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The role of online translation tools in language education

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Abstract

The aim of the pilot study is to draw attention to the importance of online translation tools as a contemporary didactic tool in the language and translation educational process. In the paper the following hypotheses were tested: (i) use of free online translation tools can contribute to the development of ICT competences; (ii) use of modern translation tools contribute to the consistency and quality; (iii) free online translation tools for under-resourced languages can be used as pedagogical tools. Two studies were conducted using the text of EU legislation (*acquis communautaire*). In the first study, evaluation of the German-Slovenian translation quality of legislation was performed between two groups: one group using traditional reference works and the other group using online electronic translation tools (the Slovenian multilingual terminology database *Evroterm* and the bilingual corpus *Evrokorpus*). In both translations, mistakes were analyzed and a paired samples t-test was conducted. In the second study, machine translation of English-Croatian legislative text using the Google Translate online translation service was analyzed. The human evaluation of the translation quality was calculated, and Fleiss' kappa metric used to assess inter-rater reliability of agreement. The evaluation was enriched by analysis of different types of errors.

Keywords: online translation tools, education, evaluation, German-Slovene, English-Croatian

1. Introduction

The translation process is not defined simply as linguistic transcoding but also through its function and the translation-technological dimension (cf. Austerlühl 2001: 247; Olohan 2004: 10; Sandrini 2012: 21). According to Biau Gil/Pym (2010: 6) the increasingly rapid development of ICT allows translators free access to multilingual resources and tools (terminology databases, translation memories, electronic dictionaries, glossaries, encyclopedias and other computerized tools) that now form an integral part of a translator's professional work. The paper deals with the necessity of using online translation tools in the translation process, arising from the fact that translation quality and speed, in addition to consistent terminology, are becoming the main components of technical translation in the modern age. Global economic and political development as well as cultural and scientific cooperation demands rapid retrieval of information and the use of computer support in the process of translating expert and specialized texts and large quantities of documents within short deadlines and "different types of documents need different quality requirements" (Muzii 2009: 17). Currently, besides linguistic and cultural competence, translators must be acquainted with information and communication technologies: i.e., translation resources such as electronic dictionaries, corpora, translation memories,

terminology databases and machine translation tools and must use these in their work (cf. Hager 2008: 15–16; Schmitz/ Freigang 2002: 95–97; Seljan 2011: 282).

Translation is a complex process comprising many sub-processes and tasks of various types. According to Alcina (2008: 79), “the relation between translation and the computer began with the development of software for machine translation; the real boom in translation technologies was marked by the development of electronic dictionaries and terminological databases, the arrival of the Internet with numerous possibilities for research and communication, and the emergence of computer-assisted/aided translation (CAT) tools”. Numerous electronic and computer tools can be used in the process of education and training for translators to enhance the quality, efficiency and speed of translation; these are the most important characteristics of the contemporary translation product. Since the turn of the last century, the translation profession has undergone a metamorphosis, embracing new information and communication knowledge and skills, as well as adopting the usage of modern multilingual technologies and e-learning (Gerlič 2010: 112). According to Kučič (2010: 87) “ensuring quality in the target text is one of the main tasks of a future professional translator.” The acceptance, implementation and application of translation technologies, as well as the exploitation of their potential by translators during the translation process should enhance the competitiveness and quality of the work. These should therefore be perceived as an integral part of a translator’s education process and as a reality necessitated by globalization and the need for swift information flow. The computer has been an integral part of the infrastructure needed by translators for some time now, but the volume of knowledge and the skills linked to the translation technologies that the future translator has to master are growing by the day. Technical innovations, research and quality management aim to compensate for the lack of translators and increased demand within time constraints.

According to Austerlühl (2007: 40) and Snell-Hornby (2006: 131–132) several key drivers, such as multilingualism and language technology, market changes (commercial translations, web products, localization) and the Internet (e-books, language barriers in communication, multilingual services, web translation, newsletters) have caused considerable changes in the translation process and in translator training, even affecting expectations in terms of quality, time and consistency.

ICT practice in translation is confirmed not only by individual experience, but also by examples from large national translation companies (Beninato/dePalma 2008: 5), where assessment procedures aim to evaluate the working environment of translators and support services in IT departments, both of which have become a corporate issue. From individual and university education and practice to integrated document workflow, translation quality has become a matter of numerous business applications and workflow document changes. According to Drugan (2004: 3) over the last ten years, the European Union has been intensively preoccupied with the inherent problems of a multilingual environment, which presents a demanding and ambitious project. EU translations have to be unambiguous and terminologically consistent which can be achieved through the consistent and synchronized use of terminology databases and other translation tools. According to Seljan/ Pavuna (2006a: 469), the GILT sector (Globalization, Internationalization, Localization and Translation) has been facing an increase in translation demands.

Owing to EU enlargement and the use of the English language as a lingua franca on the one hand, and the growing interest in the protection of national cultures and identities, on the other, the development of multilingual services plays a key role in written communication. According to Vintar (2004: 74–75), Slovenia has for some time been experiencing an increase in demand for quality translation services. This trend is particularly evident in the economic and political sectors, state administration and international institutions. It comes as a result of several different processes, such

as development of new communication-information technologies that have led to more intensive economic-political contact within a united Europe. More recently, professional translators have also had to familiarize themselves with modern translation technology and ICT-tools (cf. Bonet 2006: 3).

2. Free online translation tools – cases of Slovenia & Croatia

Quality assurance is also a key issue in the language policy of the European Commission's Directorate-General for Translation (cf. Drugan 2004: 8). Documents are mostly translated and revised in-house, demanding the quality standards that apply, according to Seljan/Gašpar (2009: 624), to completeness, terminology, clarity and compliance with linguistic and idiomatic requirements of EU legislation, while revisers consider the text from several points of view including meaning, content, language, style, form and editing. DGT is encouraging the use of translation tools through education, in-house open access and document workflow. To ensure a high quality standard, translators are required to use translation tools, memories and databases. Terminological resources and related databases generally include the translation database of the Ministry of Justice, Eurllex or the CELEX database of legal texts, IATE (Inter-Active Terminology Exchange) and EURAMIS (European Advanced Multilingual Information System). According to Hemera and Elekes (2008), apart from the growing need for translations within a brief time period, the Central and Eastern European translation markets have faced problems in the translation business in terms of differing expectations when it comes to technical aspects, prices and quality levels. According to Waddington (2006: 68–69), there are no standards in the evaluation of translation quality. Often, we judge whether a translation is more or less appropriate. As opposed to right or wrong answers, it is possible to develop non-binary categories (Pym 1992: 186–187) that relate to the degree of acceptability, ranging from the least to the most acceptable translation (1 to 5). Hansen (2006: 113) lists different types of errors: inversion of meaning, omission, addition, deviation and modification, but also linguistic, semantic and pragmatic effects. Another classification relates to the communicative function, evaluating the degree to which it affects communication in the target language. When comparing source and target texts of several software products in order to determine translation quality, Gerasimov (2007: 22) includes the following errors: inconsistency, inadequately translated terms, omission, identical source and target segments, punctuation, capitalization, number/value formatting errors, incorrect untranslatables and tags. For both of our studies, the translation and evaluation were performed by native speakers of Slovenian (students of language and translation studies) and Croatian (students of information sciences and language studies). Mistakes were classified into three categories: lexical, orthographic and syntactic/stylistic for the Slovenian translation. In the analysis of the Croatian translation, the mistakes were analyzed in the following categories: morphological errors, untranslated words, lexical errors, unnecessarily translated words, word omissions, syntactic errors and incorrect punctuation. This kind of text processing was used for easier data processing and easy-to-survey mistake evaluation.

3. What is Evroterm?

According to Željko (2008: 302), the Slovenian Evroterm started as a terminology database (term base) project in 2000 but was gradually developed into a much more sophisticated system. Its main target users are Slovenian translators. Evroterm (<http://evroterm.gov.si>) consists of three main components: a term base (more than 120,000 terms, 15 languages (not all terms are available in all languages; the majority of terms are in English and Slovene); corpora of translated texts (Evrokorpus: <http://evrokorpus.gov.si>): there are five bilingual corpora (English-Slovene, French-Slovene, German-Slovene, Italian-Slovene and Spanish-Slovene) and one multilingual corpus (22 EU languages); a terminology analyzer (Terminator) that can analyze texts in English, French, German or Slovene (<http://evroterm.gov.si/x/index.php?jezik=angl>). In comparison with classical term bases such as IATE (<http://iate.europa.eu>) or EuroTermBank (<http://www.eurotermbank.com>), Evroterm has the

following additional features: the term base is integrated into the corpora; therefore, a link to a bilingual corpus entry is provided for each term in the term base (if the term exists in the corpus). Thus, a translator can check immediately how a particular term is used in the corpus database. Corpora are integrated into the term base, so the data from the term base are used for processing the corpus data (both the search term and its translation are highlighted on the corpus output page and thus the user can more easily find the item of interest. Where applicable, the corpus provides links to full texts (this may be useful for a translator when translating similar texts and when additional terminological data is needed).

Željko (2009: 276) argues that the term base search engine tries to help a translator even if it has not found the search term in the term base. For this purpose it uses several search strategies (such as wildcard search, fuzzy search, corpus search and IATE search). The idea of a terminology analyzer as a tool for translators and terminologists is less familiar, so it will be described briefly. A search by entering one word or term in the search entry field originates from a search in a book. It is useful if a user wants to find meanings for just a few terms. However, the real life of a technical translator is entirely different: a translator often gets the following instructions: "When translating the text, use the terminology from our glossary". Even if the glossary contains only several hundred terms that are continuously updated, it is impossible to know which terms are in the glossary. In such cases, computer-assisted translation tools offer basic help, (e.g., "Translate terms" in SDL Trados Translator's WorkBench). However, the translator needs more: the software should analyze the original text, mark the terms that exist in the term base and, by clicking on these, the user should obtain corresponding terminology and corpus data. The tool Terminator analyzes a text supplied by the user and transforms the terms found in the text to hypertext links that provide the information stored in the Evroterm/Evrokorpus databases. The Terminator can be used in several ways before or after translation: When a translator receives a text that has to be translated, (s)he can have it analyzed and thus see which terms are stored in the term base. The terminology in the translated text is therefore more consistent with previous translations. This is especially important if several translators translate texts from the same field. When a terminologist receives a list of new terms from a translator, the first analysis is performed with the Terminator. In this way, (s)he can see which terms are really new and which already exist in the database and may only need correction or additional information. When a terminologist checks an existing text for possible terminology candidates that could be added to the term base, the term candidates can be recognized much faster if the text has been analyzed by Terminator. This feature is especially successful if used on an uncleaned Trados (or Trados compatible) bilingual segmented text file.

4. Researches

Both studies were made on a non-probability convenience sample: i.e., one that encompasses a group of individuals available in a certain situation. In the Slovenian study, a random sample of 38 students (N = 38) from the third years of foreign language and translation study at the Faculty of Arts, University of Maribor was taken. In the Croatian study, a sample of 100 students (N = 100) of language studies were taken from the Faculty of Humanities and Social Sciences, University of Zagreb. There are some methodology issues arising from this sample. The samples are not representative because they do not include only students interested in translation technology process, so the results are to be taken as preliminary, but the aim was to investigate the use of free online translation resources in the educational setting. The samples are considered optimal, as they represent a limited part of the population defined by mutual characteristics. In the Slovenian study students of foreign languages and translation studies, taking translation at the university level participated in the research and in the Croatian part,

100 students of language and information science studies participated, although belonging to different years of study.

Had a larger number of students been selected, differences would probably have emerged between undergraduate and graduate levels of study, owing to greater ability to work with translation tools and a higher level of ICT skills in general and more intensive interest in translation practice. However, differences in average results between students of certain years of study will not be taken into account. Although these are homogenous samples, generalizations against overall student populations would not be justified because the samples are not representative. If the hypothesis proves correct, there is justification for the introduction and use of interactive translation tools that contribute to the quality, speed and consistency of the translation process. Still, it is possible to draw certain conclusions regarding the quality and consistency of translation based on statistical processing using t-tests for the Slovenian translation. The Croatian students showed interest in the use of computer-assisted translation (CAT) tools (e-dictionaries, terminology bases, translation memories, MT software), and their critical evaluation. Evaluation of mistakes suggests critical evaluation of machine translated text, but also the possible use of free translation tools in the language education process.

4.1. Study I

4.1.1. Sample

This pilot project in German-Slovenian translation was completed at the Department for Translation Studies at the Faculty of Arts, University of Maribor. A random sample of students (N = 38) from the third years of translation study was taken.

Evaluation of the translation quality of legislation has been performed between two groups: one group using traditional reference works and the other group using online electronic translation tools (Slovenian multilingual terminology database Evroterm). Analysis of lexical, orthographic, syntactic and stylistic mistakes using paired t-test samples was carried out. 38 students in the sample participated without previous experience on the translation market. In this study, two similar texts from the same domain were translated: an excerpt from the *Acquis Communautaire* (172 words in 7 sentences) and a text on intercultural communication in the EU (167 words in 7 sentences). The results were analyzed using a t-test.

4.1.2. Resources

For this purpose, the same group of students translated two texts of similar length from the same domain, differing in the type of tools used. The students translated two texts from German into Slovene:

- Group A: Text 1 representing part of the *Acquis Communautaire* (172 words),
- Group B: Text 2 about intercultural communication in the EU (167 words).

The students were given 45 minutes to translate both texts, which had approximately the same length and were equally difficult to translate. Both translations were evaluated by a professional bilingual translator, with both German and Slovene as mother tongues and a degree from the Department of German Language. The students translated the first text (Group A) with the help of the Debenjak (2003) and Pons (2006) German-Slovene/Slovene-German electronic dictionaries installed on the computer and a Duden dictionary <http://www.duden.de>, while also using Google and Yahoo search engines. The use of online dictionaries and search engines was allowed, in the belief that even translators without special education are able to use these tools. For the translation of the second text (Group B), more

specialized translation tools were available: the multilingual terminology database Evroterm (www.evroterm.gov.si), the Slovenian bilingual corpus called Evrokopus (www.evrokopus.gov.si) and the terminology analyzer Terminator (www.evroterm.gov.si/x/).

4.1.3. Evaluation

Expert evaluation of the translations of both texts was done for each student, with following mistakes: lexical, orthographic, syntactic and stylistic mistakes. The basic goal was to determine the differences in translation between texts with regard to the introduction of additional interactive, computer-aided tools in the translation process. The research aimed to examine the hypothesis of whether computer-aided translation tools and resources contribute to the quality and consistency of translation. As part of this research, the following hypotheses were tested: Differences in average results between translations should be statistically significant considering lexical mistakes, orthographic mistakes and syntactic/stylistic mistakes.

4.1.4. Results

Generally speaking, all respondents translated two texts from the same domain that were equally difficult, of similar length and translated under similar conditions. When comparing the total number of lexical, orthographic, syntactic and stylistic mistakes made by the students in both texts in the first translation, there was a total of 459 mistakes, in the second a total of 268 (Table 1). The average number of mistakes in the first translation was 12.07, which decreased in the second translation to the average of 7.05 mistakes.

Table 1. Total number of mistakes and paired samples statistics

Total No. of mistakes	N	Average result	Standard deviation	Coefficient of variability
Group A	459	38	12.07	23.45%
Group B	268	38	7.05	29.84%

Given that this is the same sample of respondents in both tests with changed conditions, to test the statistical significance of the difference between the arithmetic means of the samples we used the t-test for dependent samples, which is a standard parametric test used to establish the significance of the change in the average result after a controlled change in conditions. The t-test is based on the comparison of the calculated t-value with the theoretical t-value from the table of critical t-values with respect to different number of degrees of freedom and different risk levels. The calculation of the observed t-value was made using the formula in which the t-value is expressed as the ratio of the difference of arithmetic means and the standard error of difference between means.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{s_{\bar{X}_1 - \bar{X}_2}}$$

This method is often called a correlated t-test because the Pearson's coefficient of correlation between two measurements is used in computing the standard error of difference between means.

$$s_{x_1-x_2} = \sqrt{s_{x_1}^2 + s_{x_2}^2 - 2r_{1,2} s_{x_1} s_{x_2}}$$

To test whether there is a statistically significant change in the average number of mistakes after the repeated testing introduced new parameters that were tracked by their influence on the quality of translation, the data were introduced in the formula presented above and the corresponding t-value and border p-value were calculated. The statistical testing was performed two-sided, at a risk level of $\alpha = 0.01$ and degrees of freedom ($df = 37$). Given that the border p-value (which represents the probability of a type I error: the rejection of the null hypothesis that is correct) is less than 0.001, we can conclude that the average number of all mis- takes has decreased to a degree that is statistically significant after the introduction of electronic translation tools, suggesting the need for adequate education and use of translation tools.

Table 2. Paired samples t-test of statistically significant difference for all mistakes lexical mistakes

t	p
15.653	< .001

The same sample of students translated the first text with the help of dictionaries and web search engines, and the second text with the help of web sources Evroterm, Evrokopus and Terminator.

The students ($N = 38$) made a total of 218 mistakes in the first text and 155 in the second text. The average result is shown in Table 3. The coefficient of variability is higher in group B, suggesting greater variation when using translation tools.

Table 3. Number of lexical mistakes and paired samples statistics

Total No. of mistakes	N	Average result	Standard deviation	Coefficient of variability
Group A	218	38	5.73	38.81%
Group B	155	38	4.07	42.42%

As presented in Table 3, the averages of samples differ, and the t-test has determined ($t = 4.937$) that there is a statistically significant difference at the level $p < 0.001$ (Table 4). Therefore, the first hypothesis can be confirmed. This means that the comparison of the two translations can lead to the conclusion that interactive tools significantly contribute to the quality of translation, at least when it comes to lexical mistakes, since the number of lexical mistakes was significantly lower using additional interactive tools.

Table 4. Paired samples t-test of statistically significant for lexical mistakes orthographic mistakes

t	p
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4.937	< .001
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In the case of lexical mistakes, orthographic mistakes in both translations were analyzed.

In total, the number of mistakes amounted to 166 in the first text and 62 in the second text (Table 5.) The coefficient of variability is considerably greater in group B.

Table 5. Number of orthographic mistakes and paired samples statistics

Total No. of mistakes	N	Average result	Standard deviation	Coefficient of variability
Group A	166	38	4.36	35.47%
Group B	62	38	1.63	48.16%

The t-test determined that in this case there is also a statistically significant difference between the average number of spelling and punctuation mistakes in the two translations ($t = 11.239$). We can conclude that the second hypothesis is also confirmed: i.e., that the use of additional translation tools significantly decreases the number of spelling mistakes ($p < 0.001$) (Table 6).

Table 6. Paired samples t-test of statistically significant differences for orthographic mistakes syntactic and stylistic mistakes

t	p
11.239	< .001

In the same way, we compared syntactic and stylistic mistakes in both translations. The total number of mistakes amounted to 75 in the first text and 51 in the second (Table 7). The coefficient of variability is considerably greater in group B.

Table 7. Number of syntactic and stylistic mistakes and paired samples statistics

Total No. of mistakes	N	Average result	Standard deviation	Coefficient of variability
Group A	75	38	1.97	55.86%
Group B	51	38	1.34	63.12%

The t-test determined that in this case there is also a statistically significant difference in the average number of syntactic and stylistic mistakes between the two translations. We can conclude that the third hypothesis can also be confirmed: i.e., that the use of electronic translation tools has, on average, significantly decreased the number of syntactic and stylistic mistakes ($t = 3.321$) with $p < 0.001$ (Table 8).

Table 8. t-test of statistically significant differences for syntactic and stylistic mistakes

t-test	p
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3.321	< .001
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4.1.5. Discussion

Analysis of the quality of translation and type of mistakes (lexical, orthographic, stylistic) shows that the introduction of additional computer-aided translation tools does significantly influence the quality and consistency of translation.

Taking into account the conditions for translation, the time and identical text types, it can be concluded that the use of electronic translation tools was of significant help to students in optimizing quality of their translation, although we cannot draw conclusions for the entire population of students in these departments. In the case of such an analysis, other variables would be important, such as the year of study, success, (lack of) motivation, etc.

T-tests, resulting in t-values of 7.175, 5.887 and 4.43 have all shown statistically significant differences at the level of probability less than 0.001 and confirming that translation tools improve the quality of translation at the lexical, orthographic and also syntactic and stylistic levels. In any case, the same sample of students showed significantly better results when using an online corpus and terminology databases. It is important to mention that the introduction of additional electronic tools in translation has, on average, decreased the number of mistakes in all categories analyzed. This means that additional online tools contribute to the quality and consistency of translation at all of the most important levels.

Table 9. percentage of translation improvements

Mistakes	Group A	Group B	Reduction of mistakes in %
Lexical	218	155	28,90%
Orthographic	166	62	62,65%
Stylistic	75	51	32,00%
TOTAL	459	268	41,61%

4.2. Study II

4.2.1. Sample & tool

The second study yields results of the human evaluation of machine-translated English-Croatian texts in the domain of legislation, belonging to Acquis Communautaire documentation (<http://eur-lex.europa.eu/>, <http://ccvista.taix.be/>). 100 unique English source sentences were randomly chosen, and their reference translation pairs provided as the official Croatian documentation. The text was machine translated by the online translation service Google Translate, which almost the only online Croatian translation tool.

Evaluation of the machine translated text was made by 100 native speakers, students of language studies, belonging to different years of study (67% from undergraduate studies, all years equally represented, 29% from graduate studies, equally represented and 4% from the postgraduate study level). 15% of students have chosen language studies as major group and 85% as minor (studying equally another group).

Regarding their experience in translation, Diagram 1 shows that 49.20% of students have had professional experience in translation, and 38.10% have translated for personal need in university courses.

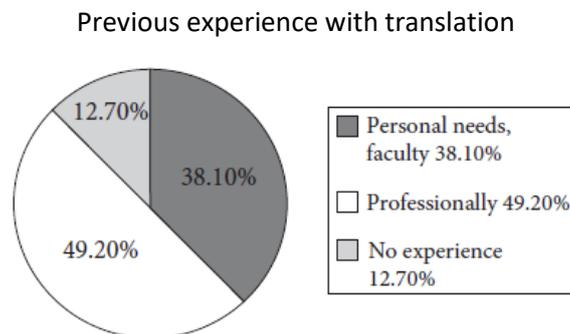


Diagram 1. Previous experience with translation

Diagram 2 presents the students level of interest in the use of translation tools and resources. 89% of students use e-dictionaries, while 86.15% would like to use these in future, which is mostly due to the low quality of free bilingual online e-dictionaries of Croatian. The biggest gap between “used and would like to use” resources is in professional machine translation software (4.0% vs. 52.3%), followed by translation memories (10.0% vs. 36.9%) and the speech-to-text system (1.0% vs. 23.0%). The gap is smaller in the use of free MT software (82.0% vs. 100.0%) and terminology bases and glossaries (59.0% vs. 69%).

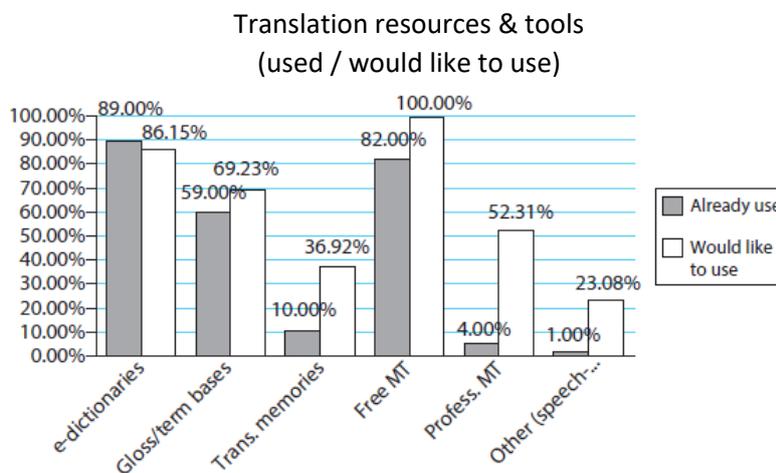


Diagram 2. Translation resources & tools (used/would like to use)

When using free Internet translation tools, students of languages often employ these to examine the results of literary translations (analysis of mistakes, for homework, curiosity) 62%, for travel information 57%, and then almost equally for translation of e-mail, legal texts, conference information and technology (Diagram 3).

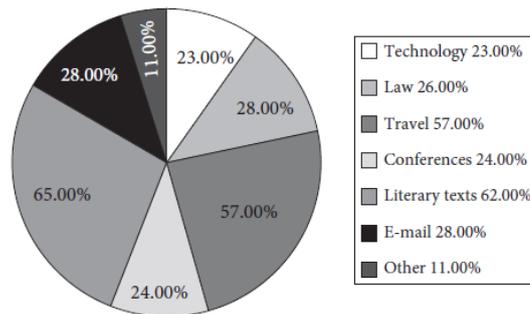


Diagram 3. Text domains translated by free internet translation tool

Diagram 4 shows the average grades for Croatian language resources and resources in general, that are freely available on the Internet, before analyzing specific items.

Quality of free internet translation resources

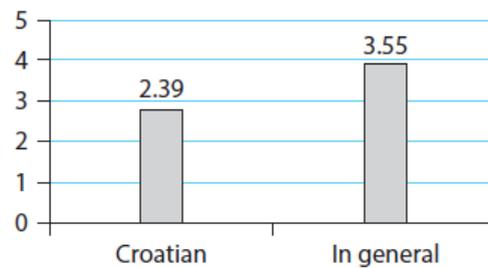


Diagram 4. Average grades for croatian and in general

Diagram 5 presents the utility evaluation of resources, with surprisingly high grades: resources in general are graded at 3.36 and, for Croatian, 3.10 on a 1–5 scale, probably due to considerable interest in the use of translation technology.

Utility of free internet translation resources

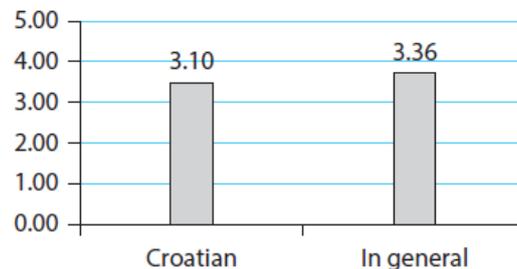


Diagram 5. Grades per item for croatian and in general

Diagram 6 shows the evaluation of resources and tools by category, in general and for Croatian. The highest gap appears for bilingual and multilingual e-dictionaries (3.42 vs. 2.08), as compared to

terminology bases (1.71 vs. 1.05), for Google Translate (being preferred MT translation service for Croatian (2.39 vs. 1.97) and for translation memories (1.02 vs. 0.72).

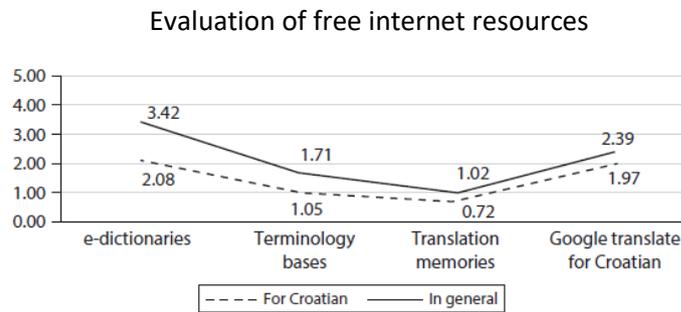


Diagram 6. Grades per item for croatian and in general

Diagram 7 gives the evaluation grades of free Internet translation services.

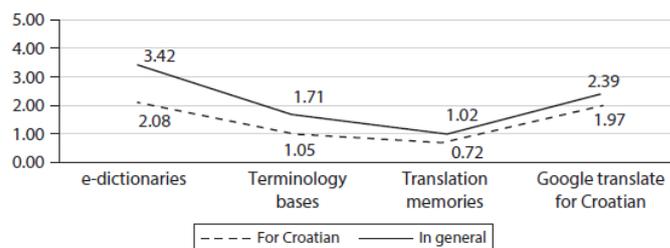


Diagram 7. Evaluation of free translation services

Although the Systran tool was given the highest grade when analyzing free online translations, Google Translate was declared to be preferred tool by 63.34% of users, followed by other resources.

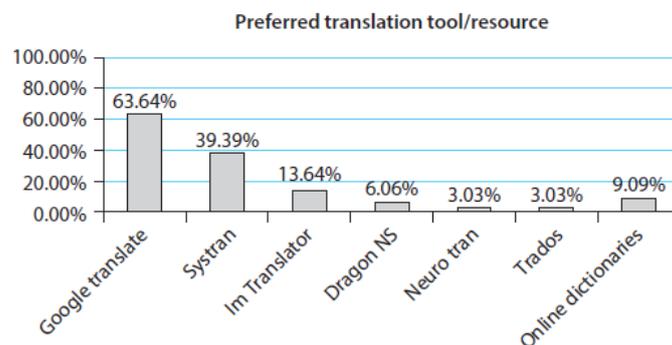


Diagram 8. Grades per item for Croatian and in general

Diagram 9 records student interest in further training regarding the use of translation technology. 41.4% would like to continue learning about translation technology use, 38.4% only if they receive funding. 18.2% are not sure and only 2.00% have no interest in translation technology specialization.

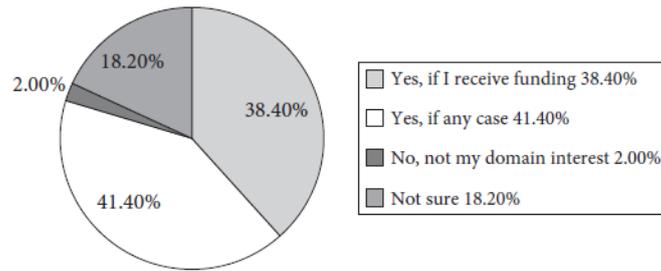


Diagram 9. Interest for education of translation technology use

4.2.2. Test set description

A total of 100 sentences translated from English into Croatian by Google Translate were evaluated. The average number of words per sentence in English is higher than in Croatian, owing to differences between language organization (morphology richness, syntax, word order). The number of words obtained by GT service is lower than in reference translation, mainly in constructions of intention (ref. je onaj koji osigurava, GT: za osigurati), multi-word units (ref. plan sigurnosne zaštite luke, GT: luke sigurnosni plan) and relative constructions (ref. osoblje koje provodi, GT: osoblje provođenje).

Table 10. Test set description

	English	Croatian – referent	Croatian – GT
# of sentences	100	100	100
# of words (average)	21.55	18.95	18.00

4.2.3. Evaluation

Average grade given to translation quality, including fluency and adequacy criteria, for machine translated sentences was 3.27, on the scale 1–5.

In order to assess the reliability of agreement among raters, Fleiss' kappa metric is used in order to measure the amount of agreement among raters indicating the extent to which would be expected if all raters made their ratings completely randomly.

$$\bar{P} = \frac{1}{Nn(n-1)} \left(\sum_{i=1}^N \sum_{j=1}^k n_{ij}^2 - Nn \right)$$

The score ranges from 0 – indicating what would be expected by chance to 1 – indicating perfect agreement. Negative values indicate agreement less than chance. The scale is as follows: < 0 poor agreement, 0.01–0.20 slight agreement, 0.21–0.40 fair agreement, 0.41–0.60 moderate agreement, 0.61–0.80 substantial agreement, 0.81–1.00 almost perfect agreement. The Fleiss' kappa measure in the evaluation of 100 GT-translated sentences in the domain of legislation was 0.79, indicating a level between substantial and almost perfect agreement.

The average grades assigned to sentence quality were enriched by mistake analysis. Mistakes were analyzed in the following categories: morphological errors, untranslated words, lexical errors, unnecessarily translated words, word omission, syntactic errors, and incorrect punctuation.

Table 11. Type and number of errors

	Morph. errors	Untranslated words	Lexical errors	Surplus of translated words	Syntactic errors	Incorrect punctuation
Av. no. of words	2.07	0.36	0.96	0.40	0.65	0.17

Most often, different types of errors appear in the same sentence (e.g., lexical and morphological errors, untranslated words, syntactic and morphological errors, etc.). As in Table 11, morphological errors (e.g. *knjige bi trebao biti dosljedan*, instead of *bi trebale biti dosljedne*; *razina bi trebao biti postavljen*, instead of *razina bi trebala biti postavljena* due to non performed agreement in gender, number and case) were by far the most common, i.e., on average 2.07, always appearing in non-nominative constructions and multiple-word units (i.e., in all cases except the nominative). Next came lexical mistakes when the wrong word was chosen (0.96), such as e.g., *registers* translated as *knjige* instead of *registri*, there may be cases translated as *postoji svibanj* *biti slučajeva* instead of *u nekim slučajevima* or *postoje neki slučajevi*) and then syntactic errors (0.65), such as *port facility security* translated as *sigurnosti luke plan* instead of *plan sigurnosne zaštite luke*). Other types of mistakes were almost evenly distributed, like surplus of words 0.40, e.g., where the choice of procedure is not straightforward translated as *u kojima je izbor postupaka nije jednostavno*) and untranslated words 0.36, e.g., official *corrigenda* of the Commission translated as *službeni corrigenda Komisije* instead of *službeni ispravci Komisije*. Least common was incorrect punctuation (instead of ; the punctuation, is used).

4.2.4. Discussion

After analyzing the quality of translation and type of mistakes, the general conclusion is that this translation service for Croatian is not perfect but can be used in the language and translation education process. Although the translations abound in mistakes, due to language differences and the specific domain, they can be useful in, e.g., error analysis and quality evaluation, i.e., to raise critical awareness regarding appropriate expectations. Fleiss' kappa of 0.79 indicates a high level level of agreement among raters, given the quality of the translated sentences (3.27). On the other hand, students, already having experience in translation were eager to use translation technology, being aware of quality differences between resources and tools for Croatian and for more widely spoken languages. Google Translate is the preferred translation service, although other tools and services have been analyzed. 79.8% of language students would like to continue with further specialization in the translation technology fields, showing high interest in the types of jobs requiring new skills.

5. Conclusion

Despite limitations, modern translation technologies and tools have given rise to considerable progress in translation practice, particularly in the area of repetitive legal, economic, technical, scientific and

other texts. These, at the same time, are the fields that are experiencing the highest increase in demand for translation. According to Pym (2010: 6) the use of computer-assisted tools (CAT) has thus become compulsory for many professional translators in the fast-growing and competitive international translation market. Among language students there is very high interest (almost 80%) in continuing specialization in the translation technology domain. The increasing demand for simultaneous translation and integrated solutions also suggests high quality translations and adequate education – use of ICT, i.e., information and communication technologies, especially computer-assisted translation tools. The integration of CAT tools into document workflow could help in the translation process during preparation, translation and revision. Analysis of the two research studies has confirmed the three hypotheses:

- i. The use of free online translation tools can contribute to the development of ICT competences, as evident from both studies.
- ii. The use of modern translation tools contributes to consistency and quality in the translation process, as shown by study I.
- iii. Translation tools and resources for under-resourced languages can be used as pedagogical and translation tools, and, therefore, can contribute to critical reasoning and evaluation of resources, as shown by study II.

With high expectations regarding translation quality, time constraints and the demand for increased productivity, translators are faced with new challenges in education and in business. The use of translation tools certainly improves the quality of professional translations but has become a corporate issue. The use of computer-assisted tools (CAT) should therefore be included in the language and translation educational process through horizontal and vertical integration.

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