

## **Impact of the Google Translate Machine Translation System on the Quality of Training Student Translators**

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### **Abstract**

Currently, an important place is given to the formation of a humanitarian orientation in the use of computer technologies, which is directly related to the profession of the future translator. The purpose of the study is to conduct an experiment to determine the impact of using a machine translation system on the quality of teaching students to translate texts in terms of the number of errors and the correctness of the industry terminology convey.

The article substantiates the relevance of the introduction of machine translation systems into the educational process of teaching a foreign language, presents various approaches to the study of machine translation features, and considers various classifications of machine translation systems.

The article presents the results of an experimental study of the use of a machine translation system by students in terms of the quality of text translation – the number of errors and the correctness of the industry terminology convey.

It has been concluded that the use of the machine translation system has had a significant positive impact on the quality of training in the translation of professional texts, both in terms of the number of errors and in terms of the convey of the key terminology of the original text. The novelty of the research consists of conducting an experimental study on the influence of the use of machine translation systems by students on the quality of text translation.

## **Keywords**

Machine Translation, Machine Translation Systems, Google Translate, Future Translators, Translation Errors.

## **Introduction**

The relevance of the research is explained by the fact that a modern translator from year to year uses information and communication technologies more and more intensively in his/her activities since it is impossible to maintain competitiveness in the market of translation services without them. To date, machine translation has become one of the key translation technologies, the quality of which has been significantly improved due to the use of so-called neural networks (Cho et al., 2014).

Scholars from various fields of science – from computer science and linguistics to psychology and pedagogy – were engaged in the problems of machine or automatic and automated translation. M.D. Okpor dedicated his research to machine translation as a direction, its specificity, positive and negative factors (Okpor, 2014); the work is devoted to the features and the latest trends in machine translation (Costa-Jussa, Fonollosa, 2015). Scientific research (Sennrich, Haddow, Birch, 2016) deals with the problems of using machine translation when translating rare words. Studies (Bentivogli et al., 2016; Fiederer, O'Brien, 2009) raise questions about the quality of machine translation.

Research is devoted to the use of machine translation in the study of foreign languages (Raheem, 2020; Case, 2015; Garcia, Pena, 2011; Anderson, 2013; Niño, 2009; Zanettin, 2009; Briggs, 2018) considered the use of machine translation systems by students of non-linguistic specialties. In his opinion, further theoretical research should be conducted for the training of such students to develop and implement didactic tasks in the educational process that can increase motivation for high-quality translation of professionally oriented texts.

A. Fernández-Torné, A. Matamala (2021) offer classifications of machine translation systems that exist, emphasizing that each translator can choose the system of machine translation that will respond to his/her personal needs and tastes. The researchers studied

the impact of translation technologies (including machine translation) on the translation process and the result (Castilho et al., 2017), the impact of specialized post-editing training on quality and productivity (Cadwell et al., 2016).

Today, there are several classifications of machine translation systems. Thus, machine translation software (MTS), following the classification (Li, 2013; Laximi, Kaur, 2013), which focuses on the methodology of linguistic research, are divided into direct-type MTS, transfer MTS, and semantic-type MTS. Direct-type MTS are the most numerous since they began to be created in the 1950s and 60s for fixed language pairs. The dictionary and syntax of the incoming language in them are analyzed only to identify the correct expressions and the order of words of the outgoing language. Semantic-type MTSs (using an intermediary language) are used to display the "meaning" of the source text, which is converted into semantic and syntactic representations that are common for several source languages. This method is usually used when translating into multiple languages. Transfer MTSs are more complex than the previous types since intermediary languages are used twice – the first time when translating from the source language, the second time when translating to the source language. In this case, an additional stage of translation becomes necessary – from the intermediary language of the source language to the intermediary language of the source language. Thus, deeper linguistic analysis and synthesis are achieved.

From the user's point of view, according to researchers (Luong, Manning, 2015; Klubička et al., 2017), MTS can be divided into three types: informational, professional, and personal. Informational MTS are designed to help those who need access to information in a foreign language and who are willing to use a "rough" but fairly understandable translation. These MTS usually have dictionaries of considerable volume, but do not rely on the latest achievements in linguistics and programming. Professional ones allow creating translation notes for professional translators. These MTS are used less and less often today – as a rule, with a large volume of current translation work that is performed simultaneously by many specialists in the same subject area. Most often, translators are provided with automatic dictionaries in these situations, thesauri with interactive access, or systems called "Translator's Memory". Personal machine translation systems usually "work in dialogue" with the user and can give a satisfactory translation (the quality of which still depends on how well the author knows the source language).

Undoubtedly, all these works have made a significant contribution to the study of machine translation systems, but the study of the use of machine translation systems is only at the initial stage, and therefore there is a need for research on various aspects of the operation

of these systems. It is especially important to analyze the impact of the use of machine translation systems on the quality of teaching students a foreign language because such studies can establish the feasibility of using machine translation systems while teaching students to translate texts of various subjects, which makes our research in-demand and timely.

**Research hypothesis:** The use of a machine translation system can have a significant positive impact on the quality of teaching translation of professional texts: the translation of a text performed by students using machine translation will be better than a similar translation of a text performed by future translators without using a machine translation system in terms of the number and quality of errors (errors that do not affect the meaning of the translation text), as well as in terms of the convey of the key terminology of the original text (the percentage of the correctness of the convey of terminology by the system will be higher).

### **Research Objectives**

- To select text for research and make a glossary with key terminology based on selected text.
- To select students of the experimental and control groups to perform text translation and machine translation system.
- To determine the procedure for evaluating errors in the translated texts and check the translation texts based on the described evaluation procedure.
- To carry out quantitative processing of experimental data, to identify the results of the study in tables, based on which to interpret the data obtained during the study, to formulate conclusions and prospects for further research.

The article consists of an introduction, a literature review, methods, results, discussion, and conclusion.

### **Methods**

#### **Research Model**

The experimental study on the impact of the use of machine translation by students on the quality of text translation was organized within three generally accepted stages: pre-experimental (formulation of a hypothesis, preparation of a general plan), experimental (implementation of an experimental study) and post-experimental (analysis and interpretation of the data obtained).

The most popular machine translation systems at the moment are Google Translate, PROMT, and Yandex. Translate (Table 1).

**Table 1 Comparative analysis of machine translation systems (composed by the authors based on (Johnson, 2017) and manufacturers sites)**

No.	Characteristics	Google Translate	PROMT	Yandex. Translate
1	free use	+	+	+
2	easy access	+	+	+
3	user-friendly interface	+	-	+
4	fast translation execution	+	+	+
5	high popularity	+	-	+
6	accessibility in the browser	+	-	+
7	ability to install plugins	+	+	+
8	service statistics	+	+	-

To test the hypothesis, we chose the Google Translate machine translation system because of several advantages: free use, easy access, user-friendly interface, fast translation, high popularity, especially among future translators, accessibility in the browser, the ability to install plugins, and the availability of service statistics.

We also recruited two groups of students of the translation department of the Foreign Languages Faculty, who were studying in the third year of the bachelor's educational level.

The students of the experimental group (EG, 22 people) had the opportunity to use all the tools necessary to ensure the proper quality of the translation text: electronic dictionaries, electronic sources in the professional field, both in Russian and in English, machine translation systems with subsequent post-editing, and so on, that is, they worked in conditions as close as possible to real translation activities.

Students of the control group (CG, 21 people) had the opportunity to use all of the above tools, except for the machine translation system.

The deadline for completing the translation was limited. According to the standards, a professional translator on average translates 5 pages of text (about 1800 printed characters) in one working day. Thus, we assumed that given this circumstance, students should cope with the translation in 18,454 printed characters without spaces during four 2-hour experimental classes, completing 2.5 pages of translation per lesson. However, taking into account the lack of proper experience, the specific subject matter of the text that the students did not study before, as well as the need to carry out all the procedures

related to ensuring the quality of the translation text (proofreading and editing the translation text), we decided to double the deadline for students to complete a translation by providing them with eight experimental sessions.

### **Empirical Methods**

We stopped at a passage with a volume of 18,454 printed characters without spaces to conduct an experimental study. We created our translation of the text, using modern Russian-language sources by means of the Memsources translation automation system, which we used as a reference when checking the translation text made by the student and the machine translation system.

The English-Russian and Russian-English dictionary of key terminology was drawn up based on the reference translation and source text to further use it during the determination of the percentage of the correct convey of the main terminology in translations performed by students using and without the use of a machine translation system. In total, we selected 150 terminological units.

When choosing a translation evaluation system, we were guided by such criteria as distinctness, clarity, ease of use, and accuracy of the results obtained. All the above criteria are fully met by the translation evaluation system, which contains three types of errors:

- Errors of the first type, i.e. errors that distort the content of the original text (1 penalty point is awarded);
- Errors of the second type, that is, errors that can potentially negatively affect the understanding of the content of the source text – the addressee may understand the original meaning incorrectly (0.5 penalty points are awarded);
- The third type of errors, that is, errors that do not affect the understanding of the meaning of the translation text, but still spoil the positive impression of the translation – incorrect spelling, punctuation, formatting, grammatical errors, and so on (0.1 penalty points are awarded).

### **Mathematical Processing of Research Results**

Since in addition to checking the overall quality of the translation text performed by the student and the Google Translate machine translation system, we planned to check the correctness of the terminology convey, a grading system for such correctness should be established. The best way here is to calculate the percentage ratio, that is, we determine

how many percent of the terminology units were translated correctly in the students' translations using and without using the Google Translate machine translation system.

## Results

Table 2 shows the results of calculating penalty points in the translation text performed by students with and without the use of the Google Translate machine translation system.

**Table 2 Comparative results of translation by students of EG and CG**

	Translation performed by students using Google Translate (in penalty points, group average)	Translation performed by students without using Google Translate (in penalty points, group average)
1st type of errors	3.2	12.6
2nd type of errors	5.3	11.8
3rd type of errors	6.1	6.3
In general	14.6	31.7

After considering the total number of errors in the translations made by the students of the experimental and control groups, we moved on to the analysis of the correctness of the translation of the key terminology. As we have already mentioned earlier, we preliminarily identified 150 terminological units, which were placed in the corresponding English-Russian and Russian-English glossaries and which became the material of our analysis, the results of which are presented in Table 3.

**Table 3 Results of translation of key terminology performed by students of the experimental and control groups**

Groups	Translation quality	The average number of errors	%
EG	translated correctly	146	97.3%
	translated incorrectly	4	2.7%
CG	translated correctly	139	92.7%
	translated incorrectly	11	7.3%

## Discussion

As follows from Table 1, the translation performed by students without using Google Translate was 2 times worse than the translation performed by students using Google Translate. Moreover, the tendency to a lower level of quality is observed at all three levels, that is, within all three types of errors. Thus, for the first type of error, the translation performed without using Google Translate was 4 times worse, for the second type of error – more than 2 times.

Table 2 shows that the students of both groups did quite well in translating the key terminology of the text. We can assume that a significant role in achieving this result was played by the tools that were allowed to be used during the translation: information resources on the Internet, both in English and in Russian, bilingual electronic dictionaries, professional text corpora. Students freely chose the necessary resources and could use them to any extent, but this is how any professional translator works at the present stage. In addition, the students showed such qualities as conscientiousness and organization. Judging from the texts of the translation, they tried to understand the essence of the concepts, supplement their subject knowledge, and choose exactly the specific terminological correspondences that are used in the chosen industry for translation. The results of the translation of terms performed by students can be considered quite satisfactory, taking into account the total volume of the translated text.

However, some differences were found in the number of correctly and incorrectly translated terms in the translation text performed with and without the use of the Google Translate machine translation system.

Thus, as can be seen from Table 2, the results of translating key terminology without using Google Translate, as mentioned earlier, can also not be called bad, in general, the students of the CG managed to correctly translate most of the terms, namely 92.7%. However, the result of the EG students was still higher by 4.6 %. This is since the machine translation system is already able to take into account the context to a certain extent, which, in turn, allows getting more accurate and better results. In addition, the databases of the machine translation system are constantly updated with bilingual text corpora, which also allows significantly improving the quality.

Therefore, the percentage of incorrectly translated terminology in CG is slightly higher than that of EG students and is 7.3%, and this is 2.7 times worse. Therewith, we should not forget about such a factor as the speed of translation. So, if the students of the CG needed to translate the experimental lesson all available time, then the students from the EG using the means of the machine translation system performed it much earlier than the specified period and they had time to check the terminology with the help of third-party sources. This is although each time they uploaded a limited number of printed characters to the system, namely, five thousand printed characters.

Scholars express many points of view "For and against" of machine translation, including F. Zanettin (2009) believes that machine translation allows developing the practical skills of using modern computer methods and implants translation skills. M. Case (2015) insists

that machine translation can only be of interest to scholars as an object of scientific research. I. Garcia, M.I. Pena (2011) agree that the initial steps in the translation activity should be carried out independently by the translator, only then he/she will become a professional, competent person in his/her field. However, the benefits of using machine translation are undeniable: high speed of work, the ability to quickly get acquainted with the material (if necessary), confidentiality, versatility, the ability to perform online translation, there is no need to manually type the translated text for a long time. A. Niño (2009) insists that the future translator should be fluent in a personal computer and programs, electronic dictionaries that can help him/her create a new product-translated text.

## **Conclusion**

The problem of using MTS in foreign language classes requires further theoretical research to develop and implement in the educational process such didactic tasks that would help to increase students' interest in the high-quality translation of professionally oriented texts, as well as teach them to use methods and techniques of translation and editing of texts after using MTS.

The results obtained in the course of our research indicate that when teaching translation using Google Translate, students managed to make a significant breakthrough in quality and take into account the context during translation. It should be particularly noted that the share of errors made by the Google Translate machine translation system falls on the first and second types, that is, these are errors that affect the meaning of the original text. The quality of the translation text performed by students using Google Translate is the best in all respects, there are fewer errors in the translation of all three types, and the percentage of correct transmission of the main terminology is the highest. However, the translation made by the EG students is not perfect, since it contains both errors of all three types and incorrectly translated terms.

We concluded that according to the results of the study, the hypothesis formulated by us was confirmed: the use of a machine translation system had a significant positive impact on the quality of teaching translation of professional texts, both in terms of the number of errors and in terms of transmitting the key terminology of the original text.

Mastering the skills of machine translation is a direct path to the formation of universal translation competencies of future specialists and one of the important factors on the way to improving the training of future translators.

We see the prospect of further research in the expansion of the experimental base (more students and larger text fragments).

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