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Visual components of scientific-technical text

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Abstract

This study aims to investigate different visualization tools and their interaction in scientific-technical texts and generally in scientific communication. The topic of the investigation gets in line with trends in the development of modern linguistics in the context of a new scientific paradigm. The research paper focuses on the synthesis of verbal and non-verbal means of communication in technical texts, interaction of different codes, symbols, systems of symbols, signs and rules of their combinations in order to transmit large amounts of information in a fairly compact form.

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1. Introduction

Nowadays the intensity of information flow is growing rapidly, and therefore the problem to represent the information in a format easy to read and analyze it becomes relevant. In the process of text-production different code systems, signs, texts are interacting, there is a discursive change through new combinations of discourse in order to implement the communicative strategies of the author.

The subject of the research is Spanish text of scientific-technical articles and dissertations defended at the Faculty of Natural Sciences of the Autonomous University of Madrid (Spain) on various branches of knowledge, namely, chemistry, geology and geochemistry, mathematics, physics and biology.

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As the subject of this study act discursive mechanisms of polycodedness and specific features of the Spanish scientific discourse. The methodological base of research is leading to modern linguistics, discursive and communicative approaches.

2. Methods of analysis of polycode texts

The method of discourse analysis has allowed that the visualization of the Spanish scientific-technical texts is emphasized to understand and justify the concept of a hybrid of the polycodedness and semiotic substance, characterized by the phenomenon of textual heterogeneity achieved by the combination of verbal and non-verbal semiotic systems. Classification and systematization method as well as the quantitative analysis made it possible to organize the non-verbal components of the Spanish scientific text and classify the most specific to each branch of knowledge.

Scientific discourse is the result of a special kind of dialogic interaction, combining elements of scientific argument and informative dialogue, the participants of which are either real scientists, or scientific texts, in which the thoughts and ideas of the participants are implemented. Scientific- technical text as a communicative value is not limited to language component. It includes various elements significantly affecting its overall perception. Thus, in conjunction with other signs of nature, verbal signs most successfully realize their communicative functions.

Specialists from various fields of linguistics addressed the description of non-verbal means of communication, their functioning in speech and writing. The research results are presented particularly in the works by E.E. Anisimova, V.E. Chernyavskaya, I E. Klyukanov, G.V. Kolshanskiy, V.I. Mikhalkovich, O.V. Mishina, T.M. Nikolaeva, L.B. Parshin, N.V. Petrovskiy, S.P. Popov, N.V. Rekonvald, A.G. Sonin, Yu.A. Sorokin, N.V. Stepanyuk, E.F. Tarasov, M.B. Voroshilova, B.A. Uspenskiy, N.I. Khristoforova, T.V. Yakhontova, and T. Miller.

The idea that the author of the text always takes into account a polycode model of the potential of the recipient can be found in the works of many scientists^{1, 3, 4, 5, 7, 8, 9}.

Chernyavskaya V.E.¹ stresses that a polycode text is a special form of textual heterogeneity. Functioning in the same semantic space, interacting with each other, verbal and visual components of the message ensure the integrity and coherence of the text and its communicative effect. The polycodedness is a manifestation of the heterogeneity of the text due to the synthesis of different semiotic systems, for example, both verbal and visual. In this sense, the phenomenon is directly related to the manifestations of polycodedness, interdiscursiveness, the interaction of different discourses.

Researchers believe that the polycode texts directly affect the sensory fabric of image consciousness, i.e. actualize sensory-emotive arguments along with rational².

As noted by G.V. Kolshanskiy, to know the world, people reflect it in their minds, language tools draw up a creative attitude of the author of the text to reality⁶.

T. Miller, comparing the content of scientific documents with the scientific and popular literature, proves the importance of visual communication components of scientific documents¹⁰. As a result of the comparison carried out by them it appears that the weight and the role of non-verbal components are much higher in the actual scientific literature than in non-fiction.

This means that a scientific-technical text differs clearly in its communicative orientation, that is, its structure is defined by a set of the representatives of different sign systems, designed for well-defined recipient. The cognitive paradigm is generally accepted that the cognitive structures are oriented to reflect the structure of the external world.

A polycode text is presented in this study as a poly-natured fixation of mental representations of reality, perceived by the author, which then selects the manner of representation of knowledge and does so in accordance with their social and cultural experience, focusing on the level of cognitive development prepared by the recipient.

As a result, the recipient internalized scientific text, which is a representation of a fragment of reality fixed by heterogeneous sign systems.

It is important to emphasize that unlike other types of polycode texts, scientific-technical text is model of reality, to know scientifically. Scientific-technical text implements pronounced information function, which is revealed in the presence in it of new cognitive structures that serve to represent the new knowledge.

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