Iconicity as a way of exchanging scientific and technical information in academic texts in the context of sustainable development of sociolinguistic interactions

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Abstract. Nowadays, there is an increasing interest in non-verbal means of written forms of interpersonal communication. It is explained by the fact that the informational component and the pragmatic potential of non-verbal means of communication are often much higher than those of verbal means. As a result, the researchers focus their studies on texts which structural organization contains, in addition to verbal code units, the means of other semiotic codes. Such texts are called creolized or polycode. Polycode texts are a distinctive feature of academic texts, and their interpretation poses certain difficulties for students. The purpose of this study is to analyze the structural components of academic polycode texts; to study the ways of organizing verbal and iconic components; to describe the functional characteristics of iconic elements; to establish the mechanisms of interaction between linguistic and paralinguistic means when creating a single semantic unity of a polycode text. The main research methods are analysis, synthesis, comparison and observation.

The textbook for the training of professional engineers Cambridge English for Engineering written by M. Ibbotson is used as the empirical material. The authors come to the following conclusions: there are four types of academic polycode texts; each type has a different pragmatic potential of verbal and iconic parts; in some types, the information function is more prominent in the iconic component; the use of photographs as iconic means facilitates the process of text interpretation and scientific and technical data exchange.

1 Introduction

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of semiotics, linguistics, psycholinguistics and others. The term “polycode” implies the usage of different semiotic codes or sign systems in the text organization. Some studies were carried out in the framework of entertainment polycode texts by L. Shatalova, N. Shatalova, V. Cherepko, S. Tumanova, A. Shuldishova; of academic polycode texts by E. Luchinskaya R. Volkova, B. Kabanyan, Yu. Luchinsky; of advertising polycode texts by N. Oprishch, O. Ogaeva; of polycode text in Internet communication by T.V. Marchenko, L.L. Zelenskaya and others.

One or several texts can participate in the creation of a polycode text, which in text linguistics are called primary texts, the newly created text, in turn, is defined as a secondary text. The peculiarity of the secondary polycode text manifests at the level of content, composition, it can differ significantly in its functional characteristics.

Polycode or creolized texts can be distinguished from conventional texts with illustrations due to their non-linearly structure of two parts: verbal and nonverbal, which act as a single communicative unit. This means that they convey the complete amount of information only if the addressee perceives the text verbal and non-verbal components simultaneously.

The way the addressee perceives the components of a polycode text depends on his or her ability to decode the author’s intensions and semantic connotations with the use of individual spiritual upbringing and life experience. The individual visual perception and correct interpretation of texts also rely on functioning of sensory organs, as biological aspects effect on the linguistic procedures. Moreover, the crucial role in the processing of verbal and non-verbal information plays the addressee’s intellectual development and the motivation that allow to focus attention on necessary items and details.

As it follows from the above mentioned, conceptual, content and compositional levels of creolized texts generate the united semantic and pragmatic meaning which can be called an “icon”, correlating with the existing cultural and/or religious traditions of communicative environment. No wonder that “creolized” means the fusion of different cultures. On the other hand, iconic means perform the function of an image.

Spaces, font, color, italics, graphic symbols, numbers, auxiliary signs, means of iconic language (drawing, photograph, table, diagram, etc.) belong to such means. Paralinguistic means are characterized by different functional impact and create a different pragmatic effect on the addressee. For example, a drawing in an advertisement is designed to interest the buyer, demonstrate the consumer qualities of the product and encourage the buyer to purchase it.

The role of paralinguistic means in the text cannot always be unambiguously interpreted. However, for the production of some texts, these means become the main type-forming features. Such iconic means as photographs, illustrations, diagrams, tables, drawings are widely used in academic texts. Some communicative and pragmatic norms are also applied to set restrictions on the use of iconic means, their distribution and location in the text, the composition of the text components (the verbal part and the iconic part), the type of connection between the text components and the nature of the verbal comments on the iconic part.

It should be emphasized that the interaction of verbal and visual components is very different from a functional point of view, depending on the functional types of polycode texts. Speaking about academic polycode texts, the involvement of verbal and visual elements in such texts makes it possible to enhance the impact and attract attention, to create an emotional image, to regulate and transmit fundamental knowledge and skills. Thus, the understanding process of the educational material becomes more productive.

Polycode texts contribute to additional and new meanings, affect the mental images of the individual consciousness and value orientations.
All of the above said confirms the relevance of the study of the iconic component in academic polycode texts in the process of exchanging scientific and technical information.

2 Methods and materials

In this study, general scientific methods of analysis, synthesis, observation and comparison are used. The textbook Cambridge English for Engineering written by M. Ibbotson [1] was chosen as the material for analysis.

3 Research results

We have analyzed the use cases of visual polycode texts that are used in the Cambridge English for Engineering textbook. It should be noted that all cases of using iconic means can be divided into four main types.

Type 1 is a polycode text consisting of a verbal part, which contains the title of the section and its numerical order according to the content of the textbook, and an iconic part, which is a photograph, which contains an image that coincides in subject with the title of the section (Figure 1).

Fig. 1. Type 1 of iconic means usage, Source: Cambridge English for Engineering

Figure 1 shows that the iconic part of the polycode text depicts various types of drawings that are used in the design by engineers. The verbal part of the polycode text is located in the foreground and the iconic part is located in the background, thereby explaining the title of Section 4 "Engineering design." From a pragmatic point of view, the iconic part has a supplementary pragmatic effect: it illustrates drawings.

Type 2 is a polycode text consisting of a verbal part, which contains several tasks for listening, and an iconic part, which is a photo, the image in which coincides in subject with the theme and text tasks for listening (Figure 2).

Fig. 2. Type 2 of iconic means usage, Source: Cambridge English for Engineering
Fig. 2. Type 2 of iconic means usage. Source: Cambridge English for Engineering

Table 1: Simplifying and illustrating technical explanations

14 a. Richard, a structural engineer, often takes clients on guided tours of their new buildings during construction. He is talking about explaining technical concepts to non-specialists. Listen and answer the following questions.
1. What does Richard say about explaining technical concepts?
2. What does he mean by dull explanations?
3. What is being patronising?

b. In pairs, think of some tips on how to solve the following problems.
   1. not being understood
   2. being patronising
   3. explaining difficult concepts
   4. sounding dull

c. Richard is giving some advice about the problems in Exercise 14b. Listen and summarise his ideas. Compare his tips with your suggestions.

15 a. Richard has made notes for a guided tour of a site. The project is a skyscraper in the early stages of construction. During the tour he explains the technical terms to the non-specialist group. In pairs, discuss the following terms and try to interpret them using everyday language to rephrase them.

   SUBSTRUCTURE
   - Pile foundations (in general)
   - Bored in situ concrete piles
   - Pre-cast driven concrete piles
   - Pile driver
   - Pile auger
   - Bentonite

Explaining how technology works

6 a. In pairs, look at the picture and discuss the following questions.
   - How do you think a space elevator would work?
   - What could it be used for?
   - What technical challenges would it face?
   - How seriously do you think the concept of space elevators is being taken at present?

b. Read the following article and compare it to your answers in Exercise 6a.

Space elevators: preparing for takeoff

In his 1979 novel, The Fountains of Paradise, Arthur C. Clarke wrote about an elevator connecting the earth’s surface to space. Three decades later, this science fiction concept is proving to take off in the real world. NASA has launched the Space Elevator Challenge, a competition with a generous prize fund, and several teams and companies are working on serious research projects aimed at winning it.

As its name suggests, a space elevator is designed to raise things into space. Satellites, components for space stations, supplies for astronauts in space stations, and even astronauts themselves are examples of payloads that could be transported into orbit without the need for explosive and environmentally unfriendly rockets. However, the altitude of orbital space – a colossal 33,790 km above the earth – is a measure of the challenge facing engineers. How could such a height be reached?

The answer is by using an incredibly strong and lightweight cable, strong enough to support its own weight and a heavy load. The design of such a cable is still largely theoretical. This would be attached to a base station on earth at one end and a satellite in geostationary orbit (fixed above a point on the equator) at the other. Lift vehicles would then ascend and descend the cable powered by electromagnetic force and controlled remotely.
It is interesting to note that the content of the text "Space elevator: preparing for takeoff" in Figure 3 is much wider and larger in volume than the image itself in the photo. This means that when reading, the addressee constantly turns to the visual part of the polycode text for support, i.e. the iconic part is a compressed semantic expression of the text expressed by units of the language system. Thus, the verbal and iconic parts are in a relationship of inverse proportional dependence: the larger the verbal part is, the smaller the iconic element is. Although from a pragmatic point of view, both parts have an equal pragmatic effect: a description of the process of sending objects into space.

Type 4 is a polycode text consisting of a verbal part, which contains a list of terms listed in the table, and an iconic part, which is a series of photographs representing a visual description of the terms (Figure 4).

Figure 4 shows that the iconic part of the polycode text depicts various objects, the names for which must be selected from the verbal part. The verbal element is located in the table in the form of words above the photos. From a pragmatic point of view, the iconic part saves the process of information perception by the addressee and has a high pragmatic effect on the addressee.

Thus, it can be noted that in the polycode text the verbal and iconic parts have a different pragmatic effect, have different locations and perform a different informational function when transmitting scientific and technical data. In Types 1–3, iconic means perform the function of visual support of the linguistic and audio-linguistic component, while in Type 4, paralinguistic means perform the leading function of understanding terminology in engineering. It is important to mention that all semantic content of the verbal part can be found in detail in the iconic part, and vice versa, that eliminates difficulties in text interpretation.

4 Conclusions

The results of the research show that academic polycode texts convey scientific and technical information in different ways.
Firstly, there can be distinguished four types of functional usage that iconic means perform:
- a visual support of the unit title;
- a visual support of listening tasks;
- a visual support of a text;
- the leading role of terminology acquiring.

Secondly, iconic elements can occupy different locations in respect to verbal elements. They are located in the background, nearby and below. The location of iconic means plays a crucial role in their pragmatic effect on the addressee.

Finally, the application of photographs as iconic means makes the process of scientific and technical information interpretation easier.

References
