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ON INTEGRATING GENERATIVE AI INTO TRANSLATOR TRAINING

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Abstract*: The evolution of large language models (LLMs) and generative artificial intelligence (genAI) has sparked off a heated debate on whether technology can be not only an aid, but also a transformative tool in the translation profession. Translators need to have a deep understanding of how they can use genAI in the most beneficial ways to meet the present-day demands of their profession. This involves not only maintaining their fundamental translation competences, but also developing a robust understanding of and expertise in using artificial intelligence (AI) in ethical and responsible ways, so as to minimize the risks involved by its incorporation into their work. The academia certainly plays a crucial role in enhancing the capabilities of both translators in training and of professional translators along these lines. This article presents findings based on a questionnaire completed by translators (both students and professionals) and translation teachers. The questions aimed to assess the current use of generative AI in translation teaching, learning, and training. The goal of the analysis is to suggest ways to improve the status quo identified — in curriculum design, in balancing AI-related and traditional translation skills, and in training university teachers to develop and apply AI literacy effectively.*
Keywords*: attitudes towards (gen)AI in translation, (gen)AI in translation, future of the translation profession, translation curriculum redesign*

1. Introduction

Studies on the integration of artificial intelligence (AI) in translation and the translator's everyday activities have generally acknowledged the diverse effects that AI, especially in the form of machine translation, has had in the field. Since its advent, a mostly positive effect of integrating AI-based machine translation technologies in translation curricula has been reported (González Pastor 2021; Khasawneh and Al-Amrat 2023; Rodríguez-Castro 2018; Wang 2023).

Year 2023 has been justifiably called the year of ChatGPT, mostly because of the tool's availability, accessibility and ease of use. It is not surprising that the rapid emergence of large language models (LLMs) at the end of 2022 and the accelerated evolution of generative artificial intelligence (genAI) have sparked off a heated debate on whether technology can be not only an aid, but also a transformative tool in the translation profession. Recently, there has been an upsurge in studies and talks of experts in the translation industry on the effects that genAI can and will have on it. Especially abundant is research checking the quality of LLMs, mostly ChatGPT,

over more traditional AI-based machine translation solutions, both in high- and low-resourced languages and language pairs and in a variety of genres and text types (see, for example, Moneus and Sahari 2024; Sanz-Valdivieso and López-Arroyo 2023). Perceptions and attitudes of translators-to-be and of those already in the industry as well as of translation teachers and trainers are also being collected and analysed (for example, by Sahari et al. 2023).

In close connection with the main findings of these studies, researchers currently agree that translators need to have a deep understanding of how they can use genAI in the most beneficial ways to meet the demands of their profession in today's very dynamic society. What follows from here are two questions: what particular knowledge and competences should be paired with this understanding, and how this knowledge and these competences may be acquired.

Facing a major pedagogical challenge of what and how to teach, translation teachers and trainers themselves need to be updated on innovations in technologies and AI and to rethink, regularly review and modify the curricula they follow (Ayvazyan et al. 2024; Guerberof-Arenas and Asimakoulas 2024; Koka 2024; Zaghlool and Khasawneh 2024; Wang and Wang 2021).

This article maintains the idea that translation teachers, being themselves crucial participants in translators' training, need to overall reassess their teaching methods and curricula, in order to sustainably incorporate the rapidly advancing AI technologies. Based on the input of translators, translation students and teachers, it also suggests some pedagogical approaches and instructional strategies that integrate genAI tools into translation curricula.

2. Translation curricula, technologies and AI

By default, translation curricula nowadays include, among other things, the development of the instrumental-technological competence. Across Europe, this is predetermined by the European Master's in Translation (EMT) competence framework, as well as by the demands and requirements for a translator's profile from the industry. The EMT competence framework 2022 defines technological competence as "the knowledge and skills used to implement and advise on the use of present and future translation technologies within the translation process" (EMT 2022: 9). This implies that translation curricula need to be constantly reviewed, modified and supplemented, so that future translators can get acquainted with the latest and most relevant digital tools that they can use in their work.

Full integration of technologies in translator training has often been advocated (Venkatesan 2023). On the other hand, Shawaqfeh and Khasawneh (2023), for instance, have recently reported on the impact of training translation teachers to use corpus linguistics tools, as, once they know how to do it, they get equipped with skills that facilitate integration of real-world data in their translation classroom. Pungă et al. (2023), in their turn, have shown how corpus linguistics may inform machine translation quality assessment, the translation quality assessment competence also being among the topics to be focused on in translation classrooms.

For a long time, however, by technologies, translation scholars and practitioners have usually meant computer-assisted translation (CAT) tools (Svoboda and Sosoni 2023). Only more recently, with the advent of neural networks, has machine translation been perceived as one form of translation-supporting technological development. Nevertheless, apart from the tools that are designed and created specifically for the translation process per se, many other digital instruments – including localization and subtitling software, terminology databases and translation project management systems, grammar and spelling checkers, text alignment software, etc. – could be employed by translators in their professional practices (Gambier and Kasperė 2021; Maumevičienė and Berkmanienė 2013; Rodríguez-Castro 2018).

LLMs and tools like ChatGPT have not been designed exclusively and primarily for translators and translation purposes, but for natural language understanding, information retrieval, content prediction and generation as well as for conversation purposes. Technology is certainly extremely helpful in translation in many ways; however, it has become apparent that it has threatened the translation profession**,** as it has made the general public instantaneously realize that translation, to some extent at least, can be done with the help of a digital tool that is readily available to everyone and everywhere, rather than by a professional human translator (Kasperė et al. 2024). This means that translation is no longer an activity that can be performed exclusively by human translators (Pym and Hao 2024). Before the appearance of LLMs, AI-based machine translation tools could also quickly do translation tasks to meet various demands of the public, offering quality that in some languages and language pairs matched that of human translations to a satisfying degree. However, LLMs have become so much more widespread and attractive that, even if non-professionals had been using machine translation for their various non-professional purposes, they seem to have rapidly turned to LLMs. This has happened because of their unprecedented interactivity and fluid text generation, which humans appear to be extremely sensitive to (Liesenfeld et al. 2023).

Translators have also quickly understood the usefulness of generative technology for professional purposes and have started largely using it in their daily practice. However, taking full advantage of genAI tools demands competence. There is currently an ongoing debate about, for instance, the competence of formulating appropriate prompts that can harness the best answers from LLM-based AI systems. Courses teaching this particular competence have appeared on online educational platforms and they have started to be offered in the academic environment as well. Nevertheless, translators need to be taught genAI way beyond being capable of creating prompts to elicit specific responses.

Guerberof-Arenas and Asimakoulas (2024), for example, suggest that tasks involving AI tools can help students explore how technology both supports and limits creativity. Their goal is to encourage pedagogical debate about the role of creativity and technology in translator training and curriculum design. They argue that, perhaps unexpectedly, creativity can be linked to AI tools and even enhanced by them. This AI-supported creativity can be developed through practical translation or translation-technology courses, in standalone modules or through various writing tasks integrated within courses in a translation programme.

In their attempt to suggest how to best engage with new language technologies in language learning and translator training, Pym and Hao (2024) maintain that genAI technologies "present a set of new possibilities and call for updates of even the most recent studies" (2024: xix). Even if it may now seem that the profession is declining and may be exposed to the threat of disappearance, or at least of becoming a niche profession, as advocated by numerous instant experts reacting "out of uninformed, ingrained pessimism", Pym and Hao (2024) invite students to test innovations to understand their capabilities and restrictions in the translation field. This directly implies that translation curricula should be adjusted to include new technologies that students should try out. They should also be offered the opportunity to reflect on their experiences with these technologies, which calls for fostering critical thinking as one of the focal points in translator training.

Soon after the appearance of LLMs, universities have intensified their concern for plagiarism and unethical use of AI-generated content in students' works, in their written papers especially. Many have attempted to design and institutionalise guidelines for the proper use of genAI tools in education and research (see, for example, the guidelines of Columbia University, Harvard University, University of Oxford, University of Cambridge, Ghent University, University of Warwick, etc.). Such guidelines, mirroring concern of the same kind outside the academic environment (see, for example, UNESCO's 2023 *Guidance for Generative AI in Education and Research*, or the European Commission's 2025 *Living Guidelines on the Responsible Use of Generative AI in Research*), generally describe the principles of generative artificial intelligence ethical use and include guidance for students, recommendations for teachers and researchers and penalties in case of plagiarism and unethical use.

Most universities today have adopted generative AI technologies, offering staff and students opportunities to enhance their digital competence, critical thinking, and ability to assess quality and relevance. For students, this entails using generative AI to support their learning in ethical, responsible, and transparent ways. For teachers, it calls for an ongoing review of advances not only in translation studies but also in related technological domains, for a reassessment of pedagogical methods and the acquisition of new tools to facilitate effective and up-to-date knowledge transfer. In the context of translation education, generative AI represents an indispensable innovation that must be integrated meaningfully into the teaching and learning process. For professional translators, familiarity with these tools goes beyond that of an average technology user, who may have little understanding of, or interest in their configuration, capabilities, and broader implications of their use. It also involves making informed and ethical choices and providing transparent, responsible service to their clients.

3. Survey overview

Building on the key issues related to the role that genAI has come to play in the translation arena, this paper aims at unravelling the attitudes of translators, translation students and translation teachers towards the integration of genAI in the translation curricula.

A number of aspects considered in our survey are reported on below, including the current situation regarding technologies, AI, and genAI in the translation industry, a look ahead at technological developments and how they affect the translation profession, as well as the role of the academia in providing expertise to future players of the industry.

3.1. Survey design

For the purposes of this study, the Google Forms tool was used to develop and distribute the questionnaires for data collection. Two surveys were designed and distributed in 2024: one was meant for translation students and translators already established in the industry and the other was meant for translation teachers.

The translator questionnaire consisted of 22 questions. In terms of demographics, the questionnaire only asked for information about the highest current educational background and experience in translation. Other questions were related to AI-associated topics and subjects they were taught (if still students), to the impact of AI on their profession, skills that would be needed in the future, and steps the academia could take to integrate AI in translator training. Of 22 questions, 7 were open, while the rest were either multiple choice or tick box type, with preset options. Some offered the respondent the option to elaborate on the answers provided.

The translation teacher survey consisted of 25 questions, of which 10 were open. In terms of demographics, the questionnaire asked for information about the level of the students (bachelor's, master's) currently taught in a university translation program and about their experience in teaching translation measured in years. Some questions were similar to those in the translator survey.

The participants were instructed that the survey was voluntary, and they could withdraw from it at any time by choosing to discontinue filling it.

3.2. Survey participants

Convenience, purposive and snowball sampling were used as data collection techniques. The questionnaires were shared on social media, namely on Facebook groups of translators and translation teachers, as well as through personal contacts, with a specific request for the addressees to recruit, if possible, additional respondents to whom we, the authors, did not have direct access. Both surveys were open for 4 weeks. In total, 63 fully completed translator questionnaires and 31 fully completed translation teacher questionnaires were received.

Among the translator survey respondents, 9.5% were bachelor's degree students in translation studies, 11.1% were master's degree students in translation studies, 12.7% were bachelor's degree graduates in translation studies with no aspiration to pursue the master's degree, 25.4% were master's degree graduates, 39.7% had other educational backgrounds, and 1.6% preferred not to say. This shows a relatively good distribution of the respondents within the sample. In terms of translation experience measured in years, more than half (52.4%) indicated having

been working for over 10 years in the field, 16.9% indicated having been translators for between 3 and 10 years, 30.2% had up to 3 years of translation experience, and 1.6% indicated having no experience at all.

Among the translation teacher survey respondents, all of them working at university level, 35.5% indicated teaching bachelor's students, 9.7% indicated teaching master's students, and 54.8% indicated teaching students at both levels – bachelor's and master's. In terms of translation teaching experience measured in years, 38.7% indicated having been teaching translation for between 11 and 20 years, the same percentage said they had been doing it for more than 20 years, 12.9% for between 6 and 10 years, and 9.7% indicated having up to 5 years of translation teaching experience.

3.3. Data analysis

Since the survey was a small-scale study, we did not attempt to conduct a statistical analysis. Rather, a qualitative analysis drawing insights from the responses of translators, translation students (considered together in one group, as all students reported to be engaged in translation activities and all translators reported to have undergone formal translation training in a higher education program) and translation teachers about AI and genAI in translator training was conducted. Further, in presenting the survey data, we report on the findings by stating the percentage of respondents in connection with their answers to the survey questions. In certain cases, we compare the answers given by translators/translation students and by translation teachers. The quantitative findings of the closed questions of the surveys are supported with observations provided as answers to the open questions.

4. Findings

4.1. AI in translation teaching and translation competence development

The majority of both respondents' groups (73% of translators and 83.9% of translation teachers) proved their ability to confidently explain what artificial intelligence was. When asked an additional question, namely whether they could confidently explain what generative artificial intelligence was and provide examples of genAI tools, almost three quarters of the translation teachers (74.3%) provided positive answers, 19.4% were not very sure about it, while a much smaller percentage of 6.5% indicated that they would not be confident explaining that or giving examples. The small difference in percentages in the teachers' group, who declared knowing what AI and, respectively, genAI was (83.9% vs 74.3%) may be the consequence of the fact that genAI is a much more recent concept than AI, which is familiar to translation teachers mainly through machine translation.

When the translator survey respondents were asked whether they had been taught (about) AI technologies in their translation studies, the majority (68.3%) said *No*, while one-fourth (25.4%) of the respondents said *Yes*. When teachers were asked

the corresponding question, i.e. whether they teach students (about) AI, more than half answered positively (67.7%), while fewer answered negatively (25.8%) and a small number of them were, quite curiously, unsure (6.5%). In terms of the topics or subjects taught in relation to AI, both translators and translation teachers could select from among multiple answers. Thus, the translators indicated that they were taught the following: quality issues (53.3%), AI ethics (40%), data safety (33.3%), a variety of AI tools (36.7% each), AI regulations (20%). The *Other* option was selected by 26.7% of the translator survey respondents. The greatest majority of the teacher respondents chose, as we anticipated, the option machine translation software and tools (76.9%), followed by AI ethics (42.3%), genAI tools (26.9%), data safety (23.1%), and other (15.4%). AI regulation was selected by 3 teacher respondents only (11.5%).

Both teachers and translators were asked to indicate the particular AI tools that they taught or were taught about, and it came as no surprise that, in both groups, the tools mentioned were mostly machine translation and computer-assisted translation tools and software, e.g. DeepL, Google Translate, Systran, SmartCat, Matecat, memoQ, SDL Trados, Wordfast, OmegaT, Aegisub, Subtitle Workshop, MyMemoryTranslated, MarianMT, etc. Both translators and teachers mentioned much fewer tools that are not directly machine and/or computer-assisted translation instruments, but which certainly aid in the translation process: Grammarly, ChatGPT, speech recognition tools integrated in respeaking and subtitling cueing tasks, etc. We believe that the answers to this question speak for themselves: translators and teachers are well acquainted with machine and computer-assisted translation tools, but they are much less familiar with other AI-based tools.

The teachers' survey also included an open question on whether they could provide a brief description of the task(s) they set for their students in case they taught them (about) genAI tools. The tasks described were, most often, obviously related to translation: using genAI (ChatGPT) for the clarification of a complex text (often, in view of translating it), translating texts using machine translation and comparing the quality of the target texts produced in this way either between themselves or with human translated texts, extracting terminology and creating glossaries, understanding AI translation-related issues. Here are some examples of answers:

> Whenever students might encounter some texts which are complicated to understand, if there are some complicated processes provided etc., I *suggest my students to use genAI tools, mostly often ChatGPT, for clarification, explanation of the given text, extracts, or even complicated phrases.

> Students are getting texts translated or modified using AI tools and they have to spot the errors and distribute them according to different types.

> In a course devoted to the description of the translator's competence, I discuss the ethical implications of using AI, as well as the EU regulation that stipulates the necessity that AI systems are safe and transparent.

The tasks mentioned that were not related to translation were much fewer: exercises using LLMs for summary generation, text editing, selecting and arranging data, or the generation of technical writing documentation.

In response to another open question, teachers who previously answered that they did not teach their students (about) AI technologies offered reasons for not doing it: the lack of equipment and licensed resources; not knowing how to approach it in class; still working on the intricacies of AI technology and not being yet fully able to structure the information about it; not knowing how to integrate it in the curriculum; absence of the topic in the curriculum; such technologies not yet popular in the country where they teach. The teachers' quite varied answers concerning what they use AI for in the classes they teach coupled with the reasons just mentioned, pinpoint the fact that AI technologies are, in most cases, not yet a well-established part of the translation curricula. It is possibly only the teacher's individual initiative if an AI topic is addressed in the translation classroom and AI technology is used as an instrument in the translation teaching-learning process. Also, AI technology, although activated mainly for translation-oriented teaching purposes, is also used for tasks focusing on the development of skills other than translation-related ones.

Translators, on the other hand, would like to be taught about a variety of tools and how to use them, about the capabilities of AI, data safety, AI-related ethical issues, etc., e.g.:

> It would be great to be taught about possibilities that AI technologies can bring to the translator. Including AI ethics, regulation, data safety, quality issues and how to avoid them, variety of AI tools and how they can be useful in translation.

Some translators mentioned their preference for learning about topics related to genAI, like prompting, hallucinations and how to avoid them, AI algorithms, etc.

Both groups of respondents were asked to indicate the advantages and disadvantages of using AI in a translation context. Among the advantages, they mentioned that is was a means of saving time, of ensuring increased translation speed, the opportunity to choose an appropriate translation version, higher translation efficiency, productivity, creativity and quality (though text type and language pairs dependent) alongside better text management, e.g.:

> Translators can do more work with less time. It can also lead to more coherent sentences and fewer grammatical mistakes. AI can help you to find the right word, too.

> AI translation tools can translate large volumes of text almost instantaneously, saving significant time, especially for individuals who type slowly.

> Enables the translator to focus on more creative aspects of translation.

> It helps to complete the redundant tasks, summarize the text to get the main gist, it could help to see the text in a broader context and avoid repetitive tasks.

> The advantages topping my – and, quite possibly, most people's – list would include speed (especially when dealing with extensive source texts) and cost-effectiveness. This, however, is particularly applicable to translators who work mainly with pragmatic (English for Specific Purposes) or non-literary genres.

The disadvantages mentioned were also quite numerous, including loss of human creativity and critical abilities, encouragement of idleness on human translators' part, translation inconsistency, potential for inaccuracies and improper answers, poor translation quality (especially for low-resourced languages and literary texts), over-reliance, the danger of disregarding data leakage and other ethical issues, no human control, etc., e.g.:

> I work with the combination of two small languages, so NONE (= no advantages).
>
> AI is not that advanced for certain languages.
>
> Students might get the impression that AI can do almost everything that the translation process involves.
> Creating a deceptively high level of confidence in the results of AI translation.
> 1. It cannot replace human creativity completely, especially when dealing with figurative language and cultural connotations. 2. Ethical concerns and worries – there is a potential for misusing AI-generated content.
> … most AI tools are not nearly as efficient when rendering literary content.

Some respondents were reluctant to judge what the advantages and disadvantages of using AI in translation were, stating that it was still too early to speak of them. Others, though only a few, thought that there were no disadvantages to it whatsoever.

4.2. A look towards future developments

When both groups of respondents were asked how they saw the role of human translators evolving in the next 5 years, teachers showed a higher degree of indecision concerning the AI-influenced future of translation teaching/training and practice than the translators did, though more of them (25.4%) than of the translators (16.1%) considered that changes, if they were to come, would not be that dramatic. In percentages, more translation teachers (41.9%) than students and professionals (33.3%) thought the translators' role would be decreasing due to AI advancement. This justifies the higher percentages of translators than of teachers offering a positive perspective on the future role of the human translator – only 16.1% of the teachers said this role would be as important as it is now, while they were outnumbered by the 22.2% of translators saying this. One in four (25.8%) teachers vs. one in five translators (19%) was unsure about it.

Of the skills that both groups of respondents thought would be most important for translators in the future, post-editing skills were selected most often by translators (76.2%), followed by technical proficiency with AI tools (68.3%), creativity in translation (66.7%), and subject matter expertise (60.3%). Only 4.8% of the translator survey respondents indicated the *Other* option. The respondents in the teacher survey also chose post-editing as the most important skill (77.4%), followed by technical proficiency with AI tools (67.7%) and creativity in translation (61.3%). Like translators, teachers (54.8%) also thought that subject matter expertise would be less important than the other skills previously indicated. As, based on our experience as

translation teachers, we anticipated creativity to be among the skills in need of being developed in translators, we also asked the teachers to briefly describe how this could be taught. The methods they mentioned included creative writing and reading tasks (in both languages involved in the translation process), translation and subtitling revision tasks, exercises meant to develop cultural awareness and sensitivity, collaborative work which offers the opportunity to learn from the better, etc.

To transition to the responses we further collected, let us mention one answer to the question concerning the skills that translators should develop which strongly indicated a point of view definitely praising the human translators' expertise and work: the respondent we refer to thought a necessary skill for translators to consolidate was that of "selling trustworthiness" in an AI penetrated context.

In terms of the overall attitude towards the increasing use of AI in translation, the answers obtained from both groups of respondents were somewhat similar. More than half of them in both groups were very positive and somewhat positive regarding it (16.1% and 51.6% of teachers vs 12.7% and 46% of translators, respectively). Fewer teachers and translators were very negative or somewhat negative (3.2% and 6.5% of the teachers vs 1.6% and 12.7% of the translators). The supporting question on the immediate impact of AI on the translation profession demonstrated more positive views on the teachers' part than on the translators'.

More than half of the teachers (54.8%) thought that AI technologies were of great help in professional translation vs 16.1% who thought that AI was threatening the translator's profession. Fewer translators (50.8%) thought that AI technologies were of great help in their work, and almost a quarter (22.2%) felt that AI was threatening the translator's profession.

29% of the teachers and 27% of the translators were unsure about the AI impact in the translation profession. These results are somehow justified if one thinks about the extremely fast development of AI technologies of which we knew almost nothing a few years ago.

When asked whether they thought that AI would eventually replace human translators, the majority answered negatively, thus indirectly testifying to their trust in the uniqueness of what human translators can do, especially in the case of expressive texts, literature in particular, e.g.:

> It can replace human translators in some scenarios, but in general, the AI translated text will need a human touch eventually. I do believe it will change the role of translators, but it will not replace human translators.

> In the future, it might improve, however, I do not believe that AI will be able to replicate the tone of the writer or understand specific idioms or metaphors and transfer their meaning accordingly. In addition, translation is not just about replacing one word with another, it is composed of various parts of the language such as culture, history, values, etc. Can AI successfully interpret that?

> No, I believe that post-editing or review will always be needed, and until the people will have fear of AI, they will always seek human work.

> Definitely no, however, I think that we should not be afraid of changes in the profession. The humans are essential in translation processes as at least they have to check the quality of MT output, not to mention translation of literature, poems, etc. where a human translator is irreplaceable.
>
> It cannot replace the creative part of human translators, especially in literature texts.
>
> I don't think so, since AI is not capable (at least at this stage of its development) of reproducing the subjective processes inherent in a person creating texts.
>
> No, human translators are here to stay, although their skillset might be different in the future.
>
> No, because human translators can interpret all sorts of problematic cases, while AI cannot think for itself only based on previous input. And more and more text-producers (authors of original texts) are protesting against re-using their work to be fed into AI databases.

This last example raises an ethical issue in AI translation. We envisage that more of the kind will be part of the discourse on AI in the near future.

However, there were a few responses in the translators' group indicating that AI would replace human translators to some extent. Here are some of the answers capturing this perspective:

> […] it depends. These tools can replace the translator, but they will not replace linguistic adaptation, especially for translations into less common languages.
>
> It will replace translators partially, no AI can localize translation fully.
>
> It again depends on the type of text. It has already replaced human translators in certain areas but it will probably not manage to replace human translators in areas that require greater finesse in decoding and reencoding skills (such as literary texts, for e.g.).

4.3. The role of the academia in integrating AI in translation curricula

Both groups of respondents were asked an open question about what steps, in their opinion, the academia (universities) should take to better integrate AI in the translation curricula. Among the translators' suggestions, there were courses and workshops on topics of AI (whose success some indirectly suggested rests on the development of soft skills and openness to innovation), collaboration with the translation industry, collaboration with AI and IT experts, investing in AI tools to be used by teachers and students, etc. If all teachers agreed that AI should be made part of the translation curricula, we got at least one answer that suggested that this should be done after very careful thinking, and definitely not to the detriment of developing other more traditional, but nevertheless vital, translation skills:

> I think making sure trainees can actually write and translate is more important than showing them some shiny new tools. Without language, translation, and subject matter

> knowledge, as well as the experience of working on projects in teams, I fear that the GenAI classes will be something separate bolted on to an already busy curriculum. If there is a relevant AI application that actually works well, it should be integrated in the relevant courses (e.g. specialised translation) instead of being taught only in a tech course.

The subjects to be included in the curricula that were proposed by translators included data literacy, AI ethics, and post-editing.

Teachers also suggested the inclusion of AI subjects into the university translation curricula and the furtherance of collaboration between translation and computer science departments to develop interdisciplinary courses and projects. They also indirectly acknowledged that some of them might not have the necessary skills to teach AI subjects and suggested that they should be trained to use AI and to take advantage of applying it in translation and translation teaching, e.g.:

> Train the staff initially, then develop an appropriate curricula and provide the required space, lab, tools for practical implementation.

> Train teachers in using AI in translation so they can teach in their turn.

This idea was also reflected in the translators' answers, in which they suggested that professors should attend conferences on AI-related topics in their field and bring good practice examples and advice into their classrooms.

5. Discussion of the findings

Although this survey was a small scale one, we believe it allows us to draw at least some informed general conclusions. We shall discuss them in what follows.

5.1. Rethinking translation curricula

It is obvious that translation curricula should be quite soon supplemented with courses on a variety of AI topics like data safety, AI ethics, AI structure, etc. In general, data literacy and post-editing skills are becoming crucially important. However, the introduction of AI courses in the university translation curricula should not marginalize or exclude other subjects whose focus still falls on skills translators cannot do without.

Our survey findings are in agreement with the results obtained in a recent study by Zaghlool and Khasawneh (2024), who report that ensuring the alignment of the translation curriculum with technological advancements includes translation curriculum design, continuous review and careful planning of specific translation technology classes. Ramírez-Polo and Vargas-Sierra (2023) have reported insufficient inclusion of ethical issues in the translation technology classes, while, at the same time, acknowledging ethics to be of utmost significance if translators are to act critically. Stahl and Eke (2024) also pointed at the issues that might arise from an unethical use of chatbots like ChatGPT (in the areas of social justice and

rights, individual needs, culture and identity and environmental impact), indirectly highlighting the need to include the discussion of AI translation ethics in translator training programs. Our survey results support these authors' observations as well.

Fostering creativity and critical thinking becomes more compelling, but also more demanding and challenging. Similar trends have been reported by Guerberof-Arenas and Asimakoulas (2024) in their work on creative skills development in translator training. The authors describe the conceptual planning and delivery of a module to teach creativity by way of exercises that focus on writing, which in turn develops divergent and convergent thinking. Our findings evidence that a good balance between teaching creativity and technology (AI) has to be achieved, as technology is not expected to become sufficient or capable of operating on its own in translation in the near future, so as to provide high-quality translations for low-resourced languages and language pairs, as well as for texts belonging to genres where connotative, expressive language prevails (e.g., literary texts).

Knowing that only a few languages so far can boast big data and linguistic resource digitization, and that harnessing enough and appropriate data for large language models in order to produce a satisfactory outcome in the vast majority of the world's languages is a mission still hardly attainable, if not impossible, we may forecast that human translators will be needed long to ensure at least accuracy, truthfulness and relevance of expression in translation. And if this is the case, translator training focusing on skills other than the instrumental, digital ones should not be neglected only because we are now facing an obvious widespread orientation towards integrating technology, AI included, in translation teaching and practice.

Sahari et al. (2023: 2937) have concluded that recent AI-based translation-related technologies like ChatGPT are "more valuable for mechanical processes of writing and editing translated texts than for tasks requiring judgment, such as fine-tuning and double-checking". Training of judgment may be executed through reflexive translation practice. As argued by Kadiu (2019: 148), the reflexive approach, being a form of criticism, "invites translators, translation scholars and trainers to welcome continual examination, and to interrogate self-interrogation itself". Approaching translation reflexively, even when using technology, can help translators, translation students and trainers understand the value, relevance and effect of digital tools or, as Gambier (2020) puts it, it helps us integrate technology within our culture. The reflexive approach to translation has prompted scholars to suggest teaching activities that encourage it. Tilghman (2024), for example, has proposed a generative AI teaching activity for a translation class, which also encompasses a reflective component. To enhance creativity and the critical thinking competence, a number of curriculum decisions and in-classroom techniques could be exploited, including study writing, reading classes, self- and other-revision tasks (Kasperavičienė and Horbačauskienė 2020), collaborative translation and revision, etc. Various didactic activities meant to foster creativity in translation have been listed by Bayer-Hohenwarter (2010) and Guerberof-Arenas and Asimakoulas (2024). Pym and Hao (2024) also provided a selection of teaching methodologies and classroom activities to integrate technologies in the translation curriculum.

The findings of our small-scale research are one more proof that all these teaching methodologies and activities respond to obvious needs in translator training.

To add to the above, we suggest that genAI tools, like ChatGPT, Gemini, Quillbot, Wordtune and many more should be tried out not only for accomplishing translations and judging their quality, but also for co-creation tasks allowing building on pre-written creative texts. GenAI is there, so to say, to stay, so we need to make use of it wisely.

5.2. Fostering collaborations

Our study findings draw attention to a desired collaborative nature of the translation training curricula. Teachers should integrate their expertise with industry practices, while translation and IT departments should work together in shaping translation training programs that would closely align teaching with the ever-changing translation market demands (of which wise and professional handling of AI tools is certainly one).

Our respondents suggest in their answers that inviting industry representatives and teachers from IT departments to deliver classes in translation programmes is now highly recommendable. Zaghlool and Khasawneh (2024) also note that partnerships between industry players, including AI experts and university translation teachers should be established. We are also of the opinion that experts from IT departments should be invited to deliver (parts of) courses in translation programmes. Translation trainees could be offered classes to understand the structure of LLMs, linguistic patterns of prompting, prompt types, quality assessment and correction of the results obtained.

However, although cooperation has been reportedly encouraged and fostered between the academia and the industry (De Bonis and Agorni 2022), more focus should be placed on creating sustainable partnerships. Not only should professionalisation and entrepreneurship be promoted, as it has been more widely done across translation programmes in terms of translation projects management, but also more diverse opportunities for skill development, possibly encompassing perspectives of smooth re- and upskilling, should be offered by both the academia and the industry. Technologies themselves may be employed to enhance translators' collaborative skills, as proposed by Zappatore (2022a, 2022b) who reports a significant increase in cooperation efficacy achieved through computer-supported collaborative simulated translation labs, to be further supported with chatbots and augmented reality.

5.3. Fostering AI literacy among translators

Even though rapid and massive technological advancements have led the translation industry to multiple and diverse concerns about its further evolution, translators are and will most probably continue to be users of genAI technology as much as any other consumers. The findings of our study demonstrate that the understanding of how to harness AI (ethically) is not particularly high among

translators. Firstly, when asked what AI tools they were familiar with, the majority of the respondents indicated machine translation, but not other, e.g., generative, tools; and, secondly, despite the fact that many admitted to being able to confidently explain what AI was, some stated that they were not able to do that. This calls for continuous professional development courses that might be offered by the academia not only to translation students, but also to translators who are already established in the industry. Such courses might focus on engineering, AI ethics, digital tools, etc. An AI-competent society is to be desired now as much as the computer-competent society used to be in the 1990s. Therefore, all groups of translation professionals, despite their expertise, experience, age, place of residence, or any other demographic factor should be offered life-long learning opportunities.

5.4. Training the trainer

An important aspect not to be missed in the discussion of translator training is the training of trainers. Research-based evidence on training translation teachers is not abundant (Rico and González Pastor 2022), although scholars advocate for the continuous development of the pedagogical or instructional competence of translation teachers. This, in their opinion, may help translator training institutions to meet the changing demands of the field (Chen and Liu 2023; Orlando 2019; Szabó 2020). Kelly (2008) draws attention to the necessity of a detailed local needs analysis before deciding what translator teachers may take advantage of in a given context. Our study findings provide evidence to support the results of previous research on the importance of teacher training and also point to the fact that research about the qualifications and expertise needed by translation teachers in education institutions is rather scarce. Still, there are some studies that underline the importance of offering translation teachers the chance to develop the competences they need. One such study is, for example, Bowker's (2021), who points out that, in Canada, a range of resources for developing machine translation literacy has been offered with a view to helping to train the trainers (the Machine Translation Literacy Project). In agreement with this, as suggested by the findings of our study, we encourage higher education institutions to follow the example and provide the necessary resources as well as organize meetings, in the form of webinars, seminars, and conferences, in order to support translation teachers and trainers. This is already common practice elsewhere – for instance, the EMT network's WG2 on translation technology leaders, as well as the Consortium for Translation Education Research (CTER) regularly organize training seminars for translation teachers, meant to help them acquire and take as much advantage as they can of AI literacy.

6. Conclusion: study limitations and future research directions

The widespread use of AI, including generative tools, has demonstrated the vulnerability of the translation profession in a world that is more and more digitalized. It has become clear that translators need to stay ahead of the general public by showcasing excellence in using IT tools, the latest of them included. They

are also required to have the capacity to quickly adapt to developments that ask for, rather than a consumerist approach, a deep understanding of the implications and consequences of resorting to these tools, so that they can not only train their students, but also educate the society at large.

Based on the data obtained, our study proposes that translation programs take the following steps to ensure the sustainability of the profession they prepare students for: rethink the translation curriculum so as to respond to the translators' current (and rapidly changing) needs; stimulate creativity and critical thinking among translation graduates; foster collaborations within and outside the academia, thus contributing joint expertise not only to better training, but also to developing collaborative skills among translation graduates; boost AI literacy, including genAI, among translators; and last but not least, train the trainer. These, however, should be tailored to the specific needs of both trainers and trainees in the particular contexts in which they work and learn.

Our study is limited in several ways. Firstly, it is survey-based only, which may have constrained the depth of the insights obtained. Secondly, the rate of response to the questionnaires was not very high, especially in the case of teachers. To extract more information so as to be able to come to better-informed conclusions, interviews, especially with teachers, could be a supplementary data collection method, if it comes to developing this study further. A wider geographical representation of the respondents would also be welcome (the answers we got come from seven European countries). Developing this study in the directions suggested would bring about more solid and generalizable results. However, we consider the findings obtained here a useful starting point for future research, including from the perspective of the possibility to trace the evolution of AI perception and use in the translation education and practice in the rapidly changing digital world we are now living in.

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GenAI use guidelines:

Columbia University:
https://www.tc.columbia.edu/digitalfuturesinstitute/learning--technology/instructional-guides--resources/instructional-guides/ai-in-education-guides/
Harvard University:
https://bpb-us-w2.wpmucdn.com/hawksites.newpaltz.edu/dist/7/800/files/2024/08/HBP-Education-Must-Reads-How-Generative-AI-is-Reshaping-Education.pdf
University of Oxford:
https://www.ox.ac.uk/students/academic/guidance/skills/ai-study
University of Cambridge:
https://www.communications.cam.ac.uk/generative-ai-tool-guidelines
Ghent University:
https://educationtips.ugent.be/en/tips/chatgpt-een-generatief-ai-systeem-met-impact-op-he/#II.GenAIPolicyforEducationatGhentUniversity
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