer the following research questions:

1. What is the reading difficulty of the sampled translated materials on the major cities' websites?
2. What are the vocabulary levels of the sampled translated materials?

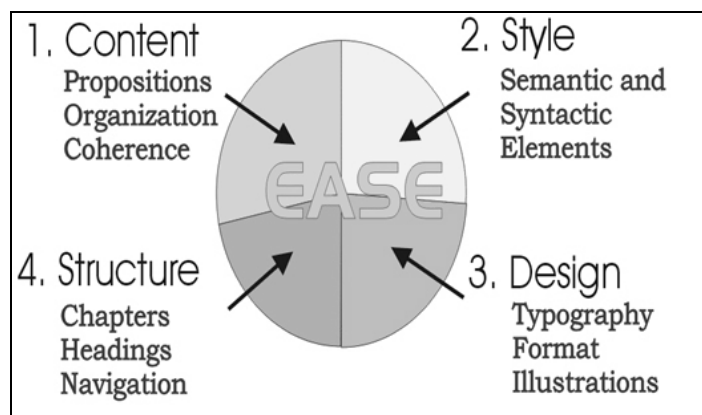
## II. THEORETICAL BACKGROUND

Since the debut of a wide variety of multimedia tools and devices in the field of language education, the nature of using the multimedia technology has greatly changed in ELT. That is, with the fast technological development, there have been ever-growing interests in applying it to many different ELT programs. A case in point includes the Internet and mobile phones, which are now commonly and widely used as manifest in the introduction and utilization of more online-based programs in ELT.

## 1. Overview of Readability

Readability describes the ease with which a document can be read. It is a composite word of "read + ability" which translates into the ability to read. When people say it is readable, it means that a text is easy to read, enjoyable, clear, and straightforward. The ease of comprehension is a major determinant of one's reading. Researchers have paid their attention to the study of readability since 1921 when Thorndike's Teacher's Word Book, the first extensive frequency word count of the English language, was published (Chall, 1988). As the Thorndike frequency word lists or other word lists based on frequency of use in textbooks, readers, or by students in given grades were used to measure vocabulary difficulty, earlier readability research tended to focus on vocabulary aspects alone such as difficulty, diversity, and range. Vocabulary or vocabulary control studies, concerned with the vocabulary words, mostly focused on new words in a book by measuring the number of times they were repeated and their difficulty while readability studies had similar purposes and produced various means and procedures by which the difficulty of printed materials was graded and measured. Dubay (2004) defined readability studies as investigating the factors that make some texts easier to read than others. When it comes to factors that may contribute to readability, there are many variables associated with a text itself such as "format, typography, content, literary form and style, vocabulary difficulty, sentence complexity, concept load or density, cohesiveness, etc." (Imber, 2001, p. 6). In addition, there also exist intrapersonal variables including motivation, attitude, abilities, background knowledge, interests, etc. Thus all of these variables are mixed together, influencing the readability of any piece of reading materials for any individual reader. In a seminal work on readability research, Gray and Leary (1935), cited in Dubay (2004), examined readability so thoroughly to identify 228 elements that affect readability and grouped them into four categories of content, style, format, and features of organization. Their research found content and writing style most important, followed by format and features of organization.

Figure 1 below illustrates Dubay's summary of these four basic elements of reading ease. Based on these four categories, they produced 64 countable variables related to reading difficulty and used correlation coefficients to illustrate the relationship. The factors with correlation of .35 or above were as shown below (Dubay, 2004, p. 18):



**FIGURE 1** Four Basic Elements of Reading Ease (Dubay, 2004, p.18)

- 1) Average sentence lengths in words (-.52)
- 2) Percentage of easy words (.52)
- 3) Number of words not known to 90% of sixth-grade students (-.51)
- 4) Number of easy words (.51)
- 5) Number of different hard words (-.50)
- 6) Minimum syllabic sentence length (-.49)
- 7) Number of explicit sentences (.48)
- 8) Number of first, second, and third-person pronouns (.48)
- 9) Maximum syllabic sentence length (-.47)
- 10) Average sentence length in syllables (-.47)
- 11) Percentage of monosyllables (.43)
- 12) Number of sentences per paragraph (.43)
- 13) Percentage of different words not known to 90% of sixth-grade students (-.40)
- 14) Number of simple sentences (.39)
- 15) Percentage of different words (-.38)
- 16) Percentage of polysyllables (-.38)
- 17) Number of prepositional phrases (-.35)

According to Dubay (2004), Gray and Leary used five of the above variables—average sentence length in words, number of different hard words, number of first, second, and third-person pronouns, and percentage of different words—to create a readability formula. Although their landmark attempts are hardly free from problems such as typography which belongs to legibility, not readability and thus it seemed that their definition of readability encompassed variables outside the current domain of readability (Anagnostou & Weir, 2006), Gray and Leary's work acted as the catalyst for an explosive

growth of readability research and readability formulas.

## 2. Readability Formulas

Since 1920, researchers, teachers, and writers have been using readability formulas which are one of the common approaches to predicting readability of a given text. As mentioned above, since 1921 when Edward Thorndike suggested a way of measuring difficult words through mathematical formulas, virtually all of the readability formulas are mathematical equations, constructed by linguists and researchers usually through regression analysis (McLaughlin, 1969) by measuring certain textual characteristics that are quantifiable (Anagnostou & Weir, 2006). Dubay (2004) stated that by the 1980s, there were 200 readability formulas available for educators and researchers to measure difficulty of various kinds of reading materials. It is hardly clear how many different kinds of readability formulas there exist but roughly speaking more than 200 readability formulas have been devised and used with better accurate and scientific means to predict the difficulty level of a text.

Out of those more than 200 readability formulas, the following nine popular and commonly used ones are singled out, which includes: the Powers-Sumner-Kearl Formula, the Flesh Reading Ease Formula, the Flesh Grade Level Formula, the FOG Formula, the SMOG Formula, the FORCAST Formula, the Fry Graph, the Dale-Chall Formula, and Spache Formula.

The following Table 1 summarizes these nine popular readability formulas by developers, usage, and variables each formula is based on.

**TABLE 1**  
Summary of Major Readability Formulas

Formulas	Developer	Usage	Variables
The Powers-Sumner-Kearl Formula	Powers, R. D., & Sumner, W. A. (1958)	primary age children materials	average sentence length, the number of syllables
The Flesh Reading Ease Formula	Flesch, R. (1948)	any kinds of texts	the number of syllables and the number of sentences for each 100-word sample
The Flesh Grade Level Formula (Flesch Kincaid Index)	Flesch, R., & Kincaid, J. P. (1948)	education	average sentence length, average number of syllable per word
The FOG Formula	Gunning, R. (1952)	Technical documents and manuals/ business publication and journals	average sentence length and the number of words with more than two syllables per 100 words

The SMOG Formula	McLaughlin, G. H. (1969)	secondary age learner materials	the number of polysyllable words in 30 sentences
The FORCAST Formula	Caylor, J. S., Sticht, T. G., & Ford, J. P. (1973)	technical manuals and forms	the number of single-syllable words
The Fry Graph	Fry, E. (1977)	any kinds of texts	the number of sentences, the number of syllables
The Dale-Chall Formula	Dale, E., & Chall, J. (1948)	all kinds of texts	percentage of difficult words, average sentence length
Spache Formula	Spache, G. (1953)	texts for up to 3rd grade level students	average sentence length, percentage of difficult words

The readability formulas in Table 1 are mostly popular and have been widely used for a variety of purposes, "attesting to their strong theoretical and statistical validity" (Dubay, 2004, p. 2). Even though they are useful and can provide somewhat objective assessment of a difficulty level of a text, they are hardly free from flaws. But it is out of scope for the present research purpose, readers are recommended to read more detailed information in the literature (e.g. Anagnostou & Weir, 2006; Dubay, 2004; Zakaluk & Samuels, 1988)

### 3. Research on Readability

Since the readability measurement tools were widely available, many researchers attempted to assess the readability of authentic and educational texts. Outside of English language teaching (ELT) fields, a majority of research on readability is found in a healthcare communication field as healthcare communication often suffers poor communication. Many researchers examined the readability of healthcare materials such as pamphlets, brochures, booklets, etc. used in hospitals designed to increase patients' knowledge and minimize their fears (e.g. Blanck & Marshall, 2011; Elliot, Charyton & Long, 2007; King, Winton & Adkins, 2003).

Domestic research on readability is also found in ELT journals since 1983 when S. J. Cho (1985) examined the readability of English textbooks. Most of the readability studies done in the Korean ELT field have focused on English textbooks (e.g. K. H. Cha, S. W. Sohn, D. H. Kim, J. H. Jeon & K. A. Yoo, 1996; S. J. Cho, 1985; M. G. Jeon & I. J. Lim, 2009, 2010). Most of these studies simply examined the difficulty of the texts while the research by M. G. Jeon & I. J. Lim (2009, 2010) was unique in that they analyzed English textbooks with Coh-Metrix, a computational tool that measures cohesion and text difficulty at various levels of language, discourse, and conceptual analysis, as a means of measuring English text readability. They made more detailed and comprehensive measurement of the

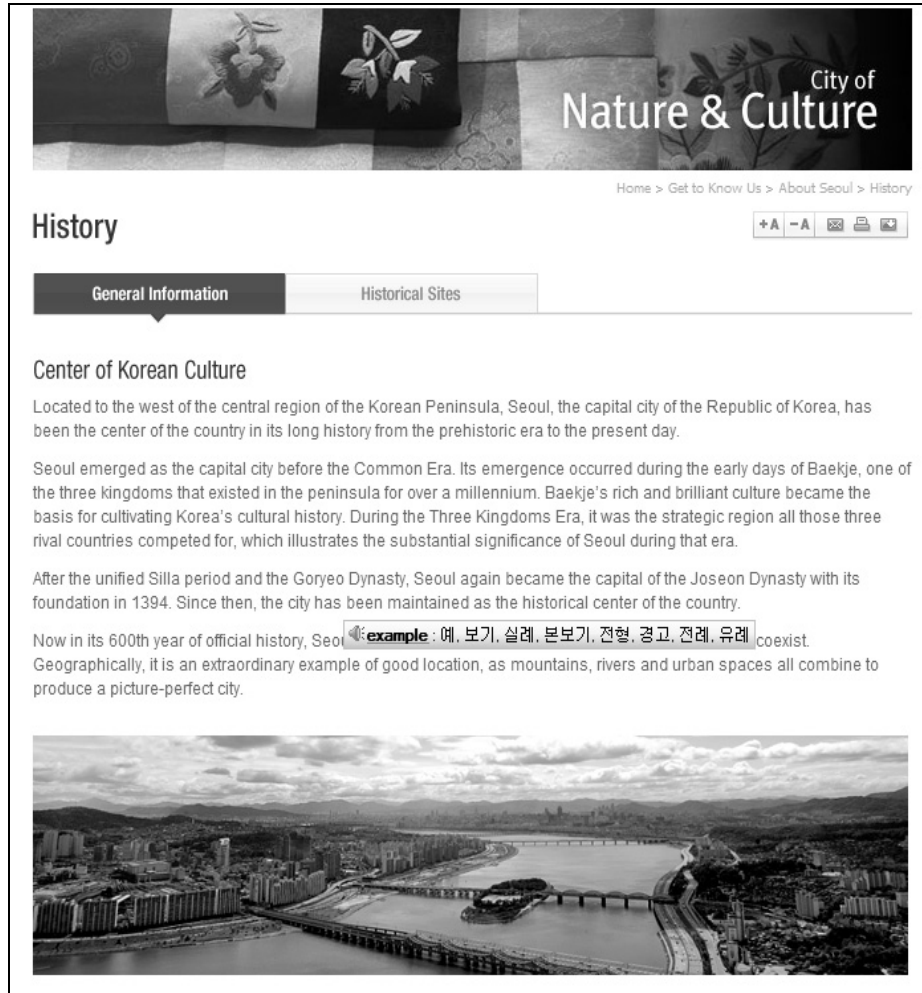
textbooks based on not only readability and word frequency but also syntactic complexity, co-referential coherence, and semantic coherence measures which would have hardly been analyzed with other readability tools.

In an effort to develop a new and more accurate readability tool, overseas researchers (Anagnostou & Weir, 2006; Greenfield, 2003, 2004; Ozasa, George, Weir & Fukui, 2007a, 2007b, 2008) have made attempts to factor in other variables other than existing ones including corpus-based collocation frequency, idiom difficulty, and etc. Their attempts were fueled by a question of the fundamental validity of the existing readability tools made in an ESL setting. Brown (1998) found that several classic readability tools were hardly appropriate for measuring EFL reading difficulty. As little attention has been paid to the appropriateness of the classical readability tools (Greenfield, 2004), EFL researchers started creating a better formula appropriate to an EFL setting. In a similar vein, J. Kim and E. H. Lee (2010) conducted a pioneering study to develop an appropriate method of measuring readability. They proposed a Korean lexile formula based upon a re-arranged vocabulary by relative difficulty perceived by Korean EFL learners and sentence complexity based on syntactic complexity, claiming that their formula was more accurate and appropriate to Korean learners of English.

### III. METHODOLOGY

#### 1. Materials

Texts were selected from the websites of the capital city of Seoul and five cities: *Incheon*, *Busan*, *Daejeon*, *Ulsan*, and *Gwangju* as these cities are believed to maintain or improve active international relationship with their counterparts overseas. A history part was located via the Internet search. When the history part was not available online, a request was made via e-mail to a city government. The history section of *Daegu* City was not obtained because its website offered an extremely short section of its history and no reply to the researcher's request was obtained. Therefore, six cities' history parts were included in this study. As shown in Figure 2 below, some part of a history section on the web page of each city government was taken and transformed into a text file which was carefully edited for the reliable analysis.



**FIGURE 2** Screenshot of History Section of Seoul City's Webpage

## 2. Research Instruments

To assess the reading difficulty of the translated materials, the researcher employed Readability Formulas manufactured by Micro Power & Light Co. The program consists of the following nine formulas - the Power-Sumner-Kearl Formula, the Flesh Reading Ease Formula, the Flesh Grade Level Formula, the FOG Formula, the SMOG Formula, the FORCAST Formula, the Fry Graph, the Dale-Chall Formula, and Spache Formula. Each formula has its own suitable usage: the Powers-Sumner-Kearl and Spache are suitable for measuring materials for kindergarten up to 3rd grade level; the FOG is widely used in healthcare and throughout business and industry; the FORCAST is used for questionnaires,

application forms, etc.; the Fry Graph readability formula is suitable for all kinds of texts. These afore-mentioned five formulas, however, are not suitable for the target texts of the present study and the last one, or the Fry Graph yields its result in a different format (e.g. a graph format) even though it is appropriate for all types of texts. Instead, the Dale-Schall, the Flesh Reading Ease, the Flesh Grade Level, and The SMOG were found to be the proper formula for the current study as the first three formulas were suitable for all kinds of texts while the fourth one aimed at secondary age ranging from the 4th graders to college students.

RANGE, a computer software developed by Dr. Paul Nation, was used to measure vocabulary size of the chosen texts. The RANGE program has default three base lists: The first (BASEWRD1.txt) with the most frequent 1000 words of English; the second (BASEWRD2.txt) with the 2nd 1000 most frequent words; the third (BASEWRD3.txt) with words not in the first 2000 words of English but frequently used in upper secondary school and university texts. The sources of these lists are A General Service List of English Words by Michael West for the first 2000 words, and The Academic Word List by Coxhead containing 570 word families (Nation, 2005).

### 3. Procedure

After the texts were selected as briefly described above, they were transformed into a text file and then each file was edited in order to yield a reliable analysis. For example, a text file was carefully checked against the pre-editing guidelines provided by the software manual, which includes: a sentence should end with a period, a question mark, or an exclamation mark; avoid the use of hyphenated words; omit bulleted, numbered and alphabetized lists, etc. And then each file was analyzed for readability and vocabulary via the above-mentioned four formulas using the procedure mentioned in the previous subsection and RANGE, respectively.

## IV. RESULTS

### 1. What is the Reading Difficulty of the Sampled Translated Materials on the Six Major Cities' Websites?

Table 2 summarizes the reading difficulty of the sampled translated materials of the targeted websites. Among the text features, average syllables per word (ASW) and average words per sentence (AWS) are believed to be associated with the reading difficulty of a given text as more syllable per word and more words per sentence are used to determine

the reading ease of a given text. For example, the Flesch score and the Fog scale rely on ASW (i.e. the number of syllables divided by the number of words). By ASW, Ulsan with 1.67 comes first, followed by Daejeon with 1.64.

The selected four readability formulas produced an average of 40 in Flesch Reading Ease; 13.1 in Flesch-Kincaid Grade Level; 14.5 in SMOG; around 13-15 in Dale-Schall. The Flesch Reading Ease scores yield that both Ulsan and Daejeon with the Flesch score of 34 and 29, respectively, compared with the rest of the cities, show that the sampled texts are too difficult as a Flesch score of 60 is considered plain English and below 30 is taken to be college graduate level.

The SMOG formula also gives a reading grade that one must have reached if he or she is to make a full comprehension of a text given (Gilliland, 1972). The average grade of the sampled texts was 14.5, which means 14.5 years of education is necessary in order to understand the sample texts. Finally, the Dale-Schall formula produced grade levels ranging from 11 to 16 and above. According to the Dale-Schall formula-based data, the sampled texts of *Seoul, Incheon, Busan, and Gwangju* were appropriate for college-level readers while that of *Daejeon* is beyond those readers. Although the four formulas yielded different ranges of readability scores, it can be concluded from the scores that the reading level of these sampled translation texts is relatively difficult as the texts were found appropriate for around high school or college-level native readers of English.

**TABLE 2**  
Readability Statistics for Translation of Selected History Section of Six Korean Local Cities

	Seoul	Incheon	Daejeon	Busan	Ulsan	Gwangju	averages
Words	570	651	1114	990	439	566	721.67
Sentences	25	36	46	49	19	23	33
Average Syllable/Word	1.50	1.45	1.64	1.49	1.67	1.48	1.54
Average Words/Sentence	22.80	18.08	24.62	20.2	19.95	24.61	21.71
Average Characters/Word	4.94	4.93	5.4	4.98	5.15	4.93	5.06
Flesh Reading Ease	40	49	29	46	34	42	40
Flesh-Kincaid Grade Level	13.3	11.0	15.2	11.9	13.7	13.6	13.1
SMOG	14.3	12.5	15.5	14.8	15.4	14.4	14.5
Dale-Schall	13-15 early to mid	13-15 mid	16+indeter- minate	13-15 early to mid	11-12 upper	13-15 mid	

## 2. What are the Vocabulary Levels of the Sampled Translated Materials?

The vocabulary demands of reading and understanding the sampled translation texts are summarized in the table below. The text coverage was calculated for the first, second, and third 1,000 vocabulary word lists. Many researchers found that there is a strong association between vocabulary knowledge and reading comprehension (Anderson & Freebody, 1981; Coady, Magoto, Hubbard, Graney & Mokhtari, 1993; Hu & Nation, 2000; K. Hwang & Nation, 1995; Koda, 1989; Laufer, 1991).

**TABLE 3**  
Vocabulary Statistics for Translation of Selected History Section of Six Korean Cities

	Seoul	Incheon	Daejeon	Busan	Ulsan	Gwangju	Total
1st 1000 word list	398/71.71	429/68.64	737/68.05	676/68.15	318/72.27	414/74.33	2972/69.90
2nd 1000 word list	27/ 4.86	29/ 4.64	31/2.86	42/ 4.23	18/ 4.09	25/ 4.49	172/ 4.05
3rd 1000 word list	48/ 8.65	33/ 5.28	115/10.62	62/ 6.25	31/ 7.05	25/ 4.49	314/ 7.38
not in the lists	82/14.77	134/21.44	200/18.47	212/21.37	73/16.59	93/16.70	794/18.67

As shown in Table 3, approximately 70% of words belong to the first 1,000 word list, followed by around 4% of the second 1,000 and around 7% of the third 1,000 word lists. Given that knowledge of the 2,000 most frequent word families enables second language readers to recognize 84% of the words in various types of authentic texts (Hirsh & Nation, 1992), the sampled texts were found to require readers of more than a vocabulary size of 3,000 word families. Even though almost 70% of words of the sampled texts, on average, are from the first 1,000 word lists which means 1,000 level vocabulary family knowledge enables readers to understand around 70% of the text, it falls well short of the 95% of lexical coverage for adequate comprehension which, according to Laufer (1997), would require a minimum vocabulary size of 3,000 word families. But the vocabulary burden on the reader for adequate understanding of the sample texts is much heavier as the vocabulary size of 3,000 word families covered only approximately 81% of the total words in the sampled texts. In other words, familiarity with other words is definitely required to reach 95% text coverage.

The table shows that slightly more than 80% of words could be covered by 3,000 word families while around 19% of the words were not found in the list. For example, proper nouns such as Korean specific names of regions, mountains, rivers, etc. related to history

took some share of those words not in the list. These words would lead to a potential decrease in the readability of the sampled texts by foreigners quite new to the Korean history. Except for these proper nouns, there must be some vocabulary words which are beyond a vocabulary size of 3,000 word families or even at the range of 5,000 word families. This may hold true for the sampled translation texts of *Incheon* and *Busan* as 3,000 word families covered less than 80%, which is quite insufficient for unassisted and pleasurable readability of a text. A certain level of familiarity or at least recognition of those proper nouns is required to adequately comprehend the sampled texts, which, however, may be a tall order to potential foreign business persons and foreign tourists.

## V. CONCLUSION

The study assessed the translated texts sampled from the English websites run by six major Korean local cities for readability and vocabulary size, respectively. Firstly, the four readability formulas produced an average of 40 in Flesch Reading Ease; 13.1 in Flesch-Kincaid Grade Level; 14.5 in SMOG; around 13-15 in Dale-Schall (See Table 2). The findings indicate that the results of readability assessment were hardly optimistic as the reading level of the sampled translation texts was found difficult enough to require high school- or college-level reading comprehension. Taking into consideration that English version of the websites operated by the local cities in Korea is for nearly all of the foreigners who come to visit their homepages, it is necessary for these local cities to consider ways of improving clarity and enhance readability, without which their English websites would be of little or no avail. Translation services are not simply translating texts into another language. They should provide service to make any texts in the target language understandable in a manner that is acceptable to virtually all of the readers including both native and non-native speakers of English.

To address the problem, the readability should be lowered to an optimum level to enable virtually all foreigners to be able to do unassisted and pleasurable reading of the translated texts. According to Fitzgerald and Watkins (2006), public documents should ideally be written at a fifth- to sixth-grade reading level or a seventh- to eighth-grade level for public documents with technical terms. In this sense, "Plain English Movement" deserves more than attention. Stimulated by a consumer advocacy group in 1960s and legislated into state laws in the U.S., the movement aimed at ensuring that government and business produced documents that the public could read and understand (Dörney, 1987). Sympathizing with the goals of Plain English Movement, almost all walks of life in the U.S. welcomed and joined the movement. Likewise, the governments and officials of the local cities in Korea need to double-check their English website contents for enabling the average foreigners

whose native language is one other than English to be capable of understanding them easily and adequately.

And secondly, the analysis of vocabulary size of the sampled translation texts yielded another unwelcome result. As shown in Table 3, around 80% words in the texts were covered by 3,000 word families, which is quite lower than 95% lexical coverage for adequate comprehension of a text. Previous research on the relationship between vocabulary and reading clearly showed that vocabulary is a good predictor of reading (Laufer, 1992; Nation 2006). Even though there is no consensus among researchers on answers to the question of what lexical coverage and vocabulary size can ensure adequate reading comprehension, translators working on public documents need to examine their choices of vocabulary words and size to produce not only a high quality but also readable, enjoyable, and comprehensible translation. It should be borne in mind that English has become international in character, it can hardly be bounded to specific cultures since it is now a multicultural and multifunctional language.

Local governments should be applauded for their efforts of making information available to people from overseas as all translation plays a vital role in helping people communicate each other all over the world. They, however, are urged to pay more attention to the quality and effectiveness of translated version of their webpage texts as the purpose of translation lies in rendering texts into another language for conveying message. To serve and ensure the purpose of translation, the functional concept of translation deserves attention from both translators and the local government officials in charge. As any translation needs to achieve the intended purpose, the following is worthy of notice (Vermeer, 1989).

Each text is produced for a given purpose and should serve the purpose. The skopos rule thus reads as follows: translate/ interpret/ speak/ write in a way that enables your text/ translation to function in the situation in which it is used and with the people who want to use it and precisely in the way they want it to function. (p. 20)

From the functionalism's viewpoint, translation should be oriented toward the target readers of both native and non-native speakers of English. As part of further research topics, more research should examine the quality of such publicity translation and suggest ways of improving the readability of translation (e.g. creating a translation guideline; establishing criteria to check the quality of translation) to better serve the purpose of translation.

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**Examples in: English**

**Applicable Languages: English**

**Applicable Levels: Tertiary**

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