



# **MACHINE TRANSLATION AND LANGUAGE LEARNING: WHAT THE RESEARCH TELLS US**

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## MultiTraiNMT

**Erasmus+ Strategic Partnership** that aims to develop, evaluate and disseminate open access materials to enhance teaching and learning about machine translation among language learners, language teachers, trainee translators, translation teachers and professional translators

### Priorities include ensuring:

- up-to-date syllabus in MT
- development of technical, critical and ethical skills and competences
- entrée into the world of machine learning for language and translation students, their teachers and others

<https://ntradumatica.uab.cat/>

### Core Partners

- Universitat Autònoma de Barcelona    Pilar Sánchez-Gijón & Olga Torres-Hostench
- Universitat d'Alicant    Juan Antonio Pérez-Ortiz, Felipe Sánchez-Martínez & Mikel Forcada
- Université Grenoble Alpes    Caroline Rossi & Alice Carré
- Dublin City University    Dorothy Kenny, Sharon O'Brien & Joss Moorkens
- Kantan AI    Riccardo Superbo
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# Project Deliverables

- Open-access online book on machine translation for everyone  
Sample: <http://tinyurl.com/hownmtworks>
- Free online activities on machine translation  
Sample: <http://tinyurl.com/nmtactivities>
- Pedagogically-oriented open neural machine translation platform called MutNMT  
<https://ntradumatica.uab.cat/>

# The Coursebook

- Module 1. Multilingualism
- Module 2. Introduction to MT
- Module 3. Evaluating machine translation quality
- Module 4. How to prepare and select texts for MT
- Module 5. Post-editing
- Module 6. Ethics and MT
- Module 7. How NMT works
- Module 8. Customisable NMT engines
- Module 9. MT and language learning

Currently under  
review with:



# MT in language learning: ramifications

High-level (national/regional) language policies

*Notably, in January 2012, Lawrence Summers, former president of Harvard University, commented that “English’s emergence as the global language, along with the rapid progress in machine translation make it less clear that the substantial investment necessary to speak a foreign tongue is universally worthwhile”.*

(Clifford et al. 2013: 109)

University policies (e.g. Groves & Mundt 2015; Mundt & Groves 2016 )

- admission
- assessment
- academic honesty / plagiarism

Instructional design ...

# So what *does* the research say?



Computer Assisted Language Learning



ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/nca120>

The effectiveness of machine translation in foreign language education: a systematic review and meta-analysis

Sangmin-Michelle Lee

**(2021)**

*L2 Journal*, Volume 14 Issue 1 (2022), pp. 26-44

<http://repositories.cdlib.org/uccllt/12/vol14/iss1/art2>

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Thirty Years of Machine Translation in Language Teaching and Learning: A Review of the Literature

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# Research on MT and language learning

>100 papers since Corness (1986) cited in Jolley and Maimone (2022)

Some reviews exclude more recent sources concerned specifically with professional translator training or post-editing studies not conducted within an L2 or L3 language learning scenario.

Typical foci:

- self-reported use of MT (extent, particular uses)
- teachers' and learners' perception, opinions, beliefs, attitudes regarding MT
- use of MT as academic dishonesty

*empirical studies on the effects of MT use in L2 learning are still scarce*

Jolley and Maimone (2022: 27)

Much of the literature is comprised of argumentative essays and descriptions of classroom activities.

**MT in Language Teaching and Learning.** This strand comprises essays, activity reports, and empirical studies that specifically address MT use in formal learning contexts. They discuss current and potential uses of MT to develop language skills (primarily translation and L2 writing), describe MT-supported activities, and report findings of experiments. Authors of these studies recommend best practices for using MT to support language learning.

Jolley and Maimone (2022: 27)



# Contemporary Relevance of “Older” Sources?

E.g. Somers (2003) and even Enkin & Mejías-Bikandi (2016) propose activities that could enhance **metalinguistic awareness**:

*the ability to focus attention on language as an object in and of itself, to reflect upon language, and to evaluate it.* (Thomas 1988: 531, in Thue Vold 2018: 67)

General assumption is that the MT will get the “structure of interest” wrong, and that students can comment on this.

French	↔	English
L'oiseau entra dans la chambre.	×	The bird entered the room.
L'oiseau entra dans la chambre en sautillant.		The bird hopped into the room.
On a dormi dans ce lit.		We slept in this bed.
On a donné le livre à Paul.		The book was given to Paul.
Nous venons de finir de lire ce livre.		We have just finished reading this book.
German	↔	English
Ich habe grossen Hunger.	×	I'm very hungry.
Es wird getanzt und gegessen.		There is dancing and eating.
Hans will, dass Kurt sein Frühstück isst.		Hans wants Kurt to eat his breakfast.

## Google Translate 02.02.2022

### Examples of difficult sentences from Somers (2003: 231) and Enkin and Mejías-Bikandi (2016)

Spanish	↔	English
Queremos que nos digan la verdad.	×	We want them to tell us the truth.
Es importante que nos digan la verdad.		It is important that they tell us the truth.

# Sample structures of interest (Enkin and Mejías-Bikandi 2016)

*I was told there is absolutely nothing they could help me with...*

GT 2014 & 2015: Me dijeron que no hay absolutamente **nada que** me podía ayudar **con...**

HT 2016: Me dijeron que no hay absolutamente **nada con lo que** me pudieran ayudar...

GT 2022: Me dijeron que no había absolutamente **nada con lo que** pudieran ayudarme...

# Empirical Study of Metalinguistic Awareness in MT Use (Thue Vold 2018)

learners of French as an L3 in Norwegian upper secondary school

read two different machine-translated versions of the same text (Google Translate & Bing Translator)

decided which MT was better and explained why

Thue Vold concludes that while the use of MT texts to develop learners' metalinguistic awareness has "considerable potential", "training, scaffolding techniques and guidance from the teacher are of paramount importance" (ibid.: 89) as, left to their own devices, learners may not explore fruitful avenues of analysis, and their group conversation may even reinforce misconceptions about language (ibid.).

# MT in writing tasks (O'Neill 2019)

>300 American students wrote short compositions in French and Spanish using:

- Google Translate with prior training
- Google Translate without prior training
- an online dictionary with prior training
- an online dictionary without prior training
- or no technical aid at all.

O'Neill found that:

- the GT+prior training group scored better than all others on their compositions, followed by
- online dictionary+prior training group.
- In post-tests conducted one week later, and three to four weeks later, where students no longer had access to the tool in question, the Google Translate + Training group no longer performed better than the other groups .
- The advantage of using the tool was short-lived and dependent on the continued availability of the tool.

# MT in writing tasks (Fredholm 2019)

Fredholm (2019) tracked lexical diversity in compositions written over the course of a full school year by 31 Swedish upper secondary school pupils of Spanish as a foreign language.

- ~50% used a printed dictionary as a translation tool
- ~50% used Google Translate

Use of MT was associated with higher lexical diversity, and hence better performance, as long as students continued to have access to the tool, but once access was removed, the effect vanished. Again, the benefit bestowed by use of MT seemed dependent on the continued availability of the tool.

# MT and Syntactic Priming (Resende & Way 2021)

Brazilian Portuguese speakers exposed to Google Translate's correct use of particular structures reproduce those correct structures, even after a delay of 24 hours.

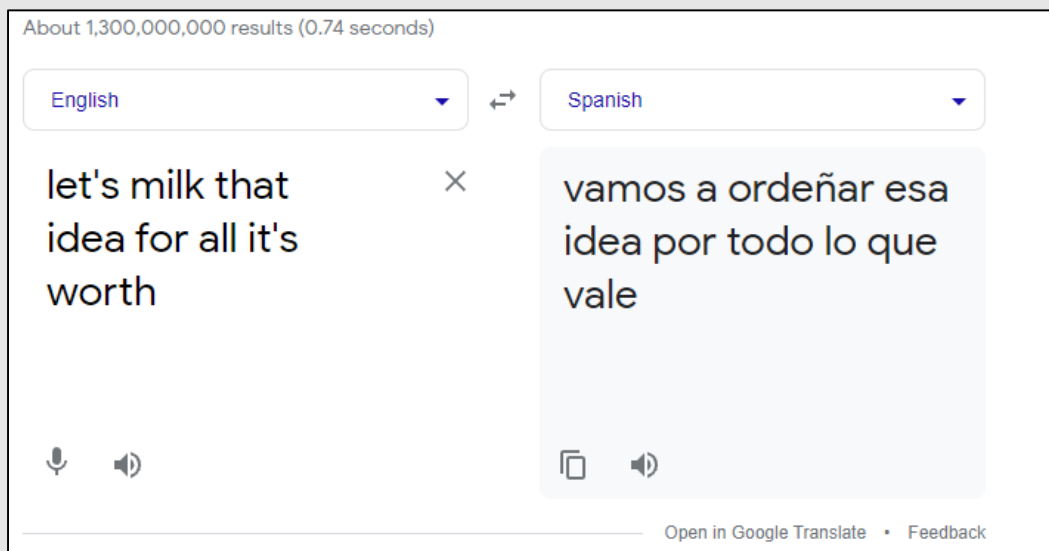
Evidence of implicit learning about syntax from NMT outputs in some of the participants.

# Some conclusions from existing research

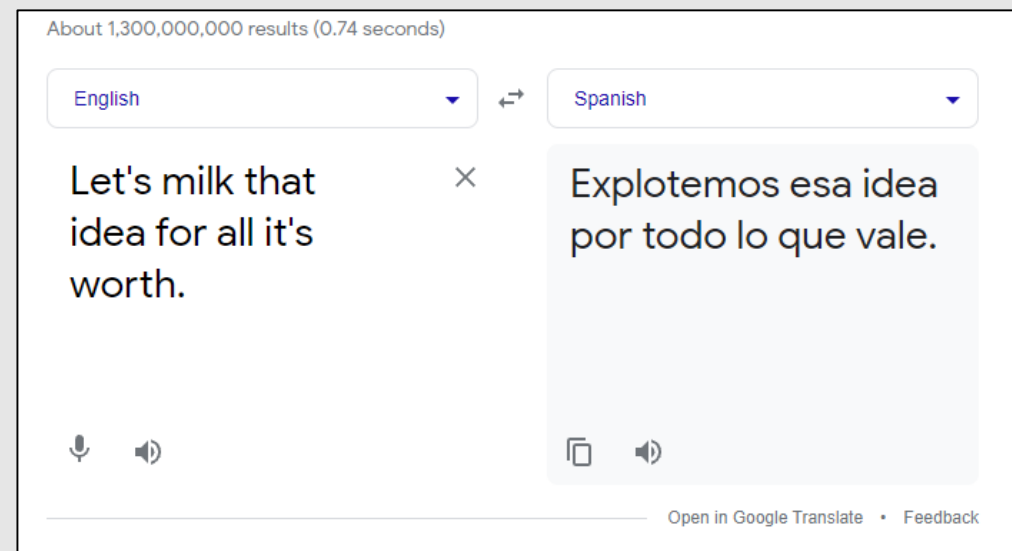
- language learners use MT and rather than trying to outlaw its use, it is better to take a nuanced approach, based on an understanding of where MT can be more or less helpful, depending, perhaps, on the extent and context of use
- language learners make better use of MT when they have received appropriate training
- language learners can generally benefit more from MT if they already have reasonably good proficiency in the foreign language (O'Neill 2012, Resende & Way 2021)



# Other Observations: Protocols for conducting research with FOMT?



*Figure 1: input to Google Translate with sentence-initial lower case and no sentence-ending punctuation, produced 19 October 2021*



*Figure 2: input to Google Translate with sentence-initial upper case and sentence-ending punctuation, produced 19 October 2021*

cf. Ducar and Schocket (2018: 785)

# It's great when researchers:

- make clear the extent to which, e.g., performance in writing tasks or evidence of increased metalinguistic awareness are ends in themselves, or are assumed to be indicative of language development over time
- give the technology a fair chance
- situate the use of tools like MT within principled approaches to SLA/language learning

*before talking about the use of technology in language classrooms, we must talk about how additional languages are learned*

(Egbert, Chao and Hanson-Smith 1999: 2)

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