

The Technology for Creating an Educational English-Russian-Sakha Terminological Dictionary of Thesaurus Type for Bilingual Students

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Abstract. The article describes the technology for creating a thesaurus-type dictionary for bilingual students at a technical university. The authors use the thesaurus approach to compile the dictionary. The suggested approach attracts students' motivation for studying the discipline, activates their cognitive activity, and influences the best perception of the studied material. The developed dictionary consists of 4 parts: classification, contextual, ideographic and alphabetical index. The classification part contains logical and semantic structures of topics and subtopics, the contextual part contains definitions of leading word concepts, the ideographic part is represented by a set of dictionary-conceptual articles, and the alphabetical index is an alphabetical list of all significant words that are part of the thesaurus terms. The peculiarity of the developed dictionary is its orientation to bilingual students, whose native language is Sakha. The terms of the oil and gas industry, difficult for bilingual students to understand, were translated into the Sakha language using associative words and added to the glossary of the dictionary.

Introduction

In the context of intensive integration processes in the world community, globalization of science and technology, accelerating of technological progress professionally oriented teaching of a foreign language at a technical university is of particular importance. Among the graduates of the educational institutions, the most demanded are the specialists who possess not only fundamental and applied knowledge in their professional field, but who are also familiar with leading international standards, are able to work in multinational teams, adapting their speech and non-verbal behavior to the behavior of a foreign cultural communicator.

The analysis of the regulatory documents in the field of higher education allows us to record significantly increased demands of society to the competences of a modern technical specialist [1]. At the same time, in a real educational process, teachers note a relatively low level of knowledge of a foreign language by future specialists, insufficient to solve a wide range of tasks in the professional and scientific fields of activity. The observation of teaching foreign languages for technical students, including "Petroleum Engineering" major in particular shows that the achievement of the goals stated in the standard is hindered by:

- low labor intensity of the discipline "foreign language";
- different level of language training of applicants;
- a great need for software in the form of special terminological dictionaries in the field of "Petroleum Engineering".

In addition, a rapid development of oil and gas sector in Sakha republic brought to an acute demand for local, highly-qualified and internationally competitive petroleum engineers.

Teaching a foreign language in multilingualism

The last decade has witnessed a rapid increase in interest in multilingualism. In the Republic of Sakha (Yakutia), it is necessary to take into account the multilingualism of the student audience, objective difficulties encountered by Sakha-speaking students in mastering a foreign (English) language, which they master through the prism of another state (Russian) language. Sociolinguistic, psycholinguistic and educational aspects of multilingual teaching were formulated in the work of U. Jessner [2]. Most students of technical universities in our republic are bilingual and knowledge of two languages—Sakha and Russian—makes up the background on the basis of which English is taught, thus forming a subordinate triglossia.

Observation of the educational process in a foreign language and our experience in a technical university show that in the course of teaching foreign vocational-oriented vocabulary, Sakha students have a number of difficulties that can be divided into two groups:

1) interlanguage (mismatch of the word meanings in the Sakha, Russian, English languages; borrowings from different languages of words of the same lexical paradigm; lexical compatibility, leading to linguistic interference, etc.);

2) intralanguage (the use of words in a specific situation; a large number of synonyms that differ in connotative meanings; metaphorical English terms, etc.);

In these circumstances, teachers of a foreign (English) language need new teaching methods and technologies for Sakha-speaking students, taking into account the linguistic features of the terminological system and the scientific and technical style of three languages (Sakha, Russian, English), the specific manifestations of the phenomena of transfer and interference in the context of mastering special vocabulary, the mechanisms of switching from one language code to another, and the features of the conceptual representation of the lexical systems of the three languages in student's mind.

The process of teaching a foreign language in a technical university is aimed at introducing students to a new language code, as a result of which they should form a professional picture of the world with its universal and cultural-specific characteristics.

Thesaurus approach to creating a dictionary

The aim of our study is to create a thesaurus-type English-Russian-Sakha educational dictionary for students of the Petroleum Engineering Department, contributing to the successful formation of the professional communicative competence of bilingual students in a technical university.

In our opinion, a foreign-language professional thesaurus is worth giving priority in the process of teaching a special language to any subject area. At different times, A. A. Zalevskaya [5], Y. N. Karaulov [6], A. I. Komarova [7] and others dealt with structuring professionally oriented thesauruses in domestic science.

Having made a content analysis of this term in different contexts and in its various interpretations in a number of sciences, two semantic groups of its definitions can be distinguished: 1) thesaurus—information and knowledge base; 2) thesaurus—a dictionary.

It should be noted that the concept of a thesaurus has an abstract meaning, however, a number of authors put forward the idea of structuring it, considering the thesaurus as an ideographic dictionary, “where semantic relationships (genus-species, synonymic, etc.) between lexical units are shown ...”; dictionary, where “the most complete words of the language are presented with examples of their use in the text”; a dictionary seeking to give a description of the vocabulary in its entirety and, as it were, reflecting thereby the “picture of the world” and others [8]. The prime function of a thesaurus is to support information retrieval by guiding the choice of terms for indexing and searching [9].

Most of the thesauri that exist today are dictionaries, which reflect the connections that each individual word has, in accordance with the modern concept of systematic vocabulary. In such dictionaries, the semantic relations of words are conveyed by a grouping of words into thematic sections [10].

G. R. Chaynikova, L. P. Shishkina [11] and T. S. Serova [12] considered the structure of the thesaurus as a dictionary-edition, consisting of four parts:

1. classification part, consisting of logical-semantic structures of topics;
2. listing and definitions of key concepts;
3. the ideographic part, represented by dictionary conceptual articles, which reflect the logical-semantic paradigmatic and syntagmatic relations;
4. alphabetical index of words.

G. R. Chaynikova supplemented the structure of the dictionary with an encyclopedic part, which allows solving the problem of contextual information [11].

T. S. Serova identified the following main advantages of the thesaurus approach to the organization of the lexical field:

- expands the number of possible “access points” to the vocabulary of the language;
- makes it possible to systematically organize vocabulary, while avoiding the grouping of words random in the meaning;
- allows to achieve the full coverage of the texts “by increasing the totality of relations”;
- allows to create a thesaurus dictionary, which in its structure resembles a “cast” of lexical information in memory [12].

Thus, the thesaurus as the optimal way to organize the totality of concepts of a particular field of knowledge with all related vocabulary allows thematically present and classify the terminology of a specific field of knowledge and reflect the relationships between the terms, thus creating a complete picture of the world of the subject area.

Creating an English-Russian-Sakha terminological dictionary of thesaurus type for bilingual students

Based on the foregoing, we have developed a technology for creating an educational English-Russian-Sakha terminological dictionary of thesaurus type for students of the Petroleum Engineering Department. By technology, we understand the system of interconnected actions of the teacher’s activity and the educational and cognitive activity of students aimed at solving educational and educational-cognitive tasks that implement personal and instrumental means to achieve educational goals.

First stage: creating a terminological dictionary of thesaurus type

We offer the following sequence of actions when creating a terminological dictionary of thesaurus type:

First, the teacher needs to identify the motivational readiness of students for educational activities in general, and the study of a foreign language, in particular. In case of low motivation, the educational process should be organized to increase it.

As a result of checking the questionnaire to determine the motivation of students, we revealed the following: broad social motives, the motive of duty and responsibility come to the fore. Many people study a foreign language only because it is included in the curriculum, but they do not believe that learning a foreign language is the duty of the student as a member of the study group, institute, and future specialist. As for the professional motive, some of the students think that they less need a foreign language to read literature in their major, are pessimistic about the possibility of using a foreign language in their future professional activities, but they also understand that knowledge of a foreign language makes it possible to obtain a promising, high-paid work.

The high level of external motivation revealed as a result of the questionnaire prompted us to build a new strategy for teaching a professionally-oriented foreign language, namely, involving students in the work on creating a terminological dictionary. This strategy helps to increase the internal motivation of students, if at the same time we use their various abilities, skills and knowledge, using active teaching methods that reveal the creative and intellectual potential of students.

Project stage: compiling the terminological dictionary by project method

When compiling the terminological dictionary, we applied the project method, which contributes to the formation of critical and creative thinking as a priority area of human intellectual development. It is the formation and development of students' intellectual skills, their moral development is a strategic direction in the development of education in world pedagogy.

The didactic goal of the project was to build competence in the field of independent cognitive activity, critical thinking, teamwork skills, and the acquisition of independent work skills with large amounts of information in their professional field, the ability to select the necessary information from different sources, analyze the information received, and draw reasoned conclusions.

The structure of the project work was as follows:

- approval of the project topic, type of project, number of participants;
- distribution of the task into groups, discussion of possible research methods;
- independent work of project participants in their group research tasks;
- conducting intermediate discussions of the data obtained in groups in the lesson of a foreign language;
- defense of projects;
- collective discussion, examination with the teacher of Petroleum Engineering Department;
- implementation of the results in education process.

The main objective of the project is the manufacture of a product (in our case, a dictionary) based on familiar professional knowledge and situations and the possibility of using the resulting product in educational activities.

The traditional structure of the terminological dictionary of the thesaurus type described above became the basis of our dictionary.

The participants of the project work were divided into groups of two or three people, where one of them spoke Russian, and the other participant was a native speaker of the Sakha language. This division is due to the results of monitoring the work of students with professionally oriented text, namely the translation. Recently, along with the development of modern online translation systems, students quickly and easily translate a particular text without delving into the essence of the content. As the observation shows, Russian-speaking students can correct endings in the text, find synonyms for inappropriate words, and Sakha students in many cases translate without correcting grammatical or lexical errors. But this does not mean that Russian-speaking students fully understand the essence of a professionally oriented text, since subsequent tasks, for example, answering questions, are difficult to complete. Another criterion for separation was the level of formation of students' lexical and grammatical skills, which was determined by the results of closed tasks prepared by the author in the form of tests using the multiple choice technique.

At a logical-conceptual analysis stage students needed to highlight noun terms that reflected the leading referents of the topic. The highlighted terms in the analysis of the texts were divided into the topics, their logical and semantic structures were created, and the hierarchical relations of the terms were clarified. Also, when highlighting the terms, knowledge from different fields, professional interests were taken into account. As a result, nine topics were selected: "Oil and Gas Industry", "Oil Corporation", "Exploration", "Extraction", "Drilling", "Refinement", "Transportation", "Selling", "Safety". These topics cover the terminology that has the greatest frequency and significance for the field in question and serves as the basis for the formation of a more complete vocabulary necessary for professional activities.

In compiling the DCA, students needed to highlight the paradigmatic and syntagmatic relationships of key terms in the texts. The main semantic relations on the paradigmatic level were generic relations based on the principle of hierarchy, as well as their relationships, such as synonymy and part as a whole. Relations on the level of syntagmatics were determined by the connection of things with the objective reality. On the example of oil and gas industry, the following relations were distinguished: action—the subject of action; action—tool; action—goal; action—problem; subject—property; subject—location.

The solution of each stage was accompanied by intermediate discussions of the data obtained in groups at the classes of a foreign language.

Associative experiment

One of the key points in the development of the terminological dictionary was the identification of associative relations of terms in the minds of Sakha students. Based on life experience, horizons and the level of education of students, a free associative experiment was conducted to identify the associations of a term with the surrounding reality. The experiment participants were second-year students of the Mirny Polytechnic Institute (branch) of the M.K. Ammosov North-Eastern Federal University. As a rule, a free associative experiment captures the first reaction to a word—a stimulus, but in our case we gave students time to think and choose the right associate. For example, on the stimulus word “wellbore/well” such associates as “hole; deep, drill the earth, pump; needed for oil production”. Based on the results of this free associative experiment, we identified the following identification models:

- recognition of the stimulus through a reaction calling the action indicated by the stimulus;
- identification of the value of the stimulus through the characteristic;
- explanation of the stimulus through a motivating word;
- definition of the value of the stimulus as an associative reaction;
- recognition of the meaning of the stimulus through the name of the subject, implying actions.

This model is common when identifying professions.

Associates identified by these identification models are auxiliary tools for memorizing key oil and gas terms by Sakha students.

An alphabetical index of words was formed throughout the work, students kept their own vocabulary of lexical minimums.

Final stage: production of an electronic terminological dictionary of thesaurus type

The final stage of the experiment was the production of an electronic terminological dictionary of thesaurus type which began with the development of a computer program. We used the Delphi 7 language with its own code. This dictionary also represents a concept-oriented terminological database, which acts as a means of structural organization of information in knowledge bases, allowing you to quickly track the relationship of terms. The advantage of the database is the simplicity of using the conceptual system fixed in it for modeling the development of human knowledge.

Summary

Thus, as the investigation manifested, the thesaurus approach in teaching a foreign language helps to streamline and normalize vocabulary on the topic and identify the system of concepts in the area of knowledge, and the educational terminological dictionary of the thesaurus type is an important means of achieving effective communication of future specialists in their professional field.

The results of experimental training showed that the inclusion of aspects of the native language, namely, associative words and definitions of key oil and gas terms and concepts in the Sakha language, contributes to the successful assimilation of their meanings and their further use in professional foreign communication of bilingual students.

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