

Article

Translation Technology and Ethical Competence: An Analysis and Proposal for Translators' Training

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Abstract: The practice of translation today is inextricably linked to the use of technology, and this is reflected in how translator training is conceptualized, with technologies present in every area of such training. More and more authors have begun to voice their concerns about the ethical issues posed by the use of technology and artificial intelligence systems, and our focus here is to ask whether such concerns are being reflected in pedagogical models and teaching programs in the field of translation. To this end, we analyze a variety of translation and translation technology (TT) competence models, together with a review of the literature on ethics, and a corpus analysis of TT syllabi to explore the different sub-competences addressed in these. The analysis reveals that ethical competence is not specifically addressed in TT classes, or at least it is not reflected in our corpus. The literature review also illustrates a dearth of specific competence models for TT classes, as well as a lack of pedagogical interventions to develop ethical sub-competence, something we aim to address by developing a series of new models and tools. We conclude that the inclusion of ethical issues in the TT classroom is still far from widespread, despite it being a necessary step towards enabling new generations to act critically and professionally.

Keywords: translation technology; translators' competences; ethical competence; translators' training



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1. Introduction

In February 2022, Meta Platforms, a multinational technology conglomerate formerly known as Facebook, which also owns Instagram and the messaging app WhatsApp, announced its intention to build “a universal speech translation” system which would allow people from all around the world to communicate in their preferred language. The accompanying narrative argued that such a technology was needed to limit the widespread use of majority languages such as English, Spanish and Mandarin in favor of other less-used languages, and two new projects were announced, “No Language Left Behind”, which would be able to learn any language, and a “Universal Speech Translator”. The creators of these envisaged a world of mutual multilingual understanding, “a superpower people have dreamed of forever”, as Mark Zuckerberg (2022) himself described it.

This example well illustrates how prevalent translation technologies (TT) have become in our day-to-day activities, and how communication and languages are at the center of our current lives and the “metaverse”. Professional translators, and scholars in the fields of Linguistics, Translation and Interpreting, Language Acquisition, etc., have been forced to reflect on the inevitable rise in language and TT. Whereas attitudes towards new technologies have ranged from acknowledging their usefulness to considering them “inconvenient” (Corpas Pastor et al. 2015), they are now an unavoidable part of how translation, and more broadly communication, works. It therefore comes as no surprise that the ethical implications posed by the use of technology here have been a concern since the early 2000s (Topping 2000; Pym 2001), and indeed even somewhat earlier

(Melby and Warner 1995). For a number of years, these concerns were accepted as the price to be paid for the advantages of technology; yet attention has also been drawn to broader ethical issues that arise. Examples of such issues are the sharing and commoditization of translation resources and the privacy and confidentiality of data (Bowker 2020), copyright issues (Moorkens and Lewis 2019), data extractivism (Paullada 2020), the risk of using technologies in safety-critical domains (Canfora and Ottmann 2020; O’Mathúna et al. 2019; Hunt et al. 2019), environmental sustainability (Cronin 2017), the ethics of algorithms (Tsamados et al. 2021), and gender bias in translation data (Savoldi et al. 2021; Prates et al. 2020).

Whereas we recognize that such attention in the academic and professional worlds is definitely a step forward, we also believe that a need currently exists for the introduction of ethics in the translation curriculum in general, and, more specifically, in the TT classroom.

This paper takes an analytical approach to the ethical questions that arise when using TT and proposes a model to integrate ethics into the training of translators when they learn how to work with technology. The first section of the article offers a state of the art on competences in translator training, providing an overview of general competence models, i.e., a set of desired competencies for specific translation tasks, as well as a survey of competence models in TT. We then review the literature on ethics in translation generally, before moving onto ethical issues in TT in particular, performing an analysis of a corpus of syllabi to explore how this sub-competence is addressed in the TT classroom, thus offering a classification of topics and areas found in these syllabi. The final section then offers a proposal to integrate ethics into the TT classroom, as well as an updated model for technological competence that includes four sub-competences. The study ends with some conclusions regarding the validity and future implementations of our pedagogical and new technological competence models.

2. Theoretical Background

2.1. Competence Models in Translation

Globalization has led to an increase in the demand for translation services to ensure that communication flows between different economic agents. Thus, commercial and technical documents, websites, software, mobile applications, etc., all need to be translated into the languages of the market in which a product or service is to be sold or provided. The volume of texts, number of words and languages translated is continually increasing due to ever-increasing technological progress and the context of globalized markets. In light of the constant changes in these markets, the incorporation of technological innovations into the translator’s workstation, and the implications here in terms of the teaching–learning process, it is worth considering whether current curricula adequately deal not only with the technological needs of the translation industry, but also with the repercussions that the use of these technologies may have in the professional sphere. Hence, two key concepts are of particular importance. The first of these is ‘competence’, that is, a “dynamic combination of cognitive and metacognitive skills, demonstration of knowledge and understanding, interpersonal, intellectual and practical skills, and ethical values” (Lokhoff et al. 2010); the second is ‘professionalization’ (Wikipedia Contributors 2021), involving the “social process by which any trade or occupation transforms itself into a true profession of the highest integrity and competence”.

In Europe, a competence-based approach is now fully established in tertiary education. Within the European Higher Education Area, the term “competence” is associated with the process of the transparent harmonization of university degrees and directly links university education not only to the free movement of students, but also to the professional world. In translation, “competence” is the term used to denote the knowledge, skills, and attitudes necessary for translating. As Tao (2012, p. 291) notes, translation competence includes the epistemological context (what?), the practice (how?) and “the ability to reflect” (knowing why).

The competences and skills that translation students need to acquire in order to develop a successful career in the industry have been widely addressed in the Translation

Studies literature (Neubert 2000; PACTE Group 2001, 2005; Kiraly 2000, 2013; Kelly 2002; Göpferich 2009; Tao 2012; Krajcso 2018; Rodríguez de Céspedes 2019; Szabó 2020, among many other). As a consequence of this, several multi-componential models of translation competence have been developed. One of the first and most frequently cited was developed by the PACTE Group (2001) and consists of five sub-competences: bilingual sub-competence, extra-linguistic sub-competence, translation knowledge sub-competence, instrumental sub-competence, and strategic sub-competence. A further set of psycho-physiological components has also been added to the model.

Another model, known as the “competence wheel”, was designed by the European Master’s in Translation (EMT) expert group in 2009 and initially included six categories: language competence, intercultural competence, info-mining competence, technological competence, thematic competence, and translation service provision competence. In 2017, it was updated, reducing these to five: language and culture, service provision, technology, translation, and personal and interpersonal. The EMT model is no longer presented as a wheel, but as a mechanism composed of cogs that represent the movement, synchrony, and smooth functioning of all competences as a whole.

Göpferich (2009) also developed an influential model which contains a more complex arrangement of competences using a wheel and a base composed of three elements (translation norms and translation assignment, translator’s self-concept/professional ethos, and translator’s psychophysical disposition) and which, in addition to those competences mentioned in the previous models, also includes motivation competence, psychomotor competence and translation routine activation competence.

The final approach we will review here is that of Kiraly (2000), whose constructivist model introduces an interesting point of difference between translation competence and translator competence, with the latter focusing on developing skills, acquiring knowledge, and adopting attitudes for the practical demands of real professional life, as opposed to those implied in translation competence, which are more linguistic in nature. The professional orientation of Kiraly’s socio-constructivist model has been taken up widely in translation studies, and a variety of initiatives have emerged to bridge the gap between what is taught at university and what is required by the market. In this sense, Krajcso (2018, p. 692) cites not only publications by various well-known translation scholars, but also forums—such as the Translating Europe Forum—expert groups—such as the EMT—and European research projects such as Optimale, TransCert, and eTransFair, all of which address the issue of translation competence. Krajcso (2018) also analyzes a series of normative competences proposed by the EMT model, those set out in CIUTI (Conférence Internationale Permanente d’Instituts Universitaires de Traducteurs et Interprètes), those established by the TransCert project, and those included in the ISO 17100:2015 standard. He concludes that these are all quite similar and revolve around three core competences: (a) translation (language, culture, info-mining, specialization); (b) technological (including terminological competence); and (c) operational (project and quality management); as such, he notes that they are not, in fact, very different from previous models.

Krajcso (2018) also presents a comparison of how these initiatives reflect market demands, using data provided by the results of various surveys (OPTIMALE, EUATC, CIUTI and EMT). He highlights two issues that seem particularly relevant for the present article. The first is that more emphasis still needs to be placed on the acquisition of technological skills in translation studies considering the inseparable relationship between the activity of translation and the various ever-evolving technological tools used therein. Indeed, in an analysis of the models of translation competence, Pym (2013, p. 490) observes that technology cannot be considered simply another component in a model, since this would mean that we would always “lag behind both technology and the market”. Krajcso’s second conclusion (2018, p. 705) relates to the need for research on “operational competence”, noting a dearth of research that addresses issues such as marketing, risk management, legal aspects, and ethical issues in the profession. These latter questions will be addressed below.

2.2. Competences in the Translation Technology Classroom

It is undeniable that the practice of translation today cannot be separated from technology since the professionals moved from using programs as simple as word processors to software capable of translating computer programs, and integrating neural machine translation engines (Google Translate, DeepL. . .) in computer-assisted translation (CAT) systems. In this sense, translation has long been characterized as a having an essentially human–machine form (O’Brien 2012), or rather, in terms of the professionals involved, a form of translator–machine interaction (Vargas-Sierra 2020). It is not only essential to teach translation practice in digital contexts in the classroom; there are also underlying theoretical issues here, arising specifically from the impact of technology on translation. O’Hagan (2013) has referred to the “technological turn” that the translation sector has adopted as a result of the advent of CAT tools and, more recently, neural machine translation engines; it has had specific consequences in translation studies, and these should certainly be taken into account in the development of theories and teaching–learning models. Over the last 20 years, the evolution of information and communication technologies (ICT) and their incorporation into the classroom, whether virtually or face-to-face, have brought about great changes in the teaching of translation at the tertiary level. Translator-training practices in CAT environments have led to a process of professionalization in the curriculum, one in which technology is key in the training of translators; as noted above, however, it is still necessary to develop specific technological competences in order to bridge the gap between the skills acquired by students and those demanded by the market (Calvo 2009; Vargas-Sierra and Ramírez-Polo 2011; Krajcso 2018; Rodríguez de Céspedes 2019).

The acquisition of technological competence, also known as instrumental or technical competence, is embraced in all models and approaches, such as those mentioned above. The PACTE Group (2009), for example, consider “instrumental competence” as a key element here, defining it as the “procedural knowledge related to the use of documentation resources and information and communication technologies applied to translation”. Meanwhile, the “tool and research competence” described in Göpferich’s (2009, p. 21) translation competence model involves “the ability to use conventional and electronic tools specific to translation”; in line with PACTE, Göpferich considers this to be one of the three sub-competences that are critical in a translator’s competence. A more up-to-date version of what this competence currently entails can be found in the European Master’s in Translation (2017, p. 9) framework, in the sense that this approach includes “all the knowledge and skills used to implement present and future translation technologies within the translation process. It also includes basic knowledge of machine translation technologies and the ability to implement machine translation according to potential needs”.

For the acquisition of technological competence, we suggested (Vargas-Sierra and Ramírez-Polo 2011) a model called “Training Web Interaction and Translation Technologies” (TWITT), designed with the aim of contributing to the teaching of ICT in translation, and including the use of educational platforms, the Internet, and social networks. It aims to develop various skills, these arising from instilling a collaborative attitude in the classroom context, with students engaging in self-directed learning, and developing an acceptable level of the kinds of professional and technological skills useful for the various roles that translators can play within the translation process. In this model, students of translation use various ICTs to collaborate with each other by sharing materials, information, and knowledge, all of this yielding advantages in terms of both learning and social interaction during the course, which, in turn, positively impact motivation, in that students feel that they are taking an active role in their own learning. The model has a ladder form (Figure 1), and two types of competences are shown within each step: on the left, those related to technological knowledge, documentation and information management and access; and, on the right, those related to translation in electronic collaborative learning environments.

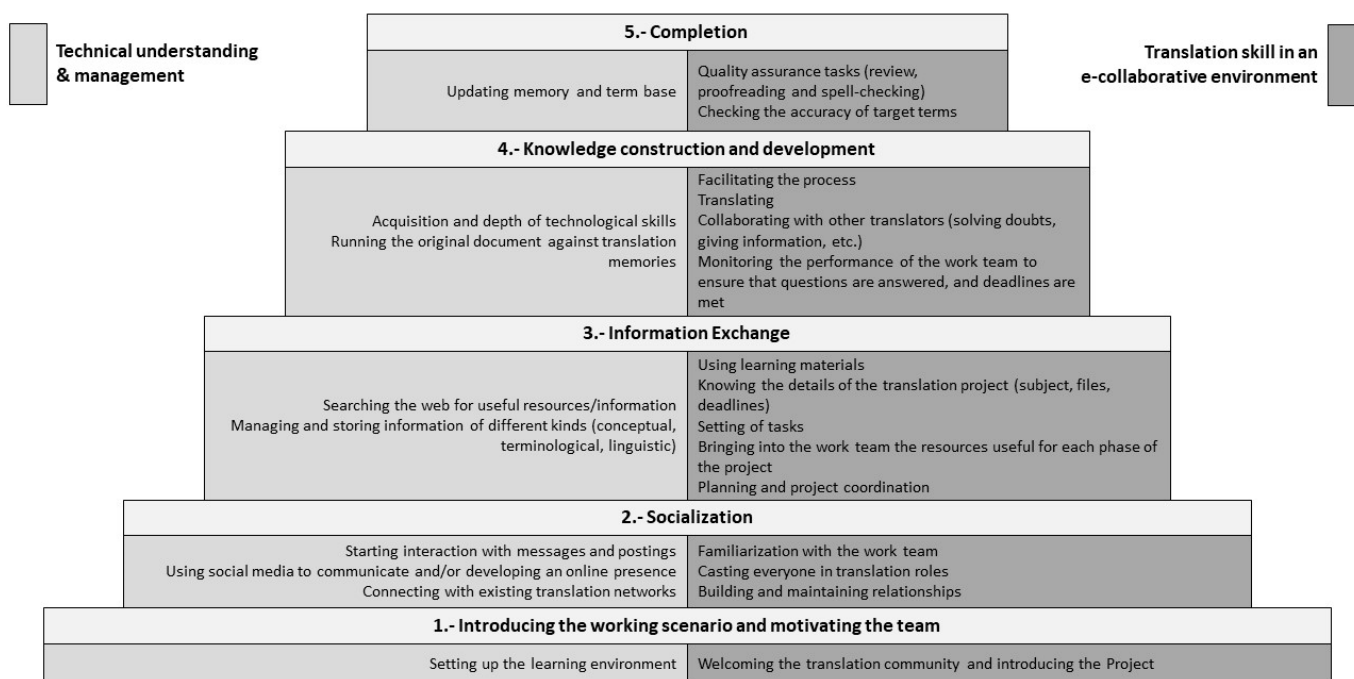


Figure 1. TWITT model.

As shown in Figure 1, the model is structured into five phases or steps. These are: (1) introducing the working scenario and motivating the team; (2) socialisation; (3) information exchange; (4) knowledge construction and development, and (5) completion. In each phase, knowledge and technology management competences (left side) and translation skills within the collaborative learning environment (right side) are addressed.

A recent model that explores the development of technological competence is proposed by He and Tao (2022). Their translation technological thinking competence (TTTC) model comprises four levels: translation technological awareness, translation technological learning, translation technological application and sharing, and translation technological evaluation and creation (p. 352). This model shows the results of implementing technological competence through the knowing-acting translation curriculum (KATC), an approach based on the unity of knowing and acting philosophy of Wang Yangming. Such knowing, it is claimed, emerges through action (p. 553).

As we have seen in the above review, translation competence models attempt to encompass the overall translation process, and technologies are just one component of that process. However, it is our belief, and that of other authors (see, for example, Pym 2013; Krajcso 2018; Rodríguez de Céspedes 2019; He and Tao 2022), that this sub-competence should be more prominent and further developed in the context of current realities. Despite the increasing complexity of the translation workstation due to the incorporation of multiple technological innovations and the central character that technological competence has assumed in the present digital climate, research on specific models or approaches devoted exclusively to developing technological competence is still scarce, and more research is needed to understand how a teaching–learning environment should be shaped to respond to real-life professional needs.

3. Ethics in Translation and the Ethical (Sub)competence

Though it is not the goal of this article to enter into a discussion on the issues of ethics in translation, we do feel that it is appropriate to explore some basic notions here in order to develop the notion of ethical competence in translation technology. Traditionally, ethical issues in translation typically revolve around the relationship between the translator, the text, and the other participants in the translation process: the author and the reader (Alwazna 2014). Two influential writers who address ethical questions relat-

ing to translation are Chesterman and Pym, with many of their discussions focusing on issues of equivalence, faithfulness, the concept of value (Chesterman 1995, p. 147) and the practice of maintaining the meaning of the source text undistorted (Robinson 2003, p. 25). Chesterman (2001) summarizes the myriad perspectives on ethics and translation in four complementary yet contradictory models: **ethics of representation**, which highlights issues of faithfulness, fidelity, accuracy regarding the source author's intentions, alterity and true representation of the other; **ethics of service**, which aligns with theories of functionalism and compliance with the translation brief, with the concept of "loyalty" at its core; **ethics of communication**, with an emphasis on communicating with others and the translator as a "mediator working to achieve cross-cultural understanding"; and **norm-based ethics**, which entails behaving according to the norms of a certain time and culture about what an acceptable translation product should look like, the notion of trust being the cornerstone of this model. Chesterman proposes a new model for translation ethics with the notion of professional practice and "commitment" at its core.

Audi (1995, p. 244, in Drugan and Megone 2011, p. 188), points out that ethics "can be subdivided into the general study of goodness, the general study of right action, applied ethics, metaethics, moral psychology, and the metaphysics of moral responsibility"; in turn, Nagel (2006, p. 379, in Drugan and Megone 2011, p. 188) expresses the view that "Ethics is the branch of philosophy that tries to understand a familiar type of evaluation: the moral evaluation of people's character traits, their conduct, and their institutions. We speak of good and bad people, the morally right and wrong thing to do, just or unjust regimes, and how we should live". It follows from these two definitions that different strands of ethics can be identified, with the most relevant for the professional world being "the general study of right action" or "the morally right and wrong thing to do".

Furthermore, many associations of professional translators have codes of ethics that reflect this approach to ethical issues, focusing mainly on aspects such as the obligation of the translator to be accurate and faithful, that is, on "how to translate" (Pym 2001), or on issues of professional conduct and excellence. From the pedagogical point of view, this is reflected in most translation teaching programs, which typically offer either some type of content in general translation classes relating to issues of fidelity, loyalty or the ethical position of translators with regard to texts, or indeed have specific courses on Deontology, where professional and ethical aspects are discussed.

In terms of the competence models analyzed, as well as the ethical notions presented therein, it is clear that different models include ethical competence, ethical sub-competence, or even an ethical "element" or disposition in some way or another. In the case of the PACTE model, this is found under the concept of psychophysiological competence, where "critical spirit" could be seen as comparable to "ethical thinking", in that the "substantive conception of ethics as a critically reflective morality aimed at identifying, examining, and addressing practical problems" (Borstner and Gartner 2014, p. 15). For Göpferich (2009, p. 21), ethics is embedded in one of the elements that determines the development of the other competences, namely "the translator's self-concept/professional ethos", where aspects of social responsibility are addressed; Tao (2012, p. 295) specifically includes "professionalism: ethical issues" as an element of professional competence. O'Brien (2012, p. 202) understands "professional responsibility" as a personal competence, in contrast to translation and social competences, where "etiquette" covers issues about how to deal properly with clients and other stakeholders in a translation project. Finally, Massey and Kiraly (2021, p. 243) have recently presented a multi-vortex model of translation competence development based on Dreyfus' "Five-stage model of the Mental Activities Involved in Directed Skill Acquisition", in which personal and interpersonal dispositions are said to embrace ethical behavior.

Thus, an ethical (sub)competence can be seen as an essential component in all professional translation activity, one that distinguishes those who simply have a certain set of skills from those who have acquired a true sense of professionalism. As such, ethical competence can reasonably be expected of any professional translator.

4. Ethics in Translation Technology

As we have seen, ethical considerations in translation are by no means new. Nevertheless, technology has not been addressed widely in either theoretical or professional approaches to translation. For instance, [Chesterman \(2001, p. 147\)](#) mentions that a translator's skill set should include a series of competences embracing "adequate technical and research skills in order to discover and evaluate possible alternatives". Some professional codes of ethics mentioned above refer to TT in relation to the commitment translators make in striving for excellence. This is the case with covenant 2 of the ASETRAD code of ethics (Spanish Association of Translators, Editors and Interpreters), which states that professionals should "have access to information sources, reference materials, as well as know the tools of the profession". The ATA code of ethics does not explicitly mention TT, but its fourth covenant includes the principle "to enhance those capabilities at every opportunity by continuing education in language, subject field, and professional practice", with technologies being part of the means through which translator's capabilities can be enhanced. However, as [Bowker](#) notes, this "seeming absence of technology-related guidance in professional associations' codes of ethics" poses problems relating to professional identity ([Bowker 2020, p. 269](#)).

Finally, resources such as [UNESCO's \(2022, p. 95\)](#) Recommendations on the Ethics of Artificial Intelligence also mention TT in terms of cultural policies:

Member States are encouraged to examine and address the cultural impact of AI systems, especially natural language processing (NLP) applications such as automated translation and voice assistants, on the nuances of human language and expression. Such assessments should provide input for the design and implementation of strategies that maximize the benefits from these systems by bridging cultural gaps and increasing human understanding, as well as addressing the negative implications such as the reduction of use, which could lead to the disappearance of endangered languages, local dialects, and tonal and cultural variations associated with human language and expression.

This recommendation thus attempts to address both the potential benefits (bridging cultural gaps and increasing human understanding) with negative outcomes (reduction in the use of certain languages, disappearance of endangered languages, local dialects, and tonal and cultural variations).

Although some early reflections on ethical issues and machine translation (MT) were voiced in the 1990s by authors such as [Melby and Warner \(1995\)](#), the late 2000s saw a growing number of authors raising concerns about ethical issues that the use of TT has not only created, but de facto exacerbated, in that "many of these questions about ethical aspects of new technologies are difficult to separate from broader sociocultural issues" ([Drugan 2019, p. 250](#)). [Bowker \(2020\)](#) offers a very comprehensive overview of the ethical issues raised here in the literature and elsewhere. She classifies the different concerns into six main "core issues and topics": the sharing and commoditization of translation resources; privacy and confidentiality of data; fidelity and collaboration; professional identity, autonomy, and job satisfaction; productivity, time, and money; and cultural hegemony versus the linguistic diversity paradox. She adds some further emerging areas of concern: social responsibility and teaching ethics on TT courses; MT in literary translation; the funding of MT research; and computer-aided interpreting. Similarly, [Moorkens \(2022\)](#) reviews various ethical issues raised by MT: data use, ownership, permissions, distribution, and privacy; the ethics of how MT is evaluated; the use of MT in professional workflows; sustainability issues relating both to working conditions and to environmental concerns; and diversity among developers and users, as well as how this is reflected in terms of MT output. Moorkens also includes a final remark on how computers are acquiring a certain kind of "agency" and how an ethical bias can indeed be implicit in their design.

Other recent contributions on the topic include a Special Issue of *Translation Spaces* in 2020. In one of the articles therein, by [Canfora and Ottmann \(2020\)](#), the authors classify the risks of neural machine translation (NMT) into three levels: first, possible damage

in safety-critical domains if a NMT contains errors; second, issues of liability in cases of damage; and third, cyber risks such as data breaches or loss, especially when online and cloud-based solutions are used. Canfora and Ottmann advocate for good risk management and the implementation of sustainable workflows. They also recommend a high level of MT literacy (Bowker and Ciro 2019) among translation and interpreting graduates and, by extension, anyone who works in the industry. Elsewhere, Kenny and Winters (2020) argue that MT influences not only the authorial voice in literary texts, but also the textual voice of the translator. It has also been claimed by Do Carmo (2020) that, contrary to industry narratives that frame post-editing as a simple and time-saving task, it is in fact a complex undertaking, one which involves intensive decision-making processes. This in turn implies the need for a wider recognition of translators as “specialized knowledge workers”.

Currently, translators and translation producers are paying the price for this depreciation of the value of their work, which, in turn, underlines the importance of reconceptualizing the value of this labor not only in terms of time, but also in relation to other dimensions involved in the complexity of the role of the translator. Moorkens (2020) explains that the tendency towards localization in the translation industry, breaking large projects down into small tasks as a means of maximizing efficiency, can be seen as a new form of Taylorism, which he calls “Digital Taylorism”. He considers translation here in relation to job satisfaction and sustainable work systems, highlighting the need to train future translators in ethical issues related to technologies and the industry, as they will become the gatekeepers and decision makers “about work practices and data harvesting that will impact many other stakeholders within the translation industry” (Moorkens 2020, p. 27). Nurminen and Koponen (2020) discuss fairness and ethics in MT, focusing on the use of MT for humanitarian purposes as well as to increase accessibility to information for underserved groups. These include ethical issues such as “quality, acceptability, and the need to involve stakeholders in development.” Finally, Kenny et al. (2020) deal with general ethical questions of MT and ethics. Particularly interesting here is the notion of how MT is approached, namely as a reductionist idea that seeks to “eliminate” alterity and to equate one language to another without all the nuances each language brings, with English always as the guiding reference.

Hunt et al. (2019, p. 28) bring a new perspective to ethical considerations in the context of humanitarian crises, focusing on the health sector. They include topics related to accuracy, privacy and security, inequalities, respect for individuals and communities, relationship protection, and managing expectations. Their view is complemented by the Ethics Recommendations for Crisis Translation Settings of the INTERACT Research Project (O’Mathúna et al. 2019), where questions are raised such as difficulties in access to technologies due to either affordability or because insufficient language resources are available to build reliable systems; this, in turn, can intensify economic differences between communities. Some other considerations that these authors discuss are the cost of data, internet connectivity, bandwidth, phone types and access to SIM cards, operating systems, and access to technology through social media.

5. Analysis of the Syllabi of Translation Technologies Courses

In an attempt to update the TWITT model and to include the latest research, we carried out an analysis of the syllabi for those translation technology courses that form part of undergraduate degrees in Translation and Interpreting at various universities in a number of countries. Our aim was to reveal which specific competences these courses sought to develop, and to establish a catalog of these as a means of identifying which competences figured most frequently, and whether ethical issues were included. We analyzed a total of 30 TT courses from Argentina, Belgium, Canada, France, Hong Kong, Ireland, Jordan, Lithuania, Saudi Arabia, Spain, Switzerland, Turkey, the UK, and the USA. The selection was based on the availability on the web of the full syllabus in English, French or Spanish, using mainly Google as a search engine and performing searches that contained the words “translation technology” OR “computer-assisted translation” either in English, French, or

Spanish. We are aware that the sample may be small; however, we believe that it will provide some useful initial insights into the issue, as well as being quite heterogeneous in terms of the countries involved. The following table (see Table 1) shows the university name where a syllabus was found, its country, and the subject name.

Table 1. Universities and Syllabi.

University Name	Country	Subject Name
Instituto de Enseñanza Superior “Lenguas vivas”	Argentina	Herramientas Informáticas Aplicadas a la Traducción
Universidad Nacional de la Plata	Argentina	Herramientas de traducción asistida por computadora
Universidad Nacional de Comahue	Argentina	Taller de herramientas para la traducción
Université Saint-Louis	Belgium	Digital tools and language technology
Université Libre de Bruxelles	Belgium	Outils d’aide à la traduction et la rédaction
University of Manitoba	Canada	Informatique et traduction
Université Paris Nanterre	France	Outils numériques et Traduction Assistée par Ordinateur
City University of Hong Kong	Hong Kong	Computer-Aided Translation
City University of Hong Kong	Hong Kong	Translation Tools Development
University of Limerick	Irlanda	Language Engineering and Translation Technology
The University of Jordan	Jordan	Machine Translation
Universidad Vytautas Magnus	Lithuania	Computer-aided Translation
Majmaah University	Saudi Arabia	Computer-aided Translation
Universidad Jaume I (UJI)	Spain	Informática aplicada a la traducción
Universidad Complutense de Madrid (UCM)	Spain	Tecnologías aplicadas a la traducción e interpretación II
Universidad Autónoma de Barcelona (UAB)	Spain	Introducción a las tecnologías de la traducción e Interpretación
Universidad Autónoma de Barcelona (UAB)	Spain	Informática aplicada a la traducción
Universidad Pontificia Comillas (UPC)	Spain	Informática aplicada a la traducción
Universidad de Granada (UGR)	Spain	Informática aplicada a la traducción
Universidad de Alicante (UA)	Spain	Tecnologías de la traducción
Universidad de Córdoba (UCO)	Spain	Informática aplicada a la traducción
Universidad de Valencia	Spain	Informática aplicada a la traducción
Université de Genève	Switzerland	Outils d’aide au traducteur
Université de Genève	Switzerland	Traductique
İzmir University of Economics	Turkey	Computer-Assisted Translation Studies
Heriot-Watt University	UK	Localization and Technical Writing
Heriot-Watt University	UK	Translation Technologies
SOAS University of London	UK	Translation Technology
Rutgers University	USA	CAT Tools (Computer-Assisted Translation)
Middlebury College	USA	Translation Management Systems

Through a careful reading of each TT syllabus, we extracted each objective and assigned each one a tag so that statistics on frequencies could be generated and patterns

identified. In Table 2, the columns show the tag used for each objective, its meaning or scope, the objective or goal that a course was intended to achieve, and the specific university where it was found.

Table 2. Sample processing and tagging learning goals.

TAG	Meaning	Example	University
AT_KNWL	Machine Translation Knowledge and/or Use	Acquire basic knowledge about machine translation (MT)	City University of Hong Kong
CAT_KNWL	Computer-Assisted Translation Knowledge	Identify main CAT tools	Majmaah University. Saudi Arabia
CAT_USE	Computer-Assisted Translation Use	Manejar herramientas de TAO	UCM
COMPUTING	Computing Knowledge	Basic programming concepts and techniques	City University of Hong Kong
CORPUS	Corpus Processing Knowledge and/or Use	Passer en revue les différents types d'outils d'aide à la traduction (. . . concordancier)	UNIGE
EDITING	Text editing (pre and/or post)	Edición de textos en varios formatos	UAB
ERGO	Ergonomics at Work	Prévention des troubles musculo-squelettiques; ergonomie du travail	Université Paris Nanterre
FILE_KNWL	File/Text Knowledge and Management	Conceptos fundamentales sobre el almacenamiento, el formato, la estructuración, la presentación, la creación y la manipulación de documentos de texto.	UA
HYBRID	Machine Translation and Computer-Assisted Translation	Combinar traducción automática y memorias de traducción	UA
INFO_MNGMT	Information Management	Resolver problemas de recuperación de la información almacenada en entornos Windows, extraída de Internet o formato Word, Excel y Access,	UCO
INTERP_IT	Information Technologies for Interpreting	Herramientas informáticas de utilidad para intérpretes	UGR
IT_HISTORY	History of Information Technologies	Conocer el desarrollo histórico reciente de las tecnologías de la información	Universidad Nacional de la Plata
IT_KNWL	Information Technology Knowledge	Conocer y seleccionar las herramientas informáticas de trabajo básicas	Comillas

Table 2. Cont.

TAG	Meaning	Example	University
IT_USE	Information Technology Use	Gestionar ficheros y datos por medio de recursos específicos	UAB
L10N	Localization	To provide the students with the skills to use localization software	Heriot-Watt
LING	Linguistics	Desarrollar la capacidad de uso de la lengua española (...)	UCO
PRJ_KNWL	Translation Project Knowledge	Captar la importancia de las tecnologías en las fases de trabajo del proceso y del producto	UAB
PRJ_MNGMT	Project Management	Knowing the different types and components of TMSs well enough to recommend workflows and systems appropriate to different situations.	Middlebury College
PROOF	Proofreading	Realizar la corrección lingüística	UAB
PROOF_IT	Proofreading Technologies	Uso de herramientas y de nuevas tecnologías aplicadas a la traducción, la revisión y la interpretación.	UCO
TAGGING	Tagging, linguistic/conceptual annotations	Uso de lenguajes de etiquetas	UAB
TERM_DB	Terminology Database Knowledge	Crear y estructurar bases de datos terminológicas multilingües	UGR
TERM_SEARCH	Terminology Searching	Interact with term banks and dictionaries skilfully	The University of Jordan
TMS_USE	Use of Translation Memory Systems	Acquire a working and procedural knowledge of how TM tools work	Rutgers University
TRADOS_USE	Specific Use of TMS Trados	Acquire practical knowledge of how to successfully translate with SDL Trados	SOAS University of London
TT_KNWL	Translation Technology Knowledge	Understand the basic concepts of language technologies	Université Saint-Louis, Bruxelles
TT_USE	Translation Technology Use	Aplicación de tecnologías a distintas tareas dentro del proceso	Universidad Nacional de Comahue
VOC_IT	Information Technology Vocabulary	Familiarizarse con vocabulario de informática y LC	UJI

In order to observe whether the objectives of TT courses were common to all universities studied, as well as their level of cohesion and which objectives predominated, we used network analysis as a method of representation. The initial idea is a simple one: the

objectives of the syllabi are the nodes of an interrelated network. The matrices with tags and universities were created using UCInet (Matrix Editor). Finally, using the graphic representation software (NetDraw), we loaded the various matrices built to obtain a graph of the relationships between the tags, taking into account their frequency (size of the nodes), their position in the network, and the relationships between them in terms of the different universities where they were taught. In Figure 2, below, the tagging of the various objectives of the syllabi is depicted in terms of their inter-relationships.

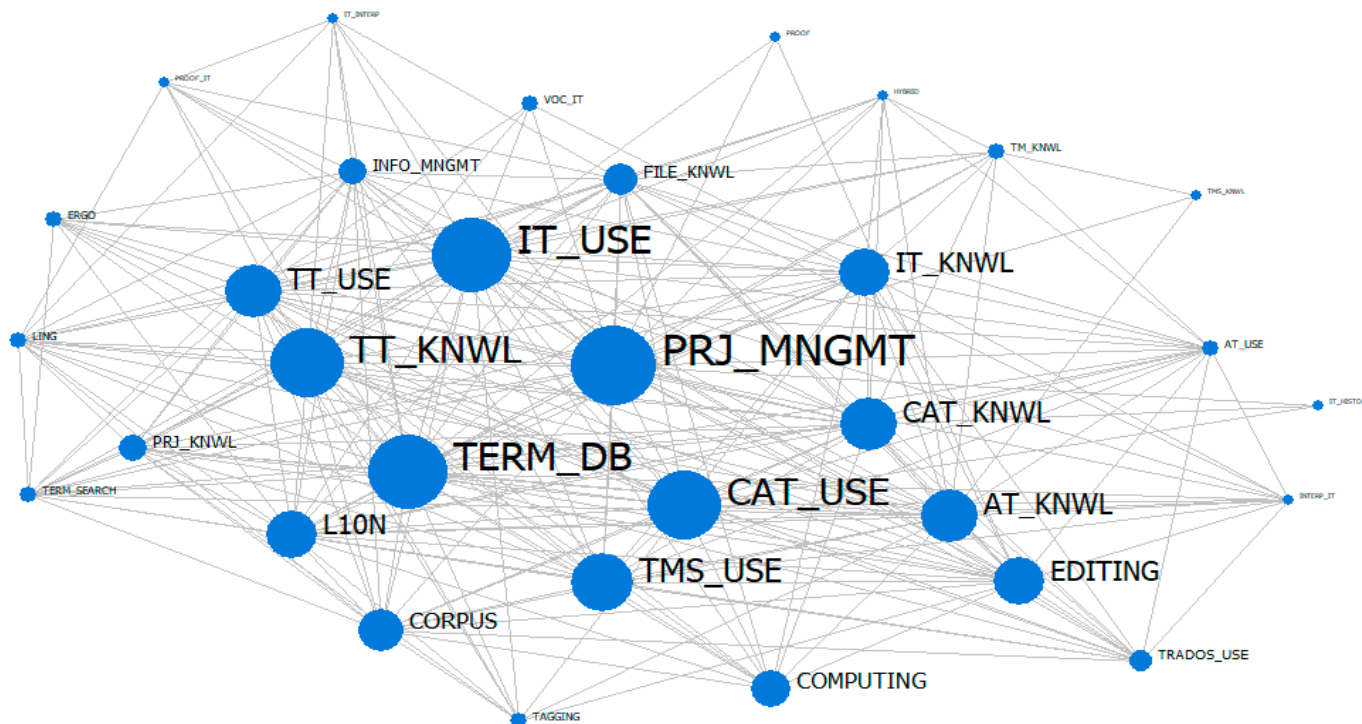


Figure 2. Relational diagram showing course learning goals.

The relationships between the nodes in Figure 2 describe the relationships between learning goals and universities. When a goal is repeated in several institutions, the size or degree of the goal is greater (the more relationships, the larger the node). The size of each node thus reflects the frequency of use of that goal in the data, with the most frequent goals at the center and the least frequent on the periphery. Thus, the goals relating to “Project Management” (PRJ_MNGMT), “Terminology Database Knowledge” (TERM_DB), “Using Information Technologies” (IT_USE), “Using Computer-Assisted Technologies” (CAT_USE), and “Translation Technologies Knowledge” (TT_KNWL) are the most predominant or frequent ones. The only university that mentioned specifically an ethical aspect in its course description was Middlebury University, in which one of its objectives was expressed as follows: “Best practices for training and using a customized statistical machine translation engine”. However, it is unclear if “best practices” includes ethical or professional conduct practices, or whether this merely refers to the technological skills involved in the training and use of these technologies. In what follows, we will address ethics in translation studies and, more specifically, in the development of professional technological competence.

6. A Classification of Translation Technology Ethics

The issues that technologies pose are extensive, often complementary, yet also sometimes partially contradictory. For instance, the extraction of data from low-resource and crisis-relevant languages without permission poses ethical issues (ethics of data), while, at the same time, the lack of data in these languages and the difficulty in extracting data from them make access to technology, training and infrastructure in those languages more challenging (ethics of justice). Following Bowker’s work on categorizing these issues into areas

or topics in the Special Issue of *Translation Spaces*, as well as Chesterman's classification of ethical models in translation, we present here a proposal that seeks to group current ethical concerns relating to the use of TT. Our proposal includes six areas or models of ethics that arise, or come into greater focus, as the result of the implementation of TT.

First, **ethics of data** cover issues relating to everything that occurs during the handling of data. This includes issues linked to intellectual property and copyright, as well as the protection of translation data from modification and other forms of violation which might have an impact on the quality of work performed and, consequently, on the translator's reputation (Mitchell-Schuitevoerder 2020, pp. 113, ff.). This, in turn, is related to the confidentiality of the information contained in translated contents, especially when these are shared in Translation Memory Exchange (TMX) format and then reused in MT, as well as issues of confidentiality, ownership, copyright, authoring rights, associated legal matters, costs, trust, and reliability (Drugan and Babych 2010). Liability is also an important aspect in terms of issues related to breaches of confidentiality. Paullada (2020) and Moorkens (2020, p. 28) advocate moving away from the kind of data extraction that is necessary to build most MT systems and to consider long-term value, including all stakeholders. On the other hand, O'Mathúna et al. (2019) discuss translation in crisis situations and raise issues concerning the support of low-resource and crisis-relevant languages, even if they lack commercial viability, so as to ensure linguistic diversity. Finally, issues about data dispossession and misuse, as well as surveillance capitalism, are also possible problem areas.

The **ethics of professional value** are addressed in detail by Do Carmo (2020) and Moorkens (2020). The latter contends that the "Taylorization" of the translation industry, as well as other technology-mediated practices such as crowdsourcing and fansub, are affecting the inherent value of the translation profession, as well as the pricing of services and fair compensation of professionals. These practices can, in turn, result in the risk of exploitation of well-intentioned volunteers, especially if they are not familiar with what translation entails or the full scope of a project (O'Hagan 2022, p. 432).

The **ethics of sustainability**, following Kenny et al. (2020, p. 5), address concerns both about the sustainability of current and new work systems and their impact on translator training, as well as concerns relating to the environment and how an uncontrolled explosion in the volume of translation can lead to more energy consumption and therefore have an impact on the environment. In relation to work practices, Nurminen and Koponen (2020) claim a space for all stakeholders, and especially translators and linguists, in the development of technological progress. As for environmental concerns, one of the main voices here is Cronin (2017, 2020), who argues for more ecological approaches to translation.

The **ethics of representation** include questions directly associated with the target text in relation to the source text, with issues that cover quality, acceptability, as well as bias in the translation output due to the data technology used to generate translation models.

The **ethics of justice** deal with inequalities regarding access to technology, technological infrastructure, and training. This dimension is especially important for those communities and stakeholders in underprivileged positions, such as migrants or communities affected by crises, who might not have the means to purchase or develop their own technological resources for translation.

Finally, the **ethics of the market** cover more general economic issues relating to the motivations behind the development of TT, ranging from the financing of systems and the interests of stakeholders to problematic narratives of selling TT as the final solution to the problem of all communication barriers, with possible neoliberal intentions of the homogenization of languages and cultures and the opening up of new markets. When we analyze these narratives, we realize there is a reason for linguistic diversity, independence, and self-determination, and that the corollary of "No Language Left Behind" could indeed mean "No Market Left Behind".

Figure 3 below summarizes the six areas of ethics outlined in the preceding paragraphs.

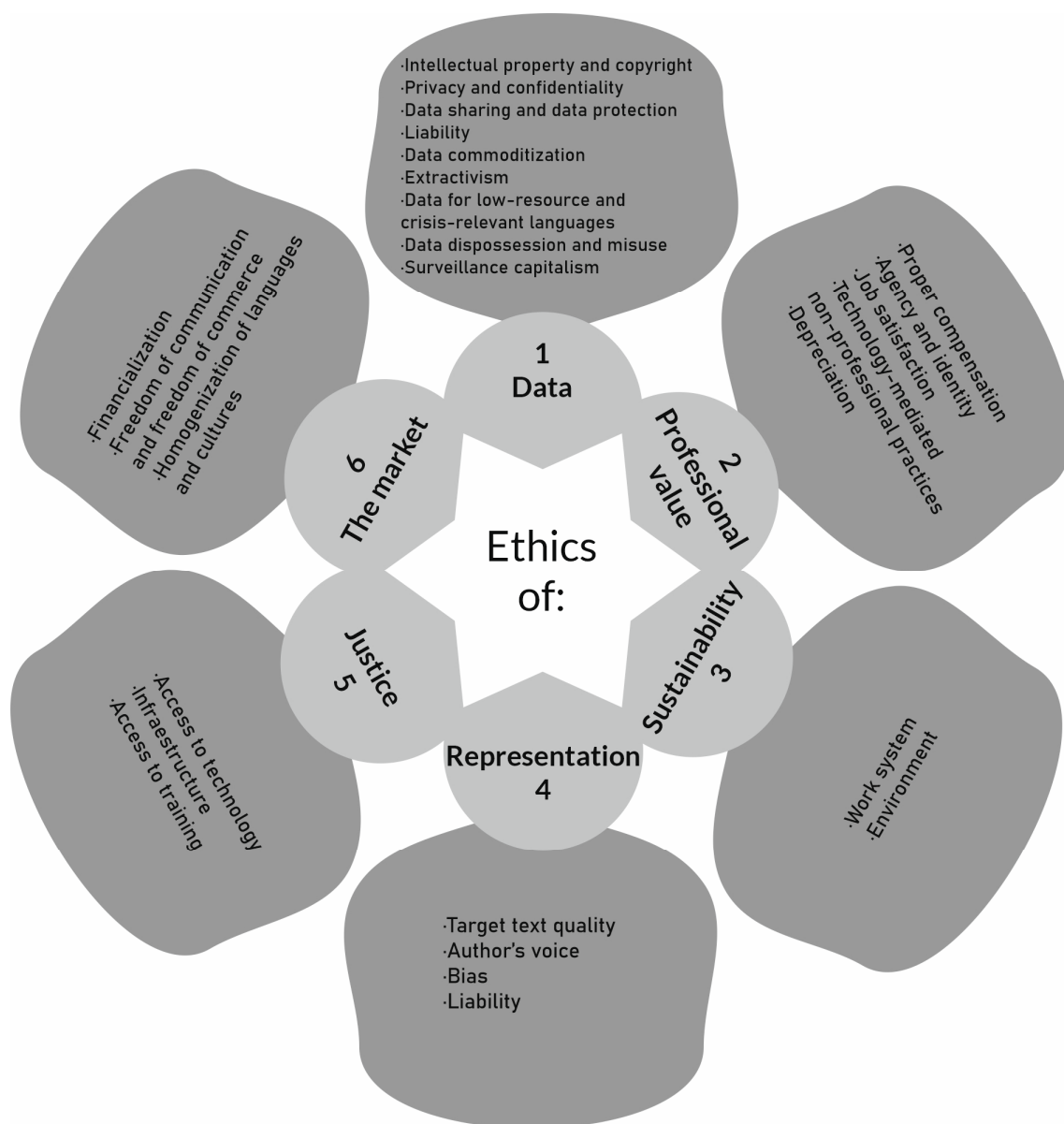


Figure 3. Ethical issues with translation technologies.

7. An Integrated Proposal to Develop Ethical Competence in the Translation Technology Classroom

The teaching of TT gained momentum in the 1990s and 2000s. At that point, it was mainly framed in terms of instrumental skills and procedural knowledge, with the focus “largely placed on describing tool function and design and on creating ‘how to’ guides” (Bowker 2020, p. 262). Practitioners and scholars felt less threatened because, as Kenny (2011) notes, “I could live with a technology that I understood, whose developers I could talk to, and whose limitations were well known. I could live with a technology that co-existed with human translation without really rivalling human translation”. Another example of this idealism is seen in Hutchins’s (1986, p. 15) work, who observes that many researchers had been “motivated by idealism: the promotion of international cooperation and peace, the removal of language barriers, the transmission of technical, agricultural and medical information to the poor and developing countries of the world.” Melby and Warner (1995, p. 13) referred to this as “the fascination of machine translation”, and Kenny (2011) reflects on the enthusiasm that was felt at the time:

I had, after all, completed a postgraduate degree in machine translation (admittedly in the early 1990s) and had been happily teaching budding translators about the technology for many years. I enjoyed participating in a community in which machine translation researchers and translation scholars could understand each other and work together, and I appreciated that machine translation could act as a test bed for lexical and grammatical formalisms that attempted to capture the complexity of natural languages.

Many things have changed since then. After some ups and downs since early experiments in the field, we have observed the rampant development of new MT technologies, with the latest advances including the use of artificial intelligence and neuronal networks, leading to unprecedented quality in output texts, and with MT thus becoming, for the first time, a genuine rival to human translation. Hence, we are now at a new “Peak of Inflated Expectations” of the Gartner Hype Cycle (Gartner 2021; Bern 2022), with technologies such as advanced AI language models, deep learning and neural machine translation being discussed in the mainstream press, such as the recently released application ChatGPT (Castillo-Gonzalez 2022). Some stakeholders in the industry even argue that humans will eventually disappear from the loop (Van der Meer 2022). Further, technologies have also enabled non-professional practices such as crowdsourcing and fansub (Jiménez-Crespo 2017) and disrupted more traditional technology-resistant realms such as literary translation (Kenny and Winters 2020) and interpreting (Braun 2019), intensifying the feeling of an approaching threat.

In a race to reflect these trends in the TT course syllabi, most courses now include teaching MT and post-editing as part of the new workflow for most current and future translators (Rodríguez de Céspedes 2019). As Canfora and Ottmann (2020) argue, however, it might well be that such perspectives and attitudes reflect inflated expectations that in turn lead to a certain blindness regarding the possibilities of technology and, more importantly, its effect on human activity.

Therefore, while it becomes clear that it is essential to educate students so that they gain awareness and knowledge of current technological advances, it is also becoming more important than ever to reflect on and teach ethical and critical thinking in relation to technology among current and future professionals. Authors such as Moorkens (2020, p. 27) highlight this need and the responsibility of trainers to introduce business ethics in particular, as current students will become future professional translators, project managers, technology experts, and localizers, that is, the ones who will devise and implement translation workflows and data-harvesting practices that will shape the future of the sector.

Including ethics in the TT class in this sense is essential; yet it is often an after-the-fact measure. Therefore, it is important to stress that ethical considerations should ideally be focused on at the beginning of the development process, that is, when software is designed, since “The social, legal, and ethical considerations of technology should not be something we consider after the fact” (Derrow 2022). This is in line with the notion that all stakeholders should be included in the development process, as reflected in the views of Bender et al. (2021, p. 619) when they observe that “Work on synthetic human behavior is a bright line in ethical AI development, where downstream effects need to be understood and modeled in order to block foreseeable harm to society and different social groups”. However, this is not always the case, due to the great speed at which technology evolves, and we are thus often left in the position of having to consider ethical questions once new technology has been developed and is already widely used.

With regard to the inclusion of ethics in the training of translators, perhaps one of the most pertinent contributions is that of Joanna Drugan, in the form of an intervention on ethics training for interpreters and social workers in the UK (Drugan 2017) and, most interestingly for us, a proposal for an “integrated, inter-disciplinary approach to bringing ethics into translator training” (Drugan and Megone 2011). This proposal aims to frame ethics training as an interdisciplinary endeavor, one in which an ethicist and a translation studies scholar work together, involving the integration of ethics into already-existing translation

courses. The main pedagogical approach is the use of case studies, which allow learners to study real-life problems and take into account a variety of perspectives in offering responses and solutions. Concrete proposals for the inclusion of ethics in the TT classroom are also developed by Mitchell-Schuitevoerder (2020) and the research group MultiTrainMT. The former dedicates a whole chapter to digital ethics and risk management in her recent handbook *A Project-Based Approach to Translation Technology*. She focuses on intellectual property rights, confidentiality, collaborative translation, non-disclosure agreements and liability, and also highlights the disadvantageous position in which translators often find themselves in relation to both the client and the language service provider. The handbook also contains a number of activities. The project MultiTrainMT (<https://www.multitrainmt.eu/>, accessed on 22 April 2022) has created training materials for both multilingual citizens and translators, including a course and a book, specific activities, and an online platform to learn neural machine translation (MutNMT). The book includes the chapter cited above by Moorkens (2022), “Ethics and Machine Translation”, and the activities section comprises 34 activities, including quizzes, topics for analysis and discussion, essay prompts, fill-in-the-blanks exercises, and games.

For our proposal, we have drawn particularly on Bloom’s taxonomy, which dates back to 1956 and was updated in 2001. It is a multi-tiered model that classifies thinking into six levels of cognitive complexity. The classic taxonomy includes three lower levels: knowledge, comprehension, and application; and three higher levels: analysis, synthesis, and evaluation. The revised taxonomy includes terminological and structural changes to best reflect the challenges students and teachers face in the 21st century. For example, nouns in English can evolve into verbs, and the new taxonomy tries to embrace such changes through the inclusion of two dimensions. These are the knowledge dimension: factual, conceptual, procedural, and meta-cognitive knowledge; and the cognitive dimension: remember, understand, apply, analyze, evaluate, create (Anderson and Krathwohl 2001, pp. 28–29). We have also been inspired by Drugan and Megone (2011, p. 188), who claim that the goal of ethics in translator training should be “to develop good judgment”, as well as by the work of Mitchell-Schuitevoerder and MultiTrainMT.

Our proposal adapts Bloom’s taxonomy and contains four levels: (1) understand; (2) apply; (3) evaluate; and (4) create (Figure 4). The aim, then, is for students to be able to understand general ethical issues as they relate to TT, to identify and analyze these as they arise in specific contexts, and to justify and develop an effective response. Further, we add the level “create” so that students are encouraged to develop new materials and devise new approaches to address ethical issues, from rewriting professional codes of ethics to cater for the specifics of TT to engaging in activism and resistance towards creating a more “humane technology”, as well as to explore new approaches as a means of solving current issues, such as the use of blockchain, a technology based on shared, immutable ledgers that can publicly track all transactions, towards addressing issues of privacy, ownership, and liability issues.

Based on this model, we propose the following taxonomy, adapted from the work of Anderson and Krathwohl (2001). Once the basic notions are established, our focus is largely on creating conceptual and procedural knowledge so that students develop a series of strategies on how to approach and respond to the ethical issues they will face in the future (see Table 3).

Therefore, our new competence model for the TT classroom, based on the results presented from our syllabi analysis, is as can be seen below in Figure 5.

First, a general IT competence would be the basis on which to start building a specific sub-competence, one which would include factual, conceptual, and procedural knowledge about different tools, from translation memories to terminology, corpora, MT, project management, social media, etc. (cf. Vargas-Sierra 2020). This would be complemented by a higher level of procedural and meta-cognitive knowledge on project management, so as to be able to integrate these tools into real processes. Finally, this ethical sub-competence would complete and complement all other sub-competences by providing a critical per-

spective on every step of the learning process, as well as providing the knowledge and instruments needed to tackle possible ethical conflicts arising from the use of technologies, and to offer innovative solutions here.

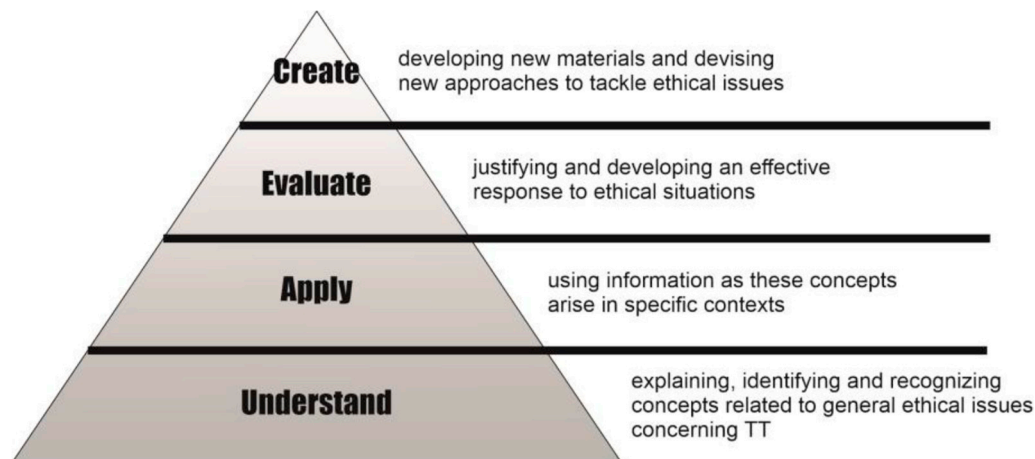


Figure 4. Learning taxonomy for ethical issues in Translation Technology courses.

Table 3. Taxonomy with learning goals and knowledge and cognitive dimension.

Cognitive Process Dimension	Learning Goals	Knowledge Dimension			
		Factual Knowledge	Conceptual Knowledge	Procedural Knowledge	Metacognitive Knowledge
UNDERSTAND	Understand and articulate the different ethical issues related to the use of TT.	Read and summarize academic articles, videos and presentations on ethical issues and TT. Read data privacy policies and interpret what happens to uploaded data. Read reports such as the IEEE (Institute of Electrical and Electronics Engineers) Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems or the UNESCO Recommendation on the ethics of artificial intelligence.	Categorize TT related ethical issues. Show understanding of the ethical problems posed by TT.	Paraphrase concepts and definitions in the students' own words. Explain the implications of a specific TT related ethical issue. Confirm knowledge through quizzes or directed exercises.	Focus on keywords to be able to summarize the main ethical concepts in IT. Produce a cognitive development. Be aware of tasks to be done and how to get involved. Connect what the student knows about ethical issues in translation to the new issues arising from the use of technology.
APPLY	Use what you know to generate different responses and actions to the ethical issues identified.	Classify ethical issues according to a number of variables. Apply knowledge of translation processes and tools to specific contexts where ethics are involved.	Take tests to understand the ethical concepts involved. Design a range of ideas and approaches, alone and in collaboration.	Identify and classify specific ethical issues in a given case study. Identify risk factors in a given scenario that includes the use of TT. Respond to the ethical issues that emerge in a case study.	Think about an ethical problem and solve it appropriately. Foresee any potential ethical issues that might arise in a given situation. Assess your own ethical position in relation to specific topics.

Table 3. Cont.

Cognitive Process Dimension	Learning Goals	Knowledge Dimension			
		Factual Knowledge	Conceptual Knowledge	Procedural Knowledge	Metacognitive Knowledge
EVALUATE	Analyze real-life cases and identify the TT ethical issues that they pose.	Rank ethical issues according to their importance, severity, dimension, etc.	Assess students' own progress and knowledge. Modify ideas and solutions to improve these.	Respond to the ethical issues that emerge in a case study. Compare opposing approaches.	Select the best solution in a given scenario. Achieve agreement between different stakeholders with different interests.
		Study new technologies that can help to address ethical issues, such as blockchain. Produce one's own work that demonstrates knowledge and understanding of the work of translators in the context of technology and professional ethics.	Generate appropriate and original ideas on protocols and processes to clarify doubts and to propose possible improvement.	Evaluate the applicability of new technologies to address ethical issues. Develop new approaches to solving ethical problems. Draft TT specific covenants for a professional code of ethics. Create more specific terms of business in a non-disclosure agreement that tackle specific ethical issues. Draft a manifesto for more humane TT.	Networking to solve ethical issues. Strategizing new approaches and solutions to existing problems.
CREATE	Engage in new approaches and create new materials.				

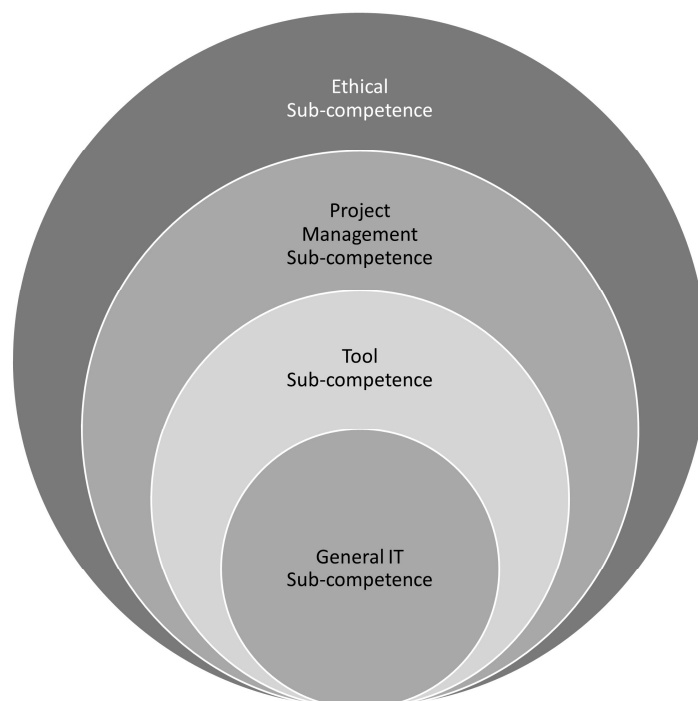


Figure 5. Sub-competences in the Translation Technology Classroom.

8. Conclusions

The practice of translation today is inextricably linked to technology. Every step of the process, from reception of the text to final delivery, is shaped and facilitated by applications, telecommunications, and digital formats. This is reflected in how translator training is conceptualized, where technologies are introduced in specific courses on translation technology

but are also often used as part of other translation classes. Whereas no one denies the need to train students to use and apply these technologies as a means of becoming competitive in the translation marketplace, more and more authors, both from the academic world and from the industry itself (Joscelyne 2022), are voicing their concerns about the ethical issues posed by the use of technology and, more recently, artificial intelligence systems. Having analyzed these issues and confirmed that they are not specifically addressed in TT classes, or at least are not reflected in the syllabi we assessed, we have argued that a space should be opened up in the TT classroom for consideration of ethical competence. Specifically, we have proposed a model to classify those ethical issues that are specifically related to the use of TT. Although it is becoming more and more difficult to differentiate technologically derived issues from a broader, general ethics of translation, especially considering that translation is now so highly immersed in technology, we argue that these issues, as identified in the literature, relate most closely to the deployment of certain technologies in the translation process. Further, we have introduced a model, based on Bloom's taxonomy and the approaches by Drugan and Megone (2011) and Mitchell-Schuitevoerder (2020), that seeks to develop ethical competence in the TT classroom.

Future research here will include a survey of universities and translator training centers to compare our results on the presence or absence of ethics in TT courses, as well as a survey of industry stakeholders and professionals on the ethical issues they face and how these might be included in training. The goal here would be to enrich and finetune the proposed model and then evaluate its viability through applications in real teaching contexts. Our overall aim is to demonstrate that ethics training in the TT classroom can help develop critical thinking skills and be used as a way of exploring topics relating to professional development, economic growth, technology, and social issues.

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