ASPECTS OF TRANSLATING SCIENTIFIC AND TECHNICAL TEXTS FROM ENGLISH INTO RUSSIAN FOR SPECIALISTS WITH TECHNICAL EDUCATION

ASPECTOS DA TRADUÇÃO DE TEXTOS CIENTÍFICOS E TÉCNICOS DO INGLÊS PARA O RUSSO PARA ESPECIALISTAS COM FORMAÇÃO TÉCNICA

ASPECTOS DE LA TRADUCCIÓN DE TEXTOS CIENTÍFICOS Y TÉCNICOS DEL INGLÉS AL RUSO PARA ESPECIALISTAS CON EDUCACIÓN TÉCNICA

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ABSTRACT: This article analyzes various difficulties that are usually encountered by specialists with technical education when translating scientific and technical texts. And although the purpose of any translation is to convey the content of any text as accurately as possible, nevertheless, one should not forget about the peculiarities of translating scientific and technical texts. In most English scientific and technical texts there is a huge number of technical terms, and much more than in European languages. Therefore, when translating such kind of texts, it is necessary to take into account their specifics and, accordingly, competently select the means for the most accurate translation of the content of such texts, while preserving its lexical, grammatical and substantive aspects.

KEYWORDS: Terminological saturation. Word-Formation model. Uncomplicated attributive constructions. Abbreviation.

RESUMO*: Este artigo analisa diversas dificuldades que normalmente são encontradas por especialistas com formação técnica na tradução de textos científicos e técnicos. E embora o objetivo de qualquer tradução seja transmitir o conteúdo de qualquer texto com a maior precisão possível, não se deve esquecer das peculiaridades da tradução de textos científicos e técnicos. Na maioria dos textos científicos e técnicos em inglês há um grande número de termos técnicos, e muito mais do que nas línguas europeias. Portanto, ao traduzir esse tipo de texto, é necessário levar em consideração suas especificidades e, para tanto, selecionar com competência os meios para a tradução mais precisa do conteúdo de tais textos, preservando seus aspectos lexicais, gramaticais e substantivos.*

PALAVRAS-CHAVE*: Saturação terminológica. Modelo de formação de palavras. Construções atributivas descomplicadas. Abreviatura.*

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***RESUMEN**: Este artículo analiza diversas dificultades que suelen encontrar los especialistas con formación técnica a la hora de traducir textos científico-técnicos. Y aunque el propósito de cualquier traducción es transmitir el contenido de cualquier texto con la mayor precisión posible, sin embargo, no se deben olvidar las peculiaridades de traducir textos científicos y técnicos. En la mayoría de los textos científicos y técnicos en inglés hay una gran cantidad de términos técnicos, y muchos más que en los idiomas europeos. Por lo tanto, al traducir este tipo de textos, es necesario tener en cuenta sus especificidades y, en consecuencia, seleccionar de manera competente los medios para la traducción más precisa del contenido de dichos textos, preservando sus aspectos léxicos, gramaticales y sustantivos.*

***PALABRAS CLAVE**: Saturación terminológica. Modelo de formación de palabras. Construcciones atributivas no complicadas. Abreviatura.*

Introduction

The main purpose of any translation, including technical translation, is to convey the content of the original text for its translation by means of another language, while preserving its lexical, grammatical, stylistic, and substantive aspects. Thus, we transfer the information of the source text to the information in the target language. It is important that the unity of content and form be preserved, but on a new linguistic basis. It is necessary to take into account the fact that a completely accurate translation is impossible due to significant differences in grammar, the number of words and in different cultures. It is necessary to take into account the logic and correctly select the translation options (equivalents). The demand for specialists with knowledge of foreign languages is caused by the wide opportunities to represent our country at the international level (ANIKEEVA, 2006; KONYAEVA, 2015).

Methodology

The methodological basis for studying this article is various difficulties in translating scientific and technical texts. With the wide spread of various novelties in the world of technology, numerous terms for their designation have appeared, which do not always manage to find the appropriate meanings and equivalents. It is also necessary to take into account the lexical and grammatical features of the language when translating such texts in order to convey their content as accurately as possible. This study is based on data from scientific and technical articles, a survey of specialists with technical education, which helped to identify some problems that arise when translating scientific and technical texts.

Results and discussion

Scientific and technical translation from English into Russian, due to its peculiarities, requires certain skills. Its task is to translate scientific and technical information from one language to another one. This translation combines the scientific style of presentation and the specifics of technical sciences. In this case, those who deal with it, for example specialists with technical education, quite often face peculiarities and difficulties, without knowledge of which mistakes can be made even with a very good command of English. One of the types of translation is the translation of scientific and technical texts in various technical specialties.

The most popular translation is a written translation. It is time-consuming and must meet certain criteria and implies a very good knowledge of the English language, the ability to present the material as close as possible to the original source, to possess publicly available information and knowledge in the field of the translated text (KOROTKINA, 2012).

Scientific and technical translation is characterized by logic, accuracy, and terminological saturation taking into account ambiguity (*for example, the word "wire" can be translated as wire, telegraph, tire, etc.)*, lack of emotions, which means presenting only facts without expressive statements, as well as the predominance of complex constructions with various subordinate clauses, which makes the text cumbersome and makes it difficult to perceive, and all thoughts and ideas in such a text are stated accurately, dryly, logically, scrupulously, and impersonally. It can be noted that the style of scientific papers in English is in many ways similar to the Russian scientific style, however, as in other languages. It is necessary to take into account the specifics of the translation of both general scientific, popular texts and narrow-profile ones, also taking into consideration the author's primary sources and context.

What are the difficulties and features of scientific and technical translation of articles from English into Russian? First of all, the main difficulty is the abundance of terms (neologisms), which are due to the rapid development of science and technology. Therefore, it is necessary to have a special dictionary or consult a specialist in a particular field of science.

Indeed, the word term is peculiar and some linguists consider it as a scientific jargon. Terminology is mainly formed from classical and neoclassical combinations, producing complex lexical constructions with different spelling and pronunciation: these constructions are subject to change as disciplines develop and are used by professionals in these disciplines (MIKHEEVA, 2019). The term is characterized by unambiguity, abstraction, logic, consistency and lack of emotional coloring. But in the English language there are many terms

that have more than one meaning, thus, the word-term gun has as many as 7 meanings: *cannon, cannon shot, tubular guide of a cannon installation, firearms, pistol, machine gun, shotgun.*

For example, in a technical translation, the word pattern also has a number of meanings: image, drawing, picture, structure, raster, directional pattern, scattering, and others, so it is important to choose the option that corresponds to the content and subject of the translated text. These correspondences are needed if there are several variants of words in the translation language that convey the meaning of the original word. For example, the English word soldier has the following correspondences in Russian: *soldier, military, ordinary soldier*. The same can be attributed to the definition of flying*: flying (helicopter), flying (vehicle), flying (weather), volatile (chemical element).* There is no ambiguity here, because Russian uses more differentiated definitions compared to English. Sometimes several English words with the same meaning can correspond to one Russian word. For example, the noun structure can be translated as *structure or construction*. Each of the above meanings has special secondary features and the use of each of these meanings in translation should be disclosed in phrases. Usually, separate terms with a simple, derivative and complex structure are considered as the basis of English word-terms. Thus, expanded phrases often interact with some word-forming affixes (prefixes and suffixes) and as a result, interesting examples of derived terms are obtained, such as national guardsman – *a member of the national Guard* (YABLOKOVA, 2012).

Word formation includes several categories: affixes (prefixes and suffixes), conversion, word composition, alternation of sounds and accents, abbreviation. The concept of word production includes affixes, conversion and alternation of sounds and accents. In this case, the focus is on the generating bases, which serve as the basis for the formation of a new term (affixes) (YUDINA, 1981).

In a technical text, almost every well-known word can turn out to be a term. So, in naval terminology, "man-of-war" is translated as "*a warship (and not as a soldier)*, in the mechanics text *"no play is admitted"* does not mean *"you can't play"*, but *"backlash is not allowed*". In aviation, the familiar word "structure" should be translated not as "structure", but as *"construction"*. For example, "aircraft structure" means *"aircraft design"*. Another example of the ambiguity of the term is the word "pocket" - (pocket) having the following meanings – *"air pit" (in aviation), "environment" (in military science), "dead zone" (in radio engineering), "cable channel" (in electrical engineering), "nest deposits" (in geology).*

In order to avoid problems with translation, it is important to know about such a concept as "professionalism". These are words and expressions that are common among people of a certain profession or a specific field of activity. They often penetrate into general literary usage and act as colloquial and emotionally colored equivalents of terms (USHAKOVA, 2017). They also represent figurative names of production processes, tools and products of labor, inventions, etc. For example, tin-fish *(literally tin fish)* is translated *as a submarine*, and block-buster *(literally sweeping away a block)* - professionalism, which should be translated as a special bomb for the destruction of large buildings.

The emergence of professionalisms in the language is associated with the emergence of new subjects that need to find the appropriate and most understandable new name. Professionalisms are actually the same terms and they are called professionalisms when it comes to a specific narrow-profile professional field.

When translating texts with professionalism, 3 groups of translation techniques are used: lexical, grammatical, and stylistic. Lexical techniques include transcription, calcification, description, semantic modification, commentary, functional substitution (zero translation). Calculus in linguistics is the borrowing of foreign words, expressions, phrases by literal translation. Terms and commonly used words and phrases are usually calcified. For example, "cyber store" is an online store and others. Many examples of calculus can be found in the novels of Arthur Haley, who immerses readers in the professional activities of people described in his novels ("Airport", "Wheels", "Hotel", etc.) So, "the lion gate" *(literally the lion cage)* in his novel "Airport" was translated as *a luggage compartment*, and loaders call it a lion cage, meaning that only brave and naive passengers hand over what is dear to them in luggage (SALIEVA, 2019).

It should be noted that one of the important features of scientific and technical texts in English is the absence of the use of Perfect Continuous tenses. This may be due to the specifics of the meaning in this time group, which expresses a long-term action that has just ended or is continuing. In scientific and technical texts, which contain mostly clear, and pragmatic information, it is practically impossible to use this group of tenses because of the very long segment of the action being performed. Of course, you can use the times of the Perfect Continuous group if we are talking about some long-term technical projects, which are currently very few due to the high cost of such projects.

Speaking about the usage of grammatical techniques, functional substitution or null translation is often used (using a different grammatical form in translation). " These airplanes were in a holding area which pilots called "penalty box" - *these planes were kept in the so-*

called "pre-landing" i.e., in a special waiting area. The literal translation of "penalty box" is *a penalty box bench or a penalty area.* This is an example of borrowing from sports, where this expression has become a professionalism in aviation.

Another difficulty in translating technical texts are chains (groups) of nouns. It is a series of three or more nouns representing a single concept. In such a chain, the main noun is always at the end, and all the preceding words are definitions to it. For the first time, the concept of "noun chain" was introduced by the lawyer-historian Richard Wydik in 1979 after the publication of his book "Simple English for Lawyers" and refers to the specifics of the English language. Usually there is an article in front of the chain.

When translating the texts of scientific and technical literature, the greatest difficulty is represented by multicomponent, uncomplicated attributive constructions - terminological combinations (SHEVCHUK, 1983; TATARINOV, 1996).

It is necessary to take into account the fact that within the chain itself there may be nouns defining one of the nouns of the chain. Here is an example - "a super high voltage transmission line" - *a transmission line of ultra-high voltages.* With the translation of a chain of nouns in the presence of a union, you should be very careful. For example, "signal and image processing" should be translated as *processing of signal and image*. Here the word "signal" is connected in translation with the word *"processing" only indirectly through the word "image"*.

The chain can consist of 3 words, the middle one is an adjective, a participle or a gerund; therefore, it is very important to determine the correct order of translation of the parts of speech that are part of it. In this case, the translation should start with the last word and follow the translation in reverse order (from right to left). At the same time, the grammatical form of the middle word in translation is not always observed. For example, "the round-feeding system" (feeding – participle I) is *the projectile feeding system*; "a job scheduling problem" (scheduling –gerund) is *the problem of scheduling work*. And if the middle word is expressed by an adjective, then in this case you can use a preposition when translating. For example, "a pilot-dependent situation" is *a situation which depends on a pilot*. Or without a pretext – "a fault-free device" is *a serviceable device*. It is necessary to clarify the fact that in the chain of definitions there may be adjectives related to both the main word and the noun-definition. In this case, if such an adjective is the first one, then it often still refers to the last (main) noun. For example, "This interesting electricity issue is being discussed now" - *this interesting question concerning electricity is being discussed now.* But it must also be kept in mind that the adjective standing first in the chain can determine the noun following it, and not

the last. For example, "This gear performs straight line motor" - *this mechanism performs movement in a straight line*.

It should be noted that all the polynomial attribute groups are diverse in their composition and character. They are used in English scientific and technical sources for greater conciseness and economy of the text. The task of the translator is to understand the semantic and syntactic relations of their components (YUSUPOVA, 2015). Moreover, it is important to understand that compound (multicomponent) nouns are not always acceptable from a stylistic point of view, so they should not be abused.

Texts of a scientific and technical nature usually abound in the lexical and grammatical category of adverbs (YUDINA, 1981). The most productive way of forming adverbs is the suffix *-ly*. This is the equivalent of the Russian ending *"o"*. For example, visually. But it should be taken into account that sometimes adverbs are translated descriptively using the words "from the point of view or using". For the first time this term was used in the works of the English linguist Henry Sweet in 1891. It appeared as a result of the loss of the infinitive suffix in many verbs and nouns that are close in meaning. It was the phonetic coincidence of a number of nouns and verbs of the same root that served as a word-formation model for the development of conversion.

Now let's analyze the conversion examples in English. It is primarily a noun - verb, which is the main source of conversion. For example, access – to access. This is especially noticeable in connection with the spread of online services and technologies. For example, e-mail – to e-mail, YouTube - to YouTube, skip - to skip, google - to Google. Further, according to the degree of distribution, there is a “verb – noun" conversion, which conveys the meaning of one action, its result, process or state. For example, to break – break and to point - point (point, question, moment). The "adjective - verb" conversion has the meaning of bringing into a state associated with the original adjective. For example, thin (thin) – to thin (to make thin, disperse).

Adverbs can be formed from adjectives not only with the help of the suffix *"ly"*, but also by adding the roots of several words - everywhere (every + where). Less common is the conversion of "preposition /adverb /conjunction– - ups and downs *(jumps, changes)*.

Another difficulty in translating scientific and technical texts is the discrepancy between the requirements for abbreviations, GOST parameters in different countries, which may differ significantly from each other. For example, in English technical literature, all parts of speech are reduced – "assembly - assy", "without - w/o", "weight to volume - w/v", etc. In addition, there are difficulties in communicating the coherence of the text, because very often

translators tend to change the structure of a sentence or an entire paragraph, as well as dismemberment of the original text. A thorough analysis of the context is required, as well as knowledge of the subject of translation (KOROTKINA, 2019).

As mentioned earlier, numerous abbreviations can often be found in English technical texts. Abbreviation is the process of forming words by reducing the initial elements (letters, syllables, morphemes, phrases). This is one of the youngest ways of word formation and because of it, its study began quite late (SUDOVTSEV, 1989). Thanks to this method, space is saved when translating, because instead of bulky and long turns, short and understandable words are formed, the meanings of which are familiar to translators. The prerequisite for this is that most of the new, modern concepts are expressed in the English language with the help of complex phrases, because it is these types of terms that make it possible to clearly reflect the signs of a particular concept with the greatest completeness and accuracy. For example, the word LASER is a well-known abbreviation of Light Amplification by Simulated Emission of Radiation *(amplification of light as a result of forced radiation)*. Here are other examples: co - company, dept. – department, approx. - approximate/approximately, HQ - Headquarters (headquarters, ETA - Estimated time of Arrival), IT - Information Technology - information Technology, VTOLV - Vertical Takeoff and Vertical Landing, SEO Search Engine Optimization, HF - high frequency (high frequency), IR (infra-red), etc (CHERNOVETS, 1983).

The abbreviation is especially widely used when learning English for business - HR - Human Resources (HR department), R &D - Research and Development (research and Development department), P&L - Profit and Loss (profit and loss), ED - Executive Director (executive Director) and others.

Conclusion

Over the past two decades, interest in scientific and technical translation has increased due to globalization, the growing number of international organizations in the domestic market, and the accelerated development of digital technologies, in particular, the Internet. Therefore, the need for training specialists in scientific and technical translation, including in English, is increasing, since numerous technical innovations and inventions that require high-quality translation are constantly appearing in the world. It should be noted that teaching written scientific and technical translation in the system of higher professional education in Russia is an important part of educational programs, despite the fact that the main focus has

recently been on oral speech. Translators of this kind of literature need to improve their translation skills, since good linguistic training and the study of the peculiarities of the translation process, depending on the scope of its application, affects the professional competence of a modern specialist.

In conclusion, we note that both Russian and foreign researchers recognize the difficulties in translating technical texts, as well as the need for a comprehensive study of them.

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