

Comprehensibility of Content Posted on the Websites of Polish Local Government Institutions

Przemysław Jatkiewicz

University of Gdansk

Gdansk, Poland

przemyslaw.jatkiewicz@ug.edu.pl

Abstract

The aim of the research was to determine the comprehensibility of the content of the local authority websites and the level of public perception of them. Methods of sampling, analysis and comparison were used. The study revealed some of the factors influencing citizens' perception of government online content and showed that the readability of information on websites plays an important role. As a result, it was found that widening the circle of Poles as users of electronic services is possible by editing content with special software.

Keywords: FOG index, local government, availability of content, readability.

1. Introduction

Local government institutions are an integral part of the democratic system, providing representation for citizens at different territorial levels. One of the key roles of local government institutions is to set and implement local policies. They also play an important role in the organisation of public services such as education, health, public transport or culture. They ensure access to these services for the inhabitants on their territory and take care of their quality.

Like other institutions, local governments should ensure that information is accessible to people with disabilities, with the accessibility indicator being the WCAG 2.1 guidelines at level AA. These guidelines contain recommendations to make content more accessible to a wider range of people with disabilities, including blind and partially sighted people, deaf and hard of hearing people, people with mobility impairments, speech impairments, light sensitivity, people with complex disabilities, and some people with learning and cognitive limitations. However, it should be noted that the main guideline relating to the latter two disabilities is only categorised at AAA level. This guideline is 3.1. Comprehensibility, which includes, among other things, the following success criteria:

3.1.3 Unusual words.

3.1.4 Abbreviations.

3.1.5 Reading level.

These criteria may be inadequate, since, according to a 2018 study coordinated by the OECD (the results of the 2022 study were not available at the time of writing), one in seven 15-year-olds in Poland has not mastered reading comprehension skills sufficiently to make free use of written sources [1]. In addition, secondary illiteracy [2] and functional illiteracy [3] are observed in adults as well as dyslexia, which affects 5-10% of the world's population [4]. A person diagnosed with dyslexia in childhood usually remains dyslexic for the rest of his or her life [5]. Therefore, it is extremely important that the institutions closest to the citizen, provide information in a way that is comprehensible to as large a proportion of the population as possible.

2. Objective and research methodology

This study investigates the readability of materials published on the websites of local governments in Poland. A preliminary hypothesis is that readability is related to the size of the institution. Larger institutions can afford to appoint an editor with appropriate competences, purchase editing services for posted materials or appropriate IT tools to support the process of editing texts for readability.

Although the study population is not very large, a representative survey method was chosen. The characteristics were assumed to have a hypergeometric distribution approximated by a normal distribution.

With a sample size of 2,917, an error of 10% and an assumed fraction size of 0.5, the minimum sample size is 66.

In order to select subjects, a stratified, non-return draw was performed using a pseudo-random number generator. Entities belonging to each type listed in Table 1 were drawn separately, taking into account the frequency of their occurrence in the population. The quantities of entities drawn are presented in the same table.

Table 1. Size classes in relation to the level of the institution.

Authority type	Size	Number	Number of entities surveyed	Sample size
Marshal's Office	Large	16	414	10
Municipality Office in a city with district rights	Large	314		
Quarter Office (Warsaw)	Large	18		
District Office	Large	66		
Urban Office	Medium	302	979	21
City and Commune Office	Medium	677		
Commune Office	Small	1498	1498	35
Total		2891	2891	66

The degree of legibility of materials can be determined by a number of different methods. According to Heydari and Riazi, more than 40 different readability indices are currently in use [6]. The most commonly used are readability measures based on clarity and/or length. One of the most popular readability indexes is the FOG developed by Robert Gunning in 1952, which determines the number of years of study required to understand a text correctly [7].

$$FOG = 0,4 \left(\frac{\text{number of words}}{\text{number of sentences}} + 100 \left(\frac{\text{number of complex words}}{\text{number of words}} \right) \right) \quad (2)$$

Where words with 3 or more syllables (for English) and words with 4 syllables or longer (for Polish) are considered complex words.

In the last quarter of 2023, one article each of at least 1,000 characters in length was downloaded from the websites of the drawn institutions. A FOG index value was calculated for each downloaded text.

Each of the units was also sent a questionnaire in the form of a request for public information using the ePUAP system dedicated to correspondence with the institutions. The questionnaire included questions on how information was published on the office's websites, i.e:

- Is it reviewed by the editor before publication or is it directly published by the content staff?
- Does any verification include the readability of the text and its adaptation to the education and/or age of the potential audience?
- Is any verification based on the readability index and supported by software?
- What is the background of an editor reviewing texts?

As a result, 54 responses were received, one of which contained an incomplete questionnaire, another information about the extension of the response time to 2 months due to the complexity of the information (Kuźnica Commune Office) and 2 refusals (Mikołów Municipality Office in a city with district rights and Brzyska Commune Office).

3. Results

Analysis of the pages downloaded from the websites belonging to local government units allowed the FOG index to be calculated, with a median value of 12.62, with the value of the first quartile being 11.5 and the value of the third quartile being 14.7.

The maximum index of 21.8 was reached by a text downloaded from the Sokolow Podlaski District Starost's website, which concerned the celebration of Local Government

Day. The lowest index of only 6.07 was calculated for the text from the website of the Gaszowice Commune Office informing about the work of the office. The data broken down by unit size is presented in Figure 1.

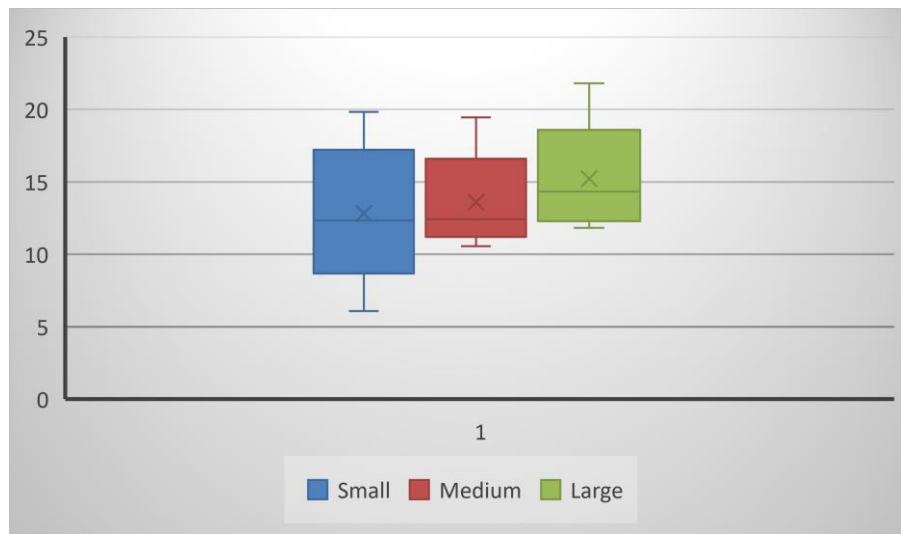


Fig. 1. FOG by size of local government units.

A Persona statistical test was carried out, obtaining $r\text{-Persona}=0.227$ at a significance level of 0.066, which indicates that the FOG index increases as the size of the unit increases.

More than 60% of the units did not appoint an editor to control and edit content, allowing content to be published by content staff. Among the editors hired, the majority had a university degree, other than technical and philological. The research confirmed the author's observation, that larger institutions can afford to appoint, but their educational background does not confirm the expected competence.

The hypothesis that larger units can afford to appoint an editor in charge of publishing and proofreading content was confirmed by the results of the survey, as presented in Table 2. The dependence of the editor's competence on the size of the institution is confirmed by statistics $X^2 = 87,411$ dla $X^2_{0,01;10} = 23,209$.

Table 2. Education of editors by size of institution.

	Small [%]	Medium [%]	Large [%]
No editor	79,17	50,00	25,00
Medium	0,00	5,56	0,00
Technical	8,33	5,56	12,50
Other higher education	4,17	33,33	37,50
Philological	4,17	5,56	12,50
External editors	4,17	0,00	12,50

The effect of the editor's education on the value of the FOG index is presented in Table 3. The result of the Pearson correlation test $r\text{-Pearson}=-0.863$ at a significance level of 0.137 confirms the strong correlation between the variables, i.e. the value of the FOG index decreases with the adequacy of the editor's education.

Only 3 institutions declared, the use of an IT tool supporting the creation of an easy-to-read tact. In all cases, this was Jasnopsis and the FOG readability factor taken into account in the editing process. It should be noted that even in cases where no editor was appointed and employees published content on their own, the use of the Jasnopsis tool allowed low FOG values to be achieved, amounting to 11.82 for the article published by the Leszno District Office and 10.13 for the Oświęcim Commune Office.

Table 2. Education of editors by size of institution.

Education of the editor	FOG index median
Secondary	15,89
Technical	12,195
Other higher education	12,66
Philological	11,23

4. Discussion and conclusions

The range of modern digital tools intended for informing and communicating with citizens of municipalities is quite wide. S. Valtolina [8] classified them and found that the most common among them are websites, special municipal newsletters, automatic subscriptions to community news, mobile applications, electronic information blogs, social pages, automatic chatbots. The researcher noted that the most common tool from this list are websites that local self-government bodies create not only to inform citizens, but also to involve them in decision-making and identifying problems in the region. At the same time, the researcher noted that the effectiveness of such digital mechanisms depends on their content and other factors. Thus, the commonality between the studies is the establishment of requirements for websites created by authorities to interact with the public. According to the F. Neves [9], information coverage on such websites should be prompt and with the possibility for citizens to provide feedback on it. For this, local self-government bodies must have special administrators who will ensure regular maintenance of websites, their filling, and most importantly, timely response to citizens' appeals. This was also emphasized within the scope of this study, in particular, it was established that citizens should be provided with the opportunity to participate in discussions and surveys directly from the site. Based on this, there is a common conclusion between the studies that the effectiveness of the websites of local self-government bodies directly depends on the possibility of receiving feedback from citizens.

In recent years, there has been no research into the readability of content published by Polish local government institutions. Recent publications related to this topic discussed readability measurement software [10]. More recent ones concerned the readability of financial information [11, 12].

Similar studies have been carried out in Turkey [13] and Spain (average FOG index was 12.79) and Spain (due to the different readability index used, the values obtained are not comparable) [14].

It should be noted that, regardless of how the content was edited, the FOG index values achieved indicate that a large part of the population, i.e. people who are less educated or have reading difficulties, will not be able to assimilate the content they contain. They will therefore be excluded from making full use of the e-services offered by local government units. It is therefore advisable to take measures which would oblige self-governments to edit content as simple and easy to assimilate, e.g. by indicating the maximum value of the central authority's chosen readability index for specific content categories. As the measurement of readability indices, despite not very complicated algorithms, is not a simple matter, appropriate software should be used. Such software is available on the market, but its use requires a licence fee (less than EUR 50 for an unlimited number of pages per month), which is, however, much lower than the cost of hiring a qualified editor or outsourcing editing. Such software could also be developed and made available free of charge by a specialised IT unit under central government. Ready-to-use source codes implementing many of the algorithms that calculate readability indexes are available on the Github platform.

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