DEVELOPMENT OF THE THEORY OF MATHEMATICAL MODELING AND ITS APPLICATION IN EDUCATION AND INDUSTRY

MODELING OF A COMPUTER TRANSLATOR IN THE CONTEXT OF LEARNING A FOREIGN LANGUAGE

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Computer translation has become a significant phenomenon of inter-lingual communication (everyday, scientific, educational, translation). The study of a foreign language must take into account the fact that Computer Translation forms an understanding of its possibilities and limitations, which can only be realized on the basis of an understanding of computer translation technology. The purpose: The development of tools for effective usage of computer translation in foreign language learning.

Material and methods. Using mathematical modeling, two prototypes were developed: an interactive computer model of a bilingual English-Russian translator and a computer model of a context bilingual English-Russian translator. The prototype is a translator program capable of communicating with the user using a predetermined «phrasebook» – a list of phrases and expected answers to them. In this case «phrasebook» is a model of educational phrases, collocations, glossary, containing aligned grammatical structures in the source language and their translations into the target language. Modeling was carried out: 1) based on LingoJam networking platform [1]; 2) by using standard HTML markup directly in the web page code [2].

Findings and their discussion. LingoJam is a free online service that allows you to create interactive computer models of a translator for any language pair and subject. LingoJam allows you to specify for the created translator: Name (will appear as your translator's name); Subtitle (appears below the translator's name); Description of the created translator; Language1 name (source language name); Language2 name (the name of the target language of translation, although LingoJam allows translation in both directions). LingoJam allows you to customize the work of the translator with individual tokens

(prefixes, suffixes, Intrawords), use Regex (regular expressions) to create your own translation rules. The syntax used by LingoJam is that of JavaScript.

Context translator (hover translator) is an application that provides translation of the text under the mouse cursor. Such work scheme saves time, does not distract the user from work, allows to quickly catch the general sense of the text. Context translation of selected words and sentences from English into Russian can be modeled with the help of heuristic use of standard HTML tools in the computing environment of a browser. To create a working model of the translator, it is proposed to enclose the selected text in the code of the page into a container with tags with its translation (interpretation) according to the template: original text .

The translation of the phrase «Lerne eine Fremdsprache in Brest und Vitebsk» from German into English: Lerne eine Fremdsprache in Brest und Vitebsk.

This model also allows to provide word-by-word translation of linked text or serve as a context electronic dictionary. To do this, it is appropriate to apply a template of the proposed code to each structure to be translated (in this case to each lexeme). For example:

Guten Tag
Auf Wiedersehen
Danke
Entschuldigung

Didactic possibilities of such models of translators:

- personally oriented approach (combines personalized, optimally selected material that is adequate to students' level of knowledge, interests and needs);
- subject specificity (contain a necessary and sufficient set of language constructs and vocabulary units that do not allow the accumulation of redundant information, thus contributing to better learning). [3].

The creation of the proposed models of computer translators is simple and affordable for the students themselves. The creation of models of computer translators by students is of particular importance in the context of learning a foreign language. In this case, training becomes productive in combination with the production of training material. In the process of creating models of translators, as an educational task performed under the guidance of a teacher, the student will work with lexical and grammatical material, choosing synonyms, antonyms, learning the meanings of new words. The creation and evaluation of computer translator models should be led by a teacher.

Conclusion. We have developed working models of computer translators (Russian-English and English-Russian; Russian-German). They can be used as a means of learning the software topic «English (German) Etiquette for beginners» in the 4th grade of secondary school. The proposed modeling of computer translators as learning tools can be carried out by teachers both English and German language. The creation of models of computer translators

can also be done by students, as a learning task in the context of learning a foreign language.

1. LingoJam (Computer Translator Model Builder) [Electronic resource]. – Mode of access: https://lingojam.com/ – Date of ac-cess: 02.11.2020.

2. The title attribute (HTML document) [Electronic resource]. – Mode of access: https://html.spec.whatwg.org/#the-title-attribute – Date of ac-cess: 02.11.2020

3. Huseva A.V. Multi-lingual dictionary as a didactic tool for learning a foreign language / A.V. Huseva // The Youth of the 21st Century: Education, Science, Innovations : Proceedings of VI International Conference for Students, Postgraduates and Young Scientists, Vitebsk, December 12, 2019 / Vitebsk State University ; Editorial Board: I.M. Prishchepa (Editor in Chief) [and others]. – Vitebsk : Vitebsk State University named after P.M. Masherov, 2019. – 446 p. – P. 17-19.

APPLICATION OF THE CONCEPT DERIVATIVE IN ECONOMY

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Modern mathematics is characterized by intensive penetration into other Sciences. Mathematics has become for many branches of knowledge a method of precise research and a means of extremely clear formulation of concepts and problems. Without modern mathematics with its developed logical and computational apparatus, progress in various fields of human activity would not be possible.

Economics, as the science of objective reasons for the functioning and development of society, uses a variety of quantitative characteristics, and therefore has incorporated a large number of mathematical methods and models. In this work, we want certain examples to show mathematical models of different types of economic problems, as well as to delve into the term derivative in the economy as a whole.

The relevance of this topic lies in the fact that modern economics uses optimization methods and mathematical models, which form the basis of many applied sciences. The aim of this work is to find out what new opportunities differential calculus offers for economic research [1, p.3].

Material and methods. We used the basic method of mathematical modeling – a way to formally describe often poorly formalized phenomena, processes, and systems based on static data analysis. In the study of economic problems, it was necessary to analyze and solve equations that include both the system parameters and the rate of their change, the analytical expression of which is derivatives

Findings and their discussion. The use of the derivative in economics allows us to obtain the limiting characteristics of economic objects or processes that characterize not the state, but the rate of change of an economic object or process over time.