# Can Machine Translation Help the Language Learner?

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## Abstract

*Translation was for centuries a dominant strategy in language teaching, until it was displaced by the communicative approach in the sixties. From the seventies the trend has been to ban translation altogether from the language teacher training curricula and from textbooks. Only a few voices have raised to defend its value, within the right context, as another communicative activity, particularly at higher levels.*

*Machine translation involves another teaching/learning strategy altogether. In the past, machine translation was considered by bilinguals as a source of amusement, and by monolinguals useful, if at all, for 'gisting' purposes, usually after the output had been post-edited. Now, even in its web-based, freely available versions (Google Translate, Bing Translator, Yahoo Babel Fish) seems to achieve results that can be deemed useful, if not elegant yet, for some communication purposes, particularly between close related languages.*

*Anecdotal classroom evidence points to the fact that, against the explicit advice of teachers, some students recognize having written first the text in their mother language, entered it into a machine translation engine (usually Google Translate), then fixing the output and presenting the final text as their own work. As machine translation improves, this trend cannot but rise.*

*Rather than condemning this practice, this research investigates whether there could be room for machine translation in the language classroom. For language learning, the machine generated translation could offer a type of scaffolding upon which the individual student can project their grammatical knowledge on the other language. The teacher could find in it also a common platform for a class activity.*

*This presentation will report on the preliminary results of a study now in course on the use of machine translation in the production of written text by Spanish language students at beginner and intermediate levels. Participants were asked to respond to an email prompt by writing directly into Spanish (control group), and first into English using the www.tradukka.com machine translation interface and pre-editing the pre-editing the source / post-editing the Spanish as required (experimental group), with participants being at some stage both in the experimental and in the control group (a repeated measures design). The researchers then will analyze the time spent on the task and communicative value of the responses (the dependent variables).*

*Previous studies brought machine translation (MT) to the classroom as proficient bilinguals would use it for the purpose of translating, or advanced learners for the purpose of mastering their foreign/second language [1, 2, 3, 4, 6, 7]. This study brings it as beginner and early intermediate language learners could for the purpose of expediency in communication. This is a timely and relevant study, taking into account recent developments in free online MT. MT engines (i.e. Google Translate) and MT-related web initiatives (i.e. Gabble-on.com) position themselves to cater precisely for the needs of learners with limited command of the L2. Against the explicit advice of their teachers, these same learners have started tinkering with machine translation (MT) for their writing assignments. The practice may not yet be widespread, but the trend seems on the rise.*

## 1. Research details

In order to find out whether MT might be a suitable activity for developing writing skills into L2 we asked learners of Spanish at beginner and early intermediate levels to perform classroom like writing assignments, in some cases directly into their target language, in others aiding themselves from a MT draft using the Tradukka interface (www.tradukka.com),. The tasks were screen recorded, and the resulting texts first subjected to blind assessment by independent markers, then to careful analysis of the keyboard log and cursor movements.

A first group, beginners, would have had some 40 hours of formal tuition; the second, early intermediate, some 160. These levels, thus, would roughly correspond to levels A1.2 and A2.3 of Common European Framework of Reference. We will refer to these two groups here as Level 1 and Level 2. We aimed at finding whether students would communicate better and learn more if writing directly into Spanish (into L2, for short) or with the help of an MT draft (with MT, for short).

The tests were carried out as email communication, with participants given fifteen minutes to respond to a prompt, and requested to submit some 50 words at Level 1 and some 100 at Level 2. The prompts were drafted at the same notional difficulty.

The data analysis was conducted in two stages. First, by looking at writing "as a product", to help us check whether students communicated better from the MT baseline, taking the number of words as an indicator of amount of communication, and the results of blind marking as an indicator of quality of communication. Then, by looking at writing "as a process", while considering pauses in the screen recordings as indicators of effort and editing interventions as indicators of engagement with the task.

## 2. Data analysis

### 2.1 Writing as a product

Nine participants sat the tests at Level 1 and seven al Level 2. By looking at the output produced by participants (writing as a product), we wanted to know whether students writing with the help of an MT draft (the experimental group) would be able to communicate better than writing directly into the L2 (the control group). This was a repeated measures design, since participants would at some stage work both directly into L2 and with MT.

Variables to be measured would be the number of words and the marks allocated by blind marking. The dependent variable would then be whether the MT feature (the Tradukka interface) had been used.

### 2.1.1 Number of words

We considered number of words as an indicator of amount of communication. While quantity of words would not necessarily be a reliable indicator with advanced learners and proficient bilinguals, verbosity hindering rather than helping communication, it does, in our opinion, with beginners. In cases of very limited command of L2 and with all other variables considered equal, it is reasonable to infer that more words should correlate with the degree of successfulness of the interaction if it was real.

For Level 1 all participants write a higher number of words with MT that they do when working directly into L2, with the exception of one participant who produces the same number of words in both. This is also the case at Level 2, with the exception of another who actually writes more words into L2. For Level 1 the total number of words is noticeable higher when helped by MT. It is also higher for Level 2, but not in the same proportion.

This data suggests that MT helps learners to communicate more, probably in a way which is inversely proportional to their actual mastery of the language: the lower the mastery the greater the help provided by the MT draft.

## 2.1.2 Quality of output

The writing samples were sent to two markers who did not know whether the Tradukka interface had been used, and didn't know the participants or the identity of the other marker.

The noticeable differences we found in number of words between texts written with MT help or directly into L2 is not found on the figures for marking.

For Level 1 and according to the first marker 6/9 participants get a better mark by helping themselves with MT, 7/9 for Marker 2. Total marks awarded to the MT mediated passages as well as the averages still favour the passages with MT. For Level 2, and from Marker 1, 4/7 get a better mark helped by MT, and 5/7 from marker 2, even though, in the case of Marker 2, the total mark given to into L2 passages is slightly higher.

The data seems to indicate, thus, that quality wise there are some advantages to be gained with MT help, although those are not as noticeable as they were when we considered the number of words. Again, it seems the less command of the language the participant has, the greater the advantage of using the Tradukka interface.

## 2.2 Writing as a process

We focus now on the process rather than on end result. We study the process by paying attention to pauses and editing interventions as a window on the mental activity of participants while writing. We do so by analysing the screen recordings looking at the keyboard log and the cursor movements. Pauses would be interpreted as signals of effort, as has been done in psycholinguistics and in cognitive theory studies. On this we follow research done on translation and editing mainly by Dragsted (2006) and O'Brien (2006). Editing interventions could give us clues on the level of engagement of the participant with the task and, indirectly, with the learning taking place.

### 2.2.1 Pauses as indicators of effort

We considered as pauses interruptions in the flow of typing of over three seconds. We were interested in knowing how many times in each test the flow of typing was broken. The more the instances, we assumed, the greater the effort.

Some pauses were rich in information, given the typing that preceded and followed them and the cursor movements while on pause. Some fitted well as indicators of boundaries between what we could call "units of writing", bouts of activity in the process of transferring thought into words; others indicated hesitation on whether to make changes or to pick the appropriate wording, and were interpreted as indicators of cognitive load.

Results show there were a higher number of pauses when writing directly into L2, with the proportion growing rather than diminishing as the learner progresses (at level one there were 56 pauses writing with MT, 83 into L2; at Level 2, 58 with MT, 163 into L2).

### 2.2.2 Editing interventions as indicators of engagement with the task

The number of editing interventions is greater as was to be expected for Level 2 (33 for Level 1, 96 in Level 2). Of these, successful editing interventions happens proportionally the most with Level 1 learners working into L2 (6 successful edits with MT against 14 into L2; at Level 2, 25 successful edits with MT, 28 into L2).

On Level 2, however, the number of edits with MT (47) is very close to the number of edits done directly into L2 (49). In the Tradukka interface, we find 25 successful edits against 22 unsuccessful. The proportion of successful versus unsuccessful edits is greater when writing directly into L2 (28 against 21).

When using Tradukka, the most striking finding had to do with the poor quality of some of the participants' English. The low level of English writing proficiency, perhaps due to carelessness, affected obviously the level of Spanish.

Both when working from MT and into L2, most errors had to do with gender, number, person and tense, errors participants in most cases should have been able to avoid, had they applied what they were meant to learn.

## 3. Conclusions

The sample is too small for us to confer any statistical value to it, but it is often the case that bigger, more representative samples are hard to reach within classroom based research.

The results from our small sample seem to support that MT can help the beginner and early intermediate learner to communicate *more* and *better.* Yet, there seems to be more effort required, as measured by the number of pauses, when writing directly into L2. There seems to be also more engagement with the task, thus more learning, as measured by the number of successful and unsuccessful edits, when writing directly into L2.

Other issues that have been raised in the literature on MT for language learning in regards to advanced language learners, for example in relation to detecting inappropriate use of it by passing the machine's output as their own [5, 8] will need also to be considered in regards to beginner learners..

There seems to be a place for MT in the beginner and early intermediate curricula. More research is needed to picture out what exactly this proper place may be.

The full data from these experiments is now being written up to be submitted for publication to the *Computer Assisted Language Learning* journal.

## References

[1] French, R.J. (1991*). Machine translation.* In W. Brierley & I.R. Kemble (Eds.), Computers as a tool in language learning. Chichester: Ellis Horwood.
[2] Higgins, John and Tim Johns (1984). *Computers in language learning.* Adison-Wesley: Aylesbury.
[3] Kliffer, M.D. (2005, May). *An experiment in MT post-editing by a class of intermediate/advanced French majors.* In Proceedings of EAMT, 10th Annual Conference, Budapest, Hungary.
[4] La Torre, M.D. (1999). *A web-based resource to improve translation skills*. ReCALL, 11(3), 41–49.
[5] McCarthy, B. (2004) Does online machine translation spell the end of take-home translation assignments? CALL-EJ Online 6.1. Available at www.clec.ritsumei.ac.jp/english/callejonline/9-1/mccarthy.html.
[6] Niño, A. (2008). Evaluating the *use of machine translation post-editing in the foreign language class*. Computer Assisted Language Learning, 21:1, 29-49.
[7] Somers, H. (2003). *Machine translation in the classroom*. In Somers, H. (ed.), Computers and translation. A translator's guide. Amsterdam/Philadelphia: Benjamins, 319-341.
[8] Somers, H. (2005). *Detecting Innapropriate Use of Free Online Machine Tranbslation by Language Students* – A Special Case of Plagiarism Detection. In Proceedings of the 11th annual conference of the European Association for Machine Translation, Oslo, Norway, 41-48.