The Effects of the Use of Google Translate on Translation Students' Learning Outcomes

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Abstract
This paper investigates the effects of uncontrolled use of Google Translate (GT) on the development of students' translation skills. It aims to find out if the current patterns of GT use by translation students could impact their learning outcomes, and if so, in what ways. The study uses think-aloud data from actual translation efforts of four students. Analysis of the four subjects' translations show that their overreliance on GT for first drafts reduced their propensity to search for equivalents. However, when students post-edit poorly constructed GT sentences, they carry out a process of analysis and synthesis similar to the process of translating from scratch. The study concludes that post-editing GT translation is beneficial for translation students' development of translation skills, but it warns against introducing or allowing its use at the elementary stages of translation training.

Keywords: Google Translate, machine translation, post-editing, think-aloud, translation memory, translation skills, translation training

1.Introduction

The rapid development of translation software and Internet translation programs over the last decade has had a significant impact on translators and translation students. The quality of translation technologies is improving daily with the enhancement of data mining and search algorithms. In some language combinations, quality has become good enough to be used by translation services and academic institutions (Alcina et al., 2007). Although Machine Translation (MT) between English and Arabic is still not satisfactory (Salem, 2009; Hadla et al., 2014), a number of translation students in the College of Languages and Translation, King Saud University, consider the MT program known as Google Translate (GT) an indispensable tool that saves both time and effort.Certainly, translation technologies should be a fundamental part of any translation curriculum, as part of preparing students for the demands of today's job market. Various studies have called for the integration of such technologies into the curricula of training institutions (O'Brien, 2002; Balm, 2003; Depraetere, 2010; Garcia, 2010; Carl et al., 2014). Although this integration may generally seem to be a positive step, the observations made by teachers in the KSU Department of English and Translation raise essential questions. Should translation students be encouraged to use translation technologies while learning necessary translation skills? What might the benefits and drawbacks of this be?

1.1. Statement of the Problem

The vast majority of students in KSU's English Translation Program use GT when completing their assignments. GT can be a useful aid for translators in numerous ways, from simple verification of word meanings to the provision of full-text translations. However, relying too heavily on GT before developing one's competence in translation might negatively impact students' progress toward the desired learning outcomes (Boase-Beier, 2011).

In translation courses, all translation teachers ask students to translate at home because the time allocated for in-class translation is limited (two hours per week for 14 weeks in each course). Some teachers ask the students to translate a text, often posted on the teacher's website, in preparation for class discussion of the translation. Other teachers assign translation homework in addition to the translation of another text for discussion in the classroom. In rare cases, teachers ask the students to do all translation in class, because she wants to ensure that the students actually practice translation and do not merely copy or retype a GT product.

Teachers often report that their students use GT. Some students even log in to GT while translating in the classroom, using their smartphones. The students sometimes bring raw GT translations to class with them, a behavior that is easy to detect. The students try to hide these translations as much as possible because they know that GT translations between Arabic and English require extensive editing. students who have not done such post-editing use GT products mainly as a safety net if asked to read their translations to the class.

The quality of some students' translations reveals their reliance on GT. Translations by GT often have some inappropriate vocabulary, leading to humorous results that human translators would not produce. For example, GT sometimes translates proper nouns instead of transliterating them, with the result that بعقوبة (Baqubah), an Iraqi city, becomes 'with punishment', or أحلام (Ahlam), an author's name, is translated as 'dreams.' In other instances, GT selects combinations of equivalents that do not collocate in the target language, as in 'columns of troops' translated by GT into أعمدة من الجنود, which back translates into (Poles of soldiers). More problematic cases occur when the equivalent chosen does not fit the context, as when GT translates 'I've got your back' into لقد حصلت على ظهرك, which back translates into (I've obtained your back). In other instances, GT produces meaningless sentences, that the students who copy them cannot explain. Obviously, on such occasions, the students feel that it is more prudent to read a raw GT product in class, no matter how bad it sounds, than to admit that they have not done their assignment. It is not certain why some students use GT with or without editing. Whether they do it to save time or because they cannot identify the mistakes made by GT will hopefully be determined through the analysis of Think-aloud data. In any case, this is a worrisome situation because avoidance of translation training may deprive the students of chances to develop their basic translation skills. Analysis of the students' process data during translation and during editing will hopefully reveal what skills, if any, will be jeoperdized if students rely solely on editing GT translations as they progress in the translation program.

1.2. Study Aim and Research Question
This study aims to answer the following research question:' Could the current patterns of GT use by translation students impact their learning outcomes, and if so, in what ways?

To answer this question, the author of this study has observed four students' behavior while editing GT translations and investigated the skills practiced during translation and editing to identify those that are applied less fully when students rely on GT in creating their first drafts. This has been done by analyzing the translations completed by four students with and without help from GT.

GT has become an easy way for students to complete assignments. In the contemporary learning environment, students can use this particular approach to gain insight and enhance their learning experiences. However, students have also been observed misusing this form of technology-based assistance, such as by cheating in the name of saving time (Chung-ling, 2005). This is an alarming situation since virtually all students today have mobile phones. In a previous study (Garcia, 2010), students were observed using translation memories for the sake of convenience rather than to enhance their learning. KSU teachers have reported similar observations. Unfortunately, students are not always aware of the extent to which GT provides inaccurate translations. Since GT is publicly available at no cost, students may readily access this software without an understanding of its adverse effects on the overall learning process.

1.3. Pros and Cons of Using Google Translate

The positive aspects of using this particular technology are as follows:

- GT is free and easy to use and may help translators and students in various ways (Carl et al., 2014).
- The software is fast and can produce translations very quickly.
- GT is a translation memory program, which means that it improves as it processes more translation orders and translation corrections.

The negative aspect of using this particular technology, on the other hand, is that the software often produces out-of-context, irrelevant, and absurd translations. The quality of GT's English–Arabic translations is invariably low and cannot be trusted unless a competent human being independently reviews them.

2. Methodology

The study uses sample translation and editing assignments. The subjects who participated in the procedure were all female students from the Department of English Language and Translation, College of Languages and Translation. These students were learning to translate between Arabic (their mother tongue) and English. The program extends over five years or ten semesters, starting with a preparatory year followed by language skills and linguistics courses. From the third year onward, students learn translation foundations and techniques through theoretical and practical translation activities along with classes on interpreting. The program focuses on preparing translators rather than interpreters, so most of the intensive practice is in translation.

2.1. Study Apparatus: Translation and GT Post-editing

The intense training of translation to which students are exposed aims at building their skill and enhancing their competence. Since some students use GT to produce their first drafts of translation assignments, teachers worry that overreliance on GT might inhibit the development of translation skills, most of which would typically be gained through the production of first drafts.

To investigate this issue, four translation students were asked to translate pieces of text of approximately 150 words each. The Arabic texts were about vocational training, and the English texts were about farming and nutrition. The language used in the texts was general, with a moderate amount of specialized terminology. The students were the first four to volunteer in response to an announcement made by a colleague. I will refer to them for convenient identification as A, B, C, and D (these letters have no relationship to the students' academic levels or grades). A and B completed translations from Arabic to English, and C and D translated from English to Arabic. To identify the skills practiced by students when using GT, the researcher used two different approaches: Each student was asked to translate a text from scratch and to edit another text that was translated by GT to produce satisfactory translations of the quality that they would submit to their teachers as assignments.

The skills to be developed in a translation training program constitute an open-ended set. In his minimalist definition of translation competence, Pym (2003) states that it is "the ability to generate a series of more than one viable target text (TT) for a pertinent source text [and] the ability to select only one viable TT from this series, quickly and with justified confidence" (p. 489). The definition assumes that such abilities would not be possible without the full set of other competencies such as language competence, computer skills, terminology, etc. Following the same rationale, the current study does not attempt to prove whether the students practice particular skills at all during the editing activity. Instead, the two activities of translating and editing are compared to identify what skills, if any, are exercised less thoroughly during editing due to the availability of GT.

The students were instructed to Think Aloud (TA) and record every thought that occurred to them while translating or editing. The TA recordings were then analyzed to identify the problems that they faced and how they tried to solve them during translating and GT editing. No claims are made about the correctness of the translations. Instead, this procedure aims to gain insight into the training experience, if any, that students lose if they turn all their translation assignments into GT editing assignments.

3. Results and Findings

On the translation and GT post-editing test, Students B, C, and D spent more time translating than editing (86 to 48 minutes, 71 to 50 minutes, and 56 to 45 minutes, respectively). This difference was expected since respondents to the questionnaire declared that they used GT to save time. However, Student A spent more time editing than translating, by a margin of 50 to 41 minutes. That particular student, who happened to have the highest Accumulative Grade Point Average among the four students, made the most changes to the GT text and retained only 48% of it. It seems that students with higher translation competence find it hard to submit translations that are of a lower standard/quality than those they are capable of producing themselves (Kliffers, 2005). The student did not seem to know when to stop editing or what level of quality she should be satisfied with (Belam 2003).

The subjects of this study had never taken a course on editing machine translation. Some translation teachers do include a section on editing, but no course includes MT editing as a stated goal in the course description, so there is little practice of MT editing, if any exists.

The four students followed more or less the same pattern for editing GT. They exhibited the following sequence:

1. Reading the whole source text (ST)
2. Reading the whole GT translation
3. Reading ST sentence 1
4. Reading the GT translation of sentence 1

5. Judging the GT translation of sentence 1
6. Reading phrase 1 of sentence 1
7. Comparison to GT's translation of the phrase
8. Writing a translation of phrase 1, either by copying GT, modifying GT, or translating from scratch
9. Repetition of steps 6–8 with other divisions of sentence 1
10. Reading the completed translation of sentence 1
11. Making modifications (if needed)
12. Repetition of steps 3–11 with other sentences
13. Reading the whole translation
14. Making any postponed decisions or necessary modifications

The sequence above was the general pattern followed by the four students, but they differed in some minor details. Student C differed in that she underlined all new words as she read the whole text at the very beginning. While students A and D looked up new words as they appeared during the phrase-by-phrase translation or editing, C consulted the dictionary for all new words in a sentence immediately after reading that sentence. Student B was the only one who looked up all new words in the text before attempting to translate it. This approach suggests an overemphasis on seeking to discern meaning at the word level rather than the sentence level.

Students A and D gave an explicit judgment of the GT translation of each sentence immediately after reading it. The decisions were brief and straightforward, such as 'unacceptable,' 'wrong and unintelligible,' 'correct,' 'don't like it,' 'wrong and too literal,' 'too long; needs dividing,' 'broken,' or even the extreme 'nuts.'

As for dictionary use, all students checked the bilingual dictionary more often while translating than while editing. Student A consulted the dictionary nine times while translating, and in five of these cases, she guessed the meaning of a word before looking it up. While editing, she checked the dictionary only three times, and in one of these instances decided to keep GT's word choice. However, A was engaged (13 times) in an active process of weighing alternatives against one another or making and evaluating 'hypotheses' (Pym, 2003) before selecting an equivalent word. The justification given for selection in most cases was collocation; when it was not, Student A stated simply that the chosen word 'sounded better'. Here is an example:

Source Text (ST): ظلت هذه الفكرة حبيسة المعامل

Google Translate (GT): The idea has been confined to laboratories

Edited Translation (ET): The idea has been restricted to laboratories

Unfortunately, Student A twice replaced a GT equivalent with a word that seemed to her to sound better but which made the rendition inaccurate. Here is one of those cases:

ST: ...فرضت نفسها على العلم والعالم...

GT: … imposed itself on the world of science

ET: It approved its benefits to the science and world

Student B checked the dictionary 29 times while translating and 12 times while editing. She expressed her awareness that she had to evaluate GT's choice of vocabulary and its suitability for the context before deciding whether or not to retain it. But this awareness was not always reflected in her performance:

ST: ... فالذين يقومون بصيانة السيارات

GT: Those who are doing the maintenance of cars …

ET: Those who work in car services …

While translating, Student C consulted the bilingual dictionary 22 times, and in two of these cases, she guessed the meaning before looking up the word. When editing, on the other hand, she checked the dictionary only four times. The big difference between the two numbers may suggest that Student C trusted GT's choices and decided not to look for alternative equivalents. But the student's TA data show that this was not the case. Student C did change some of the GT words, but without checking the dictionary for confirmation, which means that she trusted her knowledge too much. As a result, C made inappropriate changes 14 times. In 13 of these cases, she replaced a correct GT word with an incorrect word:

ST: … to help meet demand

GT: للمساعدة في تلبية الطلب ...

ET... للمساعدة في سد الحاجة

Back translation of ET: … to help fulfill the need

There is no evidence that C weighed the outcomes with and without the replacement. In sentence 2 in particular, C made four lexical changes and one structural change. All these changes served only to make the translation less meaningful and further removed from the original

meaning. She then wondered, 'Does it make sense?' Without answering, she moved on to the next sentence.

ST: The arguments can be fierce, and like our politics, we seem …

GT: …وmay be أننا يبدو ،لدينا السياسة ومثل ،شرسة تكون الحجج أن ويمكن

ويمكن أن الحجج تكون شرسة، ومثل السياسة لدينا، يبدو أننا… :GT

ويمكن أن تكون حجج هذا الموضوع شديدة كسياستنا، فيبدو أننا… :ET

Back translation of ET: The arguments of this topic can be strict like our policy, so it seems that we …

This example gives the initial impression that Student C changed GT for the sake of editing per se and that her changes were not based on a proper understanding of the ST. Though this may be only partly true, C probably had difficulty in understanding parts of the text. In three instances, she explained the sentence to herself in colloquial Arabic before trying to translate it. This possibility is further supported by the six occasions on which she crossed out a GT word, decided to come up with a better equivalent, and then went back to the original GT choice. Student C felt that the GT sentences did not sound good enough but did not know how to fix them because she was uncertain about their meaning, or possibly because she did not have the proper vocabulary with which to replace them.

Student D consulted the dictionary 19 times while translating; five of these instances were second look-ups of the same word. While A and C translated sentences phrase by phrase, looking up words as they occurred, D looked up all words in a sentence before attempting to translate it. Then she wrote the equivalent of a word above it on the ST page. This strategy probably led to the second look-ups because the initial selection of equivalents did not consider either the linguistic or extra-linguistic context. As the student translated, she gained a better grasp of the intended meaning and the context. In some of these cases, she could not align her initial word selection with the rest of the sentence, necessitating the second look-ups.

While editing, on the other hand, Student D consulted the dictionary nine times, none of which were second look-ups. She searched for alternatives to GT word choices to find a better match for the context or 'the field,' or for the sake of collocation, more clarity, or just personal preference, i.e., 'it sounds better.' For these reasons and because of having a different understanding of the ST from that of GT, Student D sometimes produced alternative equivalents to GT's words without checking the dictionary. In five instances, her translation changed the meaning and produced an incorrect translation. Here is one such example:

(6) ST: the environmental impacts of conventional farming

GT: الآثار البيئية للزراعة التقليدية

ET: العوامل البيئية للزراعة التقليدية

Back translation of ET: the environmental factors of conventional farming

Student D was initially keen on reproducing all meanings of the ST and thus made no omissions at all. While editing, on the other hand, she omitted five words from the GT translation, stating that those words were making the translation sound too literal. In one case, the omission did improve the translation, but in the other cases, the omitted words carried meaning, and D did not compensate for this loss of meaning in her rendering. Student D was probably tempted to neglect those words because they were located in poorly formulated sentences and certainly did not fit well. It is also possible that D overlooked those words unintentionally in her attempt to fix the scrambled sentences.

ST: … can give us more 'crop per drop'.

GT: تعطينا أكثر 'المحصول بكل قطرة ماء' .

ET: بإمكاننا الحصول على 'بكل قطرة محصول' .

Back translation of ET: … we can get 'with every drop a harvest'.

Generally speaking, students checked the dictionary less often when editing than when translating. The apparent explanation for this tendency is the availability of equivalents in the GT translation for the student to evaluate and then use or replace. However, when they decided to replace the GT equivalent, they did not necessarily check the dictionary, but instead used words they already knew, sometimes resulting in mistakes.

Besides, the significant drop in dictionary consultations during editing could indicate that the students place too much trust in GT's choices, which is not a healthy tendency for them to adopt. "The danger involved in post-editing at this level is not that too much will be changed, but rather that there is at times too much trust in the translation engine" (Depratere, 2010, p. 7). It could also mean that the words chosen by GT are part of the students' passive vocabulary, i.e., words that they recognize upon seeing them. Nevertheless, since the students are only identifying and approving rather than independently generating the words, the vocabulary is likely to remain passive. In other words, the students will still not remember them when translating from scratch in the future.

All four students made structural changes in GT's translations. Student A made four changes while translating and four while editing. The four alterations made during translation all

involved moving an adverbial phrase, to the beginning of the sentence in three cases and to the end once. Similarly, while editing, A moved two adverbials to the front and made two moves that brought the subject and verb phrase closer:

ST: فالذين يقومون بصيانة السيارات مثلا في معظم بلادنا أميون عاديون

Student's Target Text (TT): In most of our countries, people who are working in checking up cars

Not all moves were necessary, but the student felt that the sentence would sound better with the change:

ST: بدأت ميكنة الترجمة تظهر في منتصف الخمسينات

GT: The idea of automating the translation appears in the mid-fifties

ET: In the mid-fifties, the idea of automating the translation started to appear

As for sentence length, Student A divided a sentence into two shorter sentences four times while editing:

ST: وظهرت الفكرة مرتبطة بظهور الحاسبات الإلكترونية آنذاك فلاقت كثيرا من المعارضين

GT: The idea appeared linked to the emergence of electronic computers then Flagueta[i] lot of opponents.

ET: The idea was first linked to the emergence of electronic computers. It faced a number of opponents.

Translation students who work between English and Arabic have learned that Arabic tolerates long sentences to a higher degree than does English. While translating, however, Student A divided only one sentence and left two run-on sentences. She expressed an intention to revise them later, but probably forgot to do so.

Student B made several structural alterations. Since she was translating from Arabic to English, she shortened four long sentences by dividing them and moved an initial verb after the subject. Similarly, while editing, she divided three long sentences, one of them improperly. She also reformulated the first sentence, which had a conditional 'if' in the middle, and replaced it with an initial 'when.'

Student C made structural changes in six sentences while editing. In two sentences, changing GT's translation produced a more accurate rendition, but on the other four occasions, they changed the meaning further away from the meaning of the ST, as in example (5) above. While translating, on the other hand, C made only one structural change, namely placing the verb. Her reason for making more structural changes when editing than when translating was probably that the structure of some of the GT sentences was scrambled. As the student tried to correct these sentences, she was working independently from the influence of the ST structure, whereas when translating, she was not.

Likewise, D made more structural deviations from the original structure when editing than when translating. As she edited the GT translation, she produced an alternative structure six times. In two such cases, she fronted the verb, as in example (11) below; she sought to make sense of a scrambled sentence twice; she changed the structure due to personal preference once; and she thought that the intended meaning was not expressed by the GT translation also once. When translating, C tried to retain the structure of the ST as far as the differences between the two languages would allow. She made four changes, all of the same type (placing the verb):

(11) ST: But commercial farming has started to make huge strides

GT: لكن الزراعة التجارية بدأت في اتخاذ خطوات واسعة ضخمة

ET: ولكن بدأت الزراعة التجارية في اتخاذ خطوات هائلة

4. Discussion

The results suggest that constant use of GT to provide a first draft may jeopardize the development of several translation skills. At the word level, students checked the dictionary less often when using GT translation as a first draft. One of the basic skills developed in translation training courses is that of hunting for information by consulting a variety of resources (Sofer, 1999). Dictionary consultation is an essential skill, whether the dictionary source used is a hard-copy or digital version. A dictionary provides options for equivalents, and the user then chooses the best option based on the linguistic and situational context. One problem with GT is that it provides selected equivalents that may or may not be accurate for the context.

GT between English and Arabic is far from perfect, so the students must decide whether to accept GT's choices or to change them. Approving a GT word choice involves passive recognition of a vocabulary item and may not help the students to move that word into their active vocabulary inventory (Fan, 2000). The analysis shows that students often retain a wrong GT choice of a word without verifying it, apparently because they place too much trust in GT. In other cases, they may change a GT equivalent that they consider inaccurate, only to replace it with another inaccurate word. Students trust GT or themselves too much because they are still in the training process and have not yet developed their second language fully nor mastered all translation strategies. Their

training institution is seeking to build their strategic translation skills in conjunction with their acquisition of intermediate-to-advanced language skills (Gaspari, 2001). Although the small number of students limits generalization, the results confirm Depraetere's (2010) observation that translation trainees tend to overlook some errors in machine translation.

Also, students showed a tendency to over-edit, i.e., to change accurate GT equivalents without a good reason for doing so. This tendency may occur because they have never been trained to post-edit MT and think that more editing is always better, without a clear view of how much time the editing process should take in comparison to translating from scratch (Gaspari, 2001).

At the structural level, due to the scrambled outcomes frequently offered by GT, the students had to struggle with the GT text to turn it into an intelligible translation. They either translated the scrambled passage, thus in effect circumventing the use of GT, or fixed it. Fixing a scrambled GT sentence without careful resort to the ST may risk unintended deviation from the meaning of the original sentence (Somers, 2003). Nevertheless, judging GT translation and struggling with it while trying to edit it are highly productive activities that can develop the student's comprehension and formulation skills.

The main problem is that any potential benefits of post-editing GT are undermined if, as reported by teachers, some students do not take the time to edit GT at all before submitting an assignment. This tactic deprives the students of a valuable opportunity to learn. The gravity of the harm depends on how frequently the students avail themselves of this shortcut and how actively they participate in classroom discussions about the translation.

To compensate for this loss of learning, certain classroom strategies should be implemented by teachers. These include giving students adequate opportunities to practice the production of translations in the classroom (Albir, 2007) and monitoring classwork to prevent overreliance on GT in the production of first drafts. Awareness should be raised by continually reminding students that only translation practice can develop their translation competence and that proper editing of machine translation involves decisions that require fully developed translation competence (Tennet, 2005). Students should be trained to edit machine translations as well, but this activity should occur near the end of the program so that it does not interfere with the development of basic translation skills (Somers, 2003).

The world appears to be heading toward greater reliance on technology to meet the increasing demand for translation services. In this context, students must understand translation technologies and their proper use to be competitive in the job market (Bowker, 2014). However, the unplanned introduction of technology may prevent students from acquiring the necessary translation skills required to generate alternative translations or to make a successful selection of one alternative over the others. Pym (2003) warns against confusing means with ends, arguing that new technologies cannot help translators perform their basic task which is production of

alternatives and selection of one alternative. Basic translation skills are needed to complete successful editing of a machine translation. The translators must be able to recognize when GT errs and must view GT only as a source of options which are likely to be correct because of the information stored within the program, but which must always be verified.

5. Conclusion

Overreliance on editing GT does not help a translation trainee to grow into a professional translator any more than overreliance on heating ready-made food would help one to become a chef. A program cannot claim to have trained translators adequately and competently if its graduates cannot translate from scratch. The medium of machine translation has enormous capacity, but students seeking to develop translation skill must not rely on it too heavily. To improve their knowledge and skills, students must be guided away from behaviors that would reduce their practice time and deprive them of the opportunity to learn properly.

It is important to alert the students to the fact that translation technologies are there to help translators to become better equipped for a demanding career and to complete quality translations more quickly. However, students should avoid using technology to circumvent the requirements for proper training, which could ultimately lead to less learning. Technology is a double-edged sword, extremely powerful but risky if misused.

6. Acknowledgment

Note

[1] This is one of the nonsense translations made by GT, which is a transliteration of the Arabic word.

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