Text Complexity In Russian Textbooks On Social Studies

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ABSTRACT

Presented paper reveals the problem of the mixed complexity of authentic texts used in Russian textbooks, on a basis of textbook on social studies for 8th grade. The requirements of the Federal State Education Standards for the text content of textbooks and the rules for expert review of the educational literature included in the federal list of recommended textbooks were studied. To conduct the research, a number of formulas for the readability of the texts developed and studied by foreign and Russian scientists to assess the complexity of the text were used. The analysis of statistical parameters was conducted in order to reveal the relationship between the quantitative parameters and the content of the texts. The main results presented in the article demonstrate that 7 out 16 assessed texts meet the declared complexity of the textbook, according to the formulas of readability. More than half of the texts show an exceedance of the level of complexity. A more detailed analysis also reveals the presence in the texts of qualitative elements potentially creating complexity for reading and understanding. The results of the study indicate the necessity for an in-depth study of the problem of assessing the complexity of texts used in Russian textbooks.

Keywords: text complexity, readability, syntactic simplicity; narrativity; texts analysis.

1. INTRODUCTION

The modern education system of Russia has gone through major changes in recent years as an attempt to structuralize it and promote the unity among all levels of education. The introduction of Federal State Education Standards (FSES) for basic general education reworked the requirements for the estimated results of the main educational program. The new system include enhanced control over competencies development among students in subject-specific and cross-curriculum areas by clarifying and specifying content and structural elements. Attention to the individual needs of every student has increased; we also observe an increasing attention to the formation of a world outlook and to the development of cognitive abilities. To achieve FSES goals it is required to create relevant training materials. The Ministry of Education and Science of the Russian Federation is developing a list of recommended textbooks in each subject area. The process of textbook expertise has a detailed examination and evaluation of a variety of features at each stage. Text content is one of the key elements that compose the textbook. This problem is given insufficient attention from the developers of textbooks and organizations that carry out the examination. We believe that the complexity of textual materials does not meet the requirements determined by FSES. Text complexity directly affects the cognitive demands and the amount of time required to process the text (Williamson et al, 2013).

Given that textbooks of any language are mostly composed of textual material, it is necessary to take into account the influence of the text complexity on the overall level of complexity that will correspond to a specific grade. Such an approach exists in the educational system of any country, including in the Russian Federation (Fisher et al, 2016 ; Bloxham et al, 2011; Federalnyi gosudarstvennyi obrazovatelnyi ,2017).

[1]   Russian educational system developed strict requirements for the maximum amount of academic workload for students at every level of education, which is regulated by the Federal Supervision Agency for Customer Protection and Human Welfare. The maximum weekly workload in academic hours for grade 8 pupils is 33 hours for lesson activities and up to 10 hours for after lesson activities. Exceeding the permissible complexity of texts may lead to the excess of these norms and violation of the principles of the organization of learning activities (Postanovleniye ot 10.07.2015, №. 26 ob utverzhdenii SanPin 2.4.2.3286-15 "sanitarno-epidemiologicheskiye

trebovaniya k usloviyam i organizatsii obucheniya i vospitaniya v organizatsiyah, osushchestvlyayushchih obrazovatelnuyu deyatelnost po adaptirovannym osnovnym obshcheobrazovatelnym programmam dlya obuchayushchihsya s ogranichennymi vozmozhnostyami zdorovya") - Retrieved from:

http://pravo.gov.ru/proxy/ips/?docbody=&nd=102381888&intelsearch=%D1%E0%ED %CF%E8%CD+2.4.2.3286-15, 2017).

According to FSES regulatory documents, each standard includes the psychological and pedagogical conditions for the implementation of the basic educational program, namely, consideration of the specificity of the age-related psychophysical development of students, including the transition from junior school age to adolescence. In other words, the learning process, and therefore the teaching materials, must correspond to certain cognitive abilities of the students .

FSES also defines the key subject-matter components of textbooks content. Since the comprehension of the textual materials of the textbook on social subject is directly related to the successful mastery of knowledge by the learner, textbooks on social studies rely heavily on text content therefore being influenced by the complexity of the texts.

2. METHODS

The examination system is confidential and is carried out by a limited number of organizations on the basis of their government approved charters, which authorizes the examination of textbooks. We do not dispose information on technical means used in assessing the materials of the textbooks, as well as precise criteria for every element of text complexity that is being assessed, thus we cannot evaluate the process of text assessment.

Without access to the criteria for analyzing the texts that the experts are guided by, we are forced to turn to the standard readability assessment formulas used in Russia. According to Oborneva, (2007) it is possible to use readability formulas such as Flesch-Kincaid formula, Coleman-Liau index, Dale-Chale readability formula, Automated Readability Index and SMOG index to determine text readability via statistical evaluation. However, these formulas rely completely on statistical parameters of texts, such as the average length of sentences and the average length of words. On the basis of

the data provided, one can relatively accurate measure the complexity of the texts and the approximate grade level of the reader (Oborneva,2005).

For a more accurate analysis of text materials, it is necessary to take into account a number of qualitative parameters, namely syntactic simplicity, abstractness/concreteness of words, referential cohesion, deep cohesion and narrativity (Solnyshkina et al, 2014). The research devoted to this issue was conducted by A. S. Kiselnikov, (2017) and showed the effectiveness of this method of analysis. However, the software used in the research is not applicable to the Russian language and requires further study (Kiselnikov, 2017). Studies on the problem of an automated analysis of advanced parameters of complexity were conducted by D. McNamara. The results of several research projects have shown the success of a new method of assessing the complexity of texts based on quality indicators ignored by standard readability tools (McNamara,2012).

We have assessed the complexity of the authentic texts that are present in the social studies textbook for the 8th grade (composed by L.N. Bogolyubov). This textbook is on the list of recommended textbooks on social studies, thus it meets the requirements set by FSES. We have assessed the texts of the sections "document" of all chapters of the textbook, which materials were not adapted to preserve authenticity. In total, the textbooks include 16 texts used by the authors in some chapters of the textbook for contextualization and illustration of certain concepts or ideas.

The texts were subjected to statistical processing with the measurement of such parameters as the number of characters, the number of spaces, the number of letters, the number of words, the number of sentences, the number of words with more than 4 syllables, the number of words up to 4 syllables inclusive, the average number of syllables per sentence, the percentage of compound words. Obtained data were used in Flesch-Kincaid formula, Coleman-Liau index, Dale-Chale readability formula, Automated Readability Index and SMOG index.

3. RESULTS AND DISCUSSION

To form an integral worldview, corresponding to the current level of development of science and society the textbook includes texts that were not modified, in other words, authentic texts. These texts are fragment from documents, quotations of famous personalities, including translations from other languages. Inspection of these materials

showed a wide range of complexity values. Below we present data with an assessment of the complexity of texts conducted with the use of several formulas of readability.

Table 1. Text complexity of authentic texts used in Russian textbook on social studies (texts 1-8).

Text#	1	2	3	4	5	6	7	8
Flesch-Kincaid	19.33	16.35	15.64	9.06	16.03	11.4	14.26	12.97
Coleman-Liau index	12.05	14.44	17.06	11.15	14.45	10.08	12.22	14.11
Dale-Chale readability formula	14.67	9.92	13.34	7.84	13.26	10.63	13.38	8.31
Automated Readability Index	19.16	16.27	18.37	11.56	15.32	10.93	12.74	14.85
SMOG	7.96	8.89	14.03	8.57	12.33	9.66	12.55	9.25
Estimated audience	grade 7-9	grade 7-9	University year 1-3	grade 7-9	University year 1-3	grade10-11	University year 1-3	grade 7-9

Table 2. Text complexity of authentic texts used in Russian textbook on social studies (texts 9-16).

601

Text#	9	10	11	12	13	14	15	16
Flesch-Kincaid	**28.09**	20.73	10.74	**8.7**	10.51	16.15	17.43	10.26
Coleman-Liau index	**24.2**	18.31	10.32	**5.62**	12.2	16.88	15.45	10.31
Dale-Chale readability formula	**22.19**	18.71	7.49	8.52	**6.18**	16.3	13.46	13.35
Automated Readability Index	**26.54**	20.11	11.3	**8.08**	13.68	19.49	18.01	10.7
SMOG	**19.82**	18.6	7.62	7.08	**6.54**	11.36	15.36	12.06
Estimated audience	Phd	Phd	grade7-9	grade7-9	grade7-9	grade10-11	University year 4-6	University year 1-3

The minimum value for the Flesh-Kincaid formula is 8.7 for text 8, the maximum is 28.09 for text 9. The most difficult to read, according to Coleman-Liau index, is the text number 9 with a score of 24.2, the easiest to read is text 12 with a score of 5.62. The lower value for the Dale-Chale readability formula is 6.18 for text 13, the higher with 22.19 is for the text 9. The Automated Readability Index also rated text 9 as the most complex with the score of 26.54, and the lightest formula was text 12 with the value of 8.08. According to the SMOG index, the most difficult text is text 9 with a value of 19.82, when text 13 is the easiest with a value of 6.54.

Among assessed texts, 7 out 16 correspond to the declared level of the textbook (grade 8), 2 exceed it by two grades, 5 correspond to the complexity of the teaching materials used in Russian university undergraduate programs, and 2 represent a heavily minted

level of complexity corresponding to the texts used in Russian postgraduate study. In general, there is a tendency to exceed the level of the textbook when using authentic materials, which means insufficient attention to their selection.

Text 9 proved to be the most difficult. According to the analysis, it consists of 12 complex sentences with an average number of words in the sentence of 10.25, which influences syntactic complexity. Text 9 is also complex in terms of vocabulary, having 32 words with more than 4 syllables and a fraction of complex words equal to 26%. The text is a statement by the famous Russian economist E.N. Lobachev, there are many specific terms in the text such as mixed economy, economic freedom, regulating role, state regulation, period of functioning, etc. In addition, text is a fragment with a gap between two parts, which is not considered by formulas, but it can create a difficulty for understanding.

Texts 12 and 13 were the least complicated, according to their small size (92 words and 90 words respectively) and the predominance of simple sentences. The lexical composition of the texts is not complicated by terms, consists of general words. The texts, however, have discontinuities, which may present a difficulty for understanding.

4. SUMMARY

According to the Federal State educational standard, the Russian textbook on social science should perform such tasks as ensuring understanding of the basic principles of society's life, the formation of personal perceptions of the fundamentals of Russian civil identity among the students, the formation of the foundations of legal awareness, etc. (2). It is impossible to solve such a problem without obtaining a large amount of up-to-date information. Textbooks use tables and images to facilitate the assimilation of information, but most often information is presented as large chunks of texts. Texts differ in style, basic styles are informative and narrative, and there are also differences in the scope of certain parts of chapters.

[2]   As it was mentioned earlier, Russian educational system developed a strict order of the formation of a federal list of textbooks recommended for use in teaching. Textbooks are subject to examination by trusted organizations with the involvement of several qualified experts. Examination is conducted according to clearly defined regulations; opinions of the experts are presented in unified form, an example of which is resented to the public in the appendix of the decree of the ministry. Experts' verdict

consists of a list of assessed criteria. This procedure involves the analysis of the text information of the textbooks, which must achieve certain requirements. These requirements include the correspondence of the textual material of the textbook to the norms of the modern Russian language, the comprehensibility of the language of presentation, the correspondence of the age group for which the textbook is designed, text must be structured, systematic, and consistent in exposition of ideas (Prikaz Minobrnauki Rossii ot 18.07.2016, №870 "ob utverzhdenii poryadka formirovaniya federalnogo perechnya uchebnikov, rekomenduyemyh k ispolzovaniyu pri realizatsii imeyushchih gosudarstvennuyu akkreditatsiyu obrazovatelnyh programm nachalnogo obshchego, osnovnogo obshchego, srednego obshchego obrazovaniya" - Retrieved from: http://xn--80abucjiibhv9a.xn--p1ai/dokumentyi/8664, 2017.).

Separate unified forms were created for scientific expertise, public expertise, pedagogical expertise, regional expertise and historical and cultural expertise. Having analyzed the form of the expert's conclusion and comparing it with the requirements determined by the FSES, we come to the conclusion that the requirements for the complexity of the text of the textbook being studied are not fully disclosed. Experts have to assess the composition and completeness of the presentation of materials, the availability of printed, electronic forms of the textbook, the availability teacher books, the correspondence of evaluated textbook to the basic or advanced level. The content of the textbook has to match several criteria: the reflection of the methods of scientific knowledge, intended for compulsory study in the appropriate educational organization, the absence of unreliable facts, the content of information on the advanced achievements of modern science in the relevant subject area, the formation of interest in in-depth study of the subject. The illustrative material of the textbook should correspond to the text and complement it; there should be no mistakes, misprints. Every item in the list must be marked as "yes" (criteria are achieved) or "no" (criteria are not achieved). The final verdict concludes on whether the textbook is "recommended" or "not recommended".

5. CONCLUSIONS

The results of the study demonstrate the correlation between text content and complexity of text. According to standard readability formulas texts used in the social studies textbook for the 8th grade (composed by L.N. Bogolyubov) contains mixed texts

grade levels, which potentially does not meet the FSES requirements for textbook content. Text grade surpasses appropriate level in 9 cases out of 16. Detailed overview of the texts revealed the presence of qualitative parameters which could not be measured by readability formulas and potentially influences the overall complexity of texts. Further development of text content assessment of textbooks on social studies is proven to be a necessity.

6. ACKNOWLEDGEMENTS

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